The PALIMPSEST

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Iowa Inventors and Inventions — 1843-1873

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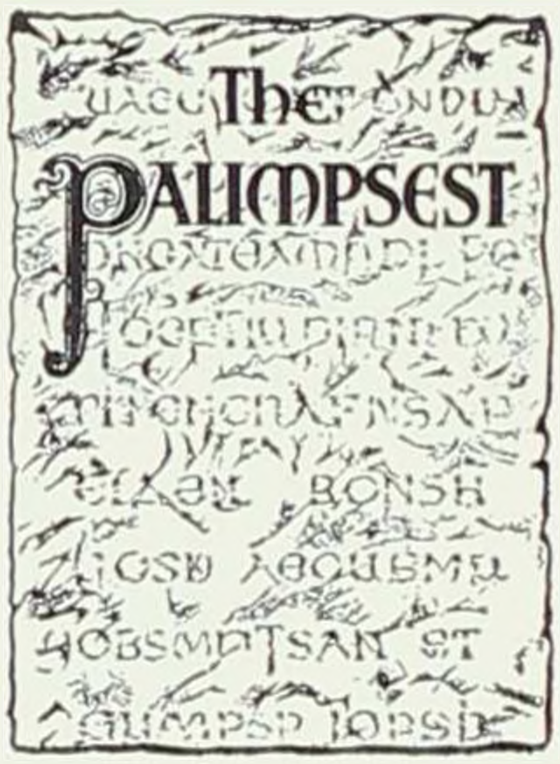

The Meaning of Palimpsest

In early times a palimpsest was a parchment or other material from which one or more writings had been erased to give room for later records. But the erasures were not always complete; and so it became the fascinating task of scholars not only to translate the later records but also to reconstruct the original writings by deciphering the dim fragments of letters partly erased and partly covered by subsequent texts.

The history of Iowa may be likened to a palimpsest which holds the record of successive generations. To decipher these records of the past, reconstruct them, and tell the stories which they contain is the task of those who write history.

Contents

Illustrations

All illustrations, drawings, and photos were gathered by Dr. and Mrs. Calkin in the United States Patent Office in Washington, D. C. Front cover picture is from the Library of Congress collection.

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THE PALIMPSEST

EDITED BY WILLIAM J. PETERSEN

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Iowa Inventive Genius

A tool is but the extension of a man's hand, and a machine is but a complex tool. And he that invents a machine augments the power of a man, and the well-being of mankind.—Henry Ward Beecher.

The July 1969 issue of *The Palimpsest* was the first of two numbers devoted to the subject—"Iowa Inventors and Inventions." The present issue concludes the story that involves 1,910 persons, living in 395 cities, towns, and townships, who patented 2,300 inventions between 1843 and 1873. The July and August issues combined, coupled with their 32 pages of illustrations of patents discussed in the text, offer a glimpse of the deep-seated genius and widespread interests of the pioneers who lived in Iowa during the first four decades of settlement.

It has been said that "Necessity is the mother of invention." Judging by the number of inventions relating to agriculture there can be little doubt that farming offered the main source of

livelihood for the Iowa pioneers. The long hours involved in plowing the tough prairie sod, tilling the soil, and planting and harvesting the crops, were the common experience of most pioneers. It is not surprising, therefore, that fully one-fourth of the inventions patented by Iowans between 1843 and 1873 were related in some way to agriculture.

Only once before (in the case of Frank Luther Mott's *Iowa Magazines,* July-August 1963) have two consecutive issues been required to complete a particular story in *The Palimpsest.* One of Iowa's few Pulitzer Prize winners, Dean Mott's contribution is a classic illustration of concise writing on a tremendous subject. The same is true of this work on Iowa Inventions by Homer and Corrine Calkin. The magnitude of the material covered is revealed in every page, and by the maps and graphs prepared to illustrate the text.

WILLIAM J. PETERSEN

Trades, Crafts, Manufacturing

Not all Iowans gained their livelihood from farming in the mid-nineteenth century. Various trades and crafts were followed. The builder constructed homes and stores; the printer produced books and newspapers; the shoemaker made and repaired shoes; others were responsible in additional ways for providing people with the necessities and pleasures they needed and wanted.

There were also many manufacturing processes being developed and used at this time. Each craft and each type of factory led to the development of new ideas and methods which could be, and were, patentable.

Blacksmithing

Inventions to aid the blacksmith were of three types: first, there were those relating to horseshoes; second, putting iron tires on wagon wheels; and third, the bellows, forges, tuyeres and tools used by the blacksmith. Four of these patents were received by C. Weitman, a German emigrant who settled first in Hazleton and later lived in Independence. Since he was a blacksmith, it was only natural that his inventions followed this line.

Augustus Weitman of West Union patented two horseshoes. His object was to secure the shoe

to the hoof without using nails. At the same time it would prevent the animal from becoming hoof-bound. He constructed his shoes in two equal parts connected with a pivot.

M. B. Wills of Humboldt developed a horse-shoe cork sharpener in 1869 that would enable every man to sharpen the shoes of his own horse. He could "thereby save a large blacksmith bill in the course of a year." However, it was never patented and probably never placed on the market, at least very extensively.

Animal shoeing stock: Sinclair, Davenport.

Bellows, blacksmith's (2): Hemmingsen, Marshalltown; Miller & Faris, Red Rock.

Blacksmith's tool: Forbes, Marshalltown.

Forge, blacksmith's: Scott, Fairfield.

Horseshoes (6): Ladd, Ottumwa; Moore, Bloomfield; Pleyel, Adel; Weitman (2), West Union; Weitman, Hazleton.

Horseshoe calk sharpener (6): Butler, Dunham & Wann, Marshalltown; Crocker, Marshalltown; Close, Chariton; Duncan, Vinton; Hays, Duncan & Bowen, Vinton; Kline, Marshalltown.

Horseshoe jack: Shimer, Scranton Station.

Horseshoe nail clincher: Rapp, Waterloo.

Horseshoe, securing: Weitman, Hazleton.

Pump, bellows: Wallis & Swearingen, Milton.

Tire bender (2): Scott, Fairfield; Tomlinson, Onslow.

Tire heater: Ingalls, Independence.

Tire, securing on wheels: Barnes, Albia.

Tire setter: Cawthorne, Lyons.

Tire setting and cooling machine (2): Guy, Postville; Courtleyou, Chariton.

Tire shrinking device (3): Weitman, Independence; Weitman, Hazleton; Scott, Fairfield.

Tire upsetting machine (2): Badley, Afton; Ingalls, Independence.

Tuyere (2): Cain, Moravia; Raines & Owens, Oskaloosa.

Brewing

Most of the brewers of Dubuque, such as Peaslee's Ale Brewery, Anton Gehrig and Anton Heeb of the Dubuque Brewery, and Ignatz Seeger's Key City Brewery, seemed to have little interest in inventions. An exception was M. Tschirgi, a native of Switzerland who came to Dubuque in 1846. He worked with Gehrig at the Dubuque Brewery from 1846 to 1847. For the next eight years he brewed beers at various locations. In 1855 he and J. Schwind organized the Western Brewery, one of the largest and most complete in the state. Based on his extensive experience he invented beer reservoirs and coolers for which he received patents in 1865 and 1866.

Aging alcoholic liquor: Purdy, Burlington.

Beer cooler: Tschirgi & Kammüller, Dubuque.

Reservoir for beers and wines: Tschirgi, Dubuque.

Spirits, manufacture of: Purdy, Burlington.

Stills, worm tub for: Johnston, Farmington.

Wine filter: Schmidt, Davenport.

Wine press (2): Davenport & Case, Davenport; Scholer, Burlington.

Building Construction

Carpenters, masons, bricklayers and painters were aided by 80 patents. Some dealt with im-

proved methods of construction such as building an arch by Frank Alsip of North McGregor, a portable fire wall by J. F. Bishop of Afton, and building walls by M.P. Turner of Des Moines.

Others such as E.K. Wood and R.W. Henry of DeWitt, J.C. and C.M. Bills of Ottumwa, and Marshall Turley of Council Bluffs developed new paints and stains.

Many Iowa inventors were concerned with developing machines for tenoning, dovetailing, mitering, and sawing lumber preparatory to building. H. Littlefield who came to Lewis in 1856 received two patents for improvements in scaffolds.

Eighteen men patented brick molds or presses. The need for building materials was great in an expanding state. The earliest patent was by H.J. Hughes of Davenport on February 5, 1856. A year later R.R. Harbour of Oskaloosa patented his machine which exerted powerful and gradual pressure in the formation of the brick by use of levers on a circle. It took only a small amount of power to operate it.

M. B. Wills of Humboldt had a machine that manufactured 16 bricks with each revolution of the wheel. "Its capacity is to manufacture 25,000 perfectly compressed and uniform-sized bricks a day," said the Dubuque *Times*. It was built by Wills and Johnson of Iowa Falls, but probably not patented.

Bernard Zwart of Keokuk was one of two who patented lime kilns. He improved the form of the smokestack, added a diversion wall whereby two fireplaces were created, and improved the construction of hot-air conductors in combination with draft flues.

In addition to inventing furnaces and car couplings David Hargar of Des Moines developed a new roofing composition. He used three parts of coal tar (not boiled), three parts sand, three parts quicklime, 1/90 part sulphate of zinc, and 1/90 part flour of sulphur, thoroughly mixed. The Des Moines *Register* had no doubt that it was certain to supersede "all roofing of the pitch, 'plastic slate,' 'crystal rock,' 'crushed limestone', and other sorts. It can be put on felting, wood, sheet iron, tin or stone." Tin on which it was placed could be heated red hot without igniting the mixture.

The *Register* writer said he had been shown a piece of tin that had been covered for eight or ten days. "It has probably been bent and twisted a thousand times, without making a crack or break in it." He concluded that he could "heartily endorse it as a big thing."

Dunlap; Newell, Des Moines; Newlove, Burlington; Schuffenecker (2), Keokuk; Williams, Dakota.

Clapboards, gage for holding: Cummings & Babcock, Boonesborough.

Dovetailing machine: Wolf, Burlington.

Lath machine: Meigs, Dubuque.

Lime kiln (2): Randall, Mason City; Zwart, Keokuk.

Log rossing machine: Nichols, Clinton.

Lumber tonguing and grooving cutter: Perrin, McGregor.

Lumber trimming machine: Lamb & Frazier, Clinton.

Mitering machine (2): Loetscher, Dubuque; Rosecrans, Marshalltown.

Oil for mixing paint: Wood & Henry, DeWitt.

Paint for roofing, wood & metal: Bills, Ottumwa, & Bills, Albia.

Planes, arrangement of parts in rotary: Kramer, Marion.

Plane, splint: Drake & Drummond, McGregor.

Planing machines (3): Climer, Muscatine; Snow, Dubuque; Tostevin, Council Bluffs.

Roofing (11): Chaffee, Des Moines; Foster, Burlington; Green, Christiansburgh; Hargar, Des Moines; Hogue, Oskaloosa; Van Dyke & Eastwick, Keokuk; Van Pappelendam, Charleston; Thompson (2), Kirkville; Weed, Muscatine; White, Dubuque.

Saw mill (3): Richardson & Richardson, Martinsburgh; Trunick, Muscatine; Woodard & Snyder, Missouri Valley.

Sawing machine (9): Bliss, Hamburg; Harreld, Washington; Meyer, Council Bluffs; Miller, Fairfield; Morehouse, Washington; Ringstad, Decorah; Schamweber, Davenport; Washburne, Burlington; Wilson, Council Bluffs.

Scaffold (3): Chatten, Marion; Littlefield (2), Lewis.

Shingle machines (5): Auld, Brighton; Bitzer, Muscatine; Craine (2), Fairfield; Dexter, Clinton.

Siding gage: Lewis, Princeton.

Tenoning machine (2): Curnan, Lyons; Witter, Sherrill's Mount.

Tinner's firepot: Cary, Millersburgh.

Wall for buildings: Turner, Des Moines.

Wall, portable fire: Bishop, Afton.

Weatherboard gage (2): Newlove, Burlington; Tinsley, Blakesburgh.

Weatherboard scribe: Miller & Faris, Red Rock Twp., Marion Co.

Weather strip (4): Case, Des Moines; Corbit, Bethlehem; Dodder, Washington; Patton, Hamburg.

Wood, composition for staining: Turley, Council Bluffs.

Dry Goods and Groceries

Among the 25 patents which were of use in dry goods stores and groceries, two may be noted as having unusual interest. George H. Smith of Glenwood combined a spring balance and knife. He used a balance such as that used by butchers and retail dealers when articles were sold by weight. By inserting it in the handle of the knife, articles could be cut and weighed by one and the same instrument. According to Smith's patent application the work was done just as accurately and far more expeditiously than by the usual method of cutting off the piece or article and placing it on an ordinary scales or balance.

Sol Kuh of Jefferson patented an advertising lantern in 1872. On each of its four sides he placed rows of varicolored glass. Upon these, words were attached or printed. The lantern was attached to a padded headrest and had a light inside of it. It could then be carried through the streets at night, advertising the enterprising merchant's products.

Bag holder (5): Darling, Davenport; McPhail, Charles City; Smith, Des Moines; Striker, Iowa Falls; Turner, Cedar Rapids.

Counter, show: Beardsley, Mt. Zion.

Filter and cooler: Woodman, Dubuque.

Lantern, advertising (2): Kuh (2), Jefferson.

Liquid cooler and ice water stand: Giebrich, Burlington.

Measuring appliance: Smith, Lansing.

Measuring cloth (2): Beaton, Grinnell; Crocker, Port Allen.

Refrigerator and soda apparatus (2): Cohen, Bloomfield; Johnson, Ft. Madison.

Ribbon case: Woolston, Marshalltown.

Scales (4): Bell, Cedar Falls; Budge & Russell, Cedar Falls; Lawrence, Cedar Falls; McDonald, Dubuque.

Scales combined with knife: Smith, Glenwood.

Showcase, revolving: Melendy, Delhi.

Showcase, wallpaper: Odell & Hudson, Iowa Falls.

Soda fountain: Hamilton, Cedar Falls.

Spool thread case: Parsons, Burlington.

Mining and Stonework

A few patents were related to mining and stonework. N.D. Clark of Bentonsport invented a gold washer which he proposed calling "Gold-Hunter." F.W. Crosby of Toledo invented an improved ore roasting oven in 1868. Shortly after receiving his patent, he went to North Carolina to prospect for gold.

The *Register,* in reporting this invention, said Crosby was also the inventor of a fountain pen "much in use" and was now " 'figuring' at something by which he thinks electricity can be applied to the working of breaks [sic] on railway cars."

Amalgamator, gold and silver: Bolthoff, Burlington.

Auger mining: Hobart, Dubuque.

Gold digging apparatus: Tisdale, Des Moines.

Gold washer (2): Canfield, Sabula; Clark, Bentonsport.

Ore roaster: Crosby, Toledo.

Ores, reduction of: Hay, Burlington.

Rock drill (2): White & Baumgardner, Davenport; White, Davenport.

Stone drilling machine: Frizell, Keokuk.

Stone sawing mill: Mills, Dubuque.

Printing

Although only eleven patents related to the printing industry, some were important in the spread of information in a frontier state. In 1858 Henry Harger of Delhi patented his mechanical typographer. It could be used either for printing on paper or for making an impression in wax so as to form molds or matrices for electrotyping.

Two years later he invented a typesetter. It consisted of an arrangement of machinery in connection with the type case. By this means type was fed to the composing stick. Levers and fingers readily took the type from the case and set it in line on the stick.

That versatile Council Bluffs inventor, Marshall Turley, received two patents for printer's ink. He developed one with Benjamin F. Thomas. They used pitch from a pine tree or pine tree rosin which they heated to about 800° F. This vaporized the more volatile portion and produced an inflammable gas.

The liquid pitch, together with the vapor thus generated, was discharged through a tube 50 to 100 feet long. The gas was ignited and burned at the end of the tube. The liquid was collected and coloring matter consisting of charcoal from soft wood was mixed with it. One pound of white lead was added to each 20 pounds of the mixture.

Ink, printer's (2): Turley, Council Bluffs; Turley & Thomas, Council Bluffs.

Photographic plateholder: Averill, Decorah.

Photographic printing press: Hamilton, Sioux City.

Printer's galley: Snyder, Burlington.

Printing, inking appliance for color: Biddle, Knoxville.

Type case: Aldrich, Marshalltown.

Typesetting (2): Harger, Delhi; Neff & Scruggs, Monroe.

Typographer, mechanical: Harger, Delhi.

Writing and printing machine: Peeler, Webster City.

Shoemaking and Leatherwork

Mid-nineteenth century shoemaking was done on an individual basis. Patents received by Iowans dealt principally with making boot and shoe patterns, improving tools, and tanning leather.

James N. Sturtevant and Harvey E. Jones of McGregor patented a new formula for tanning hides. They mixed one-half barrel of water, eight pounds of common salt and one-half pound of sulphuric acid, stirring it well before placing the hides in the barrel.

The hide was soaked for six hours to two weeks, depending upon its thickness. Then it was

removed, rinsed, and scoured with a stiff brush, removing all salt and acid. It was now ready to make into shoes and boots.

Boot and shoe shank and toe laster: Graves, Osage.

Boot blacking case: Carter, Keokuk.

Boot crimper: Marcy, Keokuk.

Boot leg: Haviland, Ft. Dodge.

Boot patterns (3): Augustine, Dubuque; Burnett, Keokuk; Forrist & Wheeler, Mt. Vernon.

Currier's slicker (2): Peters & Pauly, Keokuk; Peters & Williams, Keokuk.

Edging tool for boot soles: Smiley, Albia.

Heel, boot and shoe: Engledow, Cedar Falls.

Hide and leather dressing machine: Baumgardner & White, Davenport.

Hides in tanning, apparatus for handling: Haviland & Phillips, Ft. Dodge.

Laster, shank: Cain & Cain, Dubuque.

Leather cutting machine: Crocker, Marshalltown.

Leather rolling machine: Monson, Upton.

Leather splitting gage: Baird, Bloomfield.

Peg cutter, boot and shoe: Sellers, Keokuk.

Sewing horse: Mills, DeWitt.

Shoe fastening (2): Coppock, Earlham; Hart, Buffalo Twp., Linn Co.

Shoe lining, removable: Everts, Cedar Falls.

Shoemaker's tool (2): Clippinger, Newton; Wilson & Foster, Chariton.

Sole, boot: Van Ausdall, Keokuk.

Strap cutter: Crocker, Marshalltown.

Tanning process (8): Crane & Baldwin, Anamosa; Hill (2), Dubuque; Hisey, Tama City; Needham, Oskaloosa; Pierce & Beardsley, Castle Grove; Sturtevant & Jones, McGregor; Wilcox, Percival.

Watchmaking

Only four inventions were patented for this craft. One, Waldin's watchmaker's lathe chuck, has already been mentioned.

Another sounds very modern in nature. S.P. LaDue of Rockford invented a calendar clock in 1859. He marked the wheels of the clock with figures and letters. He then arranged them so that they would move in proper sequence before an opening in the lower part of the clock case. The seconds, minutes, hours, days of the week, and the month would be indicated without the aid of movable hands.

Chuck, watchmaker's lathe: Waldin, Burlington.

Clock, calendar: LaDue, Rockford.

Watch case calendar: Moore, Grinnell.

Watch case spring attachment: Eason, Des Moines.

Metal Manufacturing Processes

A.T. Hay, proprietor of Hay's Steel Works in Burlington, was a native of Pennsylvania. He came to Iowa in 1851 for the Illinois and Missouri Telegraph Company. In 1854 he went to Minneapolis as agent of the United States Land Office. After having been in real estate and law in Burlington from 1857 to 1866, Hay turned his attention to scientific and metallurgic investigations.

Although he was self-educated and trained in his father's trade of blacksmith, he invented the Hay Steel Process. He also patented a process for

reducing ores, providing an electrical protection for boilers, and a process for preventing incrustation of steam boilers and sugar boilers.

Corrugating machine, sheet metal: Moore, Lyons.

Cultivator teeth, rolled steel plates for making: Skinner & Skinner, Des Moines.

Cutting, punching and upsetting, tool for: Kent, Lyons.

Eave troughs, machine for making: Yates, Clarence.

Edge tools, grinding: McLelland, McGregor.

Hub boring machine (5): Jonas, Burlington; Murphy, Dubuque; Owens, Oskaloosa; Roberts & Daily, Waverly; Walters, Riceville.

Hubs, device for securing boxing in: Turley, Council Bluffs.

Iron and steel, manufacture of (2): Hay, Burlington; Usher, Iowa Falls.

Iron with a harder metal, mode of coating wrought: Rigg, Iowa Falls.

Metal cutting and punching machine: Hastings, Horton.

Metal shearing machine: Kent, Lyons.

Metal, composition for covering: Green, Christiansburgh.

Pan former: Finn, Decorah.

Plow, composition metal for: Smith, Waterloo.

Plows, manufacture of (3): Barnes, Franklin Twp., Story Co.; Howell & Browning, Webster City; Skinner, Davenport.

Punch and shearing machine: Swanson, Newton.

Scouring box: Langdon, New Hampton.

Screws, molding female: Lamb & Wood, Keokuk.

Shearing tool: Sandgren, Lyons City.

Sheet metal boilers, construction of: Moore, Lyons.

Sheet metal cutting machine (5): Hall, Dubuque; Low (3), Waukon; Stevens, Decorah.

Sieve bodies, construction of (4): Mann (4), Burlington.

Spouts, machine for making: Woodworth, Iowa Falls.

Upsetting, combination machine for: Hunt, Oskaloosa.

Wheel teeth, machine for cutting: Underwood, Muscatine.

Wooden Manufacturing Processes

Ephraim Parker patented a machine for making clothespins in 1856. He attached a cutter to a common lathe used for turning out parts of chairs. The cutter extended the whole length of the timber to be turned. A wheel and a saw to slot and finish the clothespin were connected to the cutter.

The machine would take a square piece of timber from a spout and convert it into cylinders and clothespins in a single operation.

Barrelhead cutting machine (2): Bevard, Muscatine; Young, Muscatine.

Clothespins, machine for making: Parker, Burlington.

Lathe for turning fancy handles: Wentworth, Burlington.

Lathes to turn tapering shafts, tool for adjusting: Berkeley, Cedar Rapids.

Plane for making blind slats (3): Andresen, Davenport; Bess & Hagny, Keokuk; Miller, Oskaloosa.

Stave machine (4): Clark (2), Bentonsport; Dibble, Farmington; Hurlbut, Muscatine.

Other Manufacturing Processes

One does not think of Iowa as being well-known for its cigars. In the 1870's it was apparently a thriving business. H.F. Moeller and H.P. Brandt of Davenport patented a tool for boring cigar molds in 1871. Cigar-making machines were invented by Theodore Ernst of Fort Madison and H.E. Tylander of Keokuk in 1873.

When so much emphasis is being placed today on nicotine in tobacco, it is interesting to note

Patent No. 127,939. This was issued to Marshall Turley and Mary Jane Innes, Iowa's third woman inventor, both of Council Bluffs, for a cigar mouthpiece. They made the tapered mouthpiece of cornstalk or other pithy vegetation. It was claimed that this would absorb nicotine, allowing a free draft through the cigar while still being pleasant to the taste.

William Paggett Allen of Dubuque and W. Baustian of Davenport patented formulas for making friction matches, while Burhans of Burlington invented a machine to make the match splints.

Allen used one part of sandarac and two parts of shellac which he dissolved in alcohol, producing a paste the consistency of honey. He then added one part of phosphorous and two parts of the paste. He obtained friction matches which were not affected by moisture. They were, therefore, useful to seamen, miners and others who wished to keep or use them in damp places.

Bleaching straw goods: Rosburgh, Panora.

Cigar: Turley & Innes, Council Bluffs.

Cigar machine (2): Ernst, Ft. Madison; Tylander, Keokuk.

Cigar molds, tool for boring: Moeller & Brandt, Davenport.

Match splints, machine for making: Burhans, Burlington.

Matches, manufacture of friction (2): Allen, Dubuque; Baustian, Davenport.

Mineral water, manufacture of: Maloney, Des Moines.

Pasteboard cutting machine: Burhans, Burlington.

Plastic article, composition for molding: Legg, Malcolm.

Vinegar, appliance for manufacture of (2): Michael, Des Moines; Tiffany, Davenport.

HOMER CALKIN—CORRINE CALKIN

PATENTS ISSUED BY U.S. PATENT OFFICE
1843 - 1873

Year	*Issued To Iowans*	*Total Issued*	Year	*Issued To Iowans*	*Total Issued*
1843	1	494	1859	39	4,160
1844	0	478	1860	50	4,357
1845	0	473	1861	51	3,020
1846	1	566	1862	70	3,214
1847	0	495	1863	88	3,773
1848	0	583	1864	95	4,630
1849	2	984	1865	104	6,088
1850	2	883	1866	176	8,863
1851	2	752	1867	247	12,277
1852	3	885	1868	227	12,526
1853	2	846	1869	231	12,931
1854	3	1,755	1870	201	12,137
1855	8	1,881	1871	216	11,659
1856	7	2,302	1872	224	12,180
1857	12	2,674	1873	230	11,616
1858	34	3,455			

Light, Heat, Power, Water

This group of patents was fifth in importance as far as numbers were concerned. A total of 235 patents, or approximately 10 per cent of those granted to Iowans, were in these categories.

J.C. Paine was born in Canada in 1832 and came to Dubuque in 1857 where he worked for J. Maclay. Paine established his own business in 1874, dealing in stoves, tin, copper and sheet-iron ware. He was the inventor of some of the products he sold, having patented a stovepipe drum in 1865.

Iowa's most successful inventor of furnaces at that time was probably David Hargar of Des Moines. His invention was for the purpose of conducting air from a fan, or from a cold air region, to a furnace or grate and distributing it properly to the fire. It was noted that it "can be applied to any furnace without changing a brick or bolt and without remodeling of any sort."

The Des Moines *Register* in 1868 reported: "This great invention is bound to come into use wherever its merits become known as it saves one hundred per cent, dispenses with high smoke stacks, and saves boilers and grates from wearing out."

One was put on the furnaces of the Des Moines Gas Works in 1869. G.B. Wicks, the superintendent, wrote that he could save $3.00 a day in labor and $2.50 in coke.

Mr. Hargar sold his distribution rights in Polk County for $1500. B.F. Allen, treasurer of the Des Moines Steam Brick Works, purchased an undivided half of the rights for the State of Iowa, exclusive of Polk County, after applying it to the Works furnaces.

J. L. Dickinson of Dubuque came to Iowa in 1839. After working in the printing office of the *Miner's Express* and in the furniture business, he started to manufacture sash, blinds, and doors. However, he invented valves, governors, and lubricators for steam engines.

Robert Scribe Harris was a Mississippi steamboat captain and boatbuilder until he retired to Dubuque in 1862. With this background it is not surprising that he patented an improvement in steam boilers in 1863. One does wonder what led him to invent a snow plow in 1867.

Wind and water were two things which were very important in the life of Iowans. Emory and Emerson Gore of Charleston developed a windmill with horizontal expanding and closing sails or wings. These could be regulated to any force of wind. They thought their windmill would do away in great measure with the expensive use of steam power.

A.Y. McDonald, manufacturer of pumps and plumbing goods, was a native of Glasgow, Scotland. After he came to Dubuque in 1860, he invented things closely associated with his business—pumps, well tubes, wrenches, and scales.

William Painter of Afton patented a "water elevator" on December 6, 1864, while in the United States service during the Civil War. Its chief novelties were (1) a tilting hoop which emptied the water out of the well bucket into a pail or other vessel placed to receive it; and (2) a brake so contrived that the weight of the bucket, whether filled or empty, prevented the backward motion of the axle or the descent of the bucket into the well.

One writer thought that "on account of its utility, cheapness and simplicity of construction this water elevator is destined to come into very general use. It is far preferable to a pump and costs but half as much."

Light

Burner, lamp (7): Burns, Keokuk; Hunt, Ottumwa; Marsh, Dubuque; Sanford (4), Keokuk.

Gas pendant: Warner, Des Moines.

Lamps (9): Driver, Marengo; Goff (2), Dubuque; Marsh, Dubuque; Rollins, Wapello; Sanford (2), Keokuk; Sleeth, Keokuk; Taylor, Ft. Madison.

Lamp and stove combined: Guy, Lybrand.

Lamp chimney: Floyd, Keokuk.

Lamp extinguisher (3): Hille, Lyons; McCoy, Des Moines; Toof, Ft. Madison.

Lamp wick trimmer (3): Naylor & Fairchild, Independence; Sanford, Keokuk; Toof, Ft. Madison.

Heat

Air pipe, furnace: Dawson, Des Moines.

Burners for heating purposes, hydrocarbon: Youmans & Reed, Davenport.

Burning fluid: Martin & Evans, Muscatine.

Chimney: Brown, Atlantic.

Damper, stovepipe (2): Kabisius, Davenport; Kathan, Hardin.

Draft promoter: Haycock, Richland.

Drums, heating (5): Hepburn, Clarinda; Jeffries, Council Bluffs; Paine, Dubuque; Turley & Bayliss, Council Bluffs; Webber, Calmar.

Fire chamber cleaner (2): Moore (2), Lyons.

Flue block: Binns, Oskaloosa.

Furnace (3): Chadwick, Newton; Hargar, Des Moines; Scripter, Des Moines.

Furnace lining: Haycock, Richland.

Gas for heating, producing: Springer, Clinton.

Grate bar (5): Draper, Oskaloosa; Orwig, Des Moines; Rawson (3), Des Moines.

Head block: Cumming, Lyons.

Heating furnace: Rand, Dubuque.

Radiator, stove: Fletcher, Burlington.

Smoke consumer: Dear, Des Moines.

Steam furnace: Hargar, Des Moines.

Stoves (camp, base-burner, cooking, heating) (31): Akers & Johnson, Malcolm; Ballard, Mt. Pleasant; Brockman, Davenport; Clark & Cady, Sioux City; Converse, Dubuque; Field, Davenport; Gilmore, Morning Sun; Green, Christiansburgh; Henney (2), Dubuque; Jones, Waterloo; Keyser, Newton; Mason, Indianola; Moore (4), Lyons; McNeil, DeWitt; Raub (3), Davenport; Ross (2), Davenport; Snyder & Garrett, Cedar Rapids; Stover, Sandyville; Tefft, Des Moines; Webb (3), Vinton; Wilson, Columbus City; Yates, Dubuque.

Stove doors: Moore, Lyons.

Stove leg: Roberts, Lacona.

Stove, hinging cover to: Ball, Keokuk.

Stovepipe (3): Adams, Bloomfield; Moore, Lyons; Weaver, Tipton.

Stove shelf: Turner, Marshalltown.

Stove thimble (2): Newell (2), Oskaloosa.

Stove ventilator: Thrift, Monroe.

Stoves, case for enclosing: Driver, Marengo.

Power

Boilers, steam (11): Bradford, Calamus; Camp, Fairfield; Clark, Ft. Des Moines; Cook, Magnolia; Harris, Dubuque; Hay (2), Burlington; Hess, West Union; Hewett, Nora Springs; Keen, North McGregor; Petersen, Davenport.

Electromagnetic engine: Gaume, Davenport.

Gas machine: Springer, Clinton.

Governor, steam engine (2): Clark, Council Bluffs; Dickinson, Dubuque.

Hot-air engine (2): Blackman, Decorah; Kilbourne, Waterloo.

Motive power: Batcheller, Des Moines.

Movement, mechanical (3): Clippinger, Newton; Lancaster, Le Claire; Zeitler, Bentonsport.

Oscillating engine: Kilgore & Eberhard, Washington.

Pressure gage and safety valve: Kent, Lyons.

Reciprocating steam engine: Shepherd & Clark, Bloomfield.

Rotary engine (5): Cox, Belle Plaine; Maxson, Independence; O'Leary, Iowa City; Scott, Burlington; Weed & Weed, El Dorado.

Rotary steam engine (7): Boicourt & Barnes, Boonesborough; Campbell (2), Abingdon; Fischer, Garibaldi; Grotz, Ottumwa; Grotz & Dennison, Ottumwa; Sumner & Youmans, Davenport.

Sled, steam: Ross, Webster City.

Steam and air brake: Smith & Ogden, Burlington.

Steam and hot-air engine: Musselman, Chariton.

Steam condenser: Kennedy & Berkshire, Muscatine.

Steam engine (5): Haycock, Richland; Hill & Roberts, Panora; Parker, Davenport; Savage (2), Knoxville.

Steam engine lubricator: Pelton, Lyons.

Steam generator (8): Branagan (3), Burlington; Demarce, Fairfield; Kilgore, Washington; Savage, Knoxville; Turley, Council Bluffs; Wright, Bonaparte.

Steam motor: Crumlisk, Keokuk.

Steering apparatus, steam: Morrison, Keokuk.

Valves, steam engine, and parts (16): Beesley, Muscatine; Cabell, Keokuk; Chambers, Muscatine; Dickinson (2), Dubuque; Gould, Davenport; Jones (2), Davenport; McConnell, Iowa City; Reichmann, Dubuque; Staley, Clinton; Sweet, Cedar Rapids; Tallant, Burlington; Woodruff (2), Lansing; Woods, Fairfield.

Wind and Water

Pumps (16): Baldwin, Summitville; Barnes, Maquoketa; Brooks & Munson, Independence; Burt, Mt. Pleasant; Cole, Mt. Pleasant; Garretson, Salem; Hovey, Waverly; Hunt & Devin, Ottumwa; McDonald, Dubuque; Mills, Bloomfield; Moon, Maquoketa; Nichols, Wheatland; Plank, Pulaski; Scott, Earlville; Wyeth, Pulaski; Wyeth, Bloomfield.

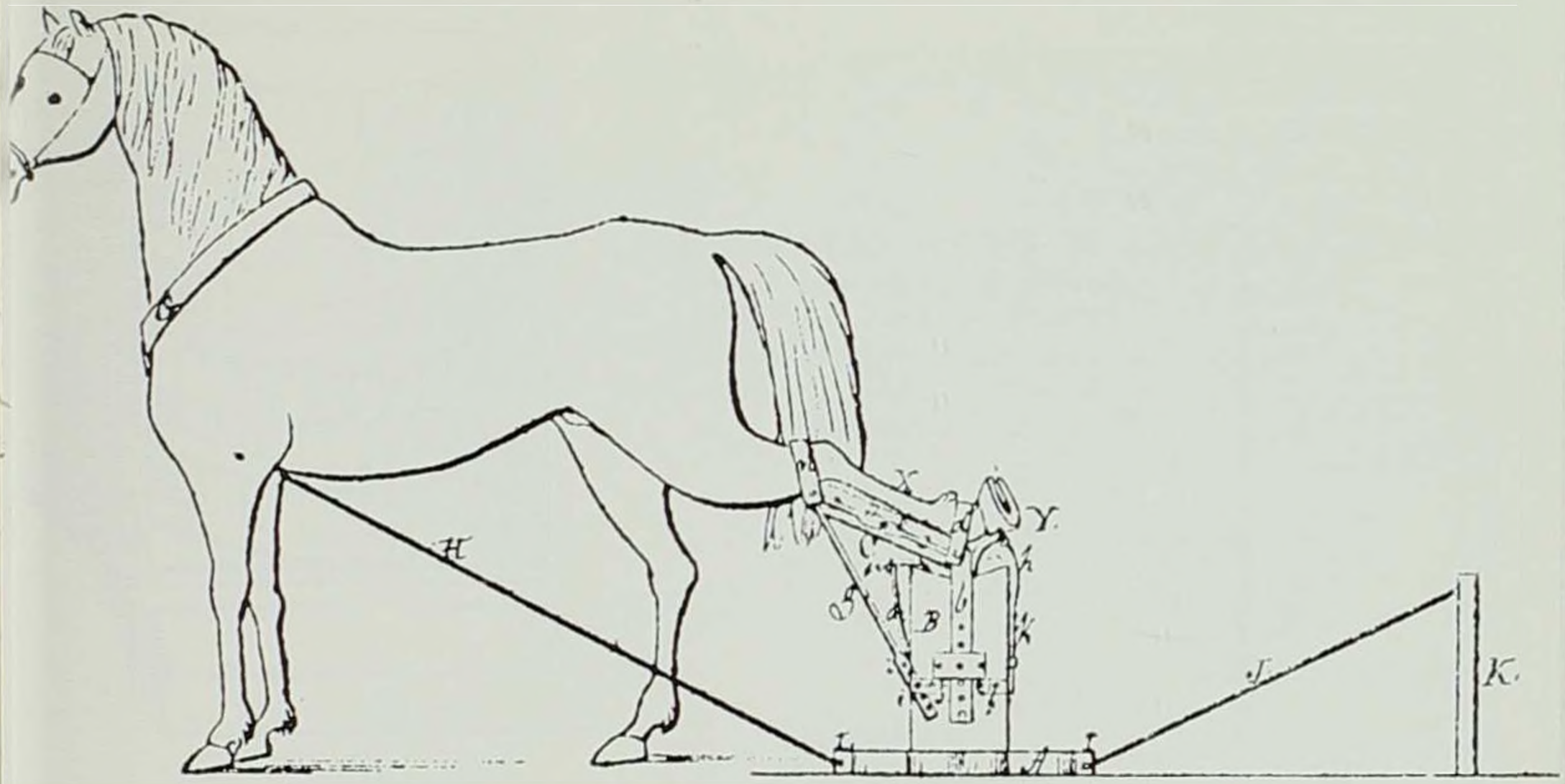
Water elevator (10): Adams, Iowa City; Bartle, Independence; Curts (2), Ottumwa; Johnston, Eddyville; Kock, Davenport; Painter, Afton; Pratt, Iowa City; Warren & Martin, Maquoketa; Wentworth, Burlington.

Water heaters (2): Carroll, Independence; Jones, Dubuque.

Water meter (3): Moore, Lyons; O'Leary, Iowa City; Treat, Tabor.

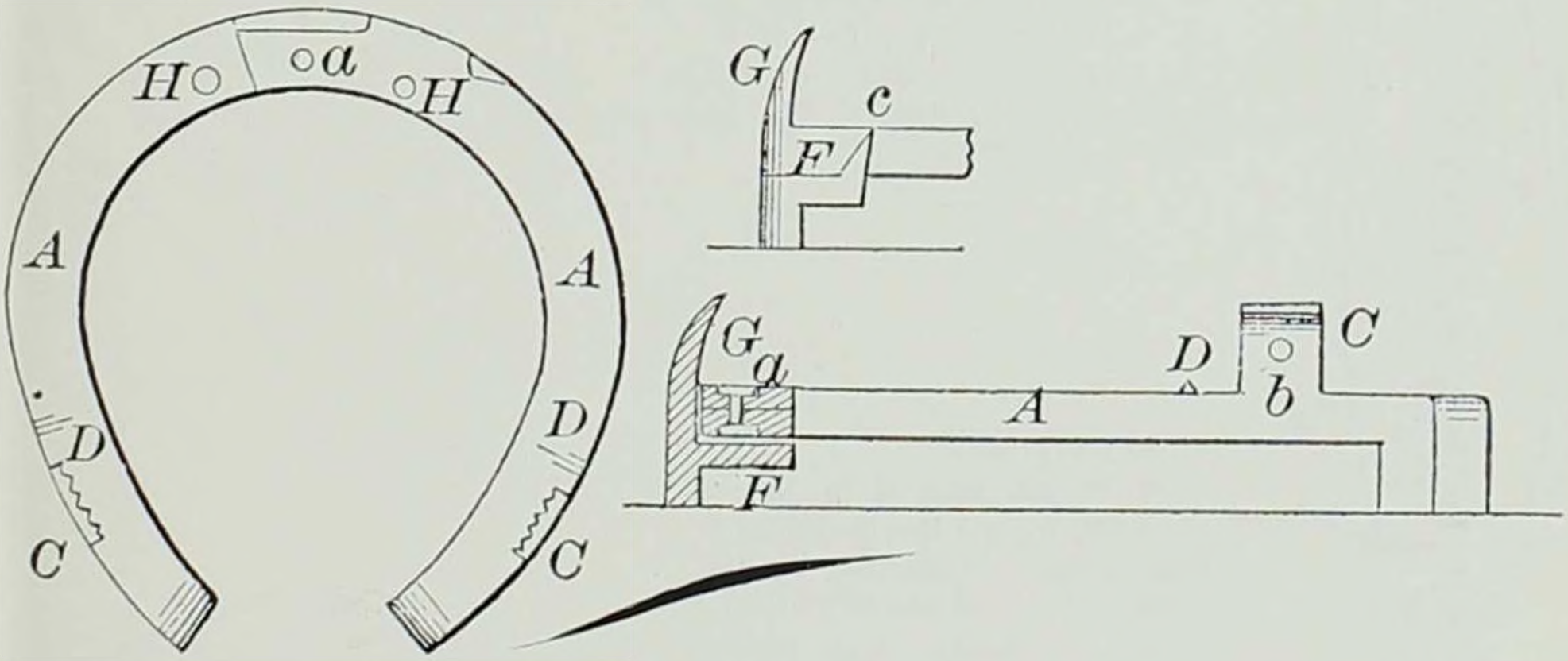
Water power (2): Broadwell, Logan; French, Central City.

Water wheel (19): Blackmer & Carpenter, Clermont; Boyle, Waterloo; Briggs, Fayette; Carpenter, Moscow; Flenniken, Colony; Gable, Dubuque; Grow, Ft. Dodge; Hadley, Anamosa; Holdiman & Goodwin, Waterloo; Jack & Brand, Des Moines; Kirkhart & Ramsay, Long Creek Twp., Decatur Co.; Luther, Walnut Fork; Sherwood, Independence; Smith, Cedar Rapids; Stevens, Lancaster; Talbott, Iowa Falls; Weed & Marr, El Dorado; White, Chatham; Whitmore, Waterloo.



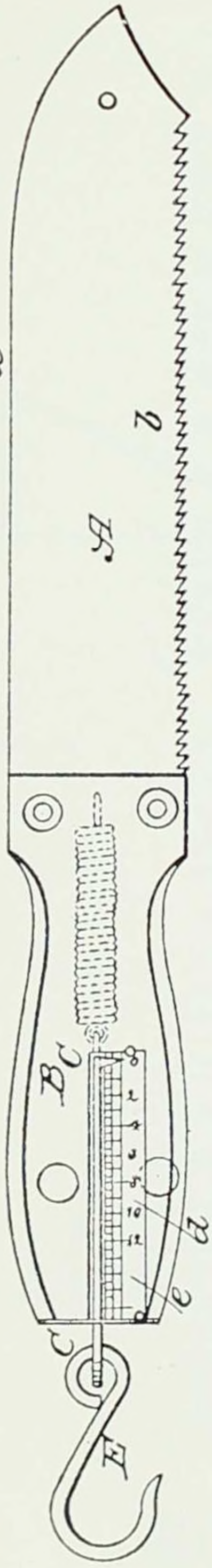
JOHN SHIMER, SCRANTON STATION
Horseshoeing Jack
124,452 — Mar. 12, 1872

This horseshoeing jack was invented by John Shimer of Scranton Station.



AUGUSTUS WEITMAN, WEST UNION
Horseshoe
49,812 — Sept. 5, 1865

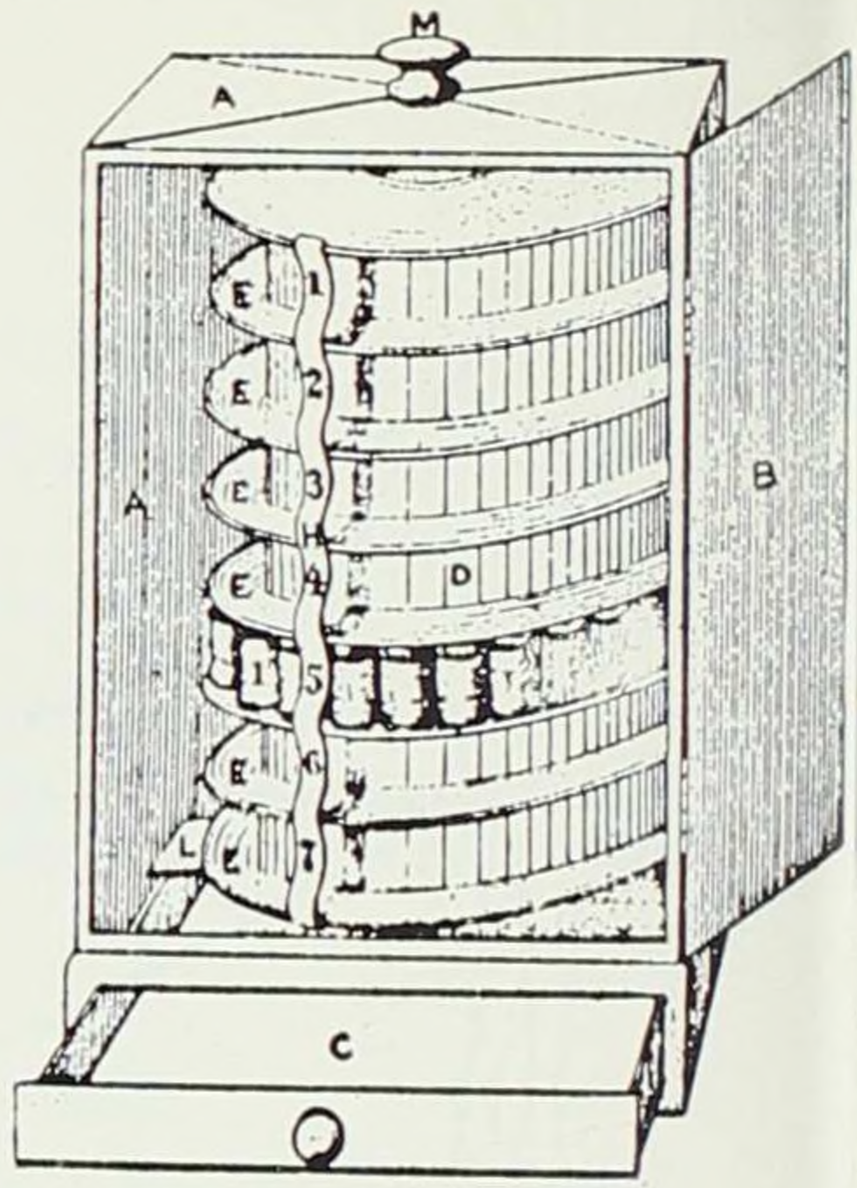
Augustus Weitman constructed shoes in two equal parts, A,A, connected with a pivot, a. He used spurs, D, instead of nails to attach shoe to the hoof, together with flanges, C, which pressed against the outside of the hoof, and a screw, b, passed through the flange into the hoof.



(Left)

G. H. SMITH, GLENWOOD
Spring Balance and Knife
21,520 — Sept. 14, 1858

A combined spring balance and knife was patented by George H. Smith of Glenwood.



(Right, top)

A. PARSONS, BURLINGTON
Spool Thread Case
101,909 — Apr. 12, 1870

This spool thread case was invented by Albion Parsons of Burlington.

(Right, center)

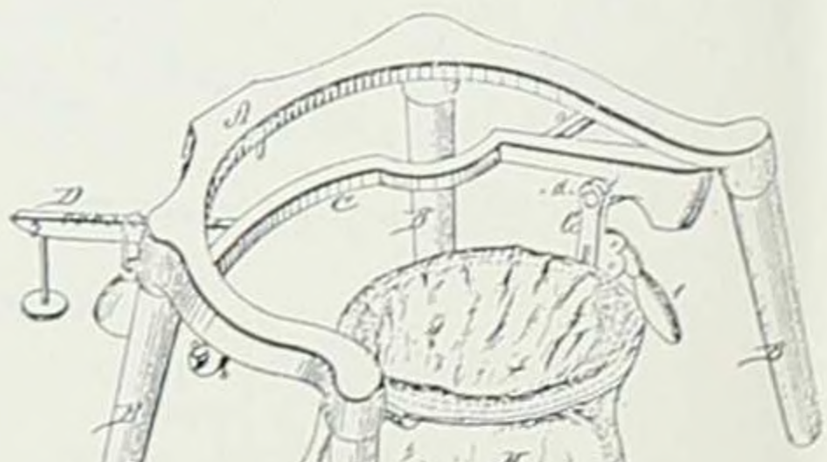
S. KUH, JEFFERSON
Advertising Lantern
133,158 — Nov. 19, 1872

This improvement in advertising lanterns was patented by Sol Kuh of Jefferson.

(Right, bottom)

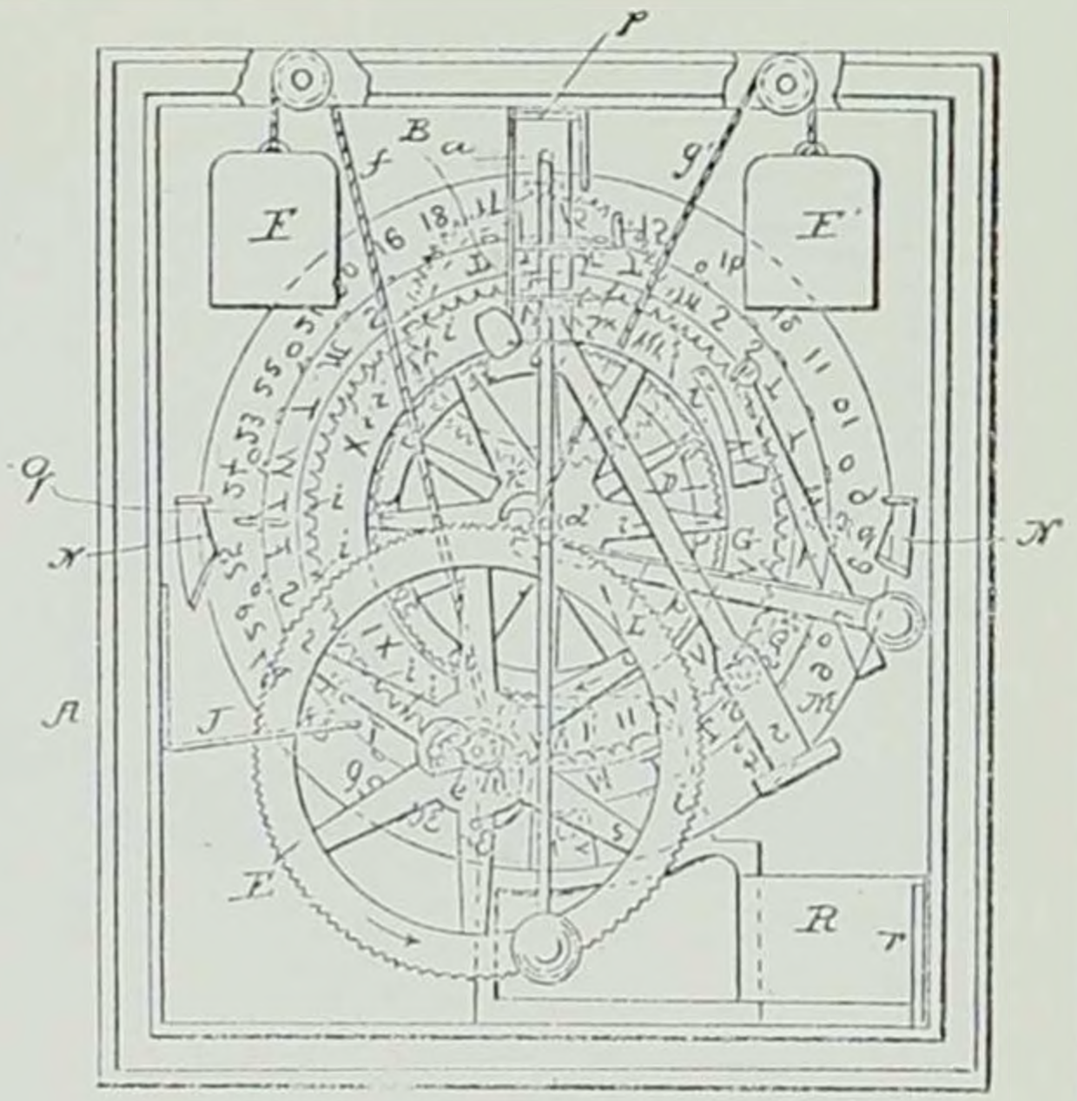
H. T. BUDGE & N. W. RUSSELL, CEDAR FALLS
Bag-holder Weighing-scales
138,315 — Apr. 29, 1873

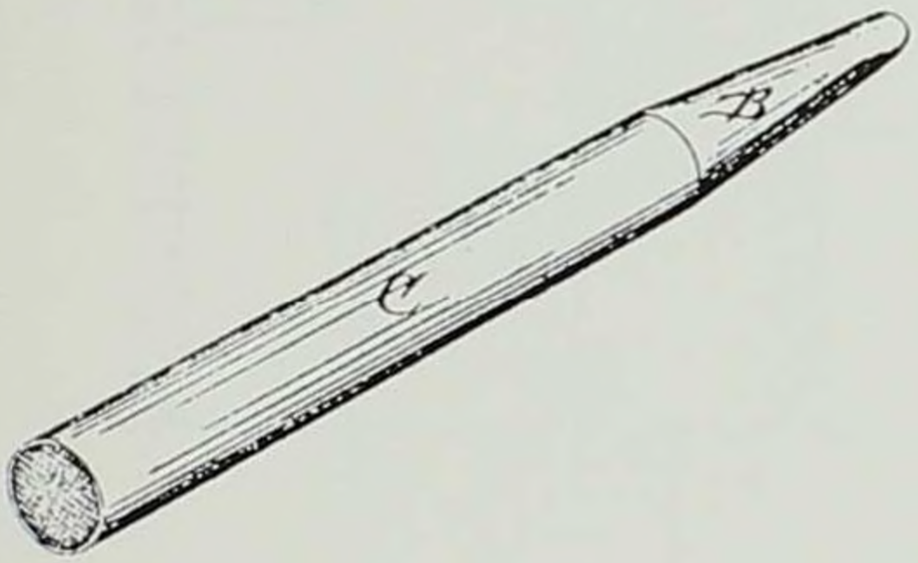
Henry T. Budge and Nelson W. Russell of Cedar Falls combined a bag holder and scales in their invention.



S. P. LA DUE, ROCKFORD
Time Piece
25,468 — Sept. 13, 1859

This time piece, or calendar clock, was patented by S. P. La Due of Rockford.



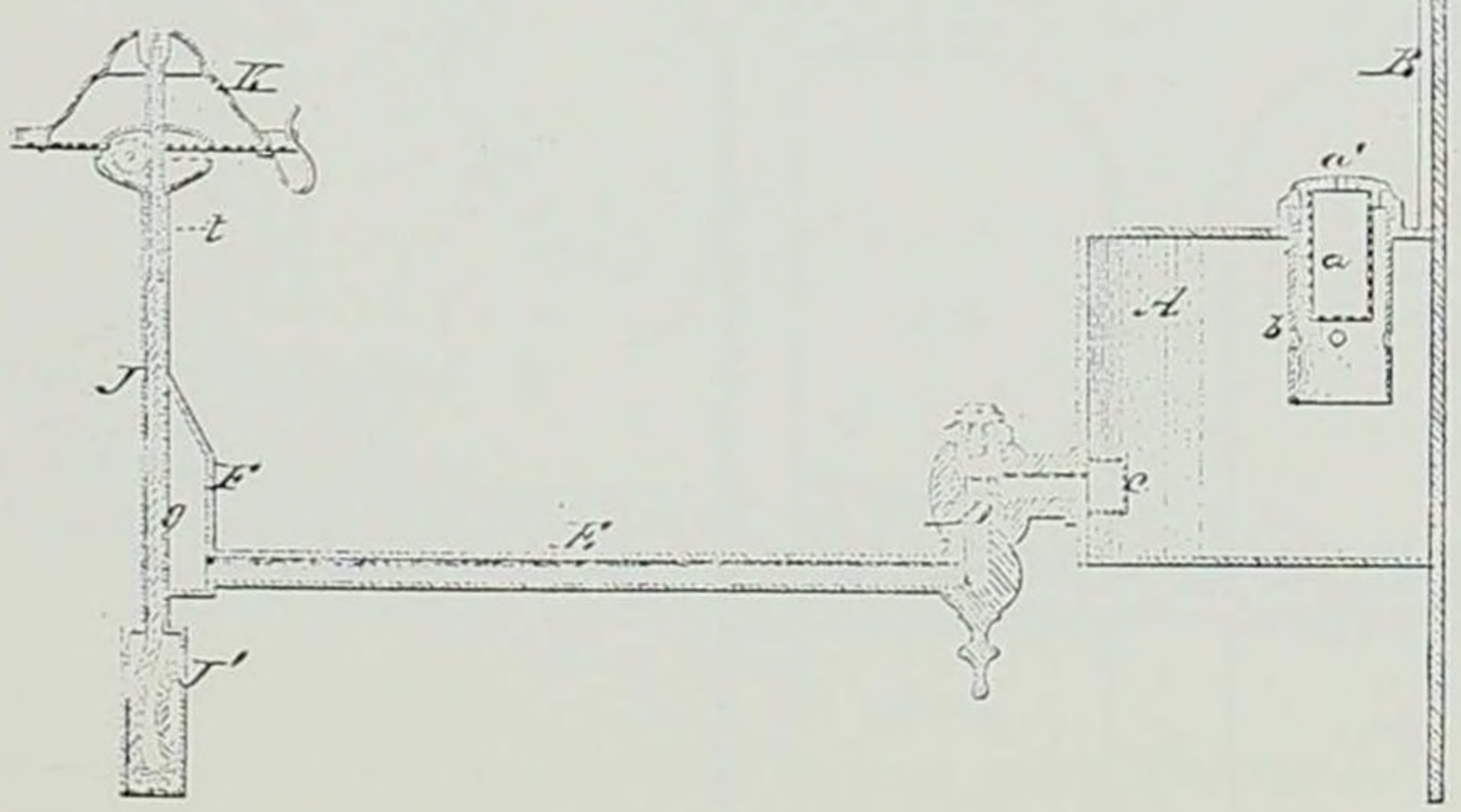


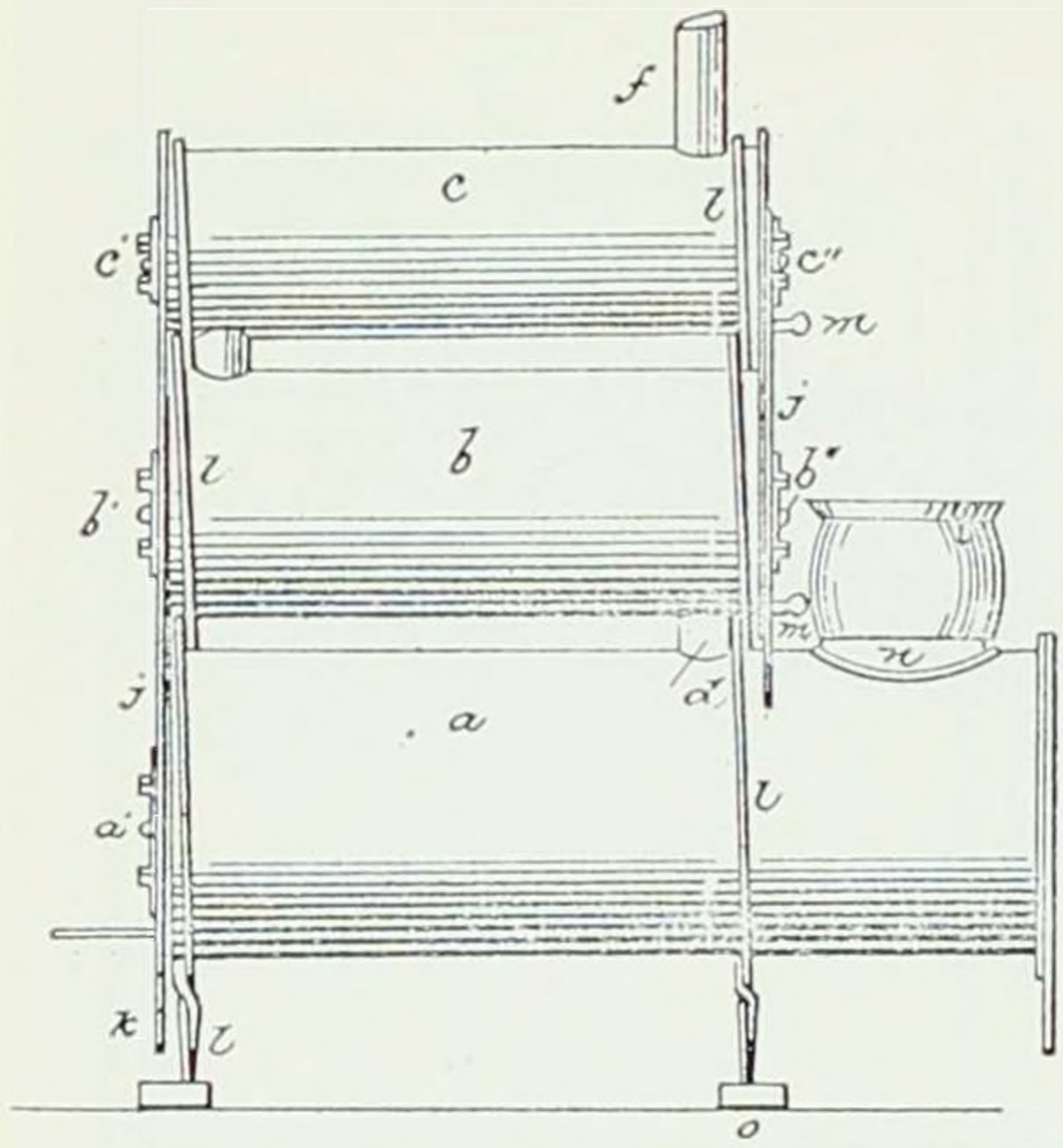
M. TURLEY & JANE MARY INNES, COUNCIL BLUFFS
Filter-Tip Cigar
127,939 — June 11, 1872

A "filter-tip" cigar was patented by Marshall Turley and Jane Mary Innes. The mouthpiece, B, of corn stalk or other pithy vegetation was supposed to absorb the nicotine.

H. J. GOFF, DUBUQUE
Lamp
112,586 — Mar. 11, 1871

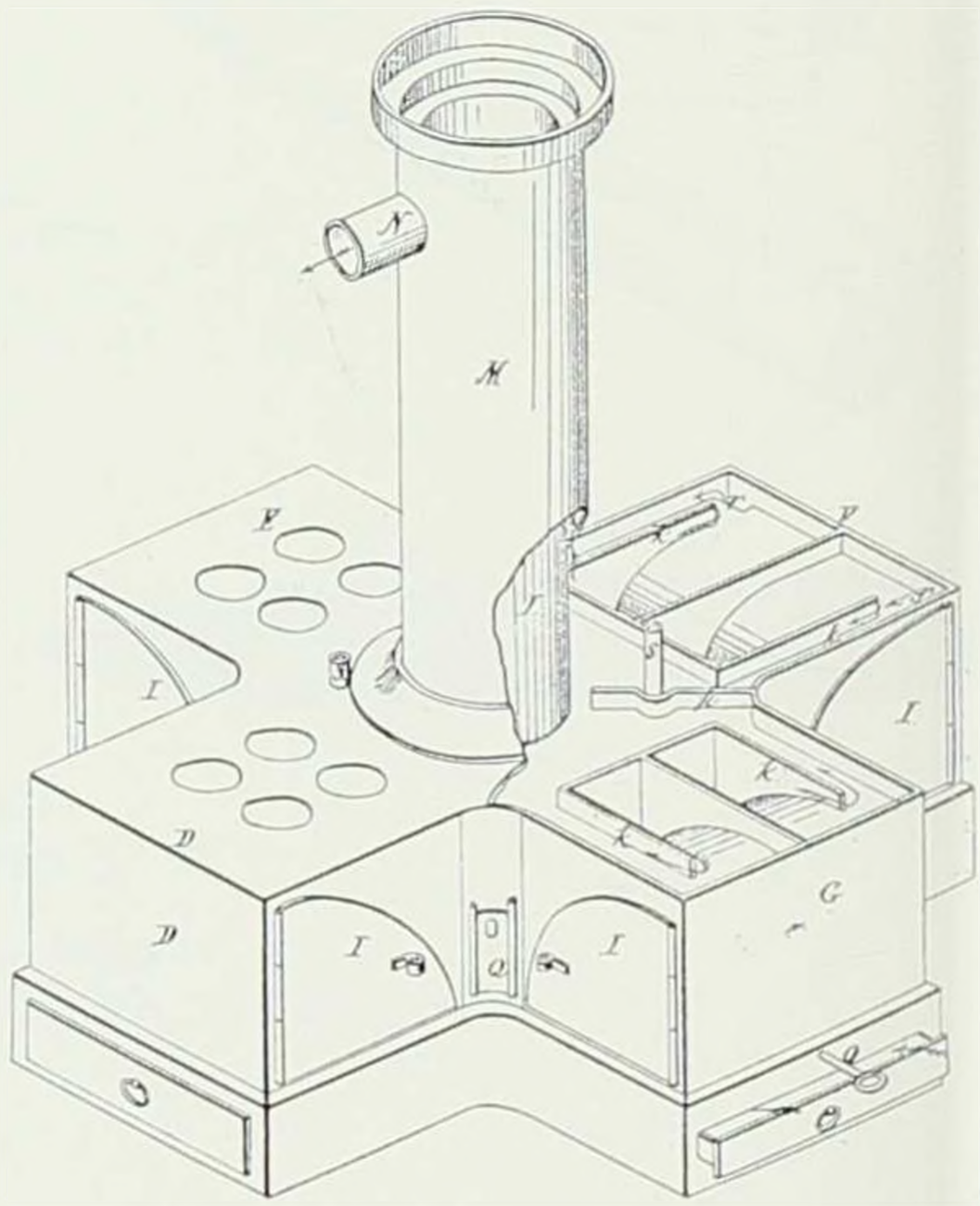
This lamp was patented by Henry J. Goff of Dubuque.





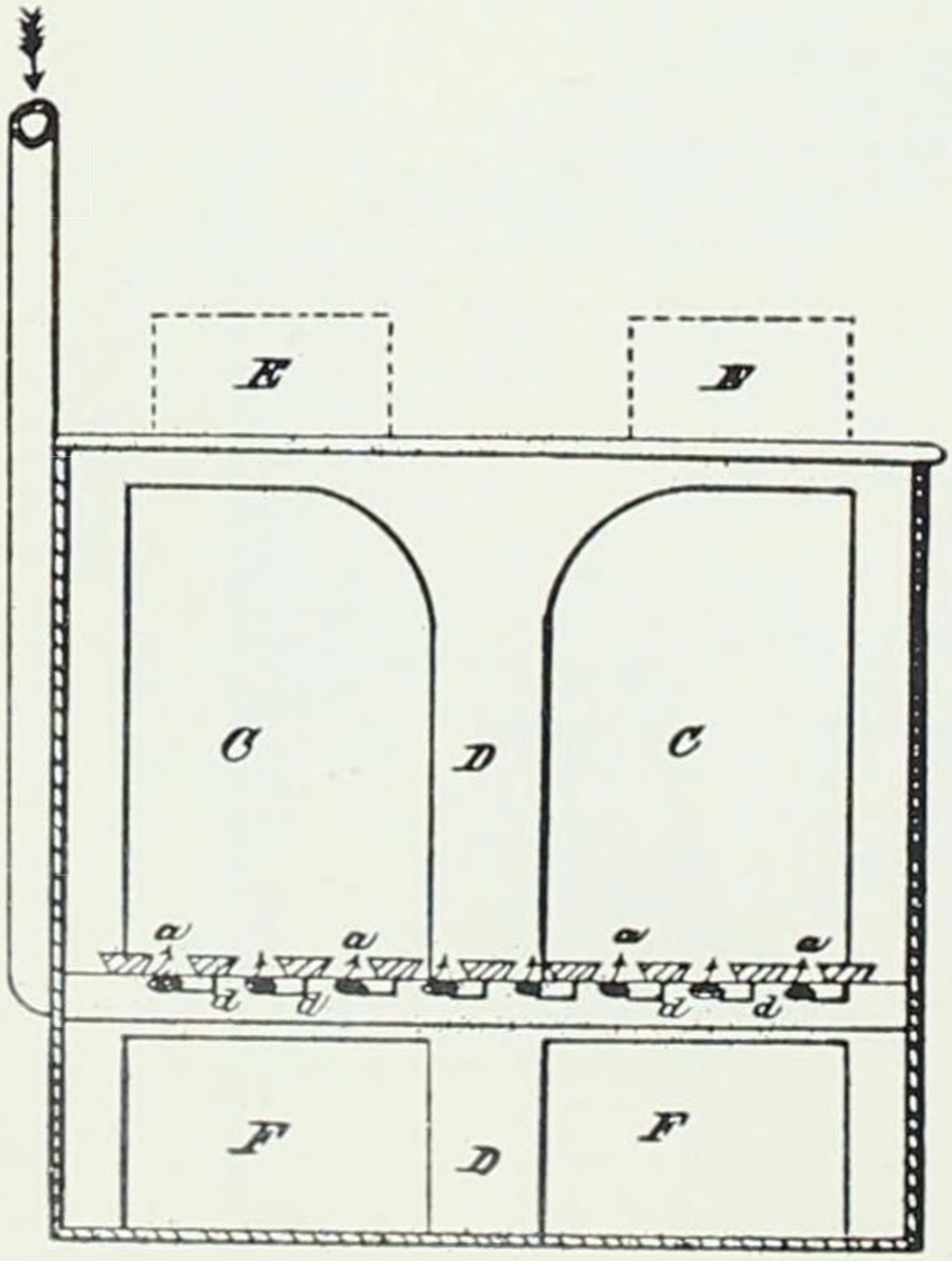
ROBERT WILSON, COLUMBUS CITY
Cook Stove
13,194 — July 3, 1855

The cook stove patented by Robert Wilson consisted of an arrangement of cylinders for stoves and ovens, lined with removable rolls of sheet iron and the whole supported by iron bars around the ends.



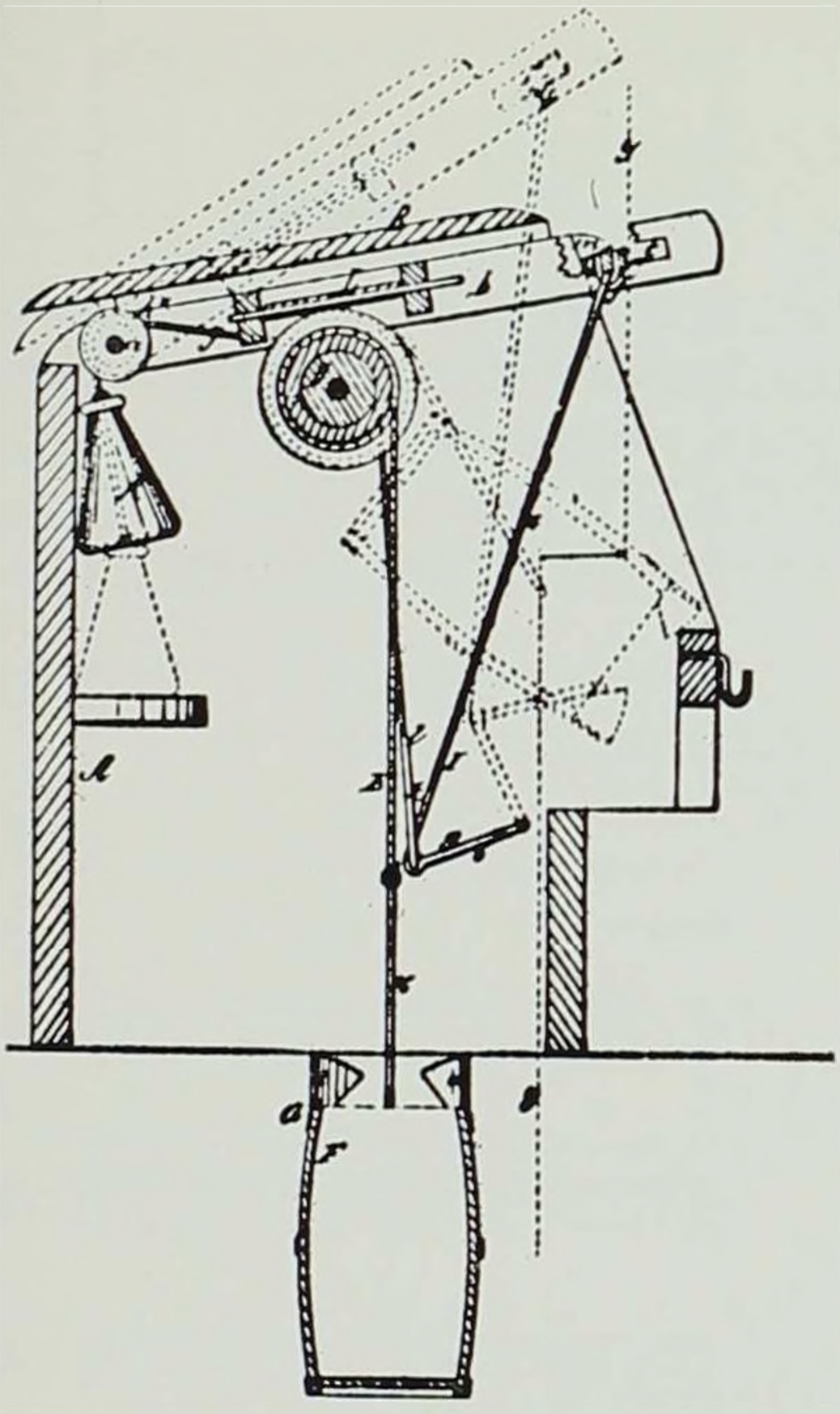
C. RAUB, DAVENPORT
Cook Stove
19,650—Mar. 16, 1858

A four-sided cook stove was patented by Christian Raub of Davenport.



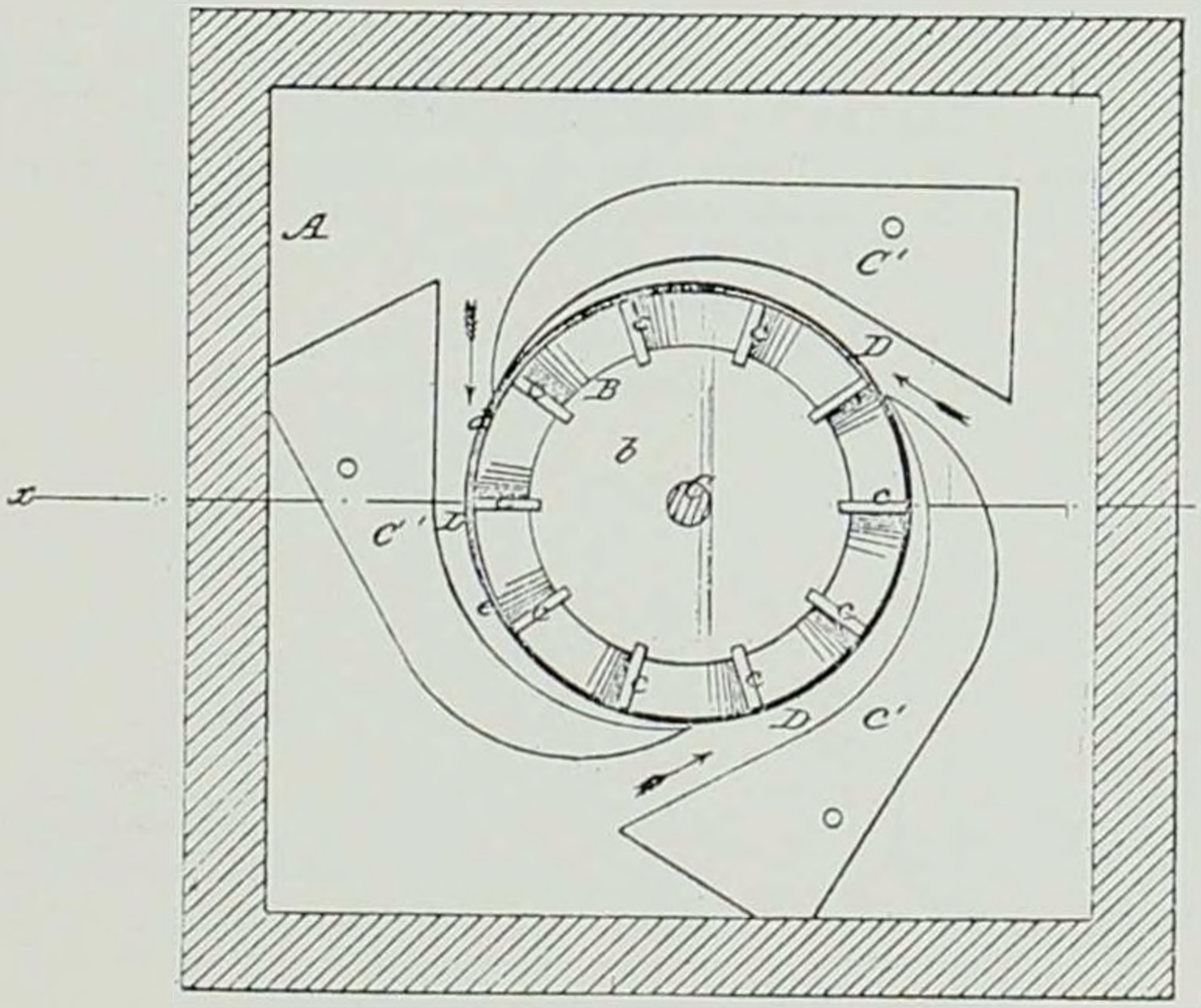
D. HARGAR, DES MOINES
Hot-air Furnace
70,557 — Nov. 5, 1867

A hot-air furnace was invented by David Hargar of Des Moines.



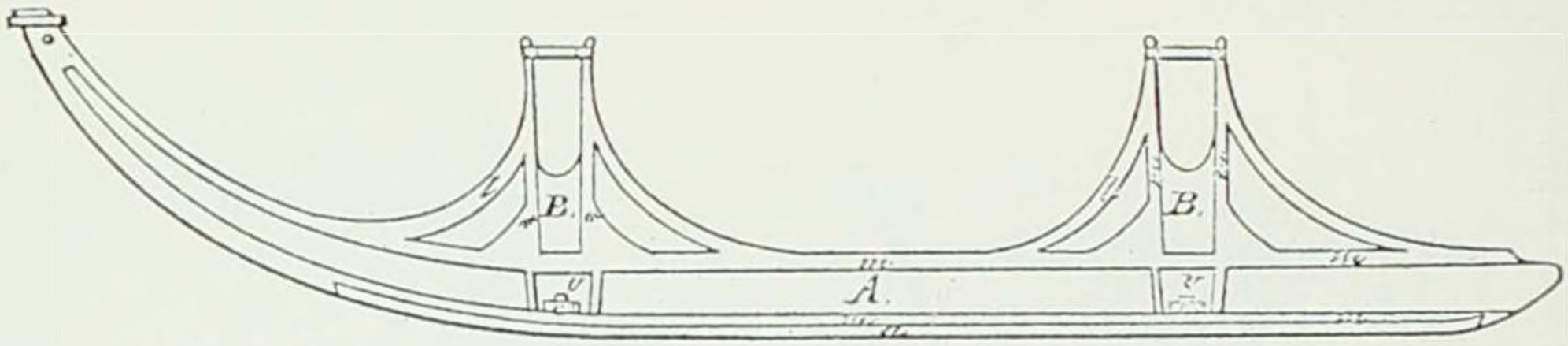
W. PAINTER, AFTON
Water Elevator
45,339 — Dec. 6, 1864

A windlass water elevator was patented by William Painter of Afton.



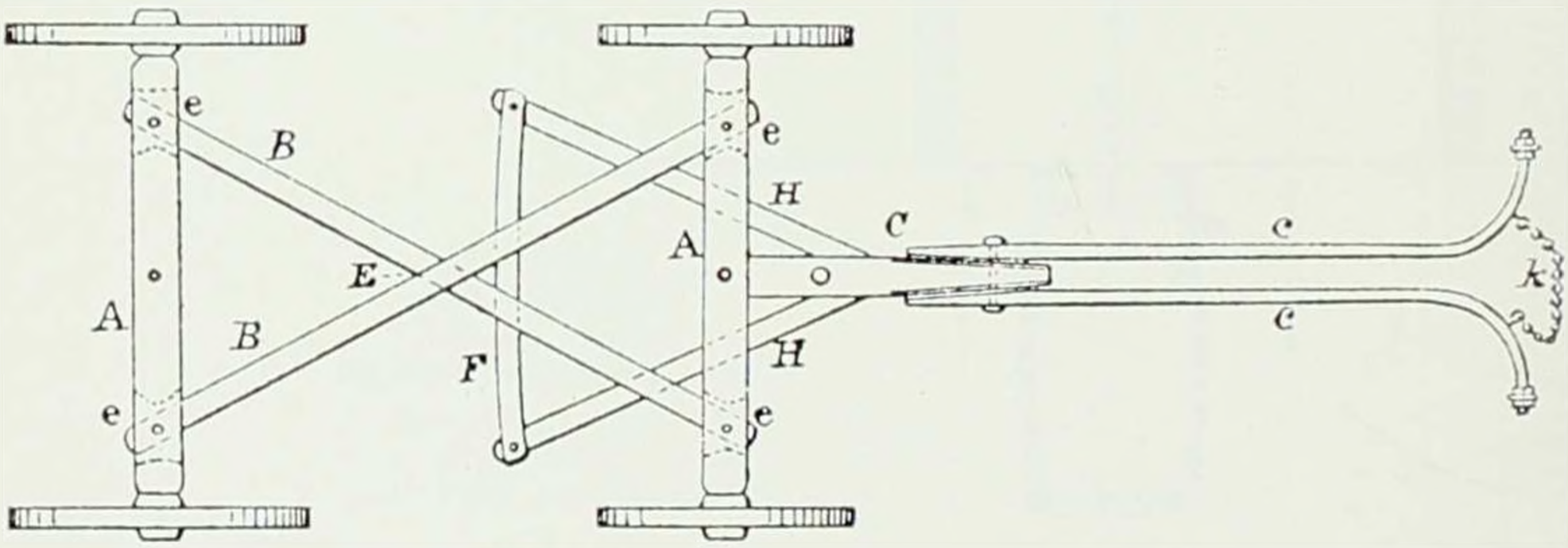
BLACKMER & CARPENTER, CLERMONT
Water Wheel
58,208 — Sept. 25, 1866

A water wheel was patented by W. H. Blackmer and E. R. Carpenter of Clermont.



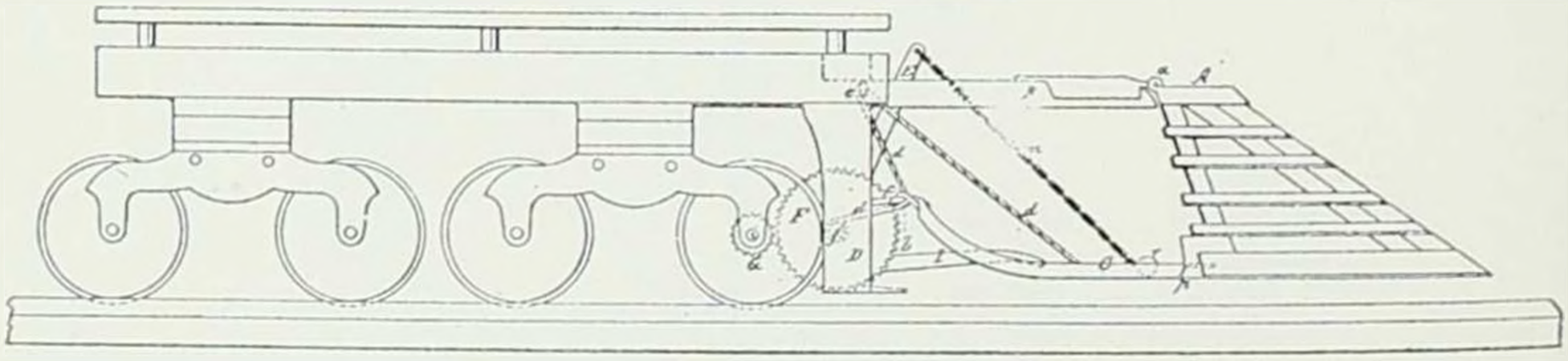
JOHN LOGAN, WATERLOO
Sleigh Runner
108,917 — Nov. 1, 1870

This cast iron sleigh runner was invented by John Logan of Waterloo.



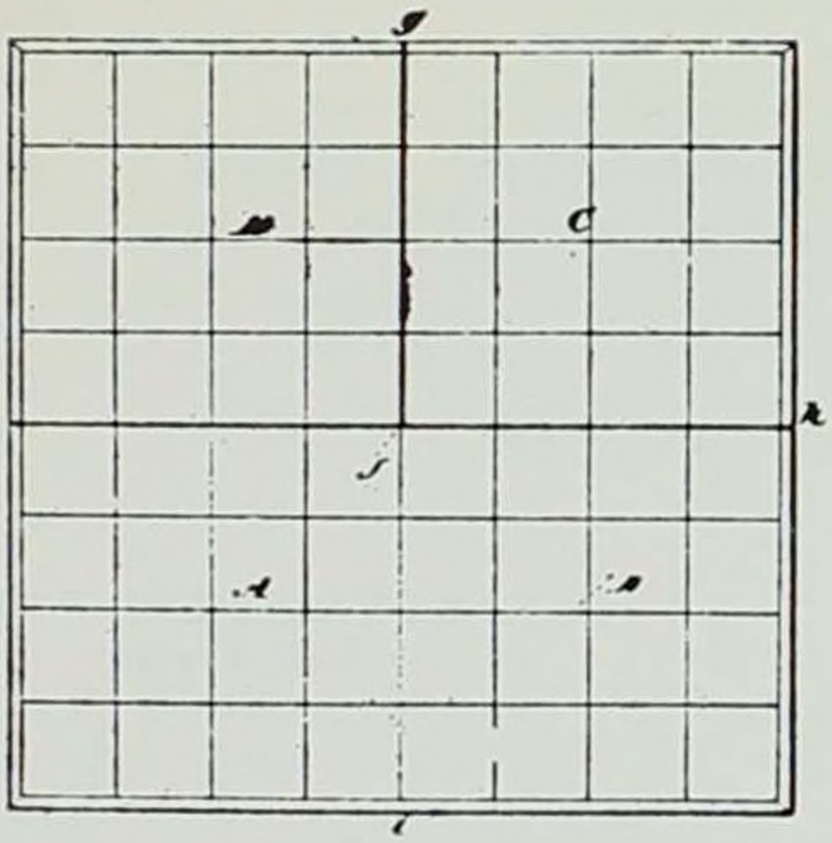
FERDINAND POST, CLINTON
Wagon
143,185 — Sept. 23, 1873

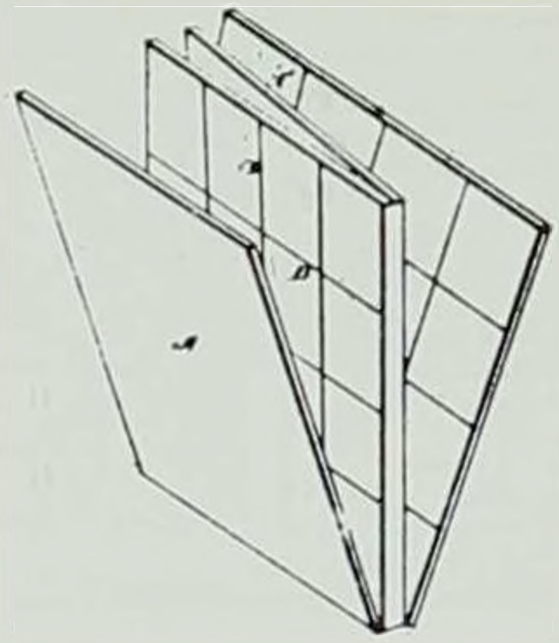
Ferdinand Post of Clinton received a patent for his combination of the tongue piece, C, supplemental pieces, c, chain, k, axle, A, hounds, H, and crosspiece, F.



JAMES MITCHELL, OSCEOLA
Locomotive Cow Catcher
18,348 — Oct. 6, 1857

James Mitchell of Osceola was responsible for this early development in a locomotive cow catcher.





FREDERICK C. SCHAEFER, DUBUQUE
Chess Board
52,891 — Feb. 27, 1866

A folding chess board was created by F. C. Schaefer of Dubuque.

Fig. 1.

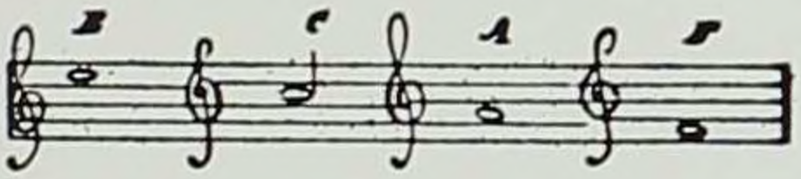


Fig. 2.

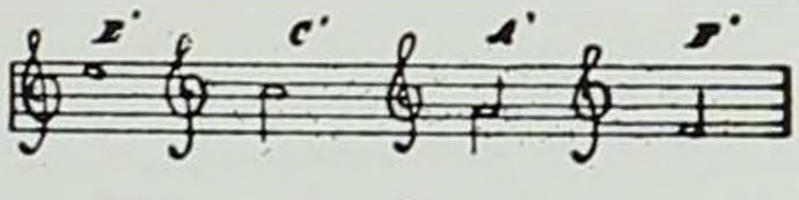


Fig. 3.

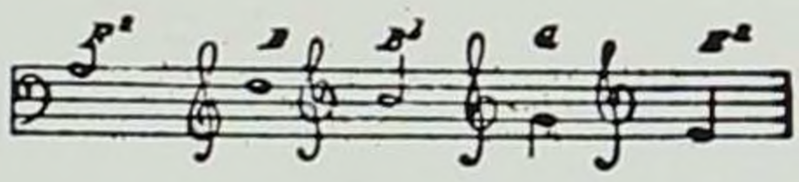
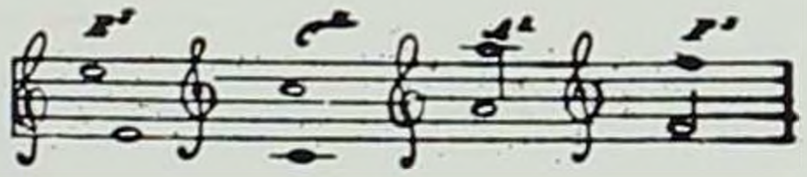


Fig. 4.

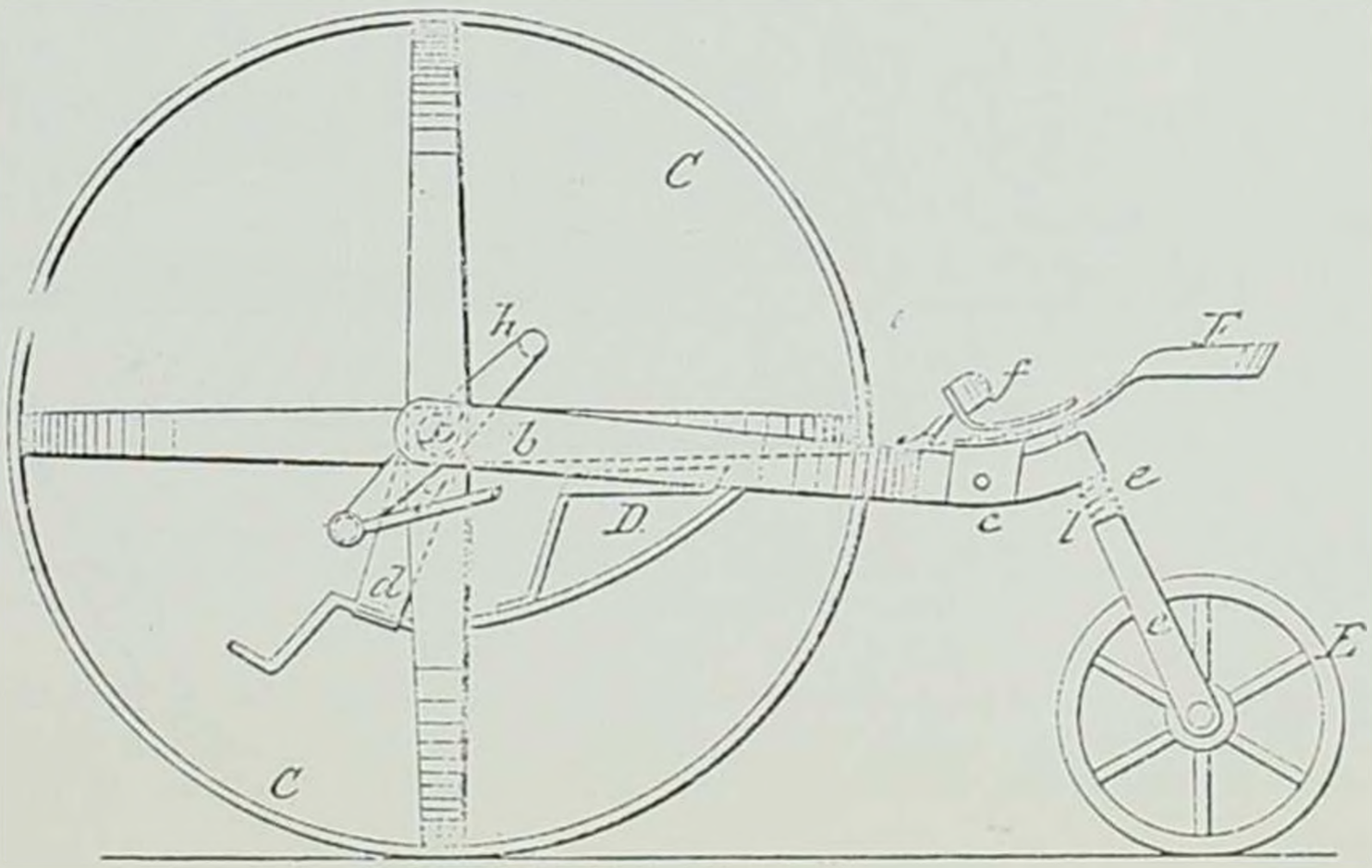


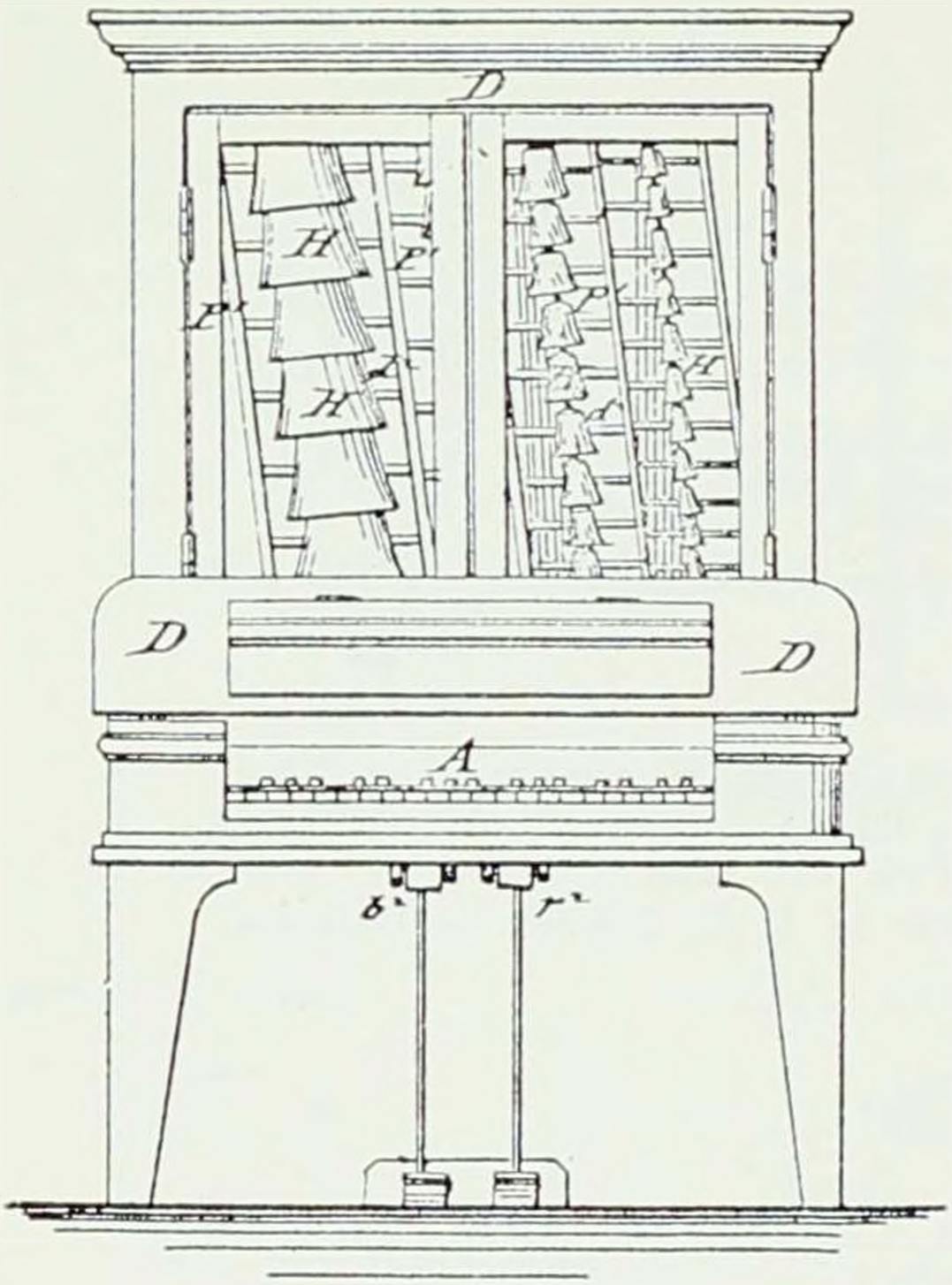
V. C. TAYLOR, DES MOINES
Music Staff
71,550 — Nov. 26, 1867

Virgil C. Taylor patented this music staff to indicate the key note. Fig. 1 uses wider spaces; Fig. 2, narrower spaces; Fig. 3, a lighter line; and Fig. 4, a combination.

C. B. GUY, POSTVILLE
Velocipede
93,433 — Aug. 10, 1869

Sketch of the velocipede patented by C. B. Guy of Postville.





C. G. BUTTKEREIT, TOLEDO

Bell Piano

142,768 — Sept. 16, 1873

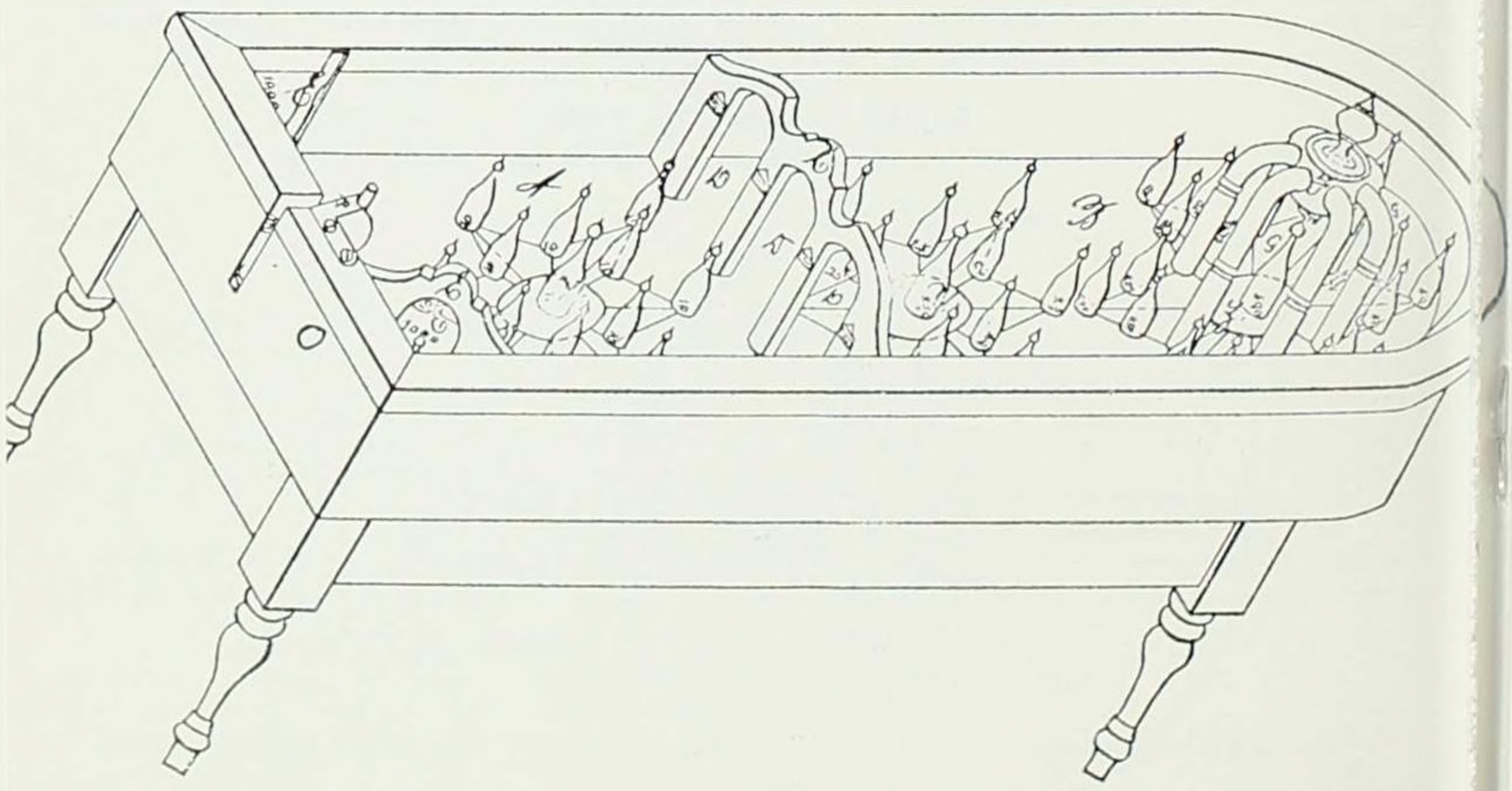
A bell piano, using bells instead of strings, was patented by Carl G. Buttkereit of Toledo.

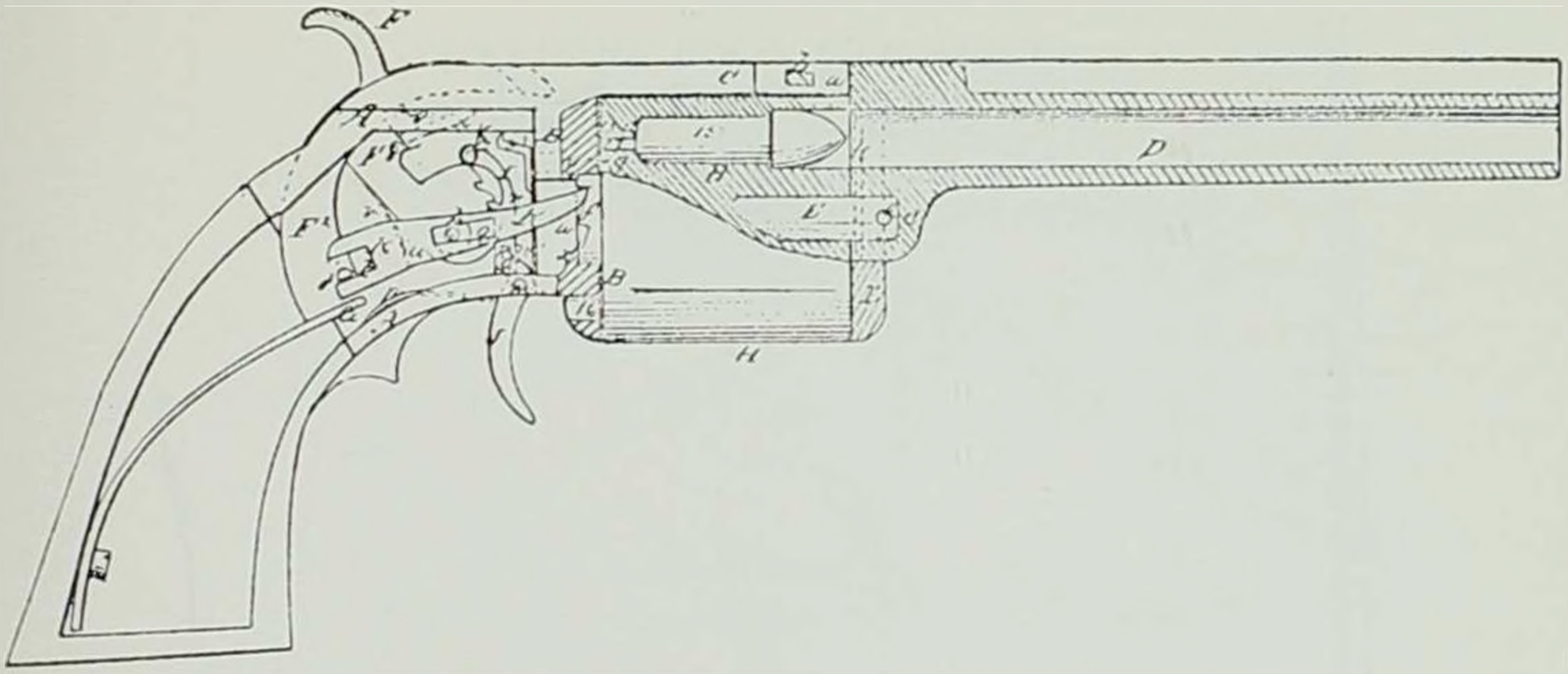
FERDINAND UEBEL, CEDAR RAPIDS

Game Table

138,961 — May 13, 1873

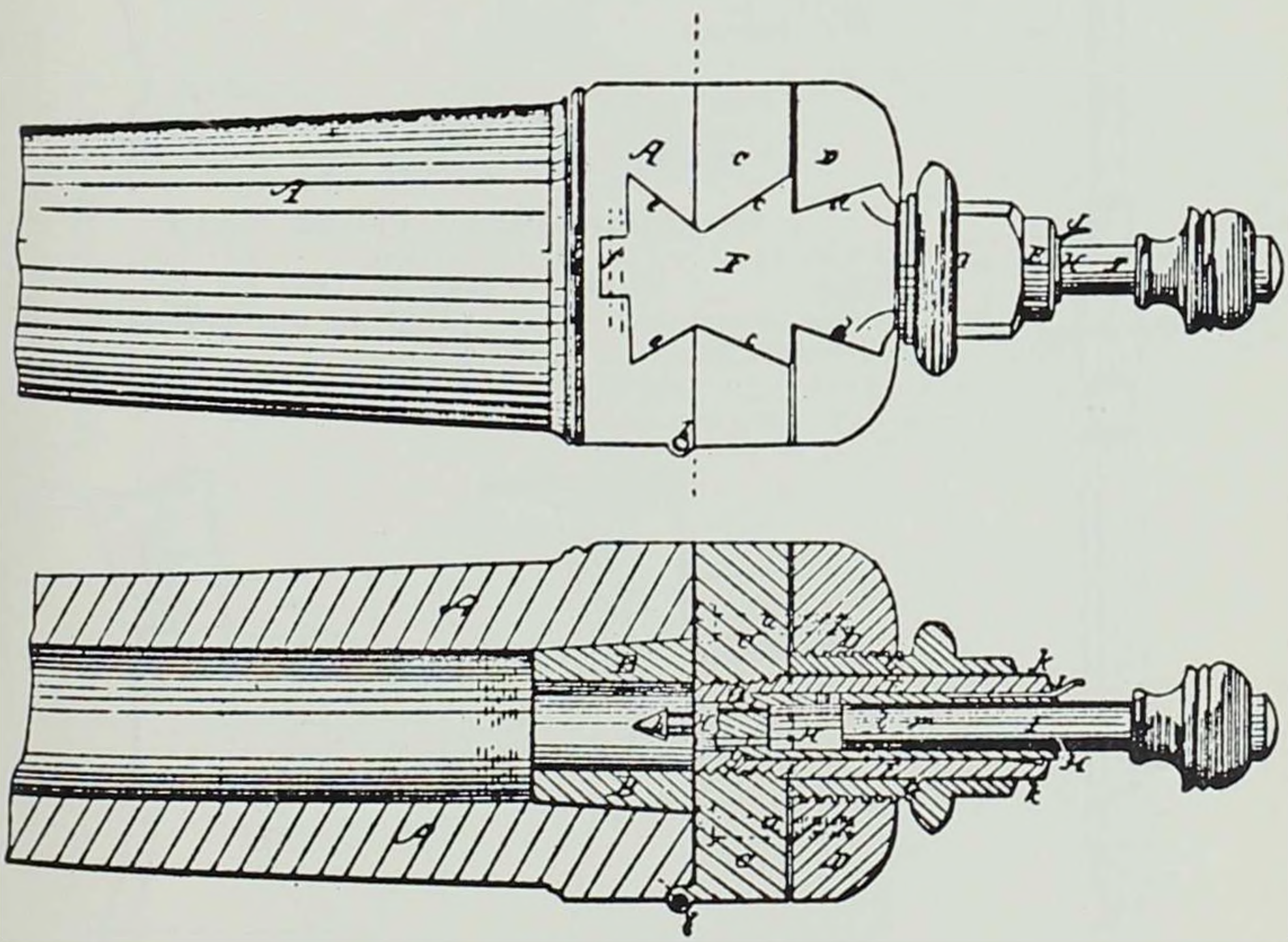
A nineteenth century "pinball" or game table was invented by Ferdinand Uebel of Cedar Rapids.





ALBERT HALL, DANVILLE
Revolver
37,961 — Mar. 24, 1863

This improvement in the revolver was patented by Albert Hall, Danville, Des Moines County.



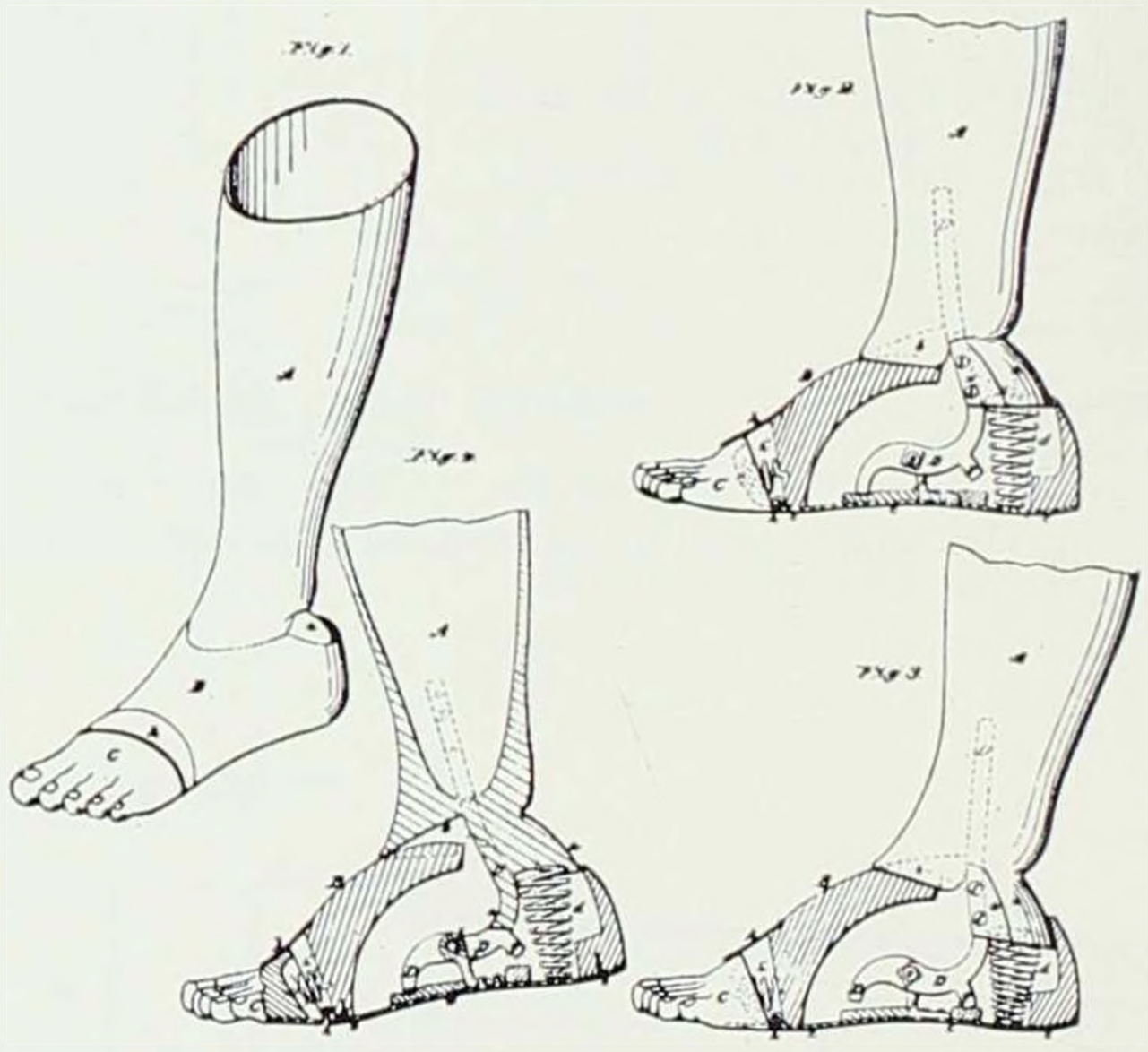
E. R. McCABE, ROCHESTER
Breech-Loading Ordnance
35,380 — May 27, 1862

Edward R. McCabe strengthened his breech-loading ordnance, so he could use guncotton, by adding two very strong blocks of metal, C and D. He also added a removable tube, B, for reinforcement.

(Left)

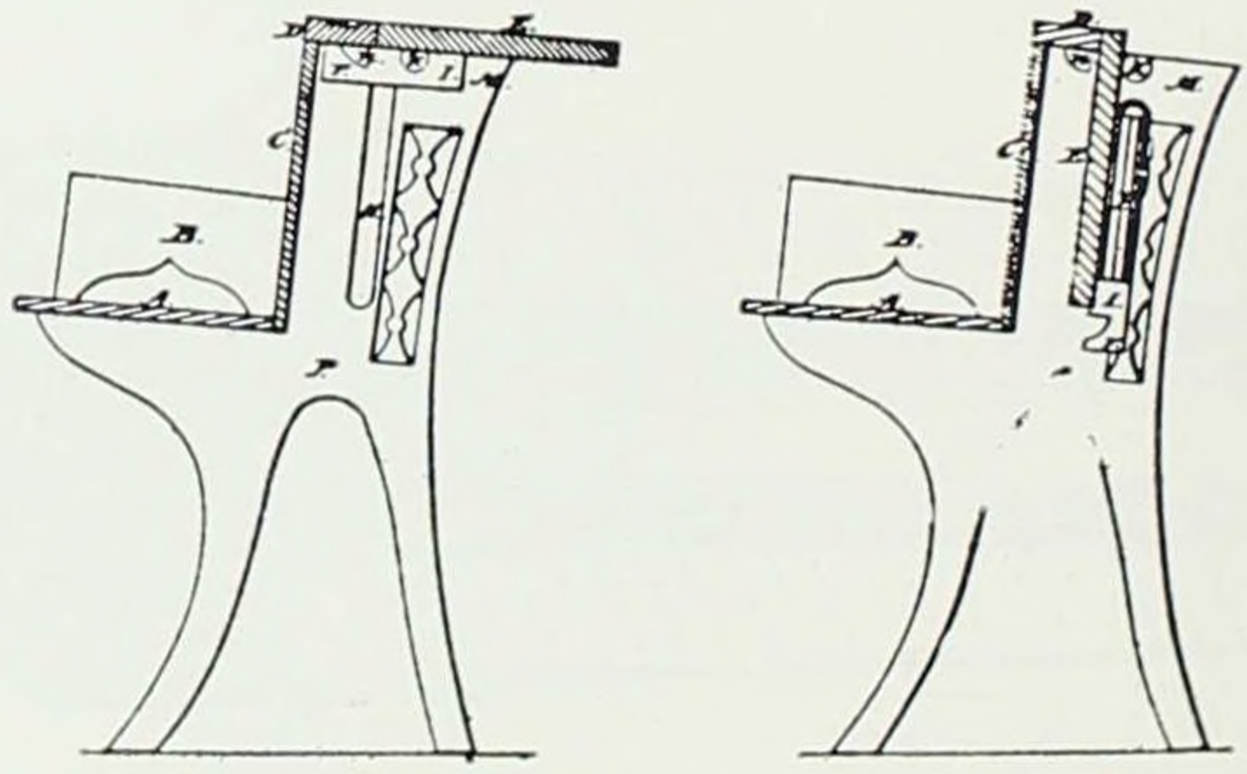
CHANDLER POOR, DUBUQUE
Dentists' Plugging Mallet
58,133 — Sept. 18, 1866

Chandler Poor invented his "Piston-Mallet" for condensing gold or other substances used in filling or plugging teeth.



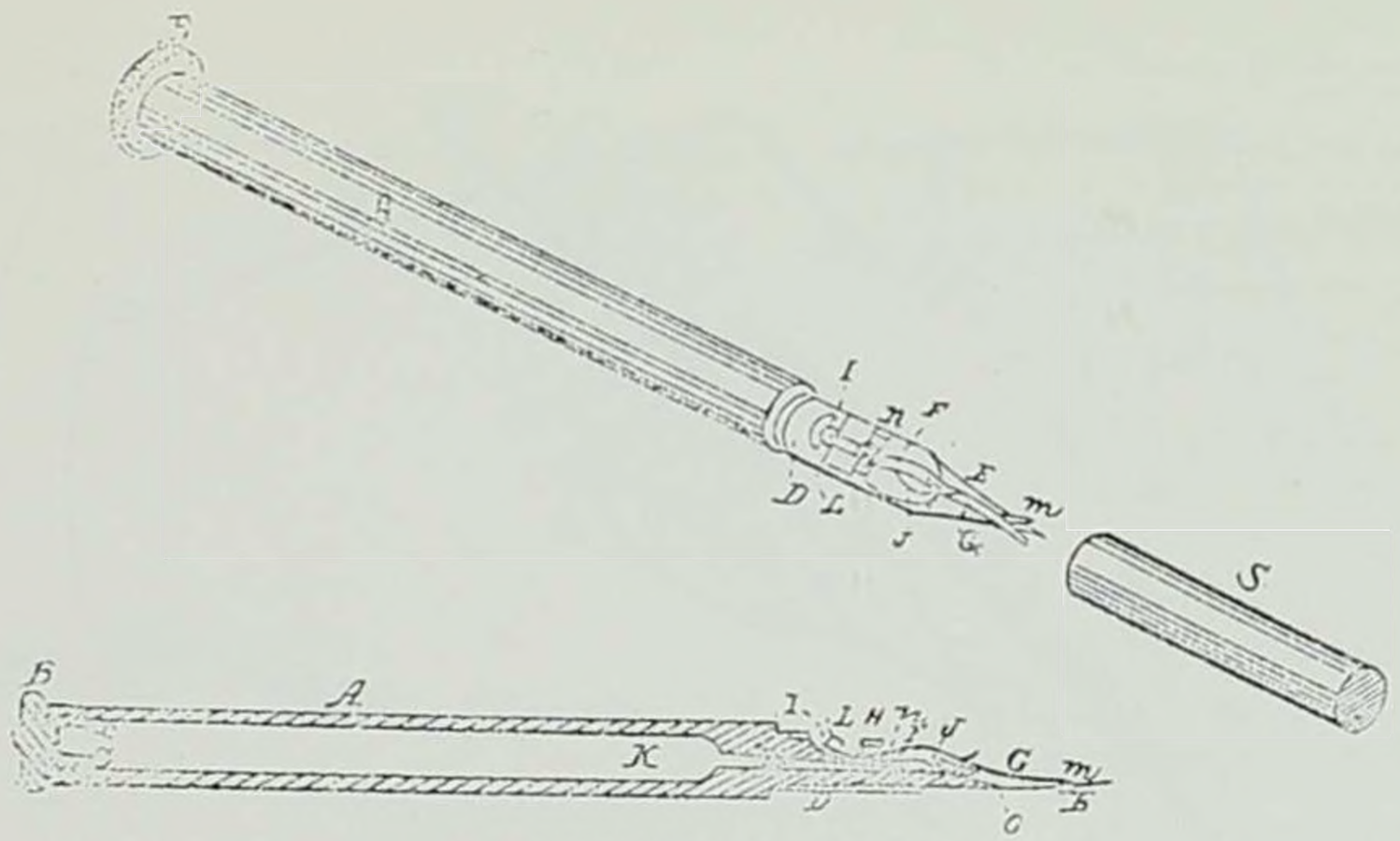
JONATHAN EMERY, CEDAR FALLS
Artificial Leg
65,187 — May 28, 1867

This improvement in an artificial leg was patented by Jonathan Emery of Cedar Falls.



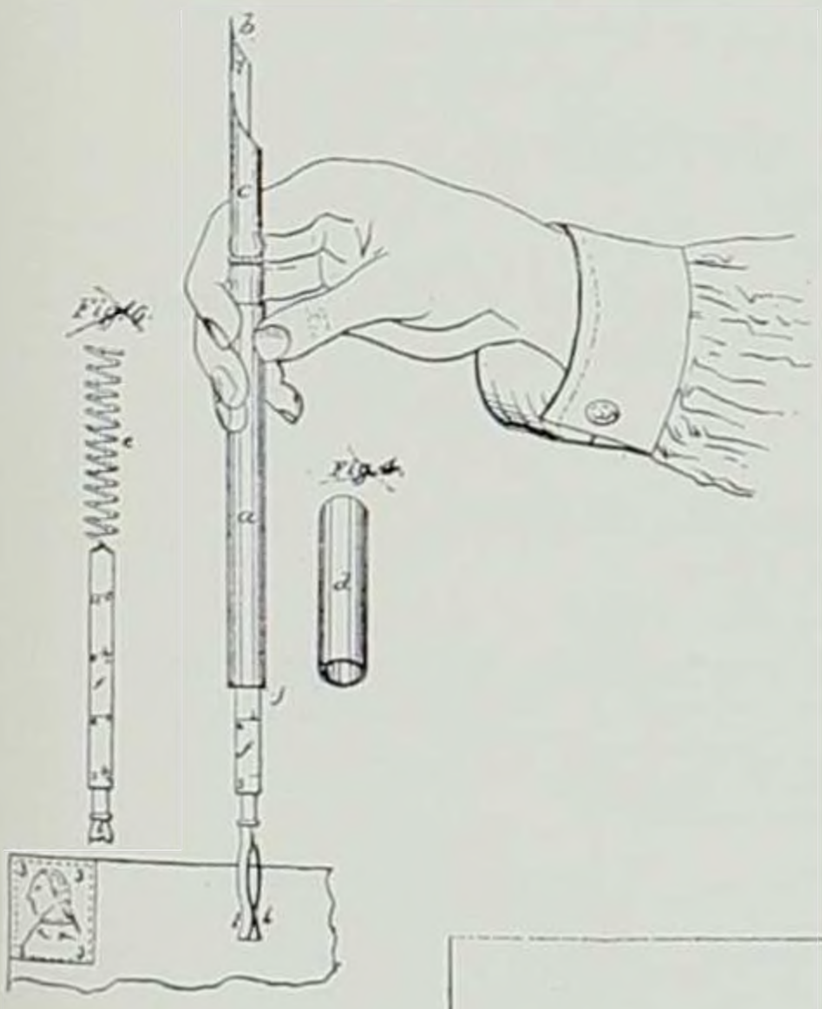
A. E. ROBERTS, DES MOINES
School Furniture
79,145 — June 23, 1868

A school desk patented by A. E. Roberts. The desk top, E, could be folded forward into slot, H, and permit more room for student to pass between desks.



SANDFORD & BEEBE
Fountain Pen
51,090 — Nov. 21, 1865

Levi M. Sandford and James P. Beebe of Clinton patented this fountain pen.



(Left)

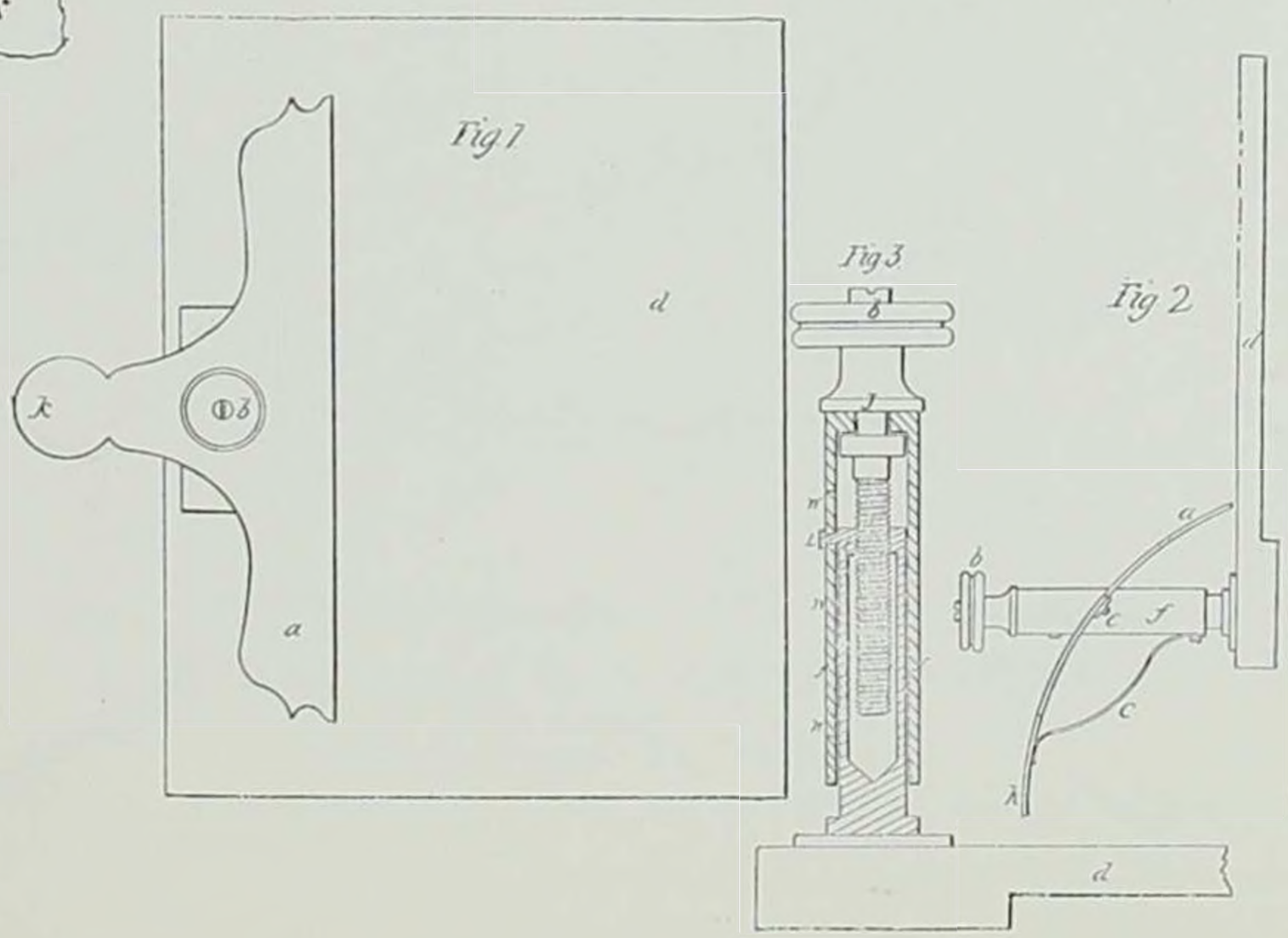
D. C. LAWRENCE, CEDAR FALLS
Spring Scales
33,091 — Aug 20, 1861

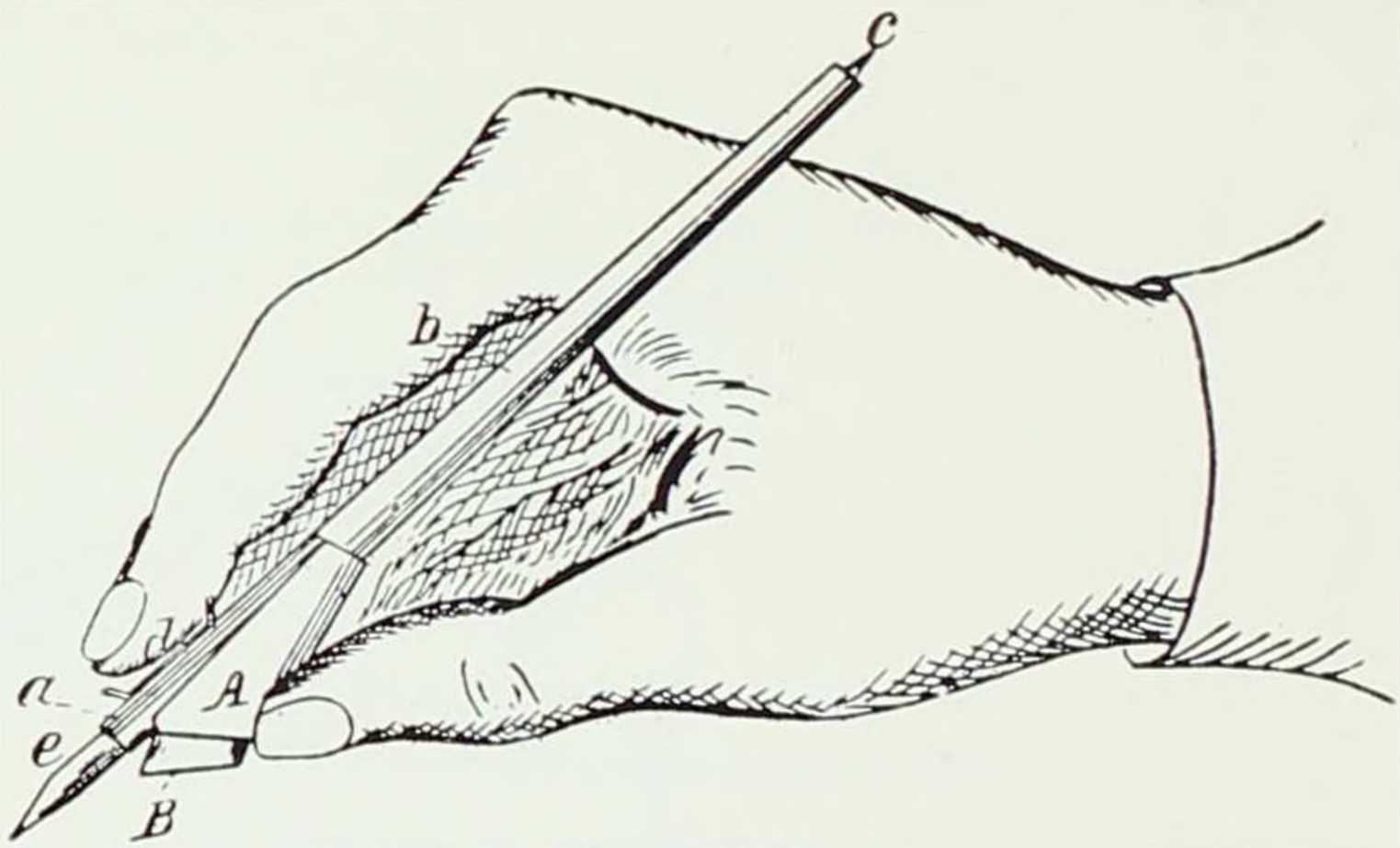
This combined penholder and letter scales was patented by D. Clinton Lawrence of Cedar Falls.

(Below)

J. L. HARVEY & C. A. MILLS, DUBUQUE
Paper Clip
15,232 — July 1, 1856

A paper clip, similar to the clip boards we know today, was invented by John L. Harvey and C. A. Mills of Dubuque.





E. J. TOOF, FORT MADISON
Pencil Case
78,158 — May 19, 1868

A pencil holder invented by Edwin J. Toof. The pencil, e, was slipped into the case, b. B is an eraser pad which had been added.

(Below, left)

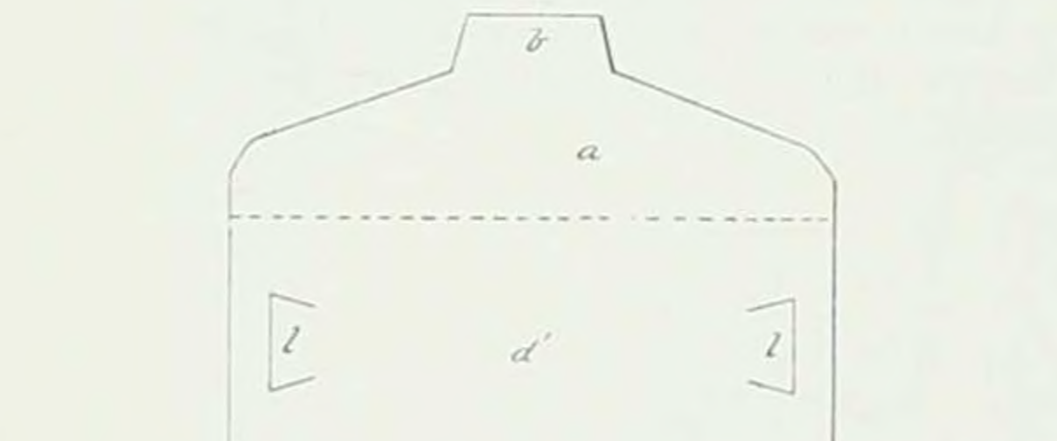
LOUIS GIEBRICH, OTTUMWA
Envelopes
140,496 — July 1, 1873

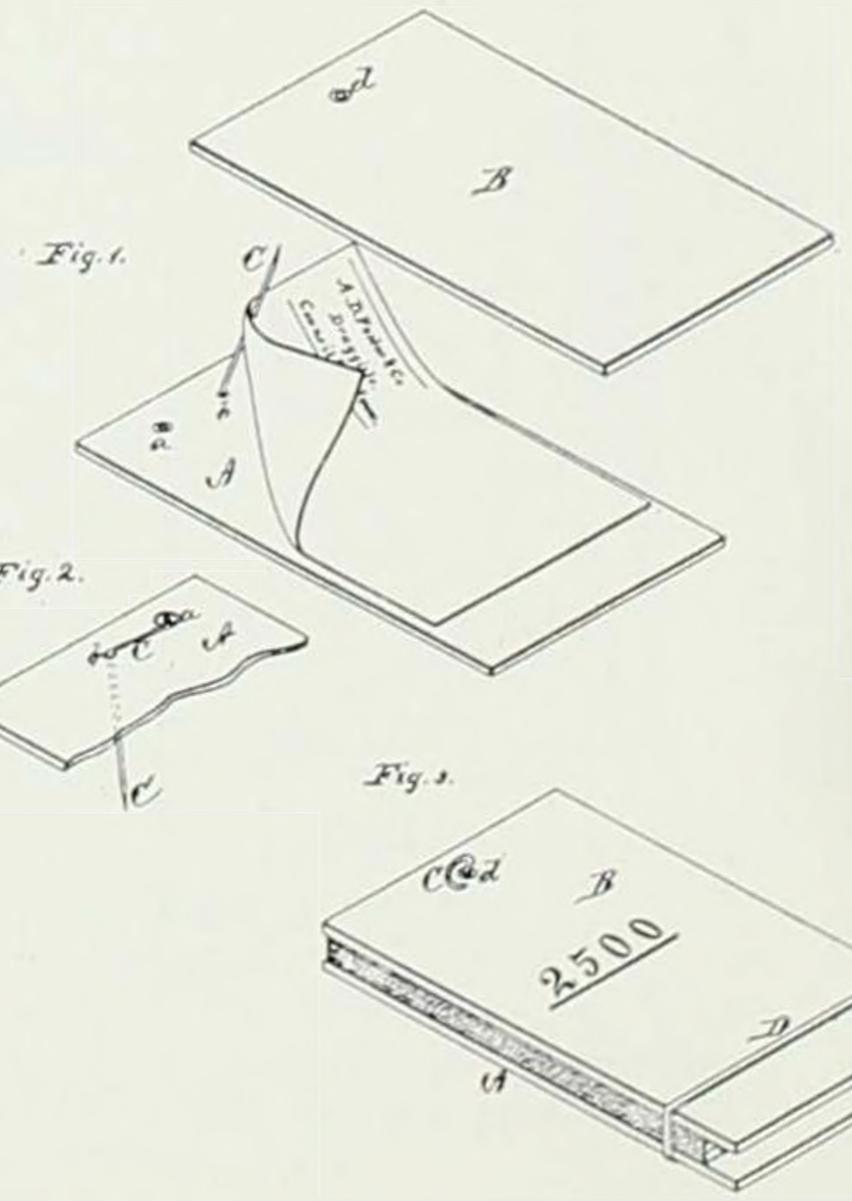
Envelope with an arrangement and formation of sealing laps and slits, was patented by Louis Giebrich of Ottumwa.

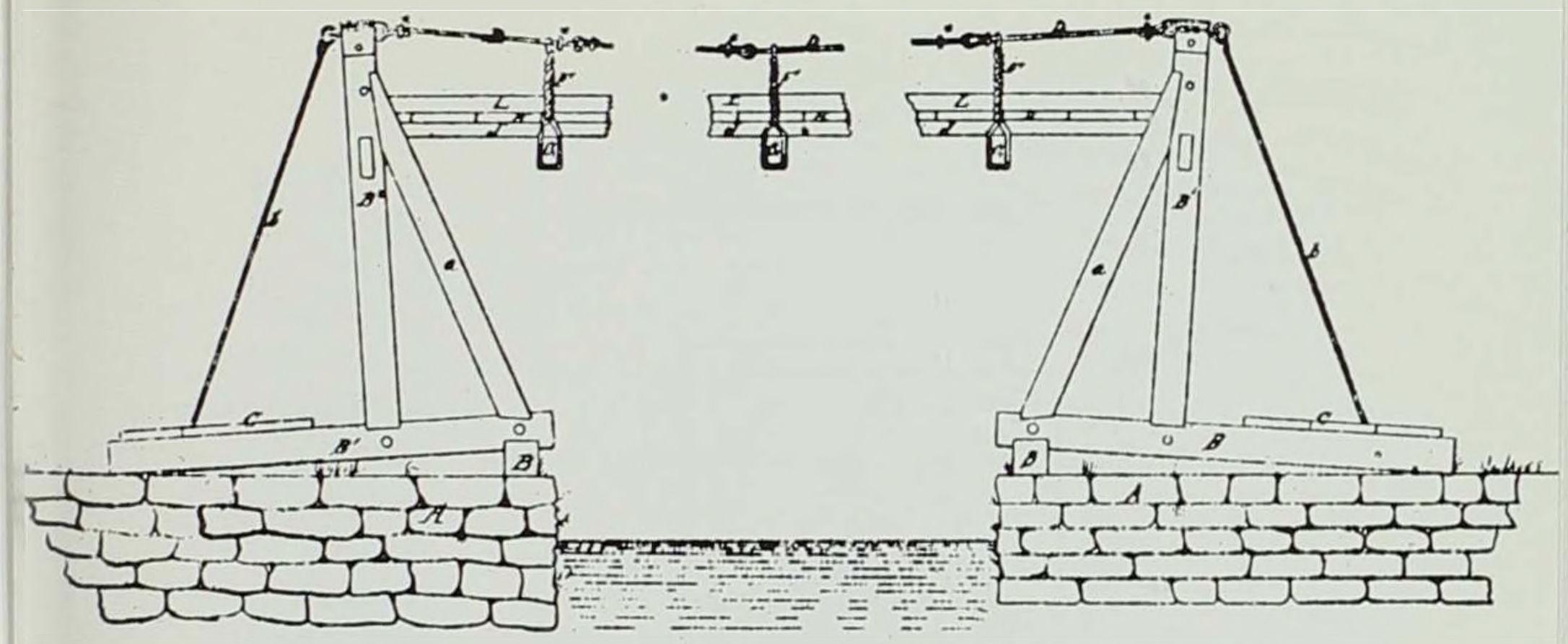
(Below, right)

A. D. FOSTER, COUNCIL BLUFFS
Prescription Files
138,390 — Apr. 29, 1873

A simple device for druggists to hold prescriptions was patented by Albert D. Foster of Council Bluffs.

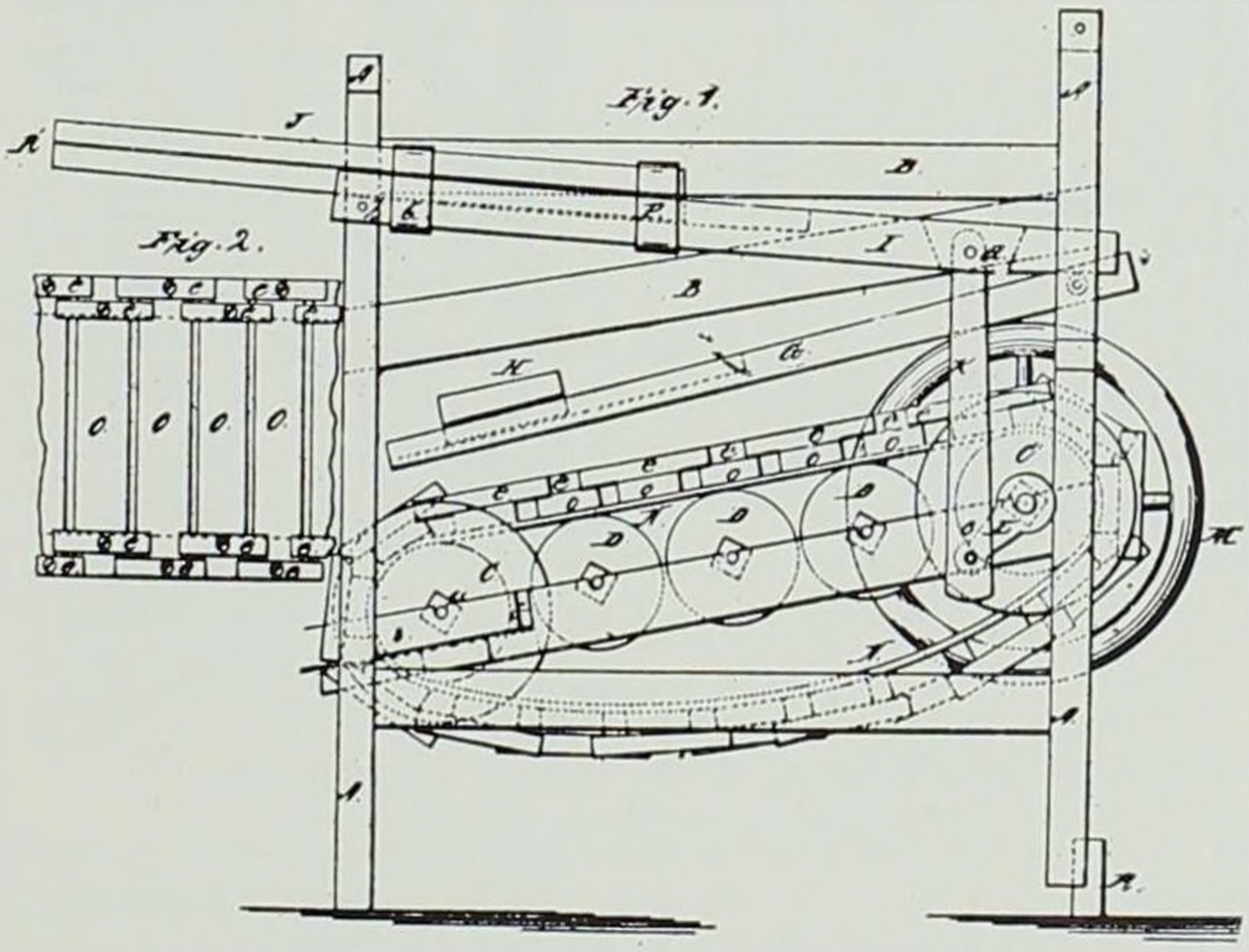






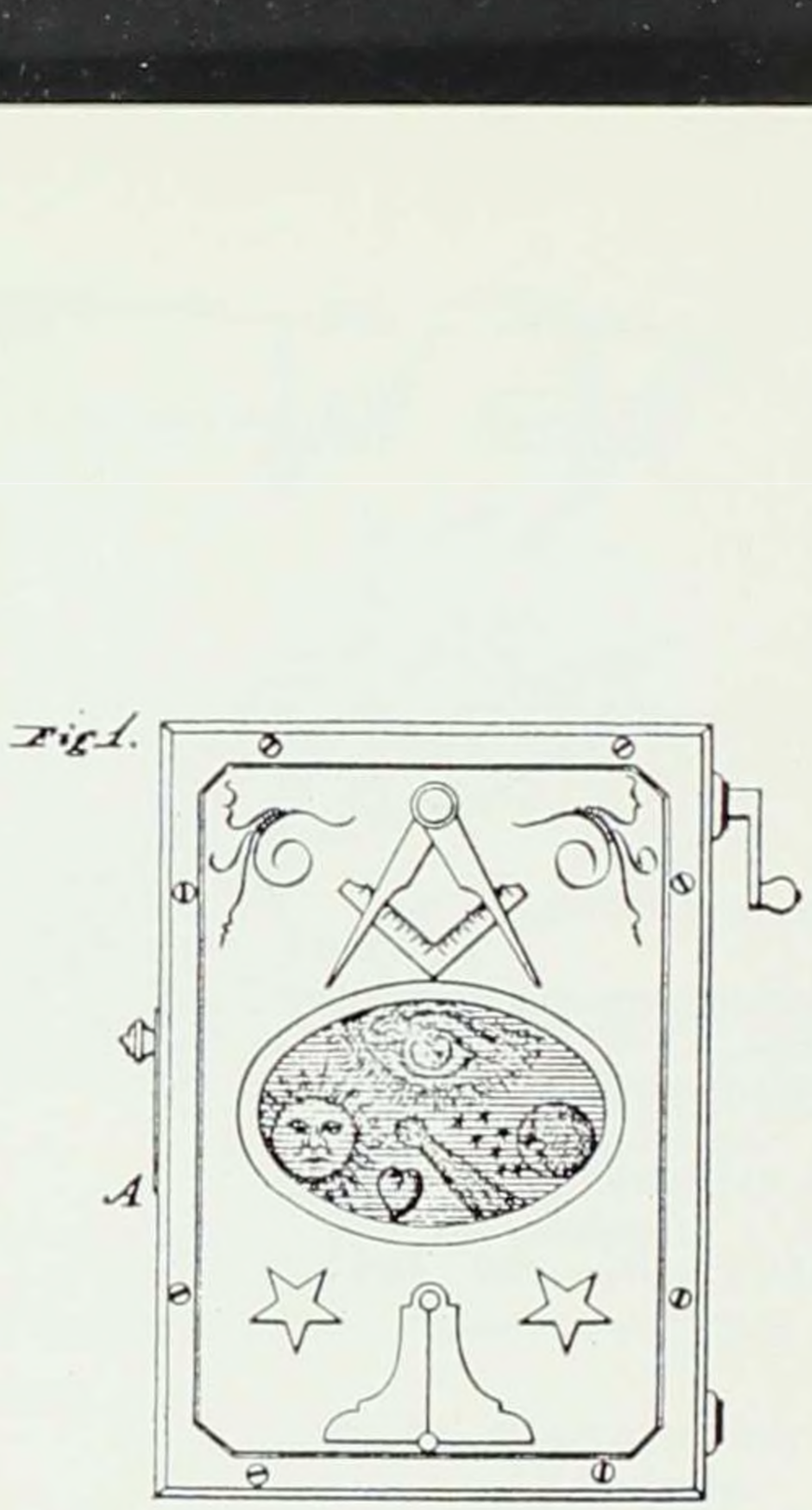
PETER HENDRICKS, FLORIS
Bridge
71,483 — Nov. 26, 1867

This improvement in a suspension bridge was patented by Peter Hendricks of Floris.



A. W. HAGER & J. H. S. GROVE, WAVERLY
Dog Power
84,354 — Nov. 24, 1868

A machine for harnessing dog power was invented by A. W. Hager and J. H. S. Grove of Waverly.



R. H. LYON & G. B. RAND, DUBUQUE

Apparatus to Show Emblems

133,236 — Nov. 19, 1872

An apparatus for displaying Masonic or other emblems was patented by Royal H. Lyon and George B. Rand of Dubuque.

To the **Commissioner of Patents.**

The Petition of John Godden of Pittsburgh in the County of Van Buren and Territory of Iowa

Respectfully represents.

That your Petitioner has invented, or discovered, an improvement in the manner of constructing a Machine for the Breaking and Cleaning of Hemp and Flax

which has not, as he verily believes been heretofore used or known, and that he is desirous that Letters Patent of the United States may be granted to him therefor, securing to him and to his legal representatives, the exclusive right of making and using, and of vending to others the privilege to make or use, the same, agreeably to the provisions of the Acts of Congress in that case made and provided, he having paid Thirty dollars into the Treasury of the United States, and complied with other provisions of the said Acts.

And I do hereby authorize and empower my Agent and Attorney, Thos. P. Jones, to alter or modify the within specification and claim as he may deem expedient.

John Godden

County of Van Buren } 88.
Territory of Iowa.

Dated this 27 day of Oct 1842

before the subscriber, a Justice of the Peace in and for the said County personally appeared the within named John Godden and made solemn Oath according to law, that he verily believes himself to be the original and first inventor of the within described improvement in the Machine for Breaking and cleaning Hemp and Flax that he does not know or believe that the same has been before used or known; and that he is a Citizen of the United States,

Sworn to and subscribed before Me
This 27th day of Oct. 1842
John Lewis, J.P.

John Godden of Pittsburgh received the first patent issued to an Iowan. This is his petition to the Commissioner of Patents.

To all whom it may concern: Be it known that I, John Godden, of Pittsburg, in the County of Van Buren, and Territory of Iowa, have invented a new and useful improvement in the manner of constructing the Machine for breaking and cleaning of Hemp and Flax; and I do hereby declare that the following is a full and exact description thereof.

¶ In a frame suitable for supporting the various parts of the machinery, I place a stationary frame of slats, made in a manner similar to such as are used in other machines for the same purpose; and above this I place a similar frame, which is made to vibrate up and down, by the revolution of a crank shaft placed above it. For a machine of the ordinary size, these frames of slats may be about two feet two inches in width, and about three or four feet in length. When intended for breaking Hemp, the slats, where the hemp first enters, may be about three inches apart, and at the opposite end about half that distance; when made for Flax, the slats should be placed nearer together. The crank to be connected to the vibrating frame by a connecting rod, in the usual manner, and should make about two hundred revolutions in a minute. The crank may have a throw of three or four inches. The slats of the upper, pass into the spaces between those of the lower frame, as in other Hemp and Flax brakes.

¶ My principal improvement consists in the employment

On this page are shown the first pages of Godden's description of his improvement in a flax and hemp machine—written in longhand and as printed by the U. S. Patent Office.

UNITED STATES PATENT OFFICE.

JOHN GODDEN, OF PITTSBURG, IOWA TERRITORY.

IMPROVEMENT IN MACHINES FOR BREAKING AND CLEANING FLAX AND HEMP.

Specification forming part of Letters Patent No. **2,922**, dated January 20, 1843.

To all whom it may concern:

Be it known that I, JOHN GODDEN, of Pittsburg, in the county of Van Buren and Territory of Iowa, have invented a new and useful Improvement in the Manner of Constructing Machines for Breaking and Cleaning of Hemp and Flax; and I do hereby declare that the following is a full and exact description thereof.

In a frame suitable for supporting the various parts of the machinery I place a stationary frame of slats, made in a manner similar to such as are used in other machines for the same purpose, and above this I place a similar frame, which is made to vibrate up and down by the revolution of a crank-shaft placed above it. For a machine of the ordinary size these frames of slats may be about two feet two inches in width, and about three or four feet in length. When intended for breaking hemp, the slats where the hemp first enters may be about three inches apart, and at the opposite end about half that distance. When made for flax, the slats should be placed nearer together. The crank is to be connected to the vibrating frame by a connecting-rod in the usual manner, and should make about two hundred revolutions in a minute. The crank may have a throw of three or four inches. The slats of the upper pass into the spaces between those of the lower frame, as in other hemp and flax brakes.

My principal improvement consists in the employment of a second vibrating frame of slats, which is placed below the stationary frame of slats, the slats on which correspond in number and length with the spaces between the slats of the stationary frame. This lower frame is made to move up and down simultaneously with the upper vibrating frame, but not in the same direction, its motion not being at right angles with the stationary frame, but in a line inclined obliquely in the direction in which the hemp moves in its passage through the machine. This lower frame of slats I usually make of thin strips of iron, which pass into the spaces between the stationary slats as the upper vibrating slats are raised therefrom. The planes of these strips stand in the direction in which the frame that carries them moves, and they are attached at each end to short standards or rods attached to the frame. to sweeps of such length as to cause it to move in the proper direction; or it may be guided between slides, or be governed in any other way that will produce the desired effect, the object in view being to cause these lower slats to drive the hemp or flax forward horizontally over the stationary slats and toward the cleaning-rollers. My feeding and cleaning are effected by means of rollers properly constructed for that purpose. A pair of feeding-rollers about five inches in diameter are placed at the front of the brake, and these may receive the materials from a feeding-apron in the usual manner. The fibers, as they are delivered from the brake, are received between a pair of fluted rollers, which may be five inches in diameter. As it leaves these it is received between a second pair of fluted rollers, which are about seven or eight inches in diameter. This pair of rollers has thin flutes or blades, which project about two inches from the core or body and stand about two and a half inches apart. These larger rollers are geared together by toothed wheels on their journals, which cause the projecting flutes or leaves on one roller to preserve their positions in the middle of the spaces of the corresponding roller. The smaller rollers may revolve about seventy-five times, and the larger about double the number of times, in a minute. The delivering of the fibers after being cleaned is effected by a pair of smooth rollers, which may be five inches in diameter and similar to the feeding-rollers. These delivering-rollers conduct the cleaned fibers onto an endless apron. The journals of each of the pair of five-inch rollers may run in open-slot mortises without being geared together, the uppermost of each pair bearing upon the lowermost by its own weight. Each pair is to work together horizontally, the peripheries of the lower rollers being in a line, or nearly so, with the upper side of the stationary slat frame. They may all be driven by means of bands and pulleys, the motion of which may be derived from the crank-shaft, and they are all to move in the direction necessary to carry the hemp or the flax from the feeding to the delivery rollers. There may be more than two pairs of cleaning-rollers should it be found desirable to increase their number.

Well boring apparatus (9): Clark, Low Moor; Craig, Eddyville; Harter, Colfax; Hovey, Independence; King, Hamburg; McDonald, Dubuque; Skiff, Camanche; Weaver, Anamosa; Wheeler, Decorah.

Windmill (9): Bailey, Smyrna; Clement, Grinnell; Gore & Gore, Charleston; Jones, Davenport; Lowrey, Tabor; Reister, Washington; Shannon, Shellsburgh; Southwick, Oskaloosa; Wheeler, Woodbine.

Wind wheel (7): Hopper, Onion Grove; McDill, Des Moines; Reister (2), Washington; Sutton, Coon Rapids; Trim, Iconium; Wate, Wilton Junction.

HOMER CALKIN—CORRINE CALKIN

Transportation

The carriages, spring wagons and sleighs patented and manufactured in Iowa were "favorably known throughout a large section of the country." For instance, it was said of Thomas Connally's carriage factory in Dubuque: "No establishment west of the Alleghenies . . . has achieved a more widespread reputation."

There were nearly as many patents for railroad and streetcar equipment as for means of land transportation. Although the railroad had been in Iowa for a comparatively short time, many Iowans were thinking of the comfort of the passenger and the improvement of the equipment.

Andrew Cathcart of Madison constructed a locomotive that, when required, could draw a heavy load up a steep inclined plane. Its speed on ordinary grades was not affected. Small-toothed wheels were added which prevented slipping on the rails.

Although river transportation was of great importance in those early days, few patents were secured. Of those, one or two pertained to ocean steamers. In addition, some inventions pertained to related activities—baggage checks, mail, and the telegraph.

Land Transportation

Axle lubricator, wagon (2): Loewenstein, Keokuk; Soellinger & Noetzli, Keokuk.

Carriage (2): Jack, Des Moines; Whitehead, Ames Station.

Carriage bow irons: Woeber & Woeber, Davenport.

Carriage axle: Bollinger, Cedar Rapids.

Carriage brace: Howe, Mt. Pleasant.

Carriage brake (3): Jones, Dubuque; Lewis (2), Iowa City.

Carriage curtain: Woeber, Davenport.

Carriage hound: Maddock, Dubuque.

Carriage spring: Woeber, Davenport.

Carriage wheel: Harman, Hamburg.

Carriage, propelling: Swank, Newton.

Carriages, securing wheels of: Bruns, Davenport.

Carriage wheels, attaching rubber tires to: Ham, Iowa City.

Dumping platform: Fish, Glenwood.

Felly, carriage wheel: Turley, Council Bluffs.

Fifth wheel and coupling: Silsby, Ottumwa.

Hub, vehicle wheel: Hitt & Chapman, Waterloo.

Sled runners (5): Berkeley, Cedar Rapids; Holdiman, Waterloo; Lockwood & Frederick, Marshalltown; Logan, Waterloo; Noble, Vernon Springs.

Sleigh (4): Arneman, Guttenberg; Heald, Marshalltown; Huyck, Chariton; Pierce, Waverly.

Sleigh brake (4): Ast, Maquoketa; Cassidy, Montezuma; Dutton, Iron Hills; Sloan, Highland.

Sleigh shoes, mold for casting (2): Russell, Cedar Falls; Sthore, Montana.

Thill coupling (8): Boynton, Lyons City; Clark, Davenport; Cole, Columbus City; Graves, Waterloo; McCargar, Masonville; Will, Columbus City; Woeber & Woeber (2), Davenport.

Tongue support, wagon (2): Houck, Iowa City; Nunamacker, Earlham.

Trucks, moving (7): Barlow, Van Meter; Bradstreet, Monticello; French (2), Davenport; Hoyt, Davenport; Rentgen, Keokuk; Walker, Albion.

Vehicle spring: Wright, Ft. Madison.

Vehicle wheel (3): Kellogg, Floyd; Lahman, Panora; Roberts, Waverly.

Wagon (3): Post, Clinton; Stamper, Pella; West, Saylorville.

Wagon bed (3): Balfour, Mason City; Bratton, Oskaloosa; Chatfield, Waterloo.

Wagon brake (10): Bean, Iowaville; Bennett, Burlington; Coe, Des Moines; Cook, Lyons; Egeberg, Columbus City; Pierce, Maquoketa; Roberts, Dubuque; Schultz, Mt. Pleasant; Urie (2), Springfield.

Wagon jack: Long, Council Bluffs.

Wagon loader: Johnson, Iowa City.

Wagon lock (3): Counts, Indianapolis; Kenyon, McGregor; Noethlick, Muscatine.

Wagon reach: Plumb, DeWitt.

Wagon seat: Rockwell, Glenwood.

Wagon standard (2): Harding, Ainsworth; Smith, Dixon.

Wagon step: Floyd, Bloomfield.

Rail Transportation

Ash pan, locomotive: Dee, Grand Junction.

Axle box, railway car: Campbell, Clinton.

Car axle (2): Hard (2), Decorah.

Car, barrel: Plantz, Iowa Falls.

Car brake (6): Borthwick, Montana; Lee (2), New London; Mitchell, Osceola; Portlock & Dodds, New London.

Car coupling (25): Allen & Boyles, Mt. Pleasant; Cady, West Union; Stewart, Lyons; Cary (2), Burlington; Clark, Burlington; Evans, Homer; Graves, Hickory; Hargar, Des Moines; Hughes, Nutting & Aldrich, Horton; Huston, Keokuk; Johnson, Ft. Madison; Kenworthy, Adel; Lockwood, Denmark; Mason, Keokuk; Moore (2), Lyons; Moore, Last Chance; Morris, New Sharon; Patton, Des Moines; Pearson, Sterling; Rague, Dubuque; Tichnor, Council Bluffs; Wheeler, Afton; Wheeler & Chase, Batavia.

Car, dumping: Sharp, Tama City.

Car, hand: Johnston, Eddyville.

Car, railway: Lawless, Montana.

Car, railway cattle: Street, Marshalltown.

Car replacer: Pullman, New Oregon.

Car seat, railway: O'Neill, Clinton.

Car spring, railway (2): Allen (2), Dyersville.

Car starter: Wheeler, Grinnell.

Car, street: Turner, Des Moines.

Cars, combination brake and propelling mechanism for: Hill, Jefferson.

Cars, construction of seat: Bundy, West Liberty.

Cars, head support for railway: Williams, Dubuque.

Cars, loading cattle: Cottle, Cedar Rapids.

Cars, plow for unloading: McMullin, Casey.

Cars upon track, switch for replacing: Pullman, New Oregon.

Coach and car truss: Chalender, Burlington.

Fare box, streetcar: Wormood, Dubuque.

Journal lubricator: Sellers, Keokuk.

Locomotive cowcatcher: Mitchell, Osceola.

Locomotive for ascending inclined planes: Cathcart, Madison.

Plow, railway snow (3): Hemenway, Lansing; Wheelock, Decorah; Wilson, Des Moines.

Railway chair and tie: Fouts, Albia.

Railway gate: Sherwood, Independence.

Railway rail: Tallant, Burlington.

Railway switch (4): Gelett, Keokuk; Pullman, New Oregon; Raymond, Charles City; Rockwell, Shell Rock.

Railway train indicator: Hemenway, Lansing.

Spark arrester: Dennison, Ottumwa.

Stove, railway car: Comstock, Keokuk.

Streetcar: Nichols, Osage.

Switching device (2): Patton, Hamburg; Sloan & Sweetser, Hamburg.

Track cleaner, railway: Blakly, Fairfield.

Truck bracket, railway car: Allen, Dyersville.

Truck, car: DeHuff, Summitville.

Truck, railway car (2): Allen, Dyersville; Thielsen, Burlington.

Truck, mode for applying bolster in: Harrison, Burlington.

Truck, mode for connecting railway car: Allen, Dyersville.

Turntable, suspension: Bonnell, Ft. Madison.

Valve gear, locomotive engine: Petersen, Davenport.

Weedcutter, railway: Boicourt, Boonesborough.

Wire-way, elevated railway: Killam, Ft. Dodge.

Water Transportation

Dock and wharf fender: Moomey, Clinton.

Governor for side wheel ocean steamers: Godfrey, Auburn.

Paddle wheel (3): Ehrhart, Muscatine; Merkel, Mt. Pleasant; Thompson & Doty, Chariton.

Propellers, elevating and depressing: Hill, Muscatine.

Propulsion for steamboats: Fellows, Maquoketa.

Rafting logs, mode for: Bouk, Clinton.

Rivers, devices for forming channels in: Harlan, Croton.

Rudder, vessel's: VanSant, Le Claire.

Valve for steamboat engine: Haley, Sioux City.

Related Patents

Baggage check (4): Cottle (2), Cedar Rapids; Curless, Cedar Rapids: McAlvin, Cedar Rapids.

Insulator, telegraph: Waite, Burlington.

Mailbag, airtight: Robbins, Iowa City.

Telegraph key: Bowers, Wheatland.

Telegraph cutout: Linn, Bloomfield.

Telegraph pole: Crandal, Marshalltown.

Telegraph sounder relay: Bryan, Cedar Rapids.

HOMER CALKIN—CORRINE CALKIN

Miscellaneous Inventions

There were at least 150 inventions of a miscellaneous nature. Some were unusual, some were practical, while others probably had little application in Iowa or elsewhere.

Amusements

Inventions in the amusement field ranged from billiard cue tips to carrousels. Jonathan Green of Christiansburgh made his cue tips from a mixture of ¼ gutta-percha or India rubber and ¾ pulverized chalk. He attached it with glue to a ferrule to be screwed to the end of the cue or to the cue itself. Green claimed the resulting tip was more durable than leather and did not require chalking.

Frederick C. Schaefer of Dubuque patented a folding chessboard, made to be carried in the pocket. The carrousel of Wilhelm Schneider of Davenport consisted of two levels providing ample accommodations for the occupants.

The Dubuque *Daily Times* in 1869 reported that A. Roorbach, a young mechanic of that city, had invented a "velo-cycle." By an arrangement of pulleys each circle of the pedals would give a complete revolution of the large wheel. This was equivalent to an 18-foot stride but required no

more muscle than ordinary locomotion. Roorbach claimed he could ascend grades equal to those of Lorimer Avenue in Dubuque with ease. The Des Moines *Register* said it "bids fair to run all the velocipedes off the course." It was not ridden, said the paper, but transported its rider in the position of a "walkist." No patent was received for the contraption although two other Iowans, C.B. Guy of Postville and P. Delescaille of Montezuma, were granted patents for velocipedes in 1869 and 1872.

Virgil C. Taylor of Des Moines patented a music staff which would "be of immense advantage to the ordinary singer and player." It consisted of a new method of indicating to the eye the key in which music was written. He made the line upon which the key note fell lighter than the others; if it fell in a space, he made the space either narrower or wider than the others in the music.

Billiard cue tip: Green, Christiansburgh.

Camera focusing attachment: St. Clair, Cedar Rapids.

Carrousel: Schneider, Davenport.

Chessboard: Schaefer, Dubuque.

Fish net: Cartwright, Davenport.

Game table: Uebel, Cedar Rapids.

Music rack: Schaffer, Dubuque.

Music staff: Taylor, Des Moines.

Piano, bell: Buttkereit, Toledo.

Skate: Brownlee, Princeton.

Velocipede (2): Delescaille, Montezuma; Guy, Postville.

Excavating and Ditching

One of the earliest Iowa patents was No. 11,948, issued to Charles A. Robbins of Iowa City on November 14, 1854. He had invented an excavator and ditching plow for the purpose of cutting earth into sods or pieces so they could be easily moved.

Twenty others also invented various types of digging machines and excavators.

Digging machine: Mitchell, Osceola.

Ditching machine (6): Ballard, Mt. Pleasant; Hale, Irvington; Kidder, Moscow; Martin, Muscatine; Nichols, West Liberty; Stacy, Iowa Falls.

Drains (4): Moore (3), Lyons; Miller, Mt. Pleasant.

Excavators (9): Bradley, Cedar Falls; Curless, Cedar Rapids; Mayne, Keosauqua; Myers, Lyons; Robbins, Iowa City; Schultz, Mt. Pleasant; Williams (2), Clermont; Williams, Grand Meadow.

Spading machine: Cole, Chariton.

Firearms

The Civil War gave an impetus to the invention of cannon, revolvers, and projectiles. On January 4, 1862, the Burlington *Hawk-Eye* told of a gun invented by a Rev. Moore of Iowa. The gun had a calibre of ninety-five balls to the pound. The powder and balls were put into two tubes extending from the chamber about one foot. Both could be filled with ammunition in seconds to the capacity of forty charges.

In the hands of a regiment it was claimed that this gun would be equal to at least five regiments

armed with common muskets or rifles. Although the *Hawk-Eye* said arrangements were being made for its manufacture in St. Louis, there is no indication of its being patented or proving to be practical.

The *Hawk-Eye* also reported on a novel cannon invented by Charles W. Stafford of Burlington. Cast in two pieces, the breech had two chambers. One could be loaded while the other was being discharged. Working backward and forward, one of the chambers was brought in line with the barrel alternately, the cartridge shoved by means of a lever, which in one motion sent the ball to its place.

There seemed to be many advantages. First, a ship with one hundred guns would have the equal of two hundred regular cannon. Second, a double broadside could be fired in three seconds, giving the enemy the contents of both chambers. Third, when run out of a porthole, it did not have to be run back to be loaded. It weighed 145 pounds, had a one-inch bore and was 23 inches long. There is no record of a patent being issued. However, Stafford did receive three patents for projectiles between 1863 and 1866.

Edward R. McCabe of Rochester patented breech-loading ordnance in 1862. His principal object was to develop a gun in which guncotton could be used, especially in casements and between decks of ships. Guncotton, because of the

small amount of smoke produced, did not cause men working in a confined place to have the choking thirst, smothered sensation or blindness caused by gunpowder.

Muzzle loading with guncotton was dangerous. Therefore, McCabe's improvements were directed to strengthening the breech and its parts.

Albert Hall of Danville, about the same time, turned his attention to improving the revolver. He made it more compact by bringing the hammer, except for the thumbpiece, within the gun's frame. He also made the action of the trigger easier, more like that of a hair trigger.

Bullet casting machine (2): Driver, Marengo; Remington, Dubuque.

Cartridge (3): Hall, Danville; White, Davenport; Williams, Davenport.

Firearms (5): Berg, Davenport; Budd, Oskaloosa; Garretson, Mt. Pleasant; Hall, Danville; Schulz, Ft. Madison.

Gun lock: Bennett, Illyria.

Gun sight: Harrington, Homestead.

Ordnance, breech-loading: McCabe, Rochester.

Projectile (5): Currie, Washington; Hill, Jefferson; Richards, Muscatine; Stafford (2), Burlington.

Projectile, sabot for: Stafford, Burlington.

Shell for rifled ordnance: Rollins, Cedar Rapids.

Liniments, Panaceas, Medical Aids

During the nineteenth century "patent medicines" were common in most households. Iowans developed a number of these panaceas, using a variety of ingredients and making fantastic claims.

The earliest was Dr. Granderson Mershon of Brookville who patented a cure for eye diseases in 1866. To one pint of soft water he added 60 gr. sulphate of zinc, 40 gr. sugar of lead, 25 gr. silver nitrate, 50 gr. goldenseal, 15 gr. sulphate morphine and 10 gr. salicine. The mixture was allowed to stand a day or two and agitated once a day by shaking the bottle. The patient was directed to place 3 to 5 drops on the eye, close the lid and apply a linen cloth wrung from warm water for 10 to 15 minutes.

A few months later James M.F. Hall of Davenport patented "Hall's Health Panacea" for "the cure of diseases which human flesh is heir to." His formula was two pounds of red-root *Ceanothus* and one gallon of vinegar boiled in a porcelain kettle until it was reduced to 1/3 gallon.

Irving W. Scranton of West Liberty received a patent on September 8, 1868, for a medical compound for treating cholera. It consisted of one ounce each of chloroform, essence of Jamaica ginger, peppermint, cinnamon, spirits of lavender, and spirits of camphor; ½ oz. tincture of opium; 1½ oz. arnica; and 15 oz. of simple sirup.

A liniment patented by William P. Hamlin of Exira was to be used for wounds and bruises and "most of the pains with which mankind are afflicted." Hamlin also claimed it was good for spavins and sores of horses. He first mixed one gallon of alcohol, ¼ pound of gum camphor and

¼ pound of sugar of lead. After about five hours when these were well mixed, he added one pound of concentrated water of ammonia, one quart of the best spirits of turpentine and one pint of soft water. After standing ten hours it was ready for use.

Another liniment by A.J. Creel of Hopkinton was used for healing wounds on man and beast and curing inflammatory diseases and "various other aches and ails to which mankind, as well as the brute creation, are subject." His ingredients were turpentine, fish oil and oil of vitriol.

Joseph Benda of Yalton patented a liniment good for rheumatism, colic, diarrhea and headache. It was to be used by rubbing the affected parts lightly with it or mixing it with water which the patient would drink. Benda wrote, "It has a very invigorating effect, stimulating the action of the nerves and deadening pain." George F. Munro of Leon claimed his medicine was an "equalizer for circulation of the blood," a perfect tonic, producing perspiration and eliminating all diseased and vitiated matter through the pores.

The bitters developed by Edouard Edmond Crady of Sioux City purified the blood and acted as an invigorator for the general system, according to the patent application. It consisted of 12½ oz. of orange peel, 5 oz. of gentian, 2 oz. and 2 scruples [1/12th of an oz.] of cinnamon bark, 2 oz. and 2 scruples of anise seed, 5 drachmas of

cloves, 5 oz. of lemon peel and 5 pints of simple sirup.

Some medicines were for animals only. An ointment patented by George P. Barnum, Marion, was especially useful for ringbone, spavin, curb and splints in horses. Hog cholera was also a problem. Three patents were issued to Iowans at Oskaloosa in their attempts to find a remedy for this disease. One—that of Runyon, Haller and Morris—was made of madder, flowers of sulphur, rosin, saltpeter, black antimony, copperas, asafetida, black pepper and arsenic.

John Sprink of Council Bluffs turned his attention elsewhere. On October 9, 1866, he received a patent for a mixture to prevent hair from coming out and also to cure diseases of the hair and scalp. It was described as "a mild, sure and safe remedy." He boiled 2½ pounds of onions, 1¾ pounds of turnips, 2 oz. of salt and 2 pounds of burdock roots in a pint of cologne spirits and a pint of rain water for four hours. After scenting it with ¼ oz. of oil of bergamot, it was ready for use.

Artificial legs, beds for invalids and dental tools were also among the 24 items invented by Iowans during this period.

Chair and lounge, invalid: Boardman, Albia.

Dental drill: Poor, Dubuque.

Dental mallet: Poor, Dubuque.

Hair restorative: Sprink, Council Bluffs.

Leg, artificial: Emery, Cedar Falls.

Liniment (3): Benda, Yalton; Creel, Hopkinton; Hamlin, Exira.

Medicine (6): Crady, Sioux City; Gamble, Millersburgh; Hall, Davenport; Mershon, Brookville; Munro, Leon; Scranton, West Liberty.

Medicine, hog cholera (3): Baugh, Oskaloosa; Holton & Holton, Oskaloosa; Runyon, Haller & Morris, Oskaloosa.

Ointment for horses: Barnum, Marion.

Pessary: Atkinson, Davenport.

Syringe: Buffon, Vinton.

Teeth, mode of fastening: Mason, Keokuk.

Truss (2): Howe (2), Council Bluffs.

Uterine supporter: Byam, Hopkinton.

Schoolroom Equipment

On September 15, 1868, the Des Moines *Register* reported that D.G. Perkins, superintendent of the West Side Schools, had developed a "very complete and ingenious" school desk. The seat and desk parts were adjustable. The newspaper, in describing the desk, noted that the seat or bench portion was "thrown into slats with a single motion—in short, the bench swallows itself up so as to take but little room, leaving the scholar much or little room at pleasure."

The reporter wrote that Perkins "has surely joined the knowledge of a school teacher to the genius of an inventor, and produced a model benefit." For some reason, Perkins did not receive a patent; perhaps he did not even apply for one.

The *Register* also noted that a school bench developed by Col. G. A. Stewart of Des Moines

was "very ingenious" too. The shelf or top of the desk was stationary. The bench was hinged, "putting the 'sit-down' part of the seat entirely out of the way by lapping it up against the back of the seat." From the description one would conclude it was the forerunner of the desk many Iowans occupied in country schools.

The person writing about the two school desks concluded: "We are not going to say which is the better desk of these two; we don't know as we would if we could . . . . Like that of Prof. Roberts, they are both bound to come into very general public favor."

In March 1868 Rankin and Roberts organized the Iowa School Furniture Company in Des Moines. It had the exclusive rights to manufacture the "Climax" desk covered by A.E. Roberts' patents.

Altogether 14 patents were issued to Iowans for school desks or improvements. With an expanding school system throughout the country it was undoubtedly a profitable venture if one could develop a new and practical desk. In addition O.A. Wagner of Davenport took a step toward eliminating the old school slate by patenting an artificial slate surface in 1868.

Desk, school (14): Arnold, Des Moines; Chandler (3), Davenport; Cochran, Davenport; Osborne & Hammon, Des Moines; Roberts (4), Des Moines; Stewart (2), Des Moines; Vorse (2), Des Moines.

Hinge for desk: Roberts, Des Moines.

Slate surface, artificial: Wagner, Davenport.

Stationery

Iowa has become well-known over the years as the home of the Sheaffer fountain pen. There were a number of pens and other stationery items invented in Iowa at an earlier time.

For instance, Levi M. Sandford of Clinton patented his fountain pen in 1865. It would carry enough ink to last about half a day when used continuously. There was also a regulator by which ink could be made to flow from the holder into the pen and the pen adjusted to make a mark of any desired size. George Bartlett of Keokuk used an overflow chamber in connection with his fountain pen-inkstand.

Edwin J. Toof of Ft. Madison turned his attention to pencils in 1868. On a pencil holder he located an eraser near the writing point of the pencil. In this way it was convenient for erasing marks made by the pencil while writing.

John D. Mets of Dubuque received three patents for photographic albums and binders. One was an improved hinged binding for the albums. It was made by securing each page of which the album was composed to metallic or other plates. These were placed together so that a succession of hinges or joints was formed. The eyes of the hinges left spaces between the plates equal to the thickness of the album pages. When photos had been mounted, this would allow the book to be closed without bulging.

Mets was born in Holland in 1822 and came to Dubuque in 1862 where he became a blank book manufacturer, bookbinder, and printer. In 1876 he received for his work the grand medal of honor and the diploma of highest merit awarded at the Centennial Exhibition in Philadelphia.

D. Clinton Laurence of Cedar Falls wrote that "a convenient, accurate, portable letter weighing apparatus has long been needed, but never heretofore made, or put into general use." He combined a penholder and letter scales and produced "an apparatus that is reliable, very cheap, portable, and that has never . . . been a commercial article, or on sale, or in use." For his ingenuity he was granted Patent No. 33,091 on April 29, 1862.

Addressing machine: Davidson, Montana.

Album, photographic (3): Mets (3), Dubuque.

Billholder: Collins, Keokuk.

Book, blank: Bonnell, Burlington.

Calendar, portable: Dudley, Mitchell.

Cardholder: Stewart, Ft. Madison.

Envelope (3): Giebrich (2), Ottumwa; Kuh, Jefferson.

File, prescription: Foster, Council Bluffs.

Filing case: Bettesworth, Cedar Rapids.

Inkstand (2): Bartlett, Keokuk; Bennett, Mt. Pleasant.

Letters for signs, composition: Todd & Todd, Des Moines.

Paper clamp and inkstand: Toof, Ft. Madison.

Paper clip: Harvey and Mills, Dubuque.

Paper holder: Toof, Ft. Madison.

Paper, leather, etc., appliance for cutting ornaments in: Mets, Dubuque.

Pasteboard cutting machine: Burhans, Burlington.

Pen, fountain (2): Klein & Wynne, Keokuk; Sandford & Beebe, Clinton.

Penholder and letter-balance combined: Laurence, Cedar Falls.

Penholder, pincase and money case combined: Rose, Waukon.

Pencil holder: Toof, Ft. Madison.

Portfolio: Pratt, Davenport.

Stencil plate: Sykes, Muscatine.

Other Patents

A number of patents were also issued for inventions that were unusual or not easily placed in any of the other categories. S.G. Hill of Muscatine developed a "barrel roller." By attaching movable handles to each end of barrels, they could be rolled onto ships, in warehouses, or into wagons.

A.W. Hager and John H.S. Grove of Waverly patented a "dog power." They used a dog on a treadmill to drive light "machinery as churns, washing machines, grindstones, and the like."

An improved method of constructing suspension bridges was patented by Peter Hendricks of Floris. It was a combination of wood and metal sustained by chains connected to strong towers. The Des Moines *Register* reported on the King's Patent Bridge in 1868. It may possibly have been one of the four patented by Iowans, but advertised under a different name. A suggestion was made that all interested in bridges should see the one over Four Mile Creek where it was crossed by two railroads entering Des Moines.

The appearance of the frame was light, but good material was used and every pound of iron made to do its work. Therefore, the bridge was "abundantly strong and durable." The writer continued, "We believe this bridge will recommend itself for county purposes before any other now in use in this part of the State."

Jonathan H. Green of Christiansburgh patented a formula for waterproofing textiles and papers while permitting them to remain clear and transparent. He used one part of linseed oil, one part India rubber cement and six parts of benzine. It was applied with a brush to the cloth or paper surface while subjecting it to heat not exceeding 250° F. Normally 200° F. would be satisfactory, he said. This was continued until the mixture had penetrated the goods.

Green said it could also be used in place of oiled papers in letter books for copying by pressure, and it would take the place of oiled silk in dressing wounds. He claimed too that using it on banknotes would effectively prevent their being photographed when colors were used in printing, give durability to the bills, and provide ease of manipulating them while counting.

Henry Hannen of Dubuque patented an improved process for making white lead in 1857. It was a three-step procedure. He first subjected the lead to the action of steam and atmospheric air for the purpose of oxidation. Then he exposed it to

vapor of acetic acid in order to form a sub-acetate and afterwards to the action of carbonic acid, alternately and successively until the operation was completed.

The lead became carbonated faster than when it was exposed to the action of air, the vapor of hydrated acetic acid and carbonic acid all at the same time, he claimed.

An apparatus for displaying Masonic or Odd Fellows emblems was patented by Royal M. Lyon and George B. Rand of Dubuque on November 19, 1872. The emblems were placed on a movable belt in an open-faced case or cabinet. As a lecture was given in the course of conferring degrees, the appropriate emblem could be moved easily into view.

Barrel roller: Hill, Muscatine.

Bell, ceremonial: Smith, Keokuk.

Belt joining clasp: Randleman, Port Louisa.

Bridges (4): Hendricks, Floris; Reiling, Bellevue; Tomlinson, Putnam; Turley, Council Bluffs.

Bridges, method of turning (2): Berkeley (2), Cedar Rapids.

Buildings, method of removing: Prather, Iowa City.

Coffer dam and boat: Applegate, LeClaire.

Dog power: Hager & Grove, Waverly.

Feather renovator: Morris, Council Bluffs.

Ladder, extension: Pullman, New Oregon.

Lead, manufacturing white (2): Hannen (2), Dubuque.

Lead, packing bar: Kinsey, Dubuque.

Life boat: Robeson, Oskaloosa.

Life preserver: Crandal, Marshalltown.

Lubricating compound: Smith, Prairie City.

Masonic emblems, appliance for display of: Lyon & Rand, Dubuque.

Perambulator: Richards, Indianola.

Snow plow (2): Harris, Dubuque; Plantz, Iowa Falls.

Stump extractor (2): Bogert, Fayette; Colyar, Clayton.

Stuffing boxes, appliance for packing: Smith, Montana.

Tobacco knife: Goldman, Winterset.

Varnish for paper, cloth, etc. waterproof: Green, Christiansburgh.

Vault, fire proof: Pittman, Keokuk.

HOMER CALKIN—CORRINE CALKIN

NUMBER OF IOWA INVENTORS BY CITY, TOWN OR TOWNSHIP

1843 - 1873

ABINGDON, 1; Ackley, 1; Adel, 5; Afton, 6; Agency City, 2; Ainsworth, 1; Albia, 14; Albion, 4; Algona, 1; Amana, 1; Ames, 5; Ames Station, 1; Anamosa, 7; Atalissa, 2; Atlantic, 1; Auburn, 1; Augusta, 1.

BALDWIN, 1; Batavia, 2; Belle Plaine, 3; Bellevue, 1; Bentonsport, 4; Bethlehem, 1; Birmingham, 2; Blakesburgh, 1; Bloomfield, 24; Blue Grass, 1; Bonaparte, 2; Boone, 4; Boonesborough, 12; Border Plains, 2; Bowen's Prairie, 2; Brighton, 2; Brookfield [Delmar], 1; Brooklyn, 2; Brookville, 1; Buckeye [Luzerne], 2; Buckingham, 1; Buffalo Grove, 4; Buffalo Twp., Linn Co., 1; Burlington, 57.

CALAMUS, 2; Calmar, 1; Camanche, 6; Canton, 1; Carlisle, 2; Carroll City, 1; Cascade, 1; Casey, 1; Castalia, 1; Castle Grove, 2; Cedar Falls, 23; Cedar Rapids, 31; Cedar Twp., Van Buren Co., 2; Central City, 1; Centralia, 1; Centre Point, 1; Centreville, 5; Chariton, 16; Charles City, 7; Charleston, 4; Chatham, 2; Christiansburgh, 1; Clarence, 2; Clarinda, 5; Clarksville, 5: Clay, 1; Clayton, 3; Cleona, 1; Clermont, 6; Clifton, 1; Clinton, 17; Coburg, 1; Colesburgh, 1; Colfax, 3; Colony [Colesburg], 1; Columbus City, 5; Competine [Farson], 1; Cono, 1; Coon Rapids, 1; Corning, 3; Corydon, 1; Cottonville, 1; Council Bluffs, 19; Crawfordsville, 3; Cresco, 1; Croton, 1.

DAKOTA, 1; Danville, 3; Davenport, 100; Dayton, 3; Decorah, 16; Deep River, 1; Delaware Center, 1;Delhi, 6; Denmark, 3; Des Moines, 80; De Soto, 1; DeWitt, 9; Dexter, 1; Dixon, 1; Donnellson, 2; Dorchester, 1; Drakesville, 1; Dresden, 1; Dubuque, 70; Dunlap, 3; Dyersville, 1.

EAGLE GROVE, 1; Earlham, 3; Earlville, 2; East Davenport, 1; Eddyville, 5; El Dorado, 4; Elkader, 2; Elkport, 1; Ellington, 1; Estherville, 1; Exira, 1.

FAIRBANK, 2; Fairfield, 28; Fairview, 1; Farley, 1; Farmersville, 1; Farmington, 6; Fayette, 4; Floris, 1; Floyd, 2; Forestville, 1; Fort Des Moines, 1; Fort Dodge, 12; Fort Madison, 22; Fort Plain, 1; Franklin, 1; Franklin Twp., Story Co., 1; Frankville, 1; Fredericksburgh, 1; Fredonia, 1; Freeland, 1; Fremont, 1.

GARIBALDI, 1; Geneseo Twp., Tama Co., 1; Genoa, 1; Germanville, 1; Gilbertville, 1; Glenwood, 4; Golden Prairie, 1; Gosport, 1; Grand Junction, 1; Grand Meadow, 1; Grand River [Lineville], 2; Greencastle, 1; Grinnell, 14; Grundy Center, 1; Guthrie [Menlo], 2; Guttenberg, 1.

HAMBURG, 20; Hamilton, 1; Hardin, 3; Harlan, 1; Harrisburgh, 1; Hartford, 1; Hartwick, 1; Hazleton, 3; Hickory [Selma], 1; Highland, 1; Highland Twp., Washington Co., 1; Hillsborough, 5; Homer, 2; Homestead, 1; Hook's Point, 2; Hopkinton, 4; Horton, 5.

ICONIUM, 1; Illyria, 1; Independence, 57; Indianola, 6; Indianapolis, 1; Iowa City, 25; Iowa Falls, 15; Iowaville, 1; Iron Hills, 1; Irvington, 1.

JAYNESVILLE [Janesville], 2; Jefferson, 3.

KELLOGG, 2; Keokuk, 70; Keosauqua, 3; Kingston, 1; Kirkville, 9; Knoxville, 5.

LACONA, 1; LaFayette, 1; La Grange, 1; La Motte, 3; Lancaster, 1; Lansing, 6; La Porte City, 3; Last Chance, 1; Le Claire, 3; Leon, 4; Leroy Twp., Benton Co., 1; Lester, 2; Lewis, 1; Lime Spring Station, 1; Lisbon, 4; Logan, 1; Long Creek Twp., Decatur Co., 2; Lowell, 1; Low Moor, 2; Lybrand, 1; Lyons, 30; Lytle City, 1.

MADISON, 2; Magnolia, 1; Malcolm [Malcom], 5; Mallory, 1; Manchester, 9; Manilla, 1; Maquoketa, 21; Marble Rock, 1; Marengo, 3; Marion, 17; Marshall [Wayland], 2; Marshalltown, 27; Martinsburgh, 2; Masonville, 1; McGregor, 13; Mechanicsville, 2; Middletown, 4; Millersburgh, 2; Millrock [Baldwin], 2; Millville, 1; Milton, 4; Missouri Valley, 2; Mitchell, 2; Mitchellville, 1; Moingona, 2; Monmouth Twp., Jackson Co., 2; Monroe, 4; Montana [Boone], 11; Montezuma, 6; Monticello, 2; Montrose, 1; Moravia, 1; Morning Sun, 1; Moscow, 2; Moulton, 1; Mt. Pleasant, 52; Mt. Vernon, 4; Mt. Zion, 2; Muscatine, 53.

NASHUA, 1; Nevada, 4; New Bern, 1; New Hampton, 1; New Hartford, 2; New London, 3; New Oregon, 3; New Providence, 3; New Sharon, 2; Newton, 14; Nine Eagles [Pleasanton], 1; Nora Springs, 1; North McGregor, 2.

OGDEN, 1; Onawa, 7; Onion Grove, 1; Ononwa [Letts], 3; Onslow, 2; Orford, 2; Orleans, 2; Osage, 5; Osceola, 6; Oskaloosa, 53; Ossian, 1; Otho, 1; Ottumwa, 26; Oxford, 4.

PANORA, 6; Paris, 1; Parkersburgh, 2; Pedee, 2; Pella, 4; Peosta, 1; Percival, 1; Perry Twp., Buchanan Co., 1; Pilot Grove, 1; Pittsburgh, 1; Plainfield, 1; Pleasant Grove, 3; Pleasant Plain, 1; Plum Hollow [Thurman], 2; Polk City, 1; Port Louisa, 1; Postville, 2; Prairie City, 4; Primrose, 1; Princeton, 4; Pulaski, 5; Putnam, 1.

QUASQUETON, 13.

RED OAK, 2; Red Rock, 3; Riceville, 1; Richland, 4; Rickardsville, 1; Rochester, 1; Rockford, 1; Rome, 1; Rossville, 1.

SABULA, 2; St. Ansgar, 1; St. Charles, 2; St. Donatus, 1; Salem, 17; Sand Spring, 2; Sandyville, 1; Saylorville, 1; Scranton Station, 1; Shell Rock, 1; Shellsburgh, 1; Sherman, 1; Sherrill's Mount [Sherrill], 2; Sidney, 2; Sigourney, 1; Sioux City, 9; Smithland, 1; Smyrna, 1; South English, 1; Spencer Grove, 1; Springdale, 1; Springfield, 3; Spring Valley, 1; Springville, 2; Stanwood, 1; Steamboat Rock, 1; Sterling, 1; Stiles, 1; Strawberry Point, 1; Sugar Creek, 2; Summit, 1; Summitville, 2; Swede Bend, 1; Swede Point [Madrid], 1; Syracuse, 1.

TABOR, 6; Talleyrand, 1; Tama City, 5; Tipton, 9; Tivoli, 1; Toledo, 9; Trenton, 1; Troy, 2; Twin Springs, 2.

UNITY, 1; Upton, 1; Utica, 1.

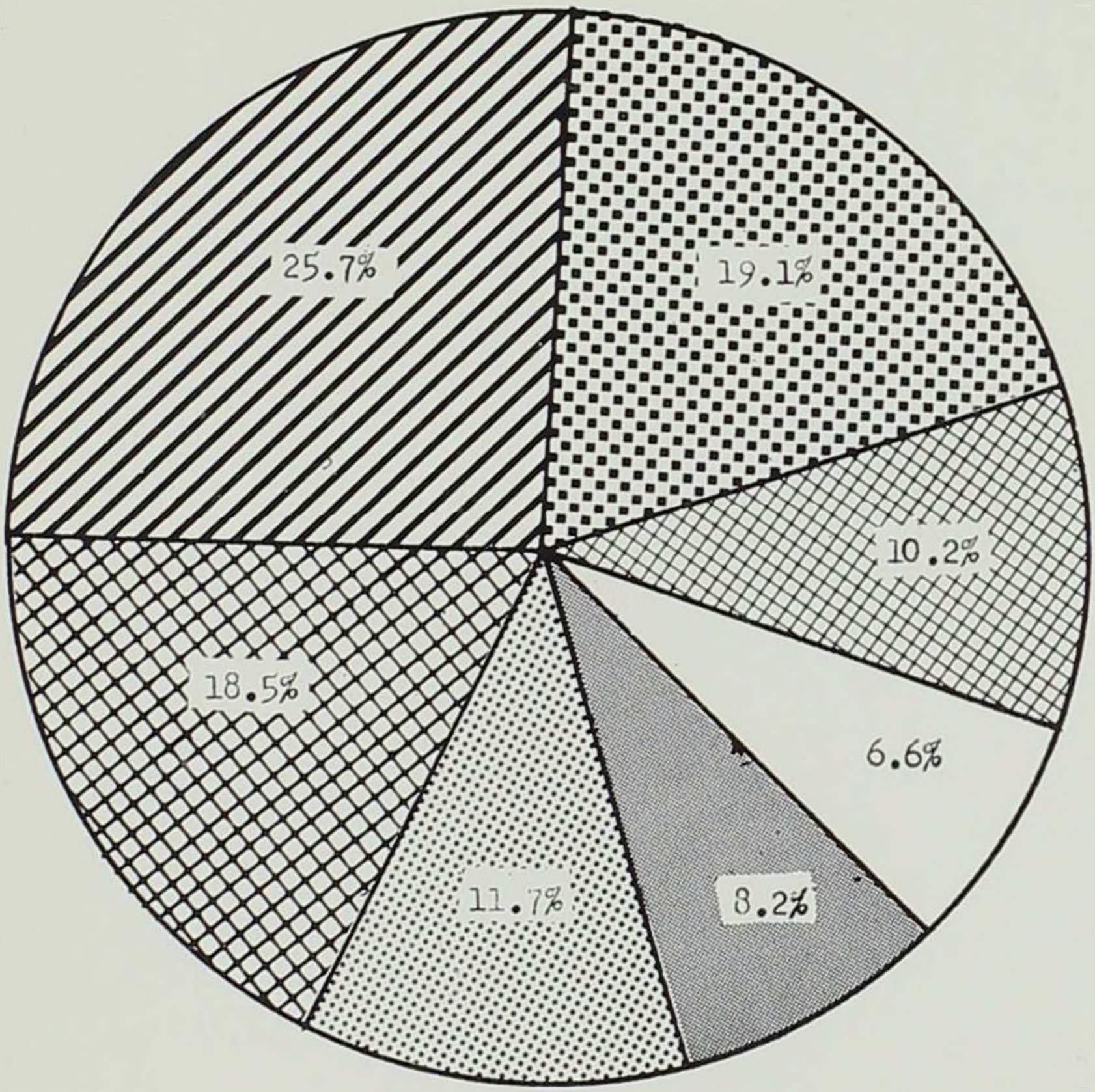
VAN BUREN, 2; Vandalia, 1; Van Meter, 1; Vernon, 1; Vernon Springs, 1; Vinton, 4; Volga City, 1.

WALCOTT, 1; Walnut Fork [Olin], 3; Wapello, 7; Ward's Corner [Lamont], 2; Washington, 25; Wassonville, 1; Waterloo, 27; Waubeck, 2; Waukon, 4; Waverly, 10; Webster, 1; Webster City, 9; West Branch, 1; West Dayton [Dayton], 1; West Grove, 2; West Irving, 1; West Liberty, 7; West Point, 2; West Union, 5; Wheatland, 3; Wheeling, 1; Wilton Junction, 5; Winfield, 1; Winterset, 8; Wiscotta, 1; Woodbine, 1; Woodbridge, 2; Wyoming, 1.

YALTON [Yatton?], 1.

ZIONSVILLE, 1.

DIFFERENT CLASSES OF INVENTIONS



Farm Implements

Food, Clothing and Furniture

About the Home, Farm and Shop

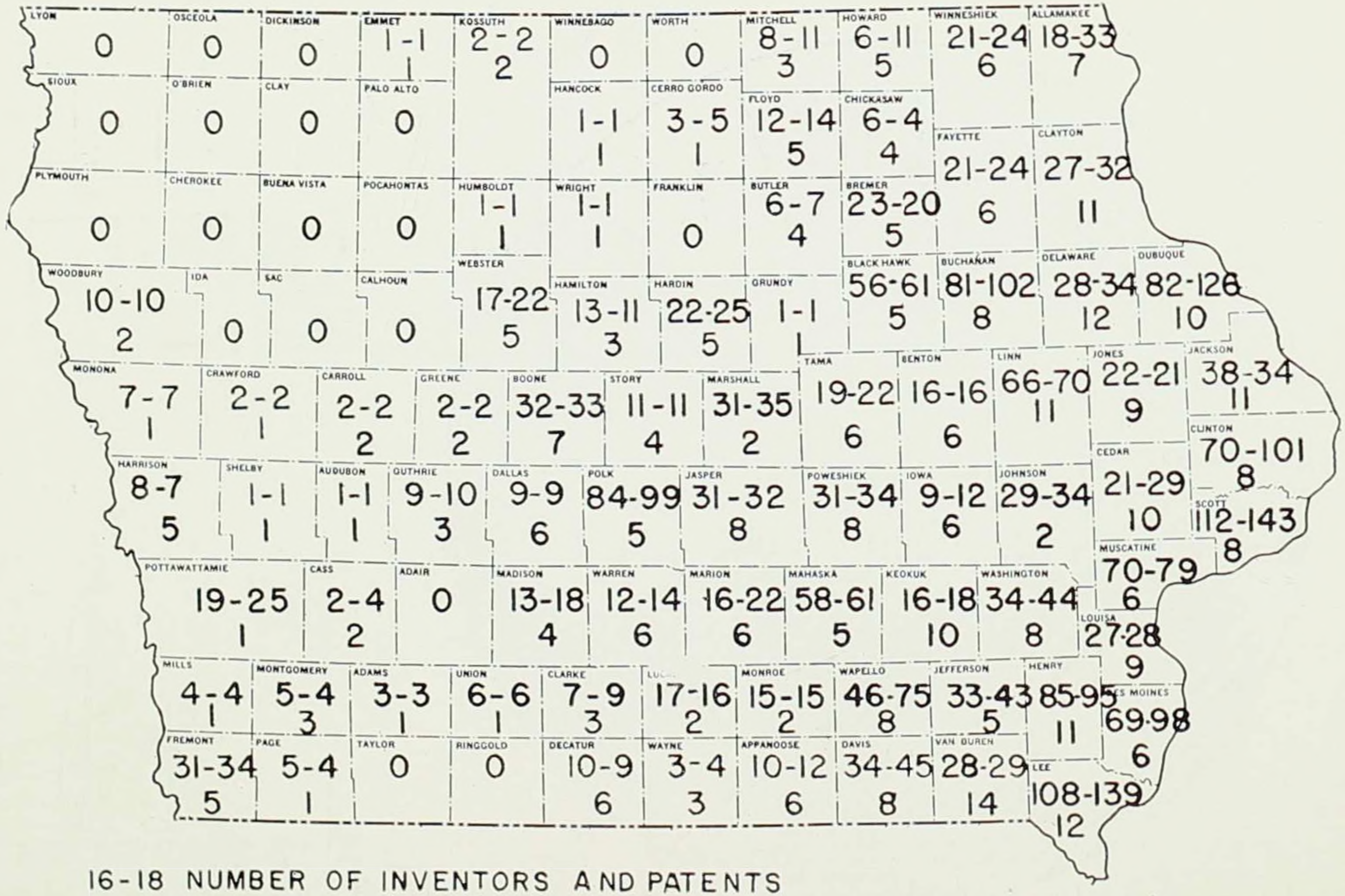
Trades, Crafts and Manufacturing

Transportation

Light, Heat, Power and Water

Miscellaneous

INVENTORS, PATENTS ISSUED AND TOWNS REPRESENTED



16-18 NUMBER OF INVENTORS AND PATENTS

10 NUMBER OF TOWNS REPRESENTED