

## 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; Scriptor, 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.

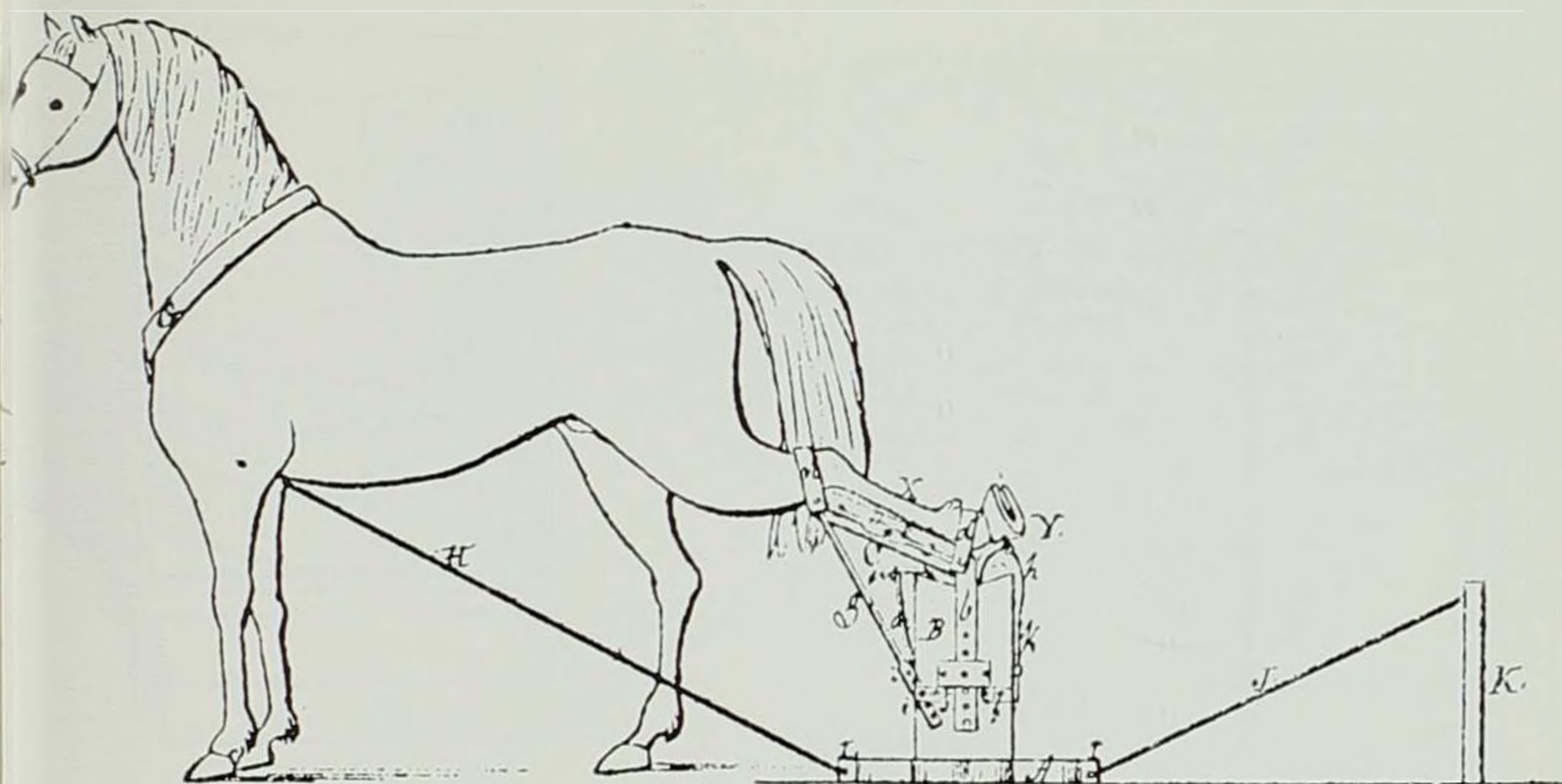
**Water elevator (10):** Adams, Iowa City; Bartle, Independence; Curts (2), Ottumwa; Johnston, Eddyville; Kock, Davenport; Painter, Afton; Pratt, Iowa City; Warren & Martin, Maquoketa; Wentworth, Burlington.

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

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

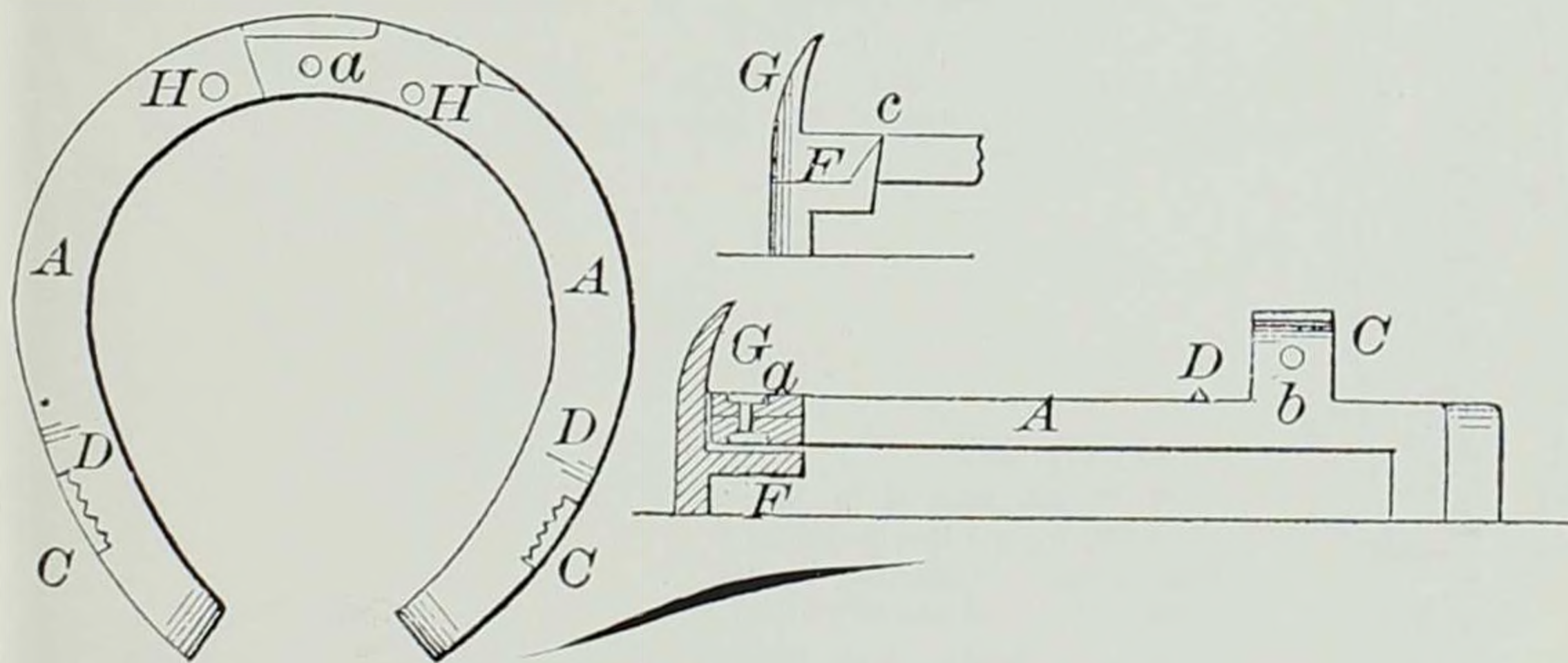
**Water power (2):** Broadwell, Logan; French, Central City.

**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.



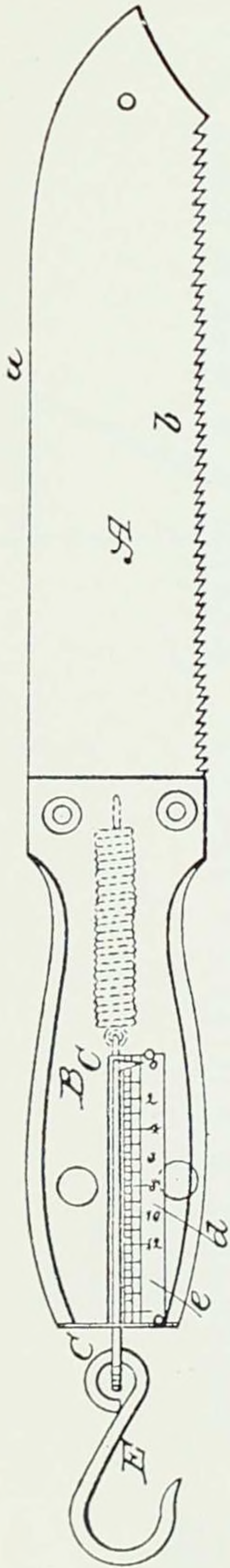
JOHN SHIMER, SCRANTON STATION  
Horseshoeing Jack  
124,452 — Mar. 12, 1872

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



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

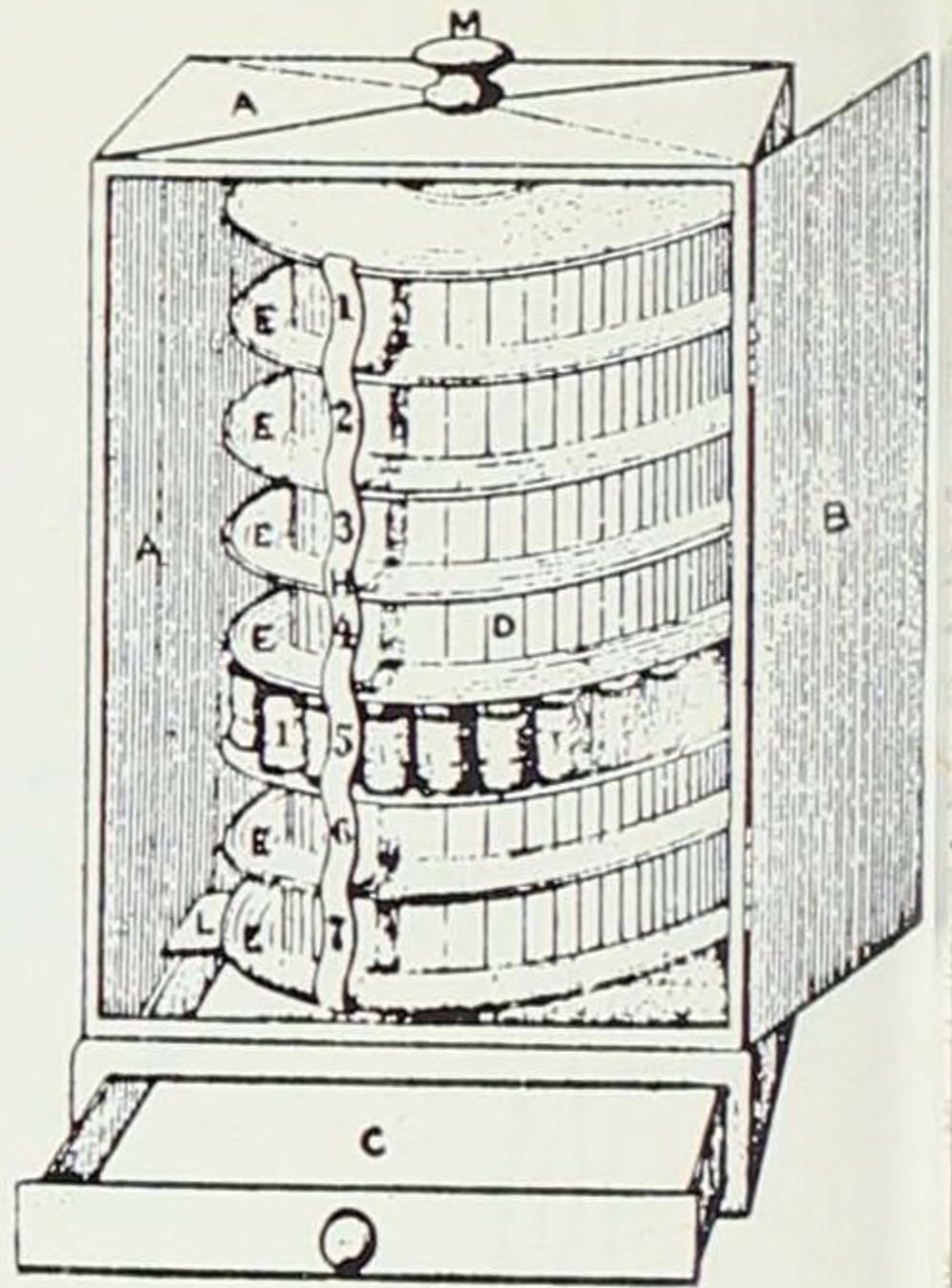
Augustus Weitman constructed shoes in two equal parts, A,A, connected with a pivot, a. He used spurs, D, instead of nails to attach shoe to the hoof, together with flanges, C, which pressed against the outside of the hoof, and a screw, b, passed through the flange into the hoof.



(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**

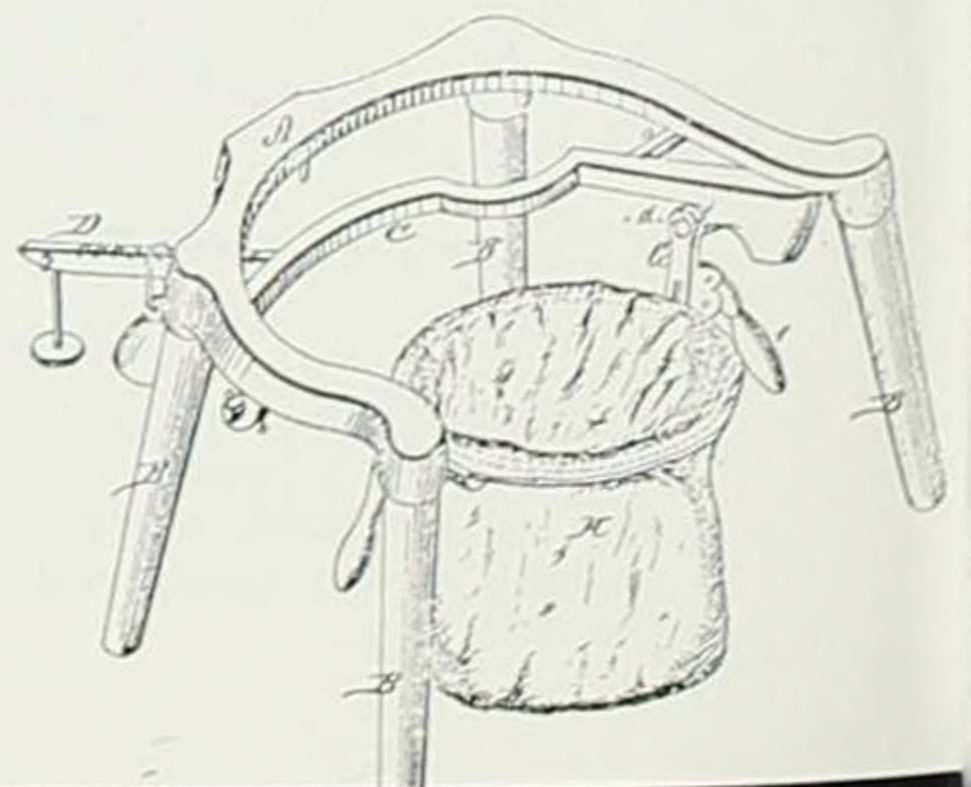
This spool thread case was invented by Albion Parsons of Burlington.



(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)

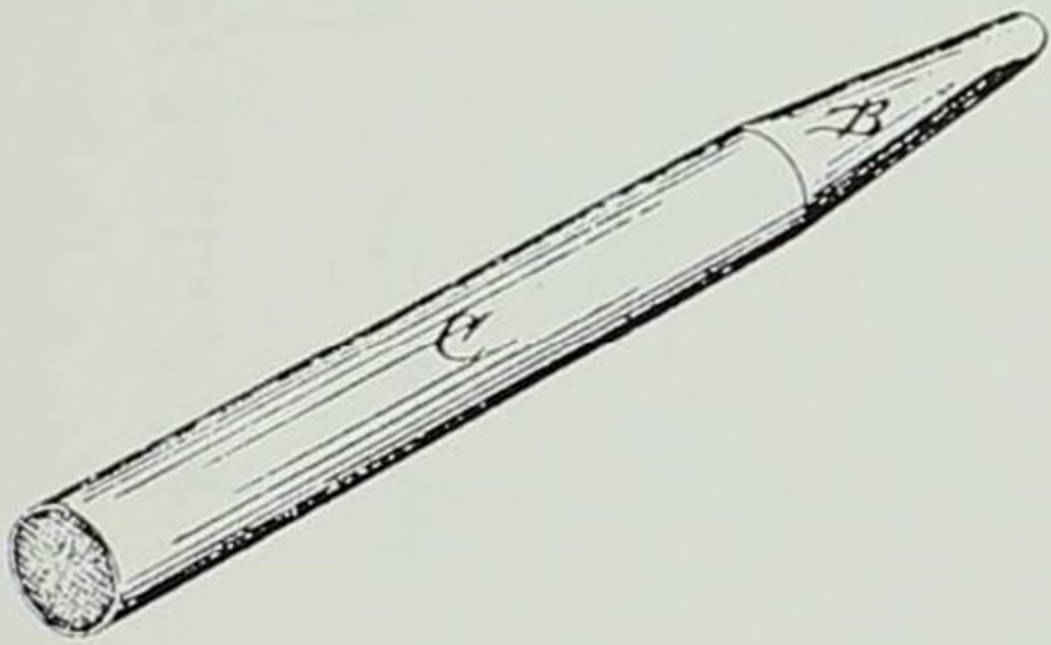
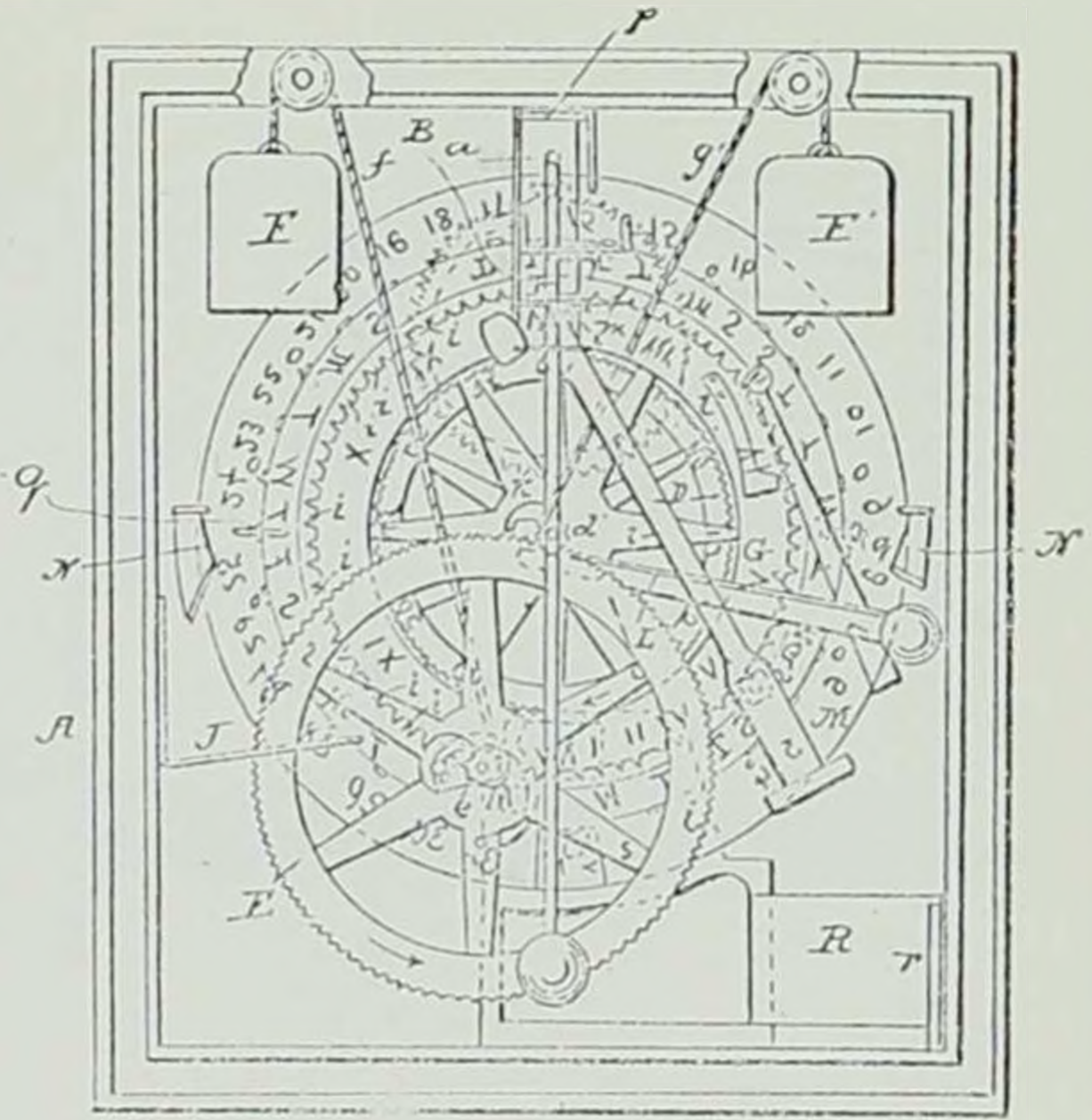
**H. T. BUDGE & N. W.**  
**RUSSELL, CEDAR FALLS**  
**Bag-holder Weighing-scales**  
**138,315 — Apr. 29, 1873**

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**

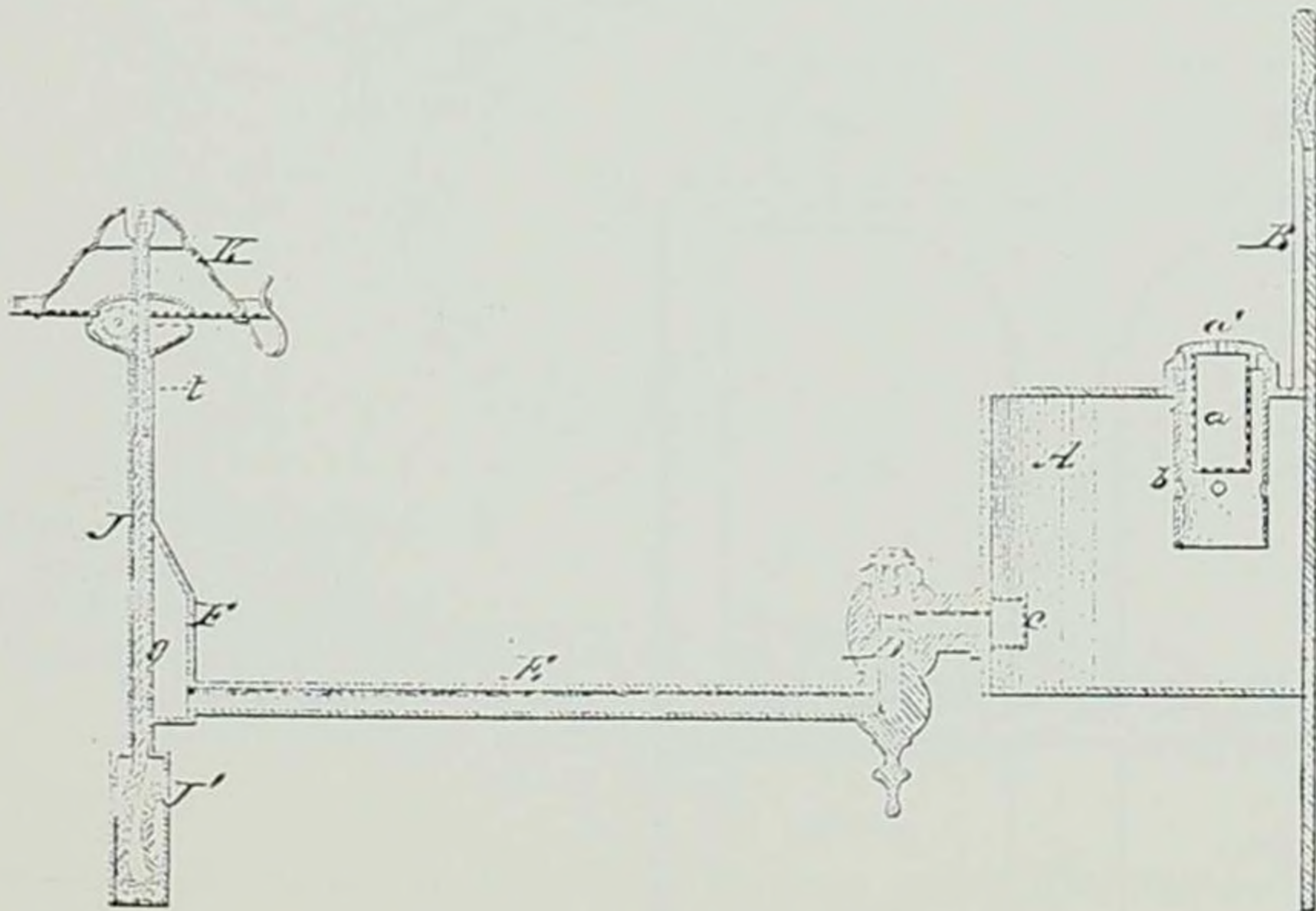
A "filter-tip" cigar was patented by Marshall Turley and Jane Mary Innes. The mouthpiece, B, of corn stalk or other pithy vegetation was supposed to absorb the nicotine.

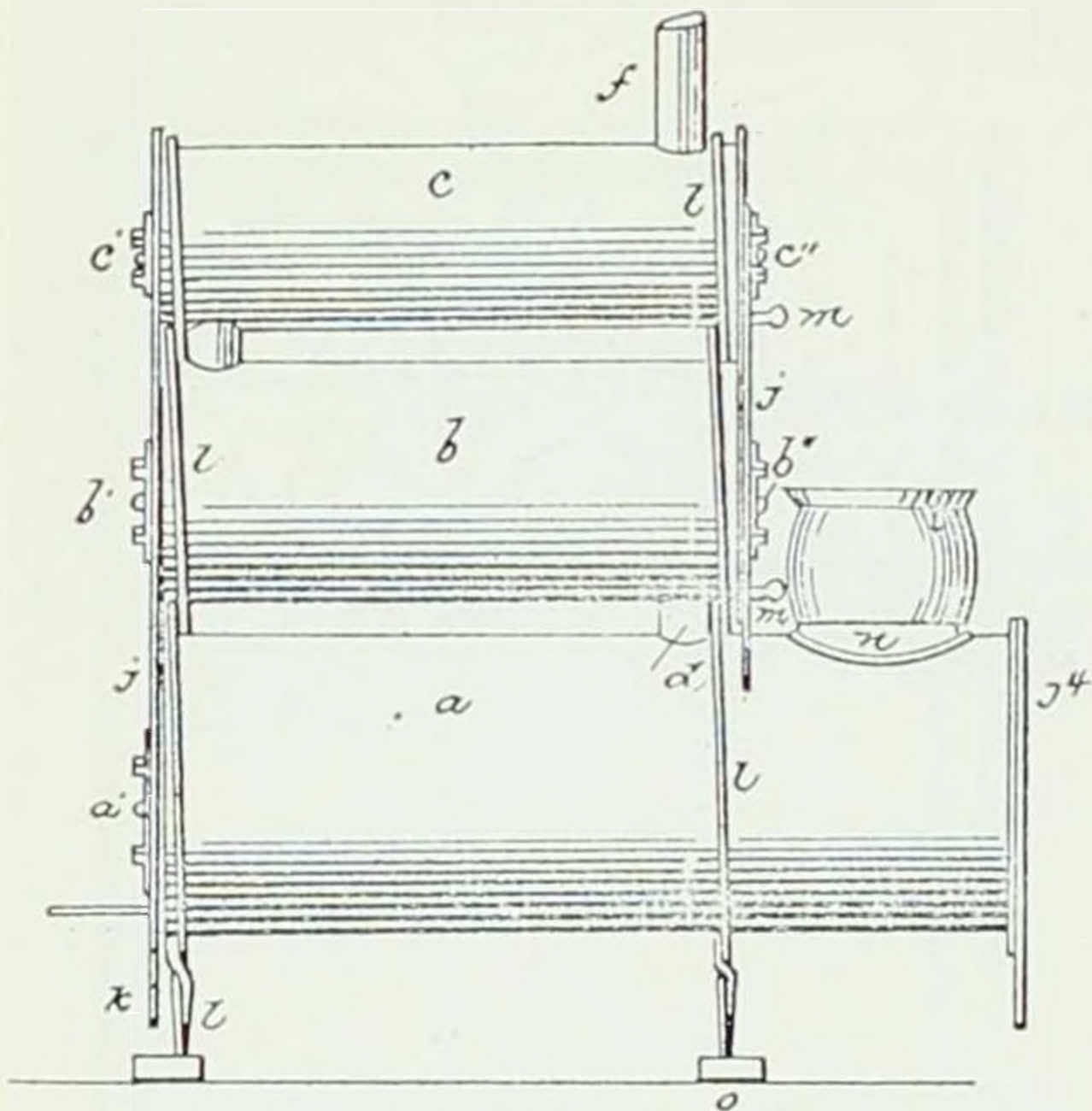


**H. J. GOFF, DUBUQUE**  
**Lamp**

**112,586 — Mar. 11, 1871**

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





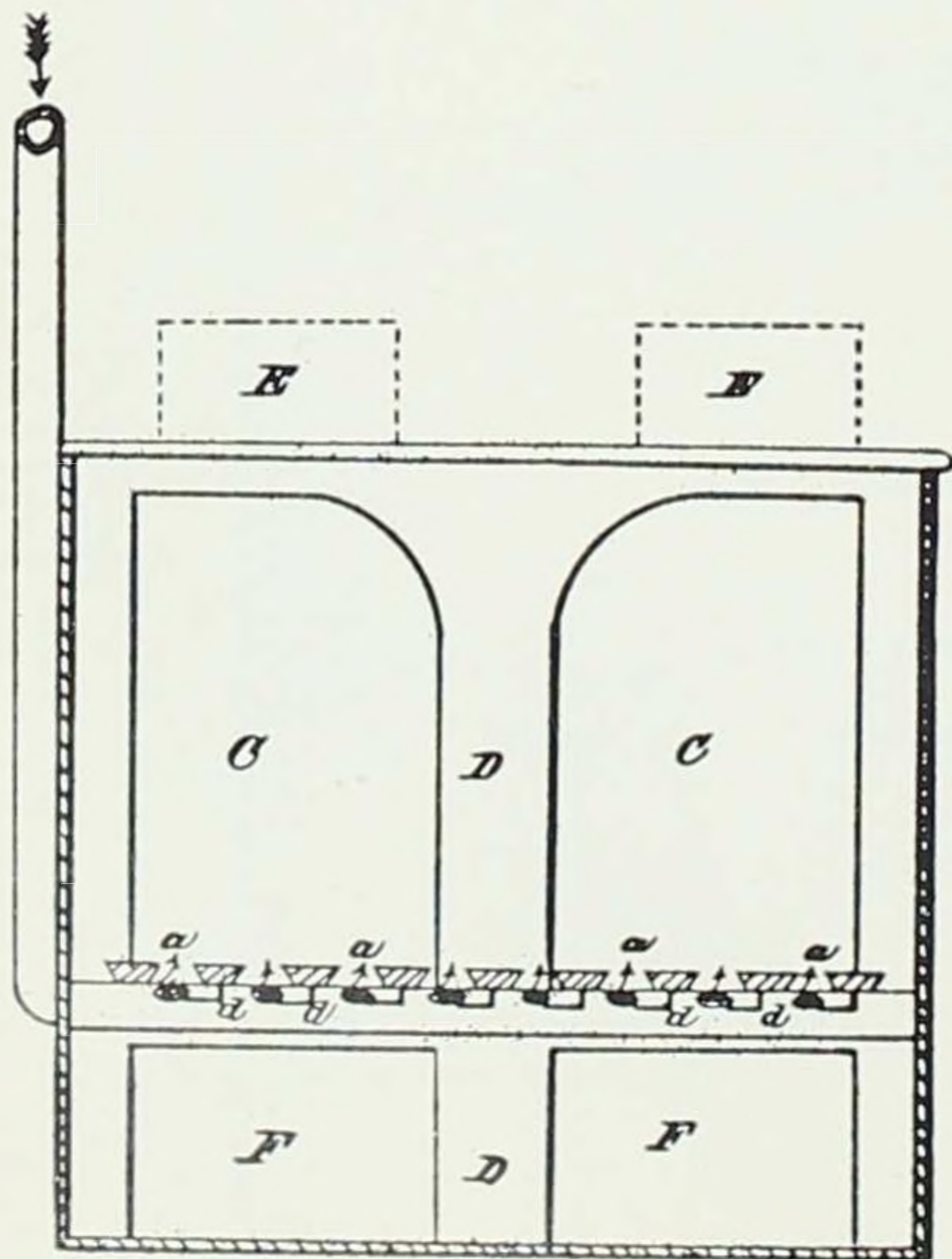
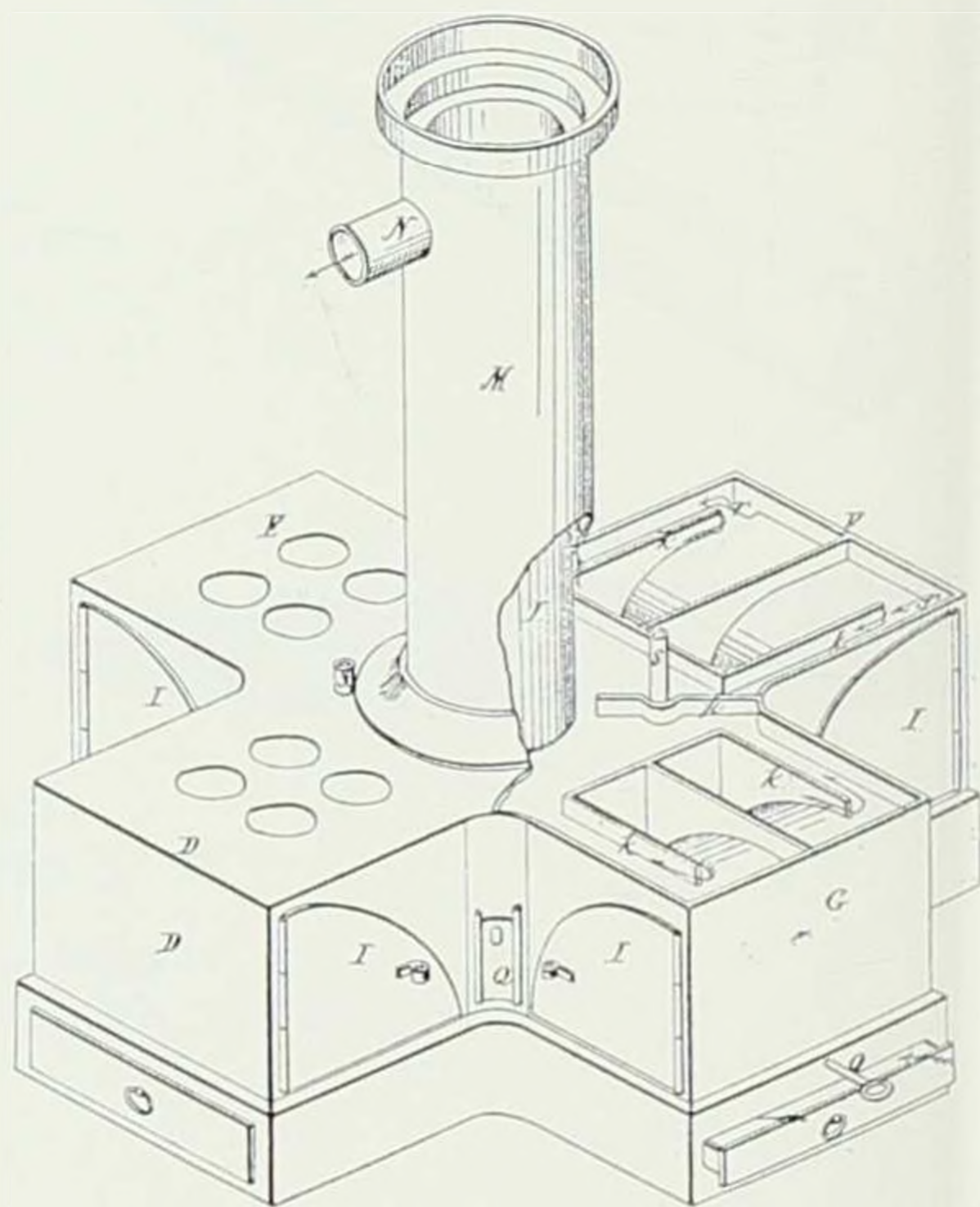
**ROBERT WILSON,  
COLUMBUS CITY**

**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.

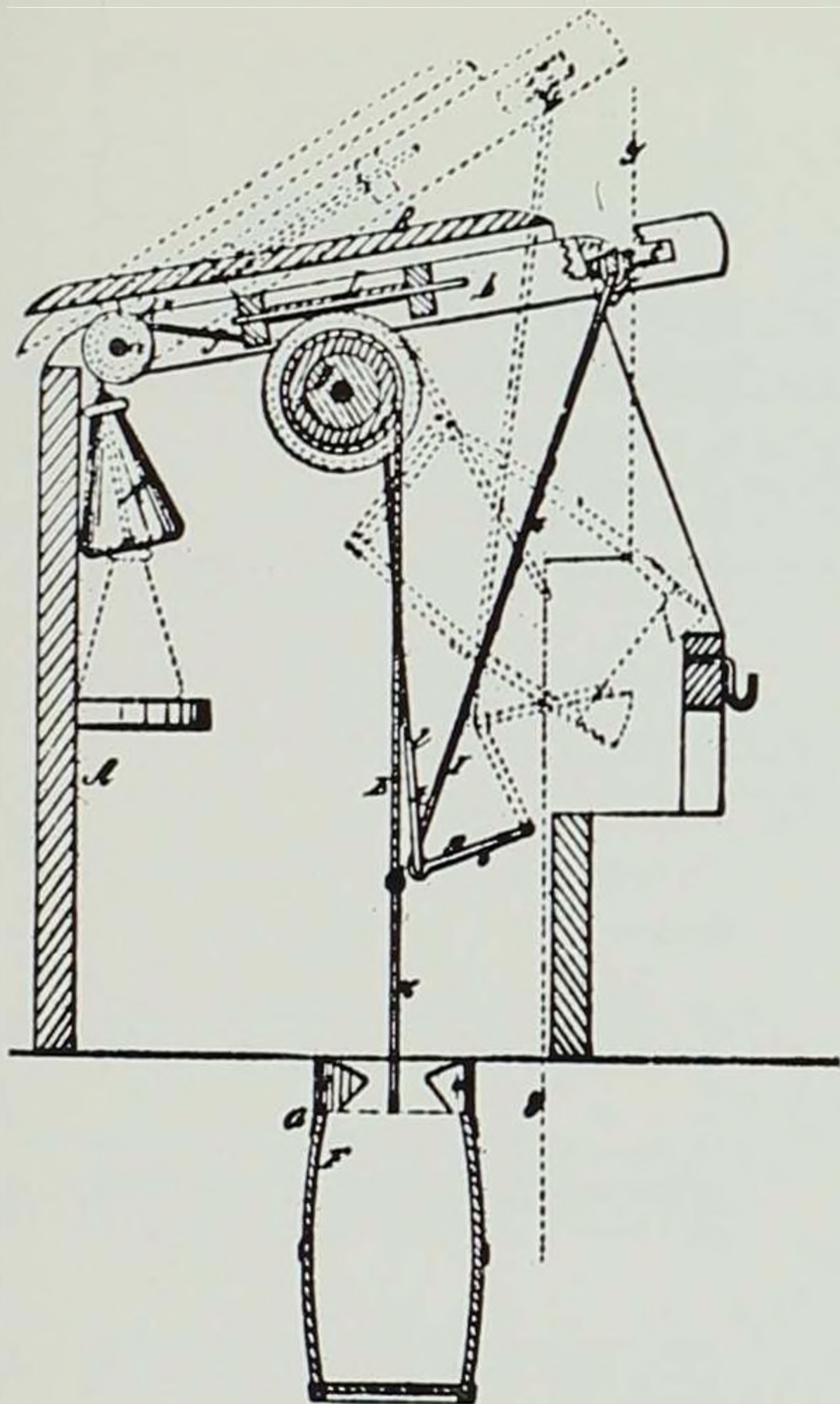
**C. RAUB,  
DAVENPORT**  
**Cook Stove**  
**19,650—Mar. 16, 1858**  
A four-sided cook stove was patented by Christian Raub of Davenport.



**D. HARGAR, DES MOINES**  
**Hot-air Furnace**

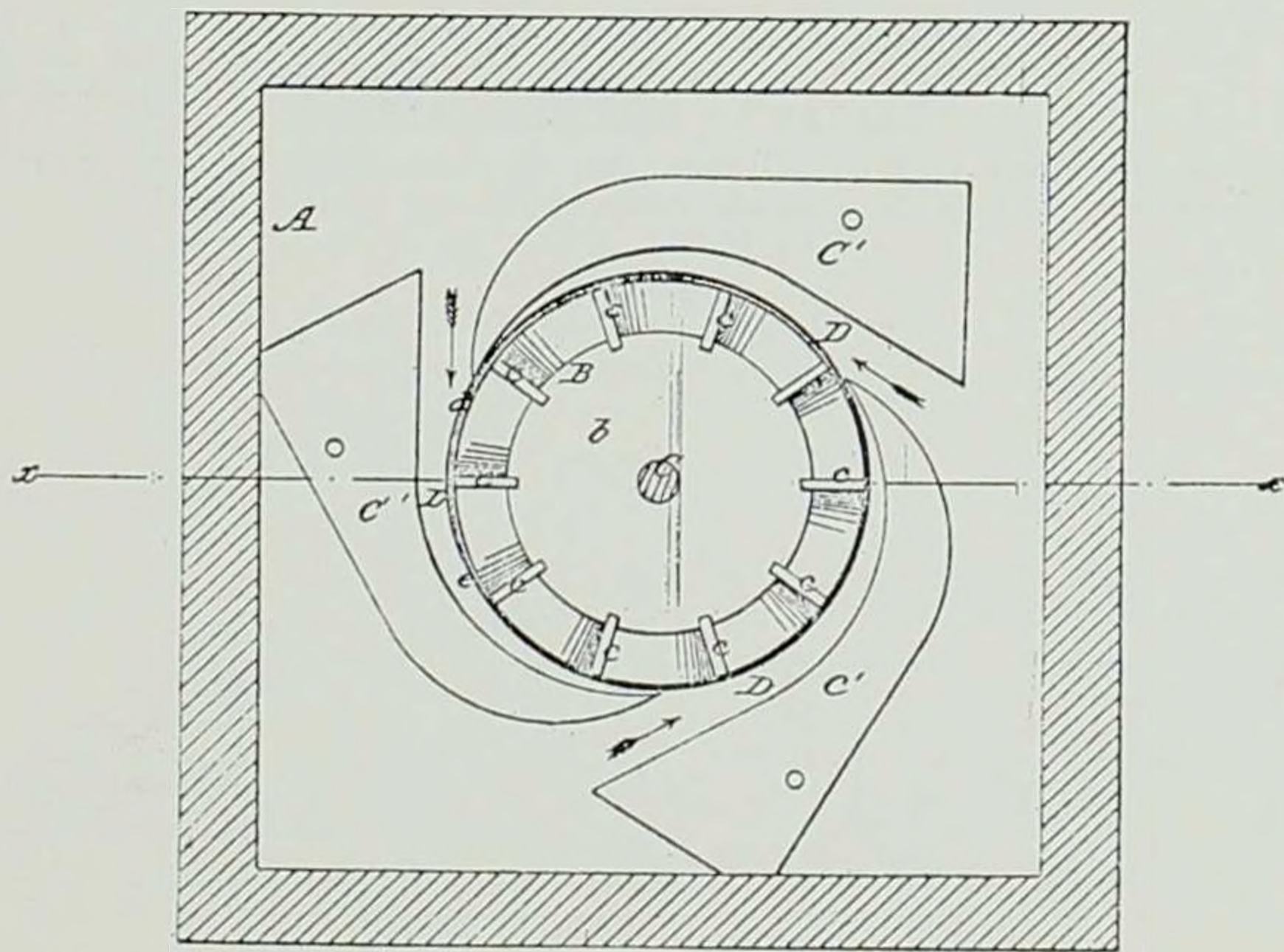
**70,557 — Nov. 5, 1867**

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



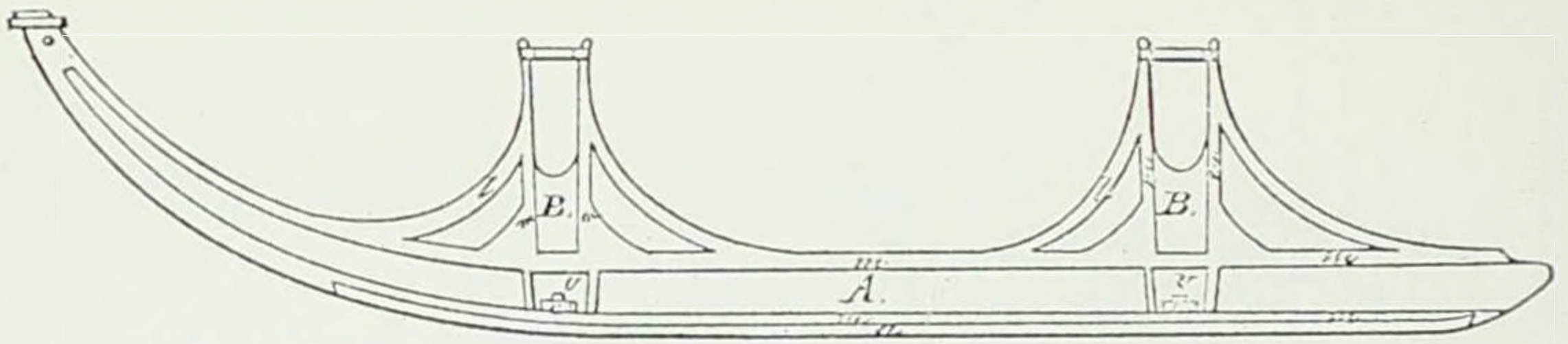
W. PAINTER, AFTON  
Water Elevator  
45,339 — Dec. 6, 1864

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



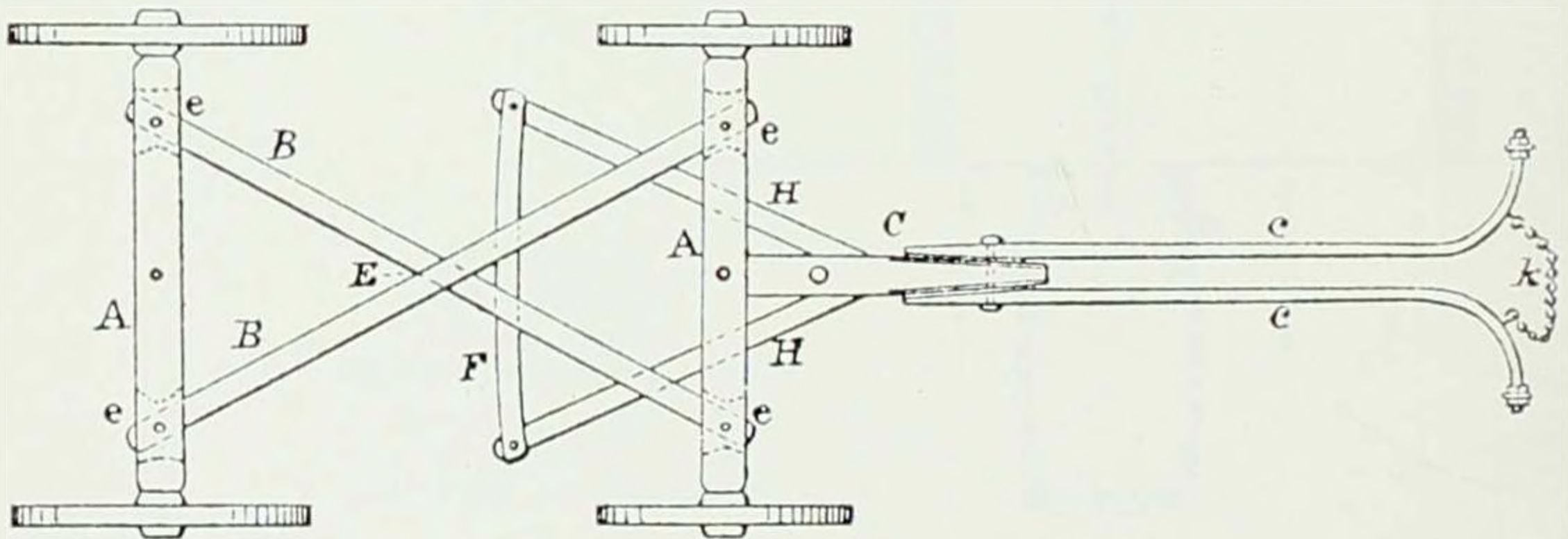
BLACKMER & CARPENTER, CLERMONT  
Water Wheel  
58,208 — Sept. 25, 1866

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



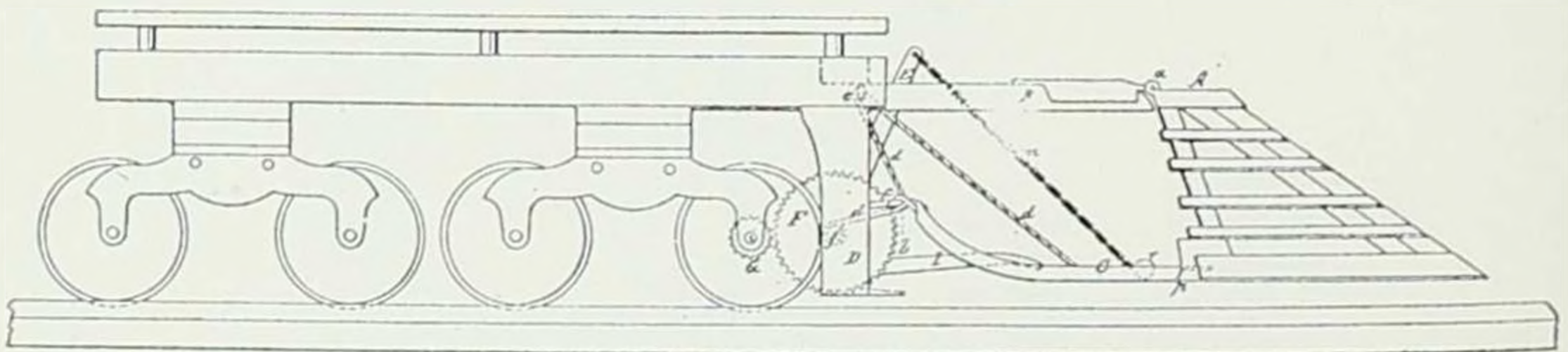
**JOHN LOGAN, WATERLOO**  
**Sleigh Runner**  
 108,917 — Nov. 1, 1870

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



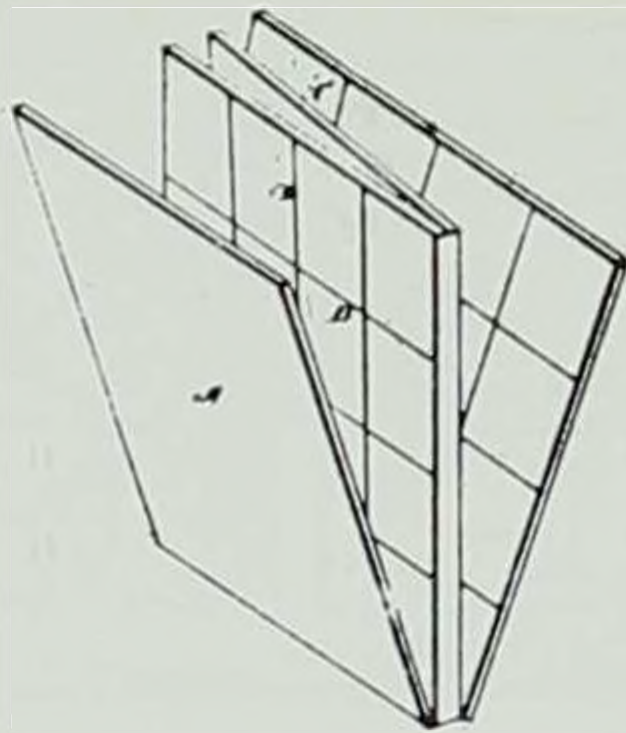
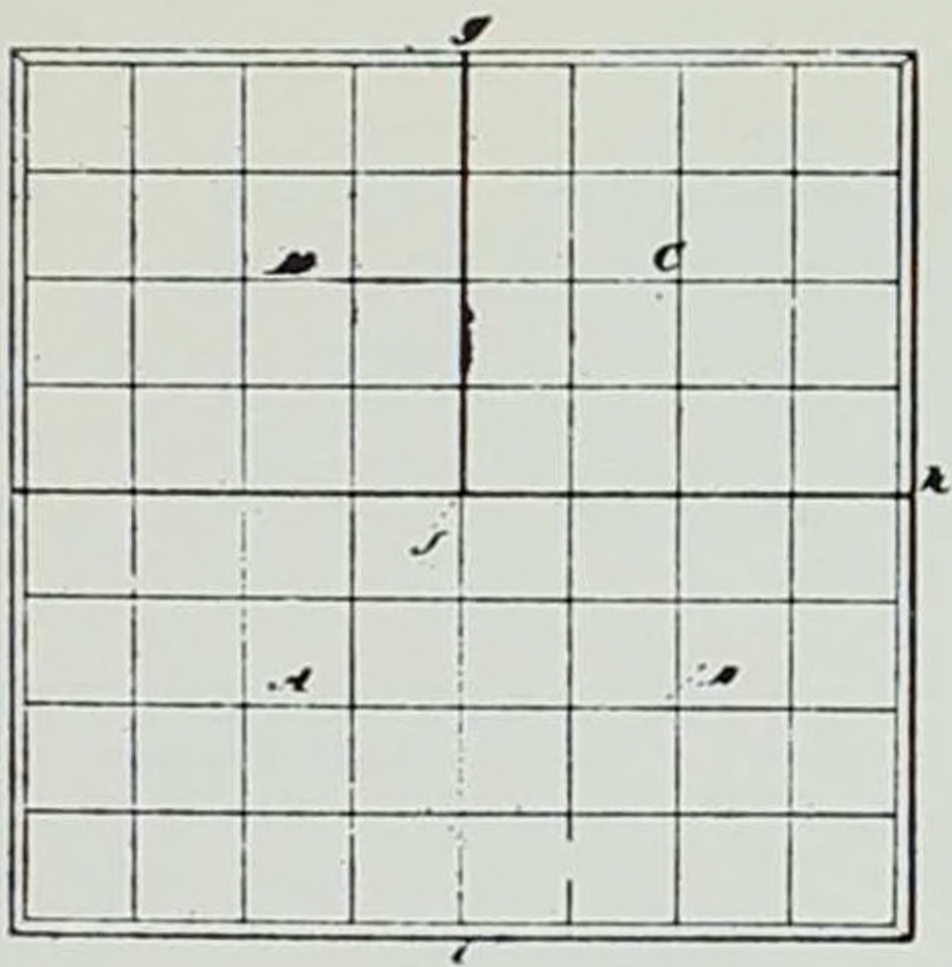
**FERDINAND POST, CLINTON**  
**Wagon**  
 143,185 — Sept. 23, 1873

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

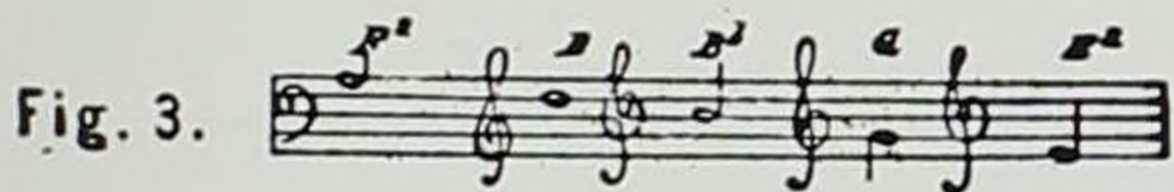
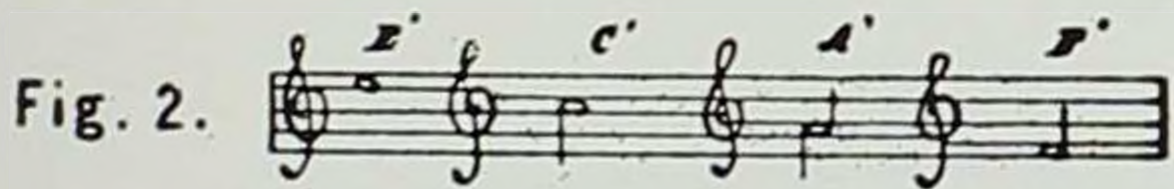
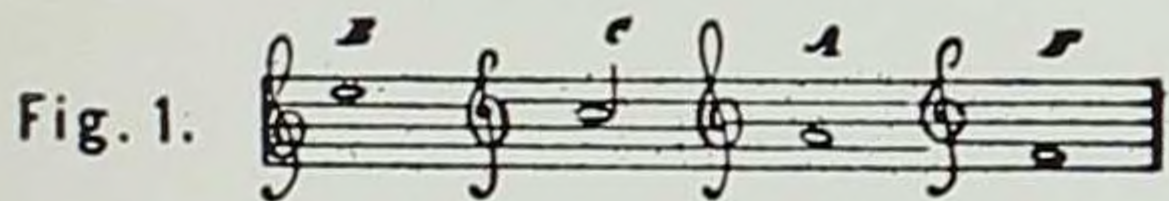
James Mitchell of Osceola was responsible for this early development in a locomotive cow catcher.



**FREDERICK C. SCHAEFER, DUBUQUE**  
**Chess Board**

52,891 — Feb. 27, 1866

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



**V. C. TAYLOR, DES MOINES**  
**Music Staff**

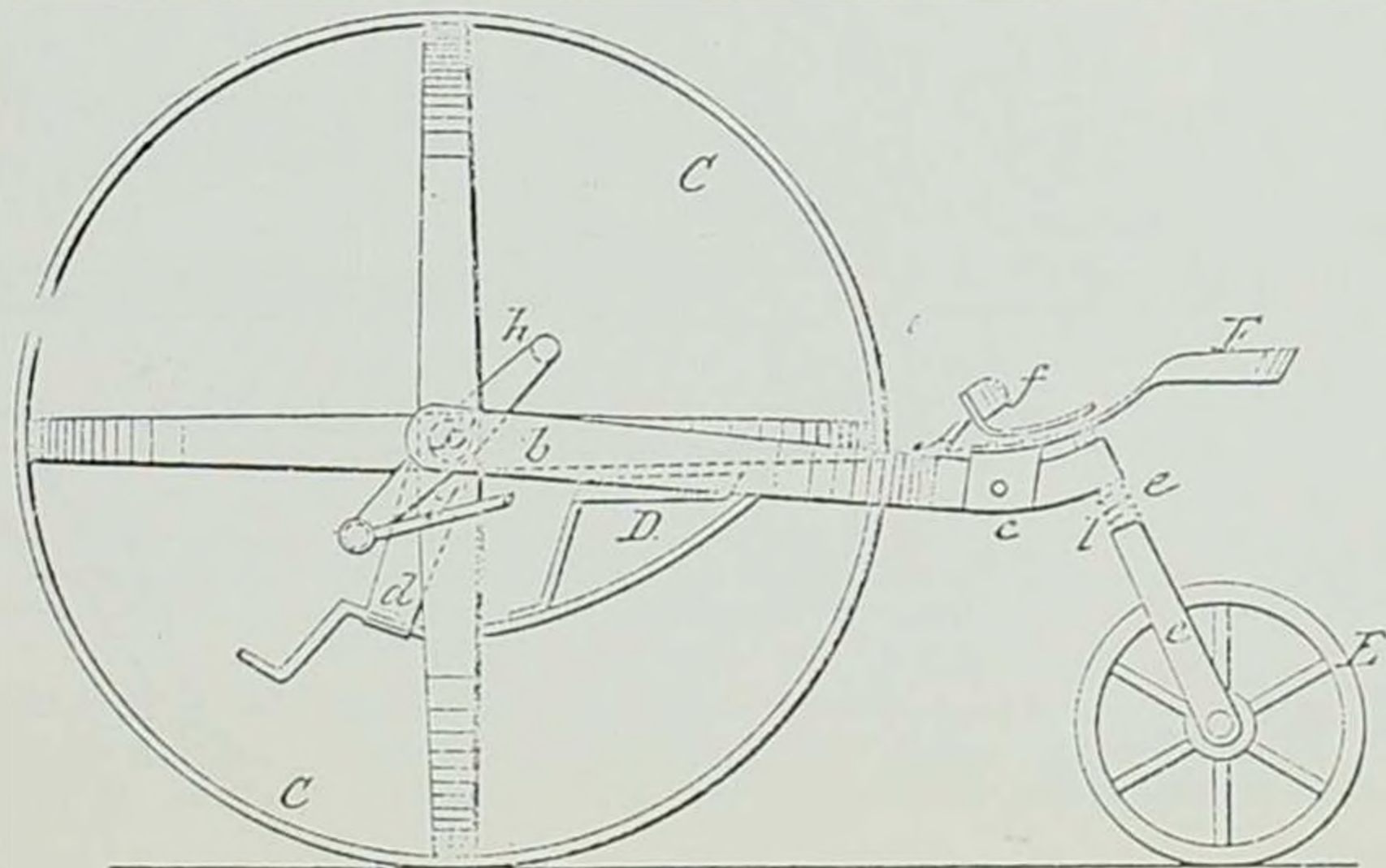
71,550 — Nov. 26, 1867

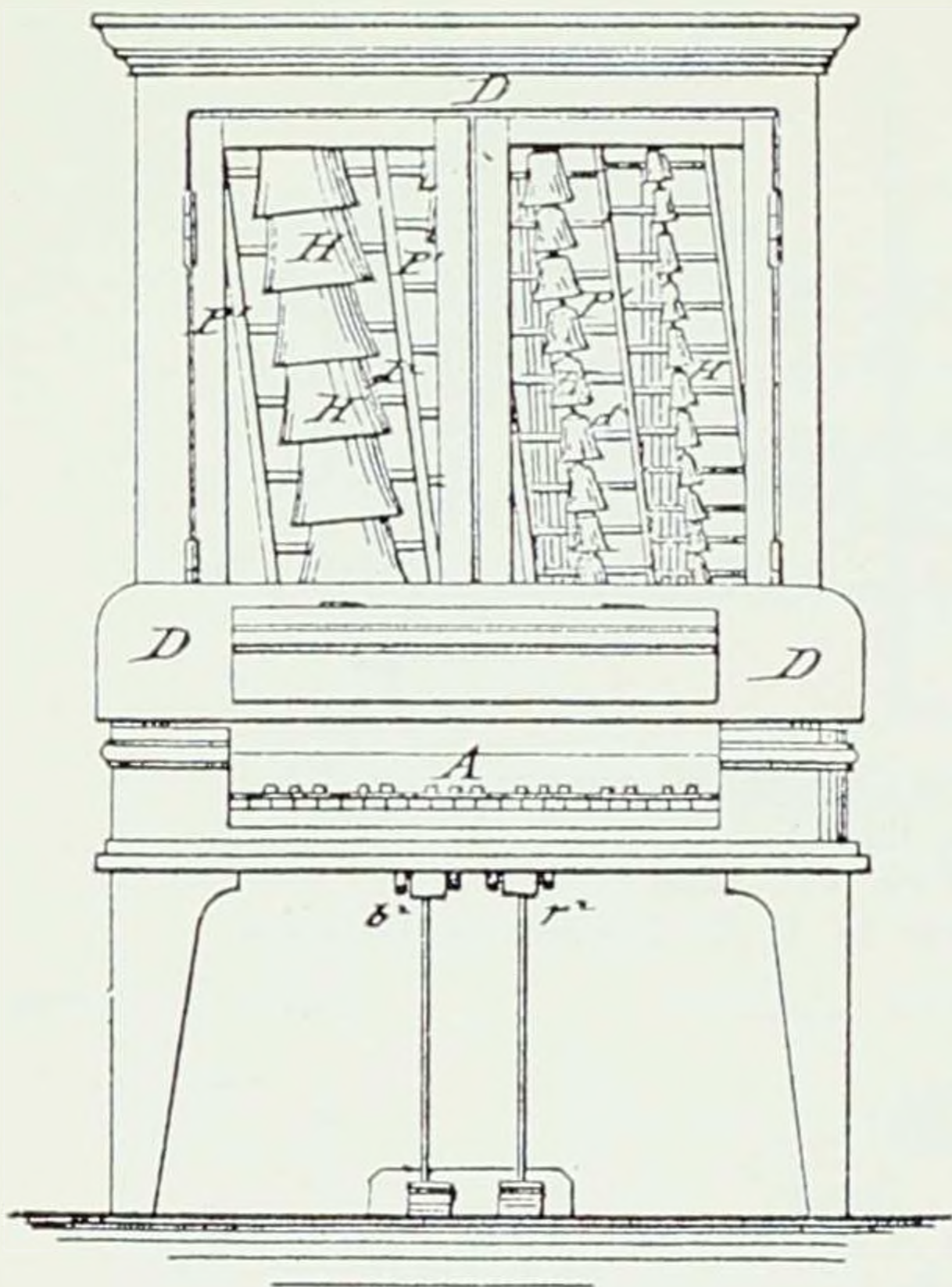
Virgil C. Taylor patented this music staff to indicate the key note. Fig. 1 uses wider spaces; Fig. 2, narrower spaces; Fig. 3, a lighter line; and Fig. 4, a combination.

**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**

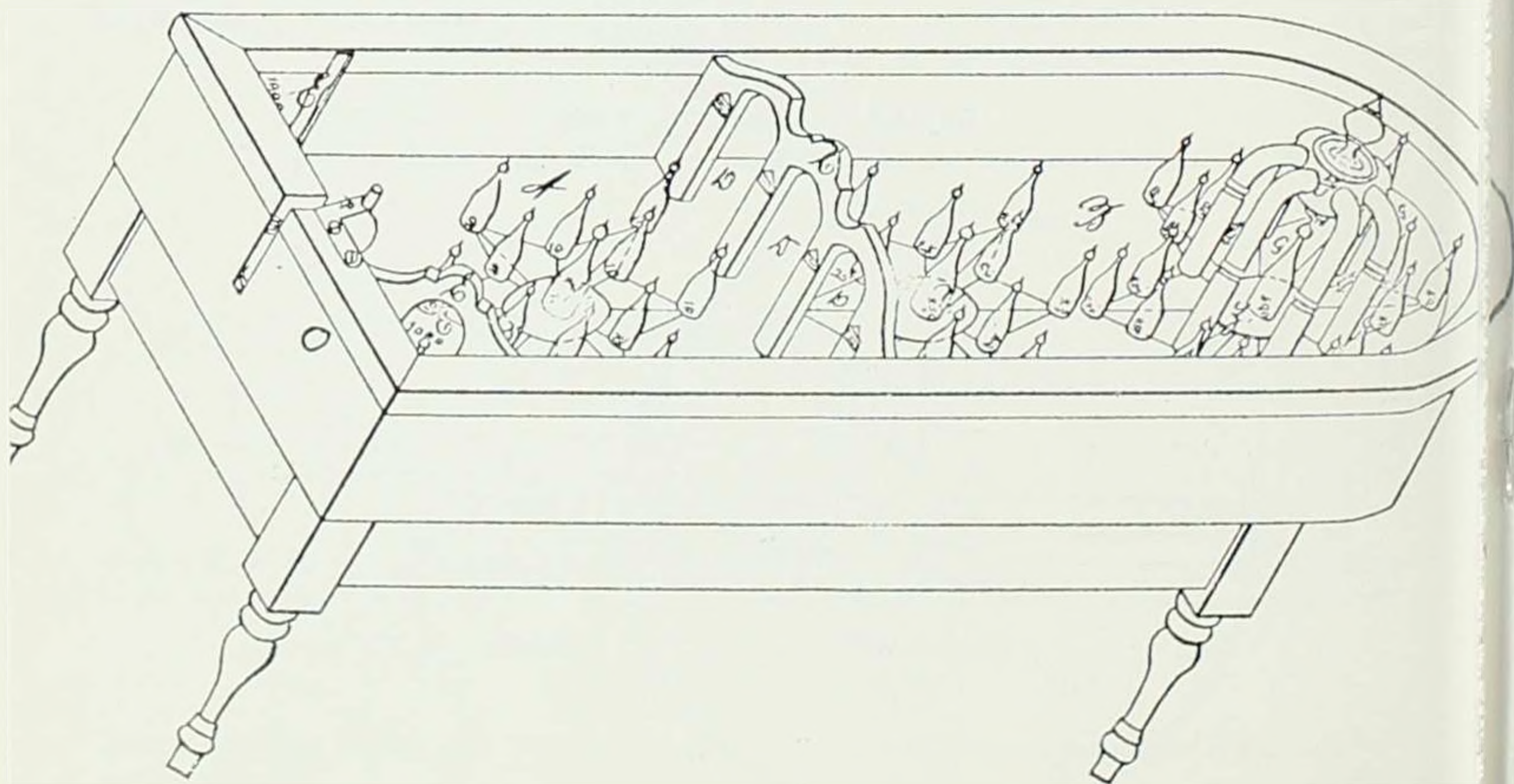
142,768 — Sept. 16, 1873

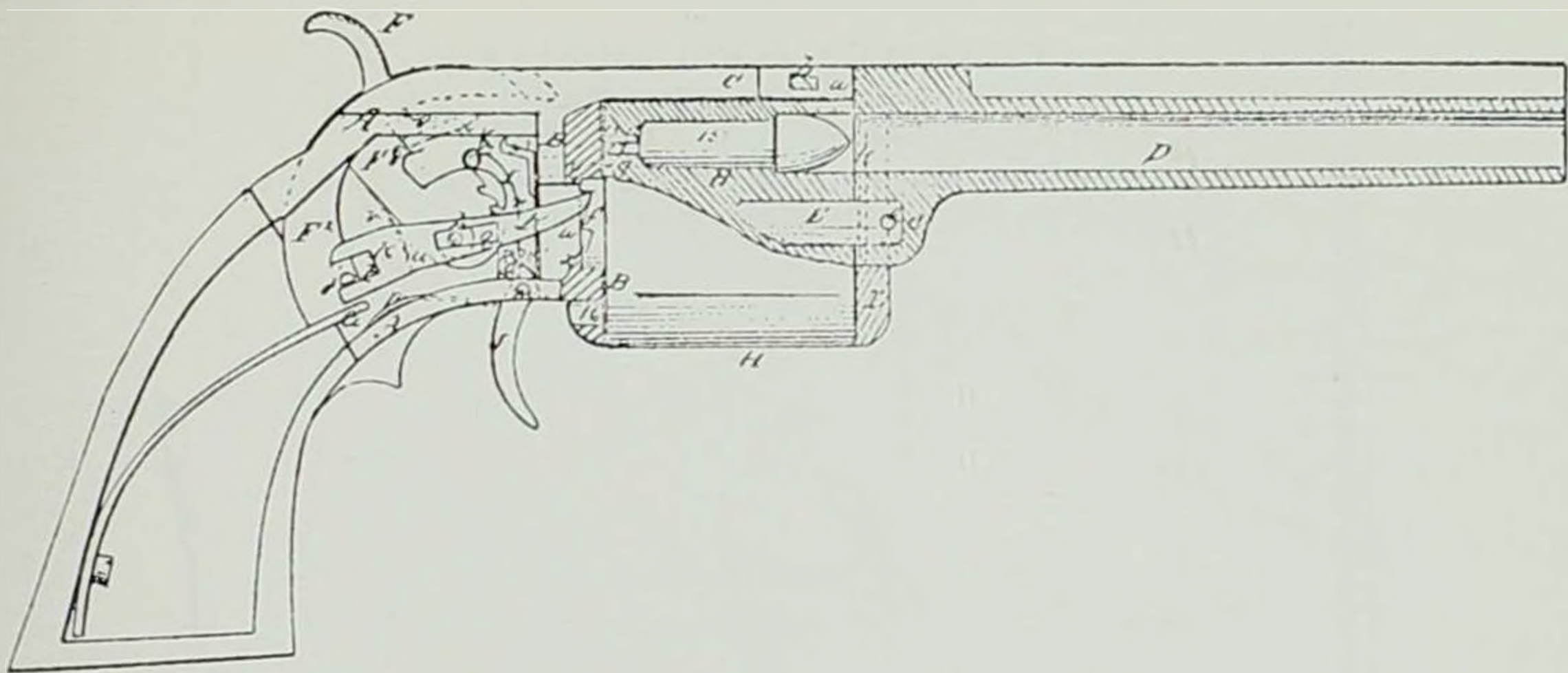
A bell piano, using bells instead of strings, was patented by Carl G. Butt-  
 kereit of Toledo.

**FERDINAND UEBEL, CEDAR RAPIDS**  
**Game Table**

138,961 — May 13, 1873

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

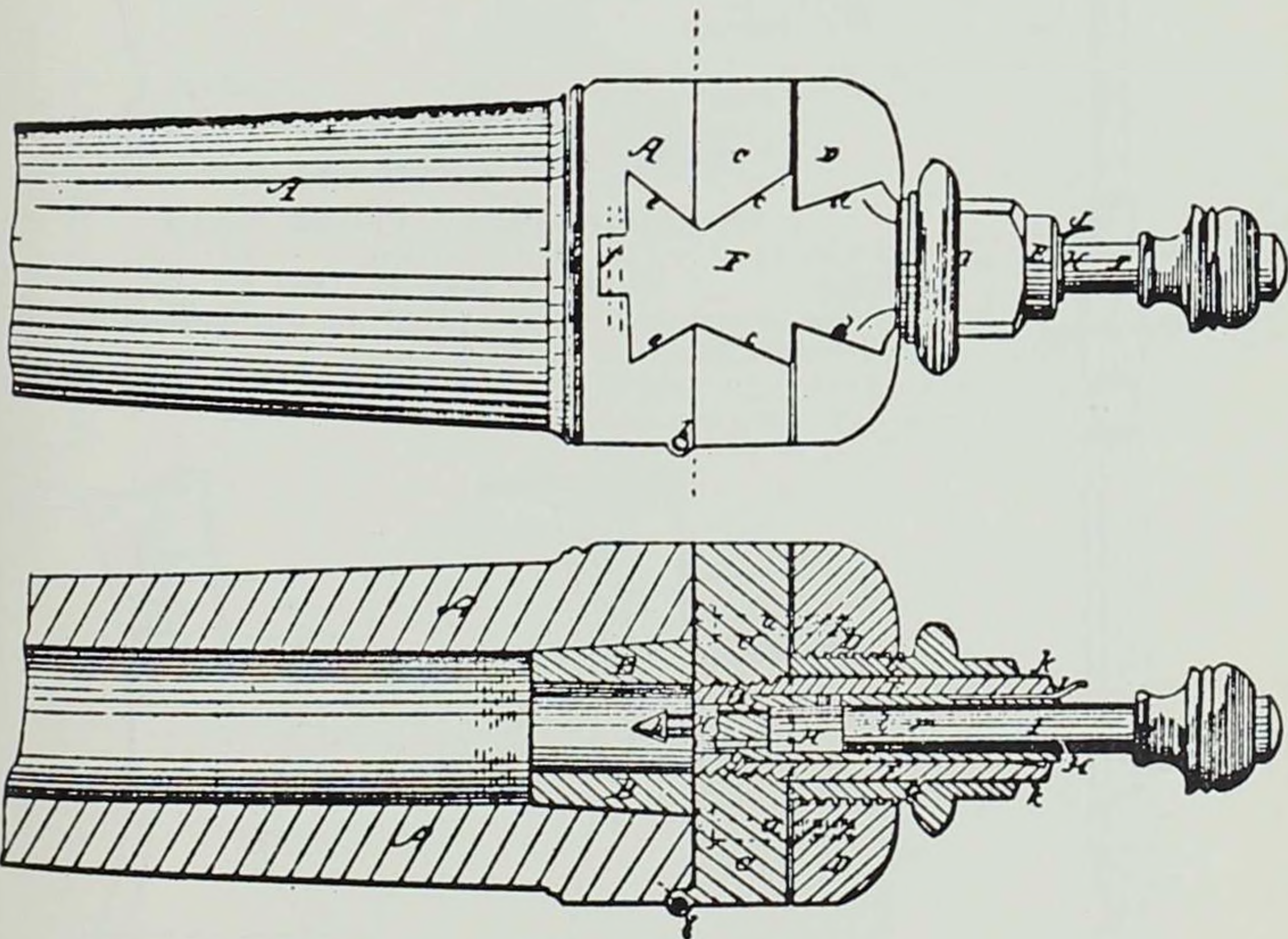




**ALBERT HALL, DANVILLE**  
**Revolver**

**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**

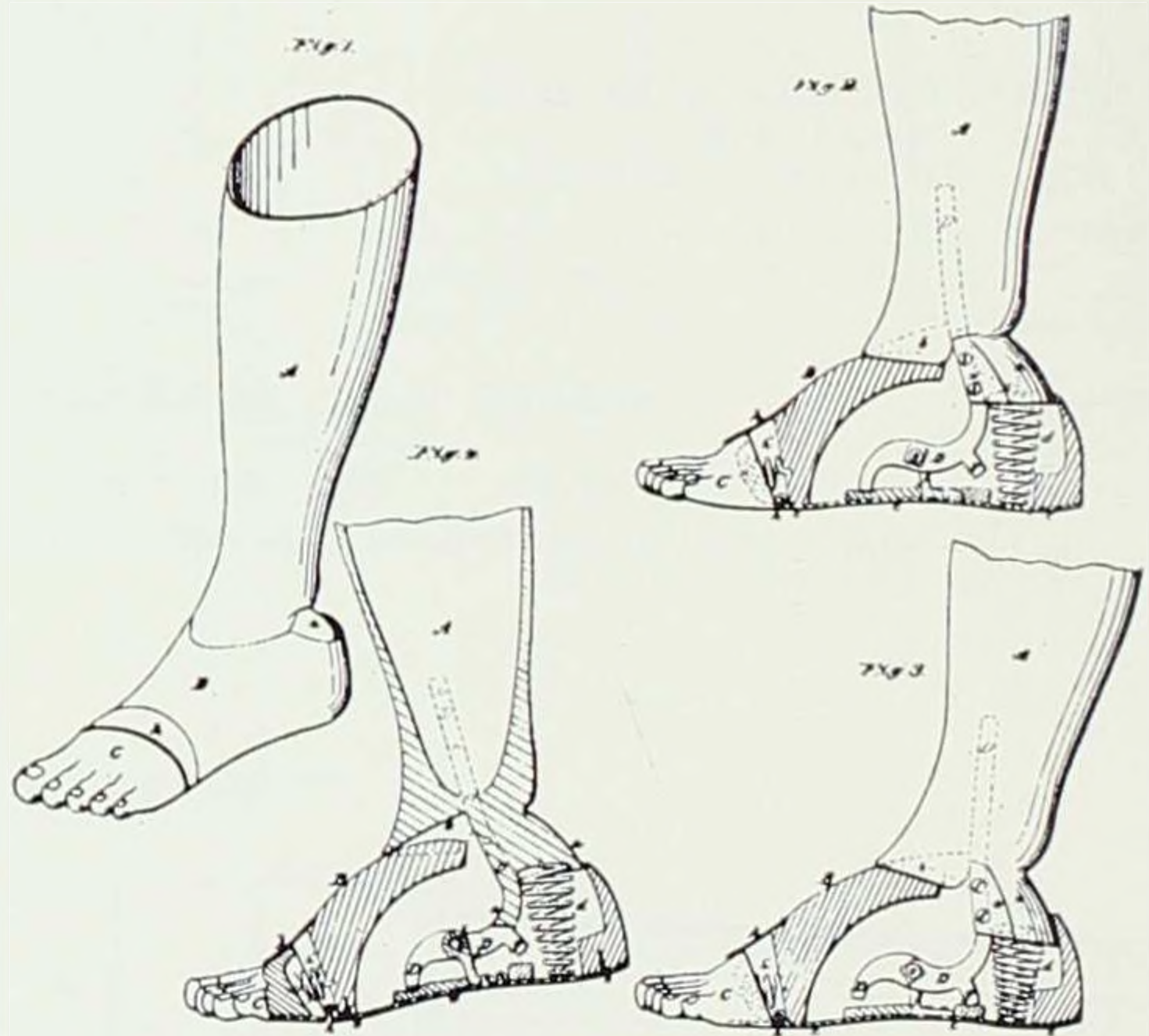
Edward R. McCabe strengthened his breech-loading ordnance, so he could use guncotton, by adding two very strong blocks of metal, C and D. He also added a removable tube, B, for reinforcement.



(Left)

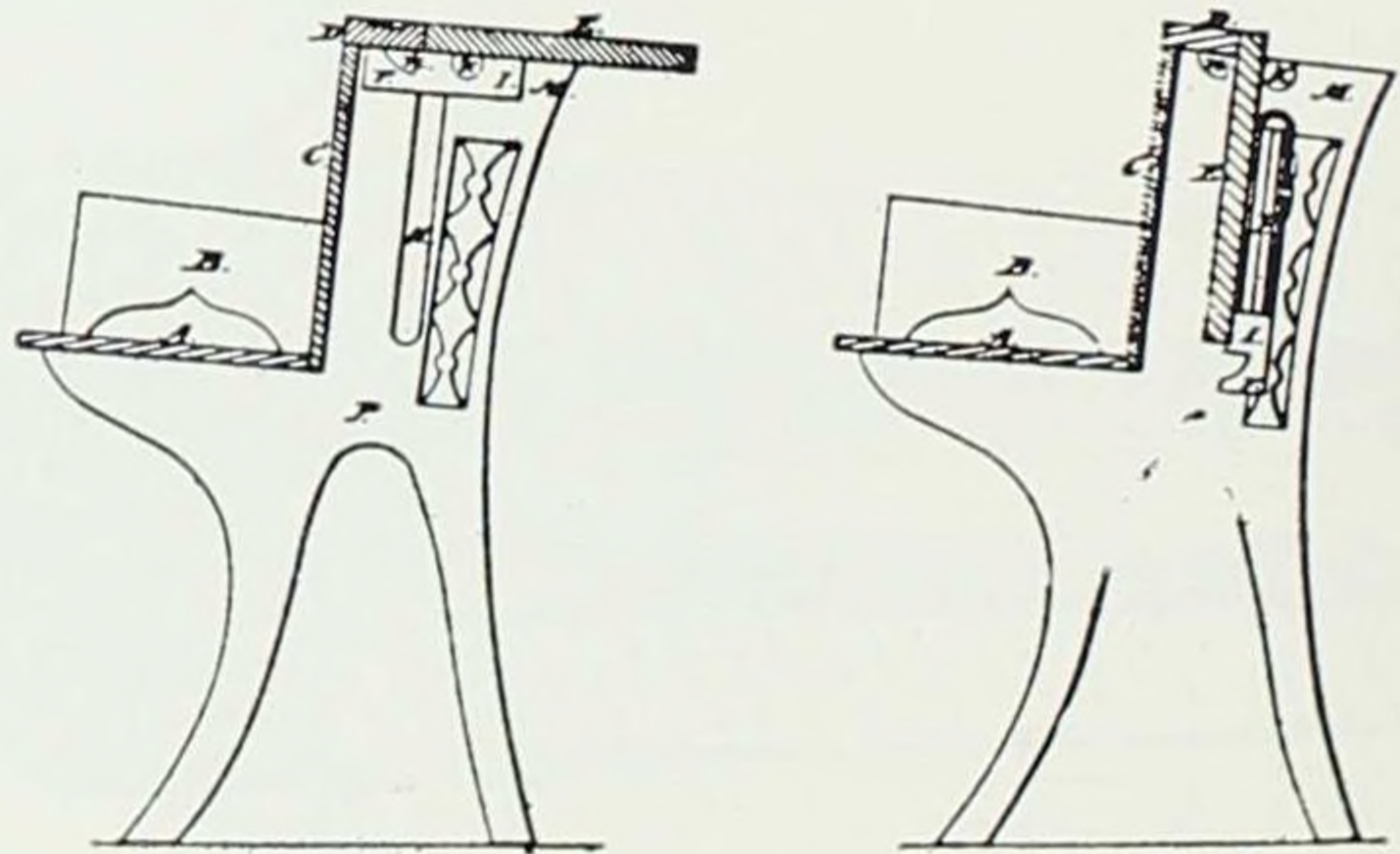
**CHANDLER POOR, DUBUQUE**  
**Dentists' Plugging Mallet**  
**58,133 — Sept. 18, 1866**

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**

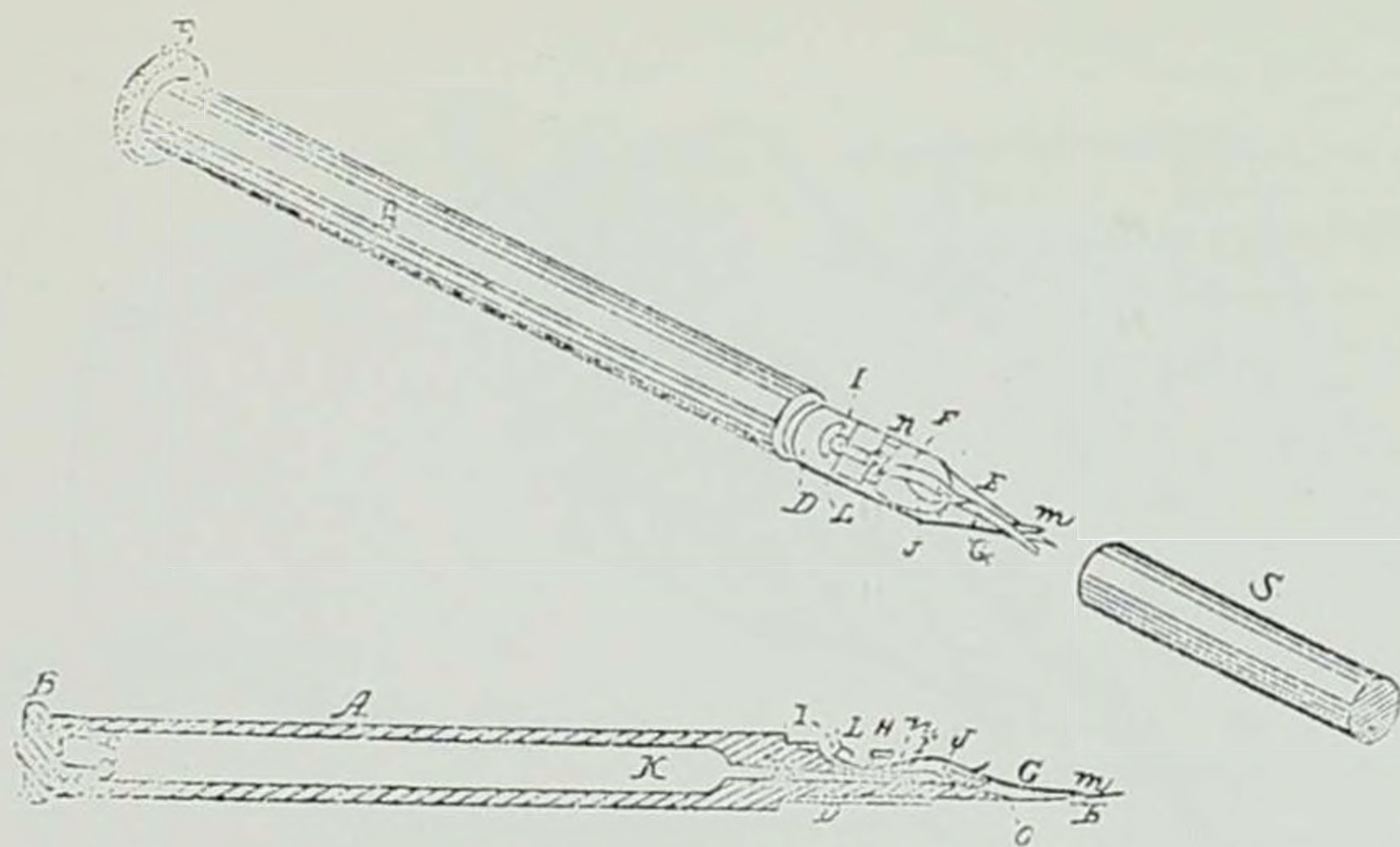
This improvement in an artificial leg was patented by Jonathan Emery of Cedar Falls.



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

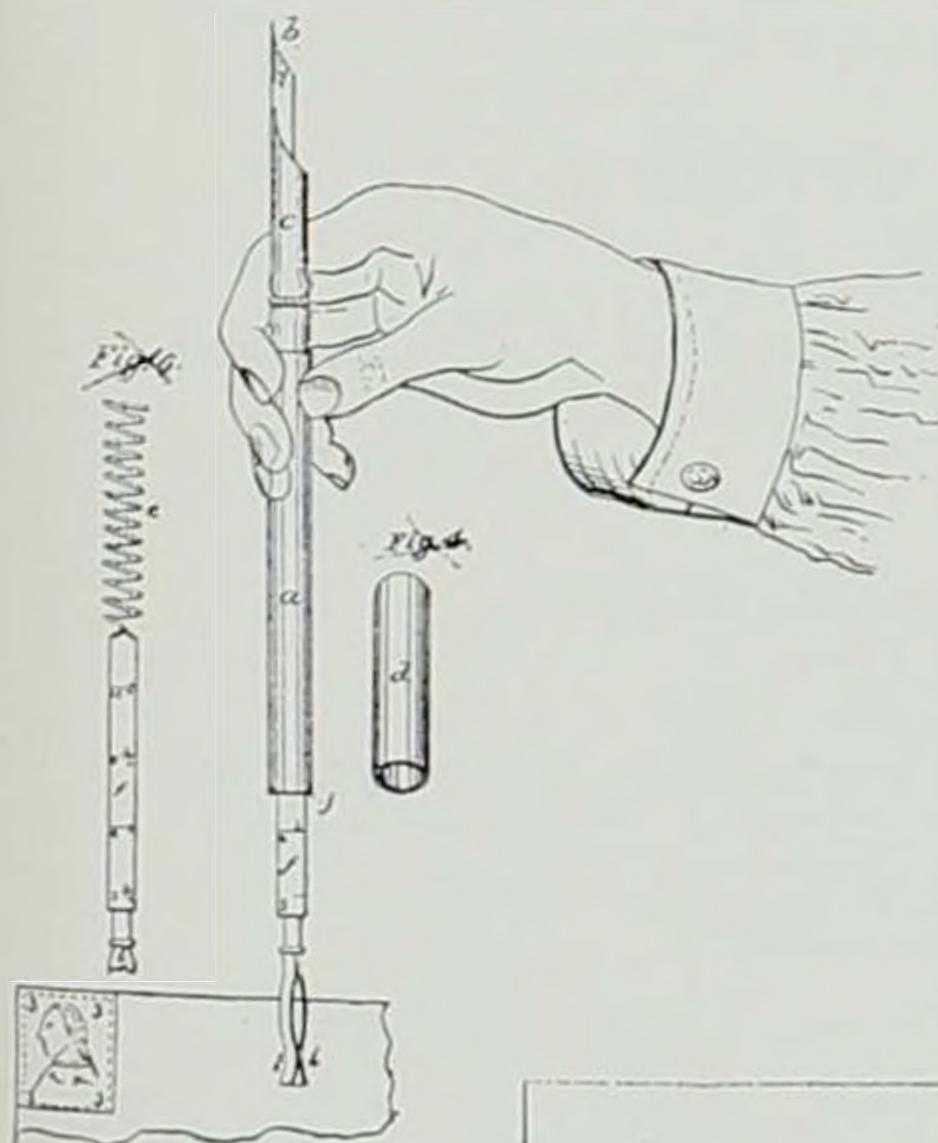
A school desk patented by A. E. Roberts. The desk top, E, could be folded forward into slot, H, and permit more room for student to pass between desks.





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

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

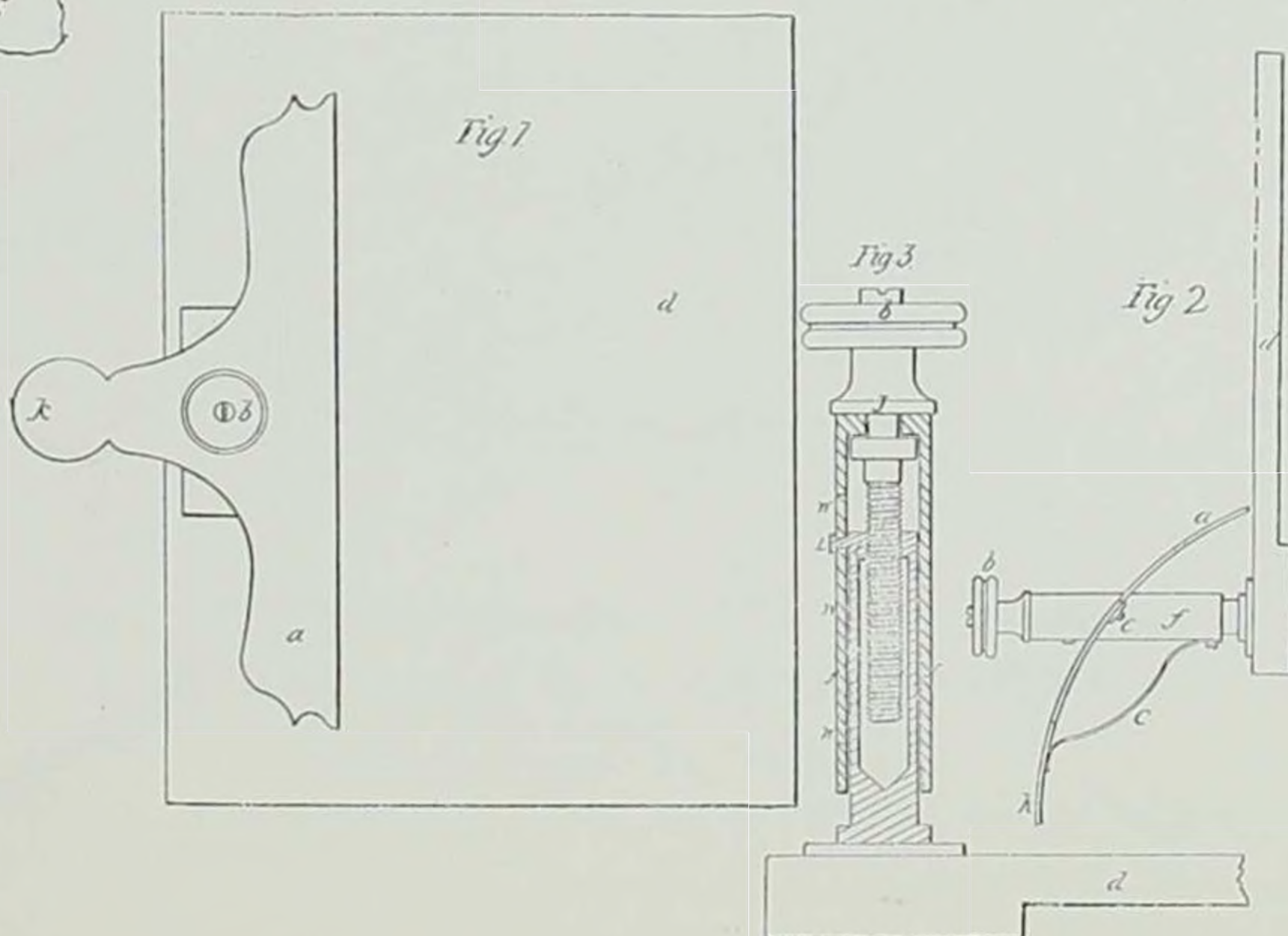


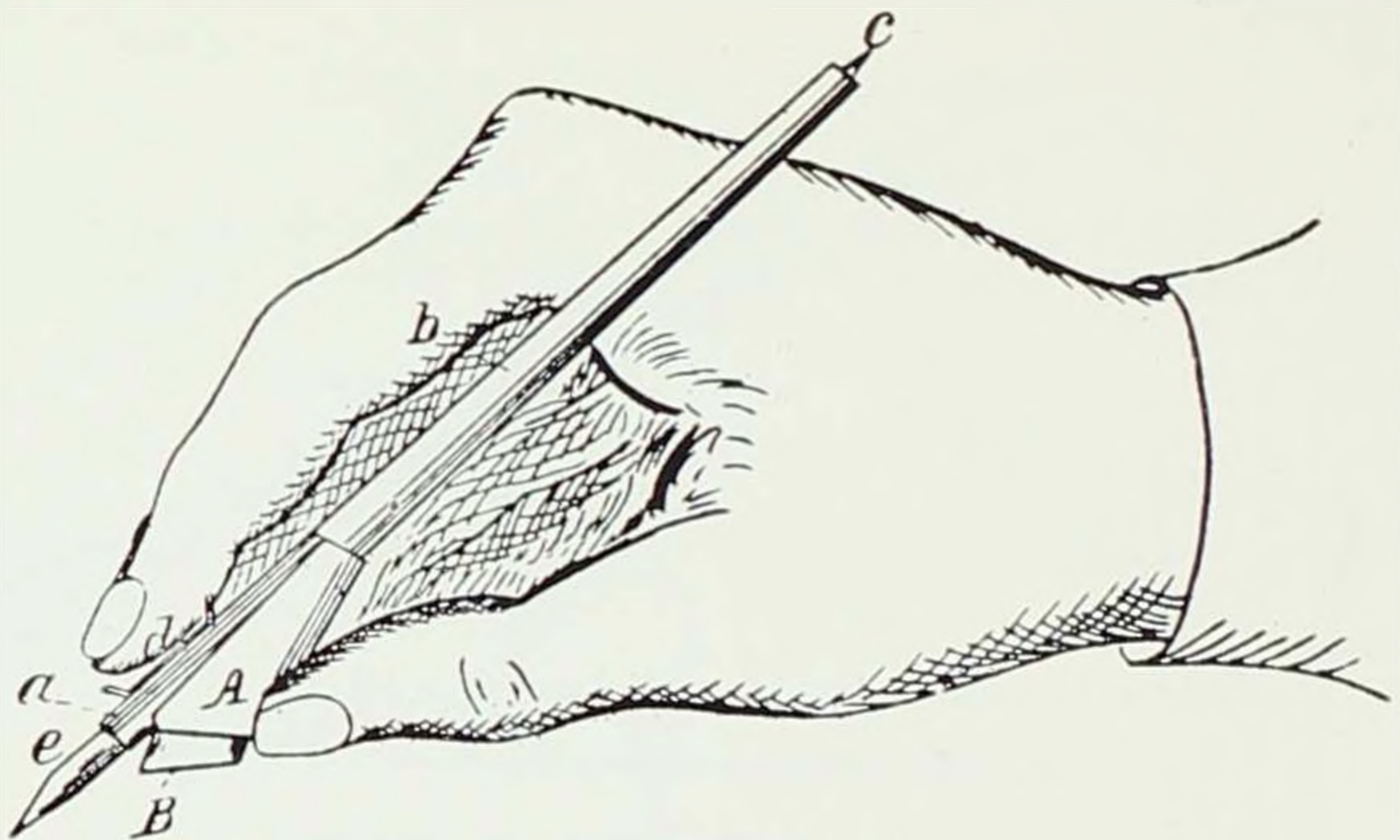
(Left)  
**D. C. LAWRENCE, CEDAR FALLS**  
**Spring Scales**  
**33,091 — Aug 20, 1861**

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

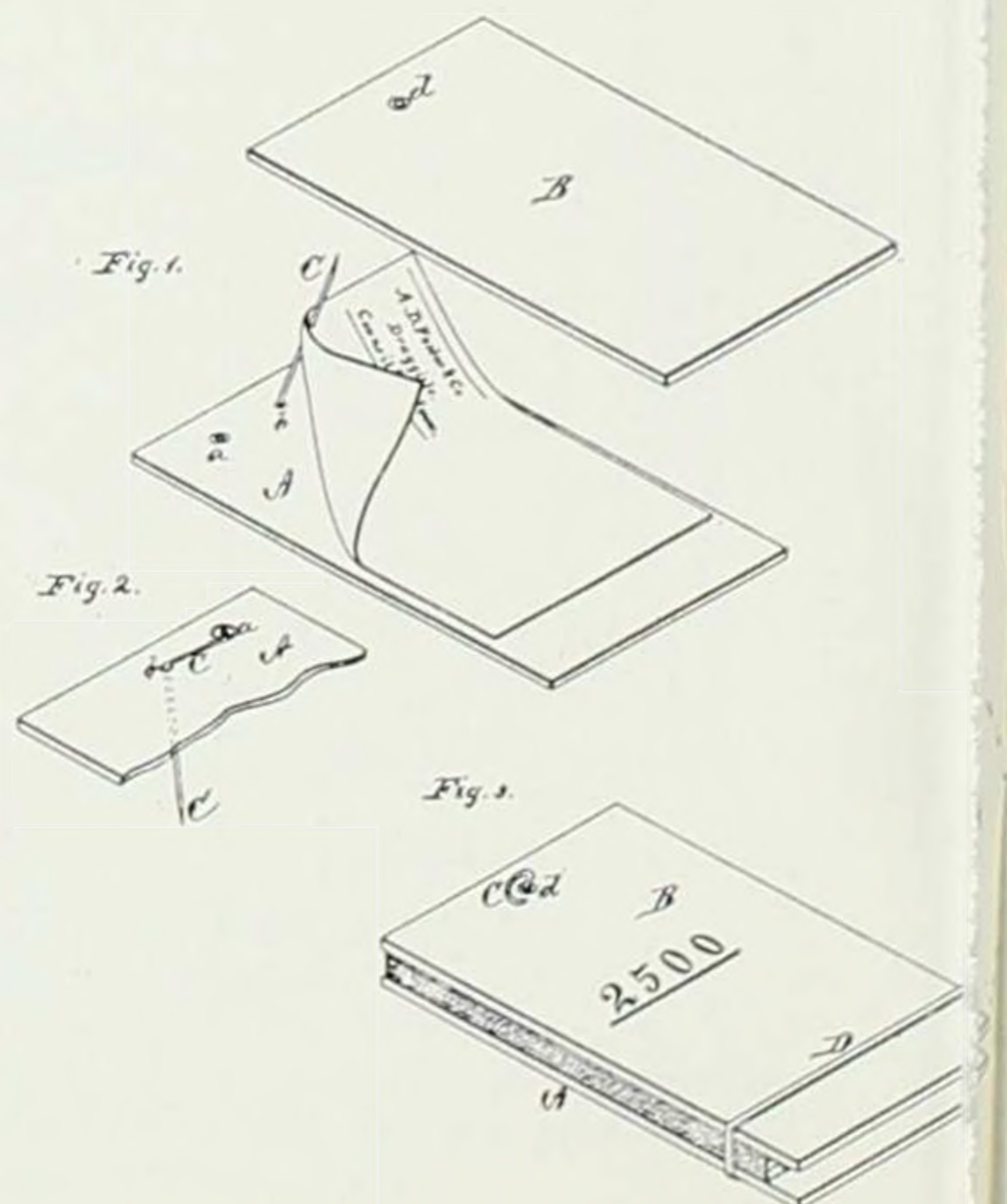
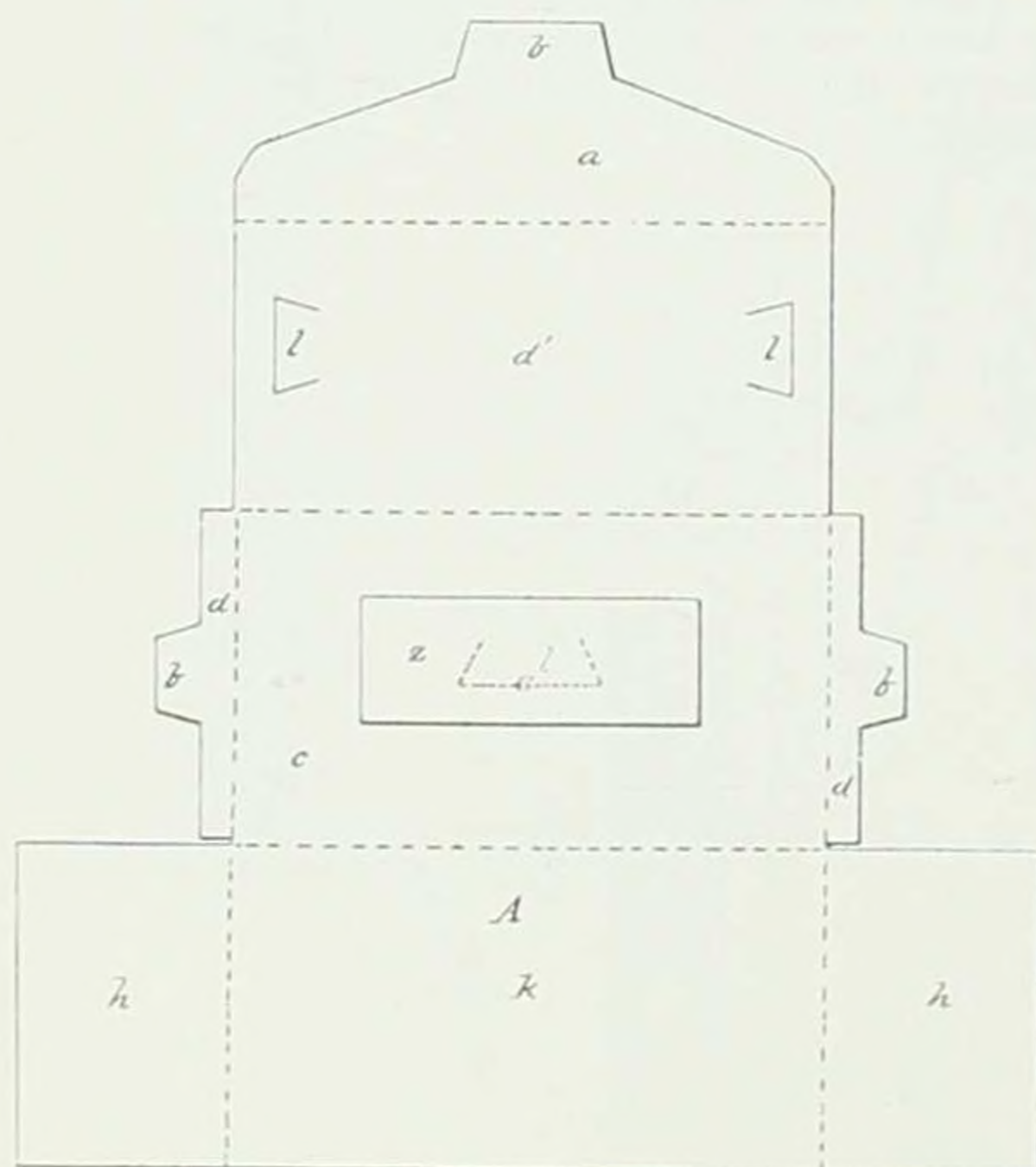
Envelope with an arrangement and formation of sealing laps and slits, was patented by Louis Giebrich of Ottumwa.

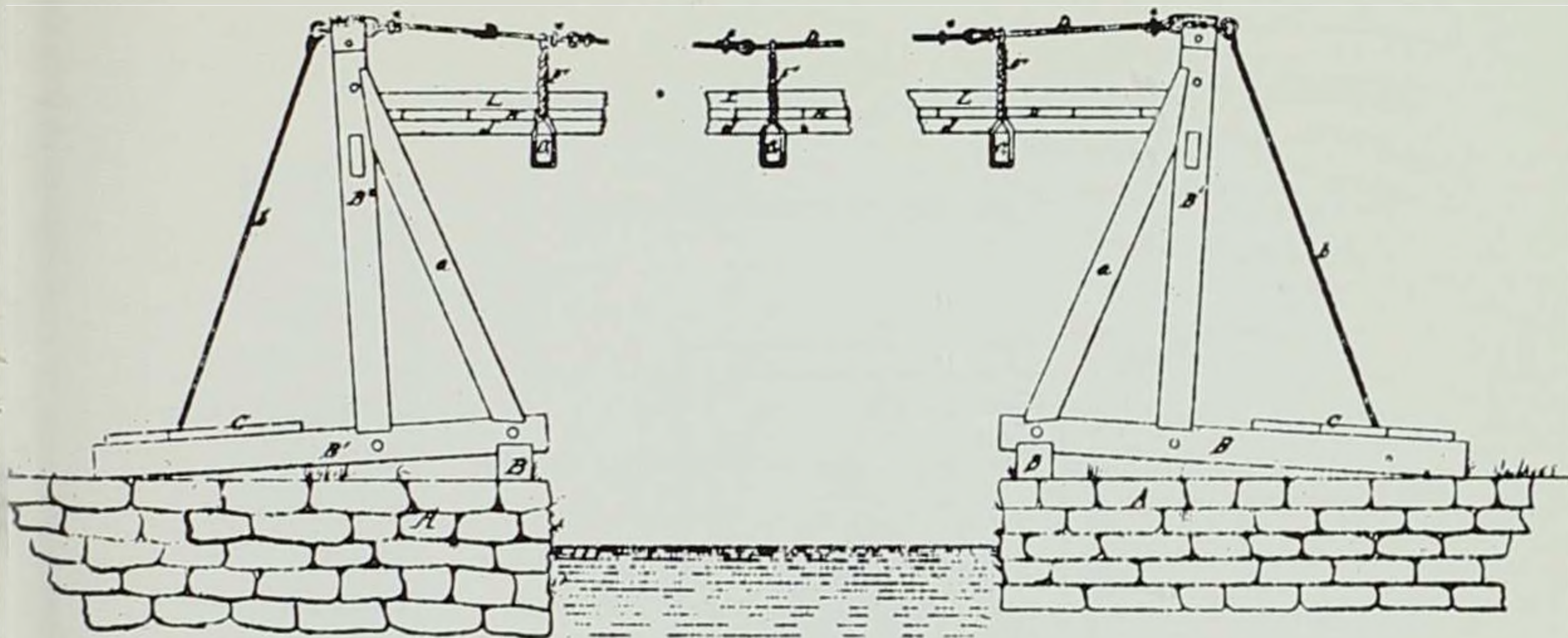
(Below, right)

**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.



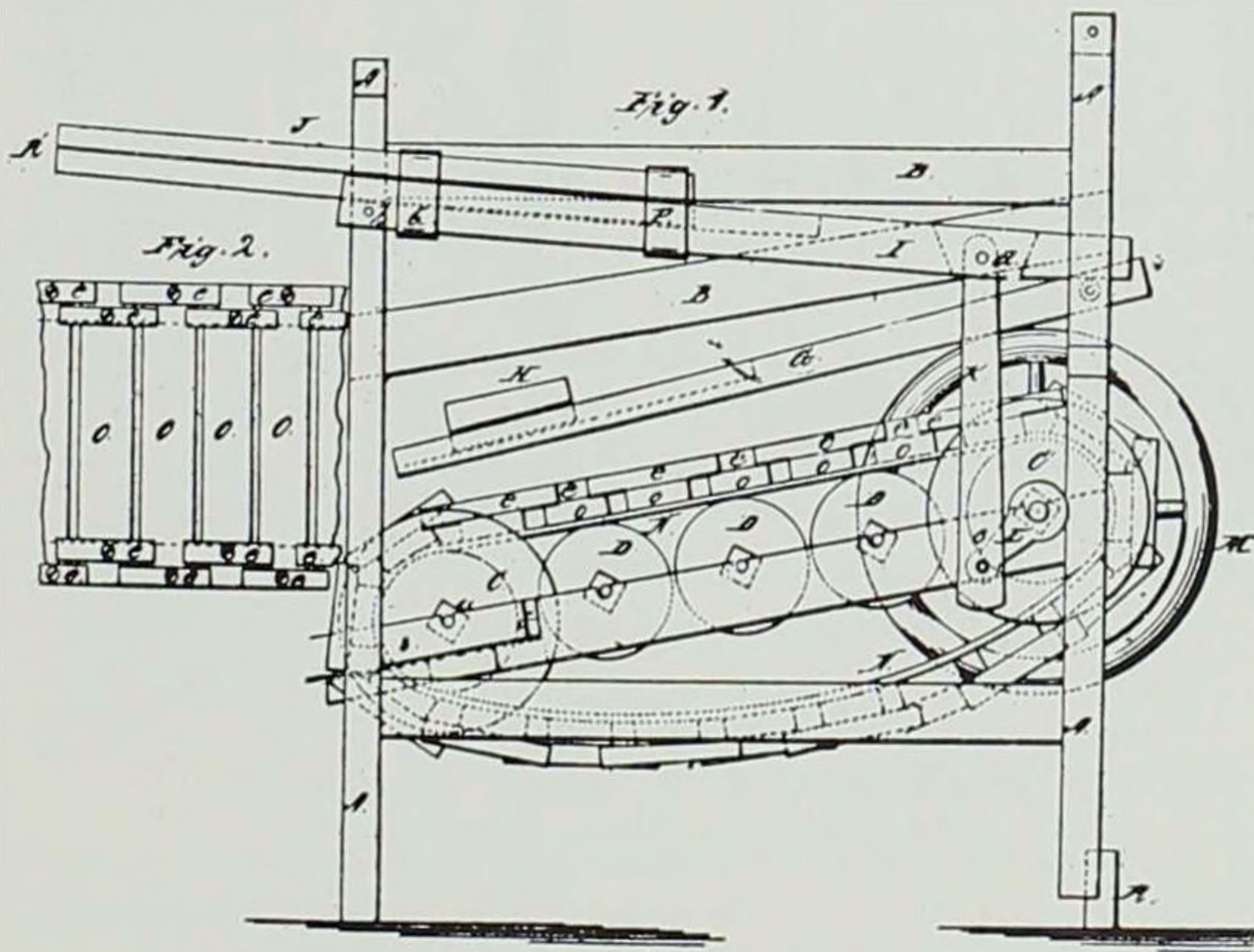


PETER HENDRICKS, FLORIS

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.

Fig 1.

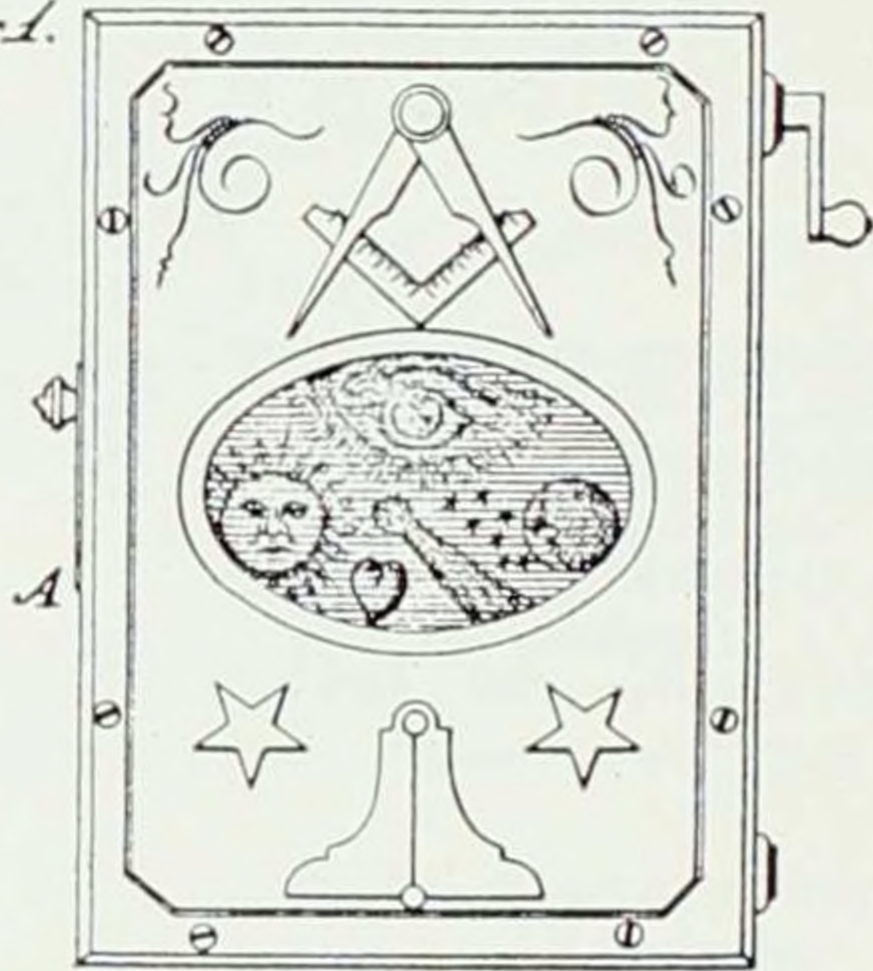


Fig 2.

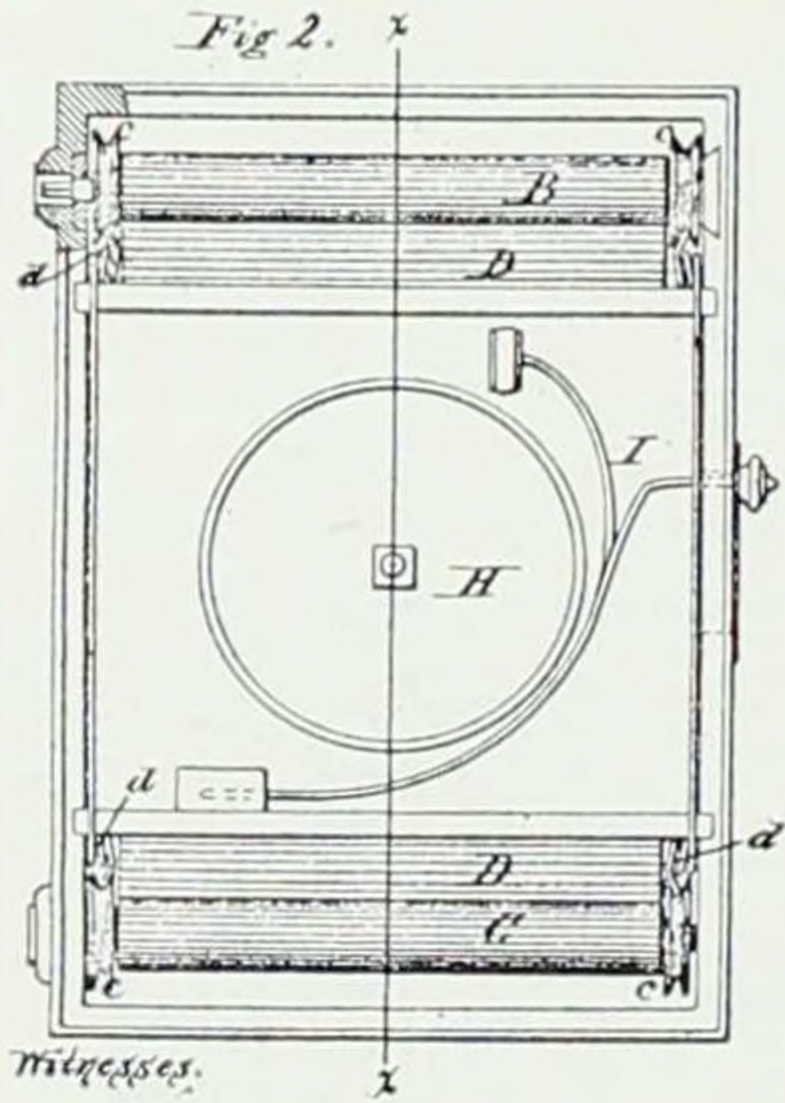
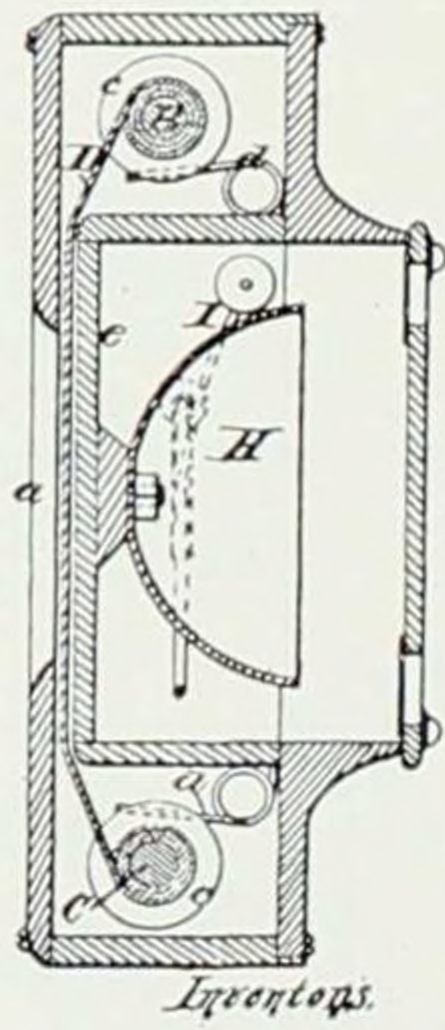


Fig 3.



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 } ss.  
Territory of Iowa.

1105. volume in. 1112. 100

~~October 27~~ day of ~~October~~ 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,

Subscribed and sworn to 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.

# 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 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.

I. 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, the 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 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.

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.

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

THE PHOTOS OF THESE RECEIPTS WERE TAKEN FROM THE RECORDS OF THE UNIVERSITY COLLEGE. THERE MAY BE MORE THAN TWO PAIRS OF CLEANING-ROLLERS SHOULD IT BE FOUND DESIRABLE TO INCREASE THEIR NUMBER. IN THE ACCOMPANYING DRAWINGS, FIGURE 1 IS THE LOWER-ROTATION FRAME MAY BE ATTACHED.