



THRESHING IN THE AGE OF STEAM

A Reminiscence by Merrill R. Pierson

A great farm country institution, once common in America's Midwest grain belt, has passed away. While it lasted, it was an annual event that combined the best and biggest application of power to farm work with a great and true spirit of co-operative neighborly assistance, and in doing so provided one of the community's best social affairs. The institution was the threshing ring, and the power was steam power.

In our part of the country, grain was harvested with a binder and the bundles were set up in rows of shocks. Usually there was a cap sheaf (a bundle) to help the shocks shed the rain. The shocked grain required a "curing" or drying-out process that took about two weeks. When the shocks had cured suffi-

ciently, it was threshing time.

Arrival of the threshing season meant it was time to lay in a supply of coal. I was usually the one who hauled home about a ton of the best grade of lump coal available. We didn't want to incur the risk of insufficient steam pressure in the engine boiler on account of slow-burning or low-heat coal. The coal wagon was left loaded and parked near the steam engine after the engine was belted to the separator.

Care was taken, too, to have the several stock tanks filled with water to be hauled to the engine in a special tank wagon. The machine crew always included one man or older boy to run the tank wagon. It required pumping water from the stock tank by means of a hand-operated pump. The pump had a rather large cylinder, so it did not require a long time to fill the tank wagon. While the wagon was away from the threshing site, the engine

depended on a reservoir mounted on its platform. If the reserve began to run low, the engineer could warn the water tank operator with three blasts on the whistle, telling him that he must hurry back to avoid a shutdown or a blowup.

As soon as the grain was cured, every farmer wanted to get it threshed right away. There were only three or four threshing outfits in the entire township, and they were all very much in demand at the same time. One of the aggravations was that threshermen would promise to start at a certain farm at a certain time and go in some logical sequence from farm to farm. Unfortunately, some of them were not dependable; they would start elsewhere or go in an unexpected direction. Thus it happened that some farmers were at the end of the run year after year, with more rain damage than the average. I can recall that one neighbor lost his entire crop of wheat on account of a rainy season, even though his closest neighbor was a thresherman.

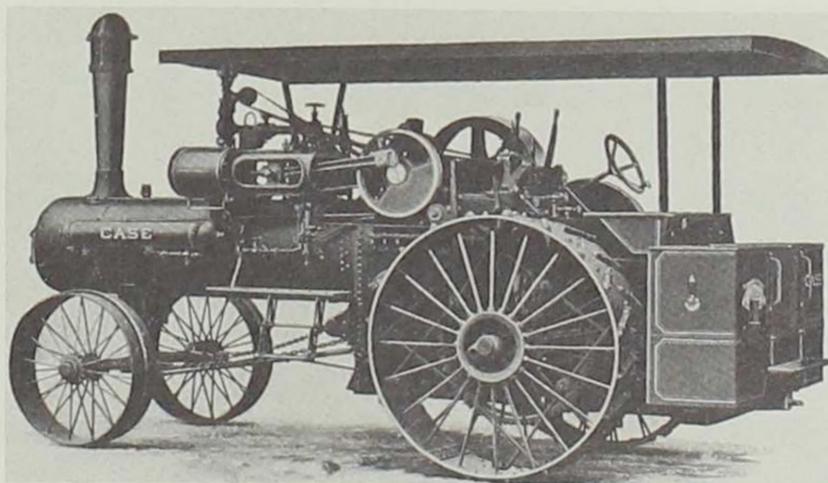
This uncertainty and delay led to the formation of threshing co-operatives, in which about a dozen farmers formed a loose partnership, contributed funds in equal amounts, and purchased an engine and grain separator, as the threshing unit was usually called. My father was a member of such a partnership arrangement. It was very informally organized and carried no insurance of any kind. A fire loss or a serious injury attributable to the machine's operation could have caused a great financial hardship to the partners, but in the pioneer spirit of those times the risk was calmly accepted. In our area there were no "company" catastrophes. A privately-owned rig broke through a wooden bridge on the road and killed the engineer-owner, but there was no question of personal liability under such circumstances.

The first step in threshing was to bring the shocks in on bundle racks. The typical threshing operation in the steam-power era

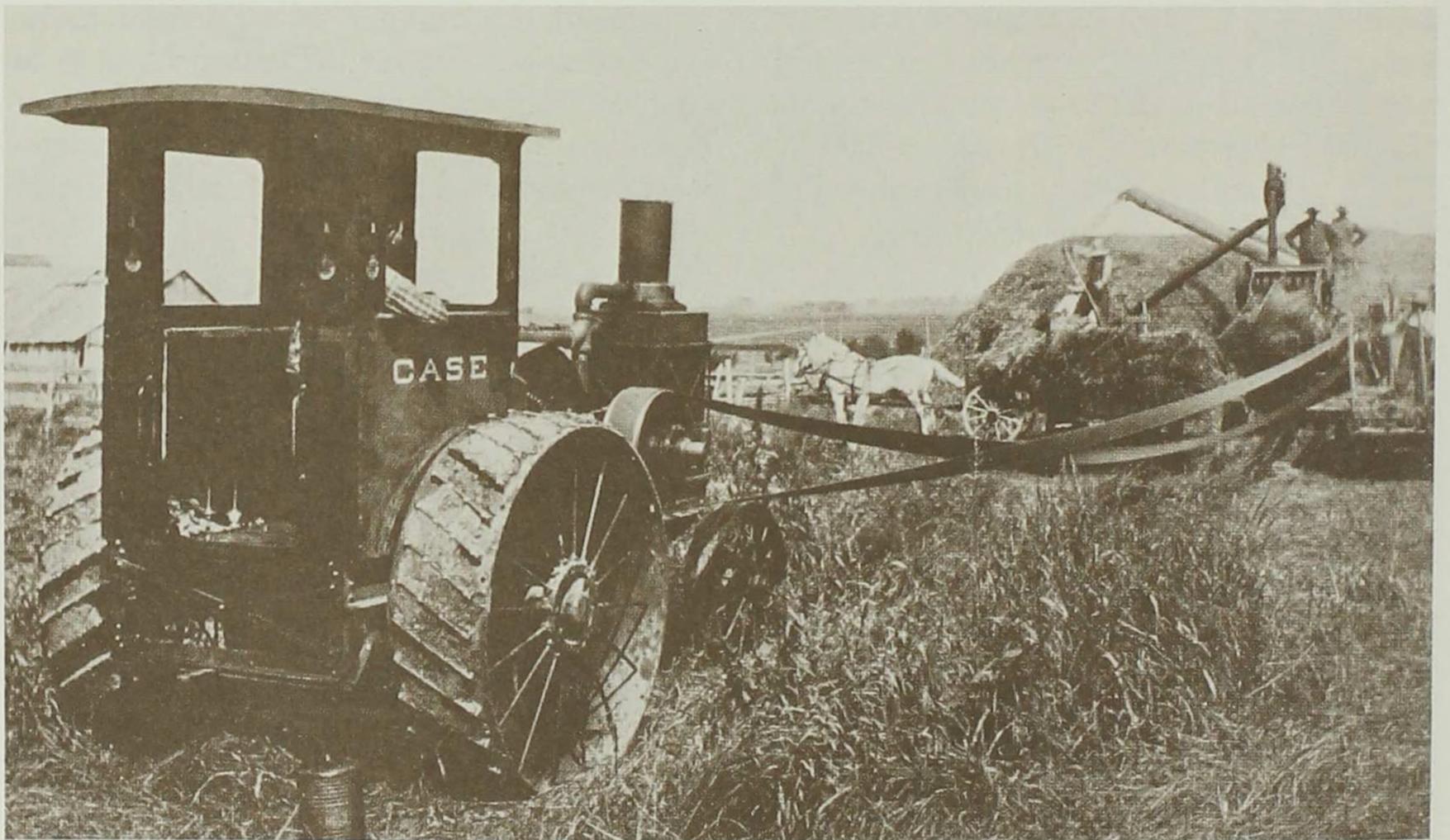
required from ten to fourteen bundle racks, depending on how far the bundles had to be hauled. Four men were needed to pitch the bundles up on the bundle rack. The loader soon displayed his experience, or lack of it, in the way he shaped his load. There was a real skill involved in placing every bundle on the perimeter with the butt end out and the head end overlaid by another inside bundle, like shingles on a roof, to keep the outside bundles from slipping off. Any novice who lacked the basic knowledge, and consequently suffered a slip-off of part of his load of bundles, was the butt of much derisive laughter and ridicule.

Sometimes the threshing was done out in the field, but on our farm it was more often done in one of the farm lots so that the straw stack would act as a wind shelter in winter for livestock. In the case of oat straw, it was also useful as winter feed for cattle; they ate it directly from the stack.

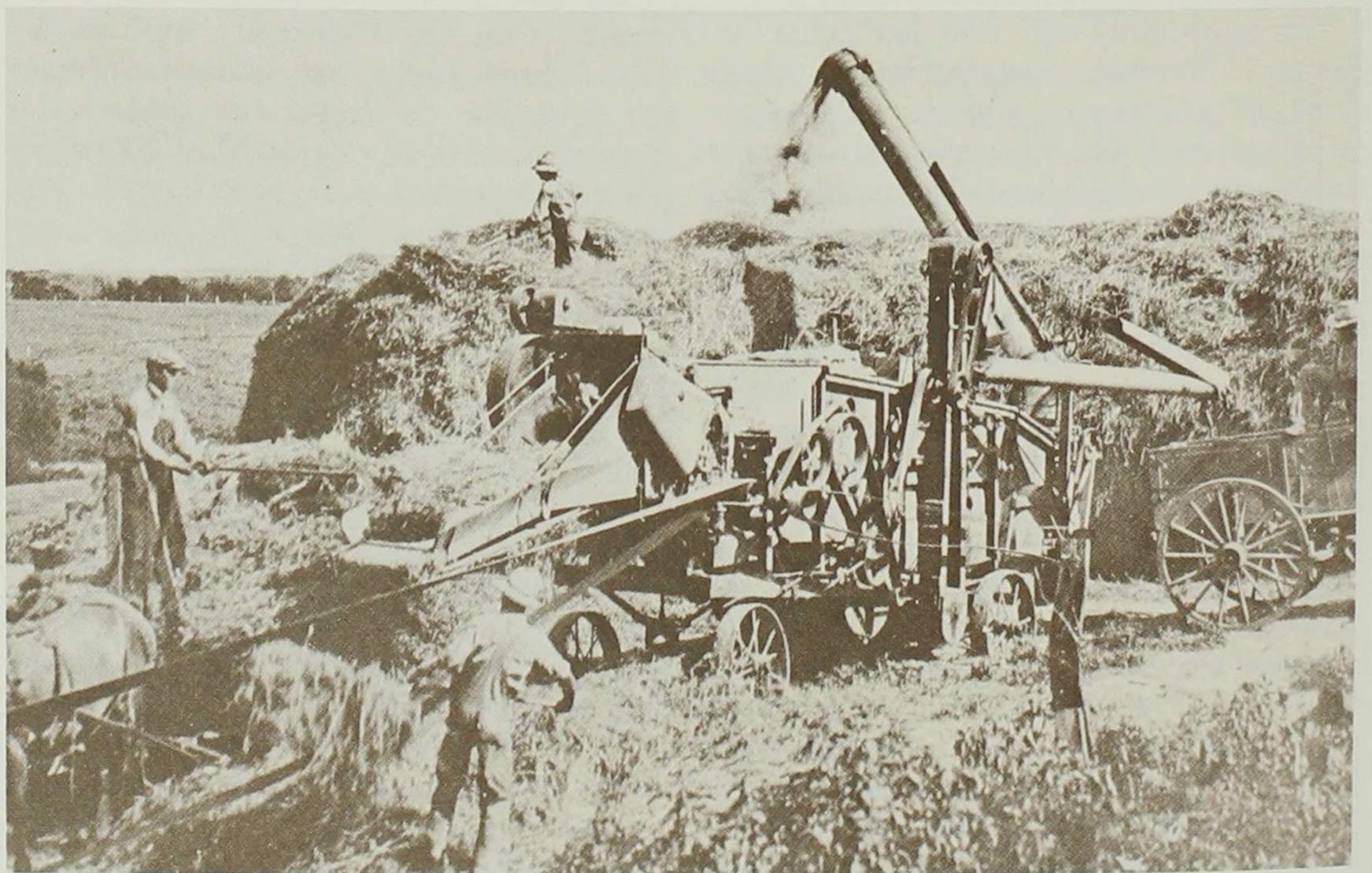
The exact location of the stack was determined by the direction of the wind on the day of threshing. It was necessary to locate the rig so that the dust and chaff from the blower would drift away and not fall on the threshing operators and grain wagons. The location was also influenced by the arrangement of the farm lot. The steam engine and grain separator had to be set up in a location



A 65-horsepower traction engine manufactured by J. I. Case in 1917. This model sold for \$2,190. (courtesy J. I. Case)



(above) A Case-powered threshing operation (courtesy J. I. Case); (below) a thresher in operation: two men feed in the bundles while another worker tends the stack (A. M. Wettach photo)



that permitted the movement of bundle racks and grain wagons to their proper positions.

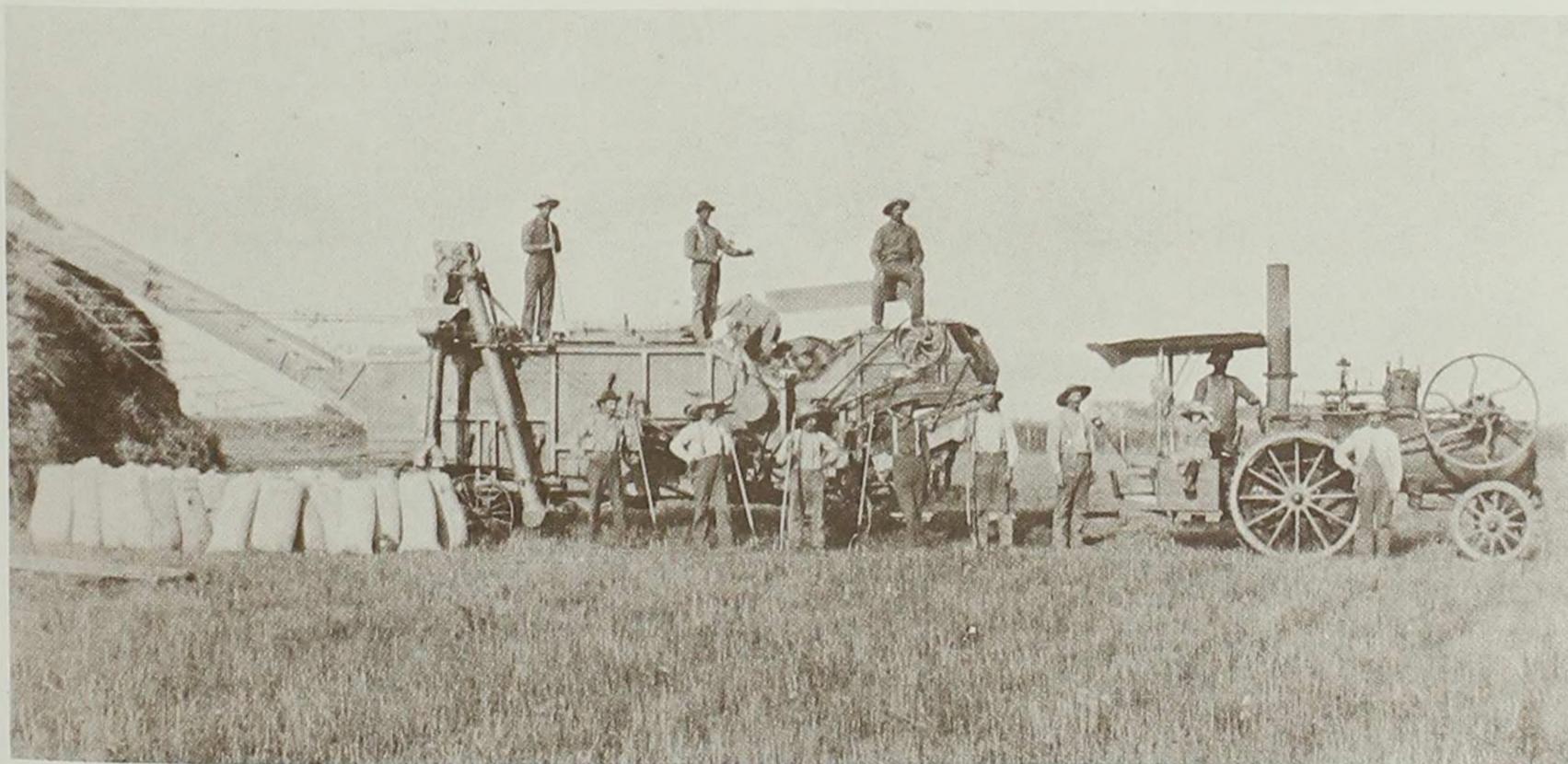
My personal recollections of threshing machines span a period dating from the first decade of this century. At that time there were still a few threshing machines powered by horses harnessed to "sweeps." The sweeps turned cog wheels that were geared to "tumbling rods" (really drive shafts), and the rods were connected to the separator to transmit the power for all its moving parts. But the conventional threshing rig during my childhood and teen years was powered by steam.

Although the actual operation of a steam engine was no job for a novice, the engine itself was basically simple. Fuel was burned under a boiler to generate steam from an abundant water supply to produce cheap, dependable power. There was no such thing as a battery, generator, starter, distributor, carburetor, transmission, or brake to get out of order. One cylinder, with steam applied to a piston in each direction of travel on every complete turn of the flywheel, was equal to a four-cylinder internal combustion engine in the number of power impulses it

generated. And there was a tremendous reserve of power when the steam pressure was maintained. But it would be a mistake to conclude from the foregoing that the operation was correspondingly simple.

The engineer had to think and plan far ahead. He had to have reserves of both fuel and water. He had to regulate the amount of water in the boiler and have enough fire, neither too little nor too much, to produce steam as required. Sometimes the water injector did not work properly and had to be cooled before it would cause fresh water to enter the boiler. If it still refused to work, there was usually a hand pump. Merely opening the steam valve did not assure that the flywheel would start in the right direction. If the first power thrust was in the wrong direction, the engineer reversed the steam flow with a lever so that the flywheel would rotate in the opposite direction. This reversal had to be sharply limited by quickly closing the throttle. Otherwise, many of the belts on the separator would be thrown off their pulleys. Usually a brief reversal, espe-

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A threshing ring with part of a day's labor (SHSI)

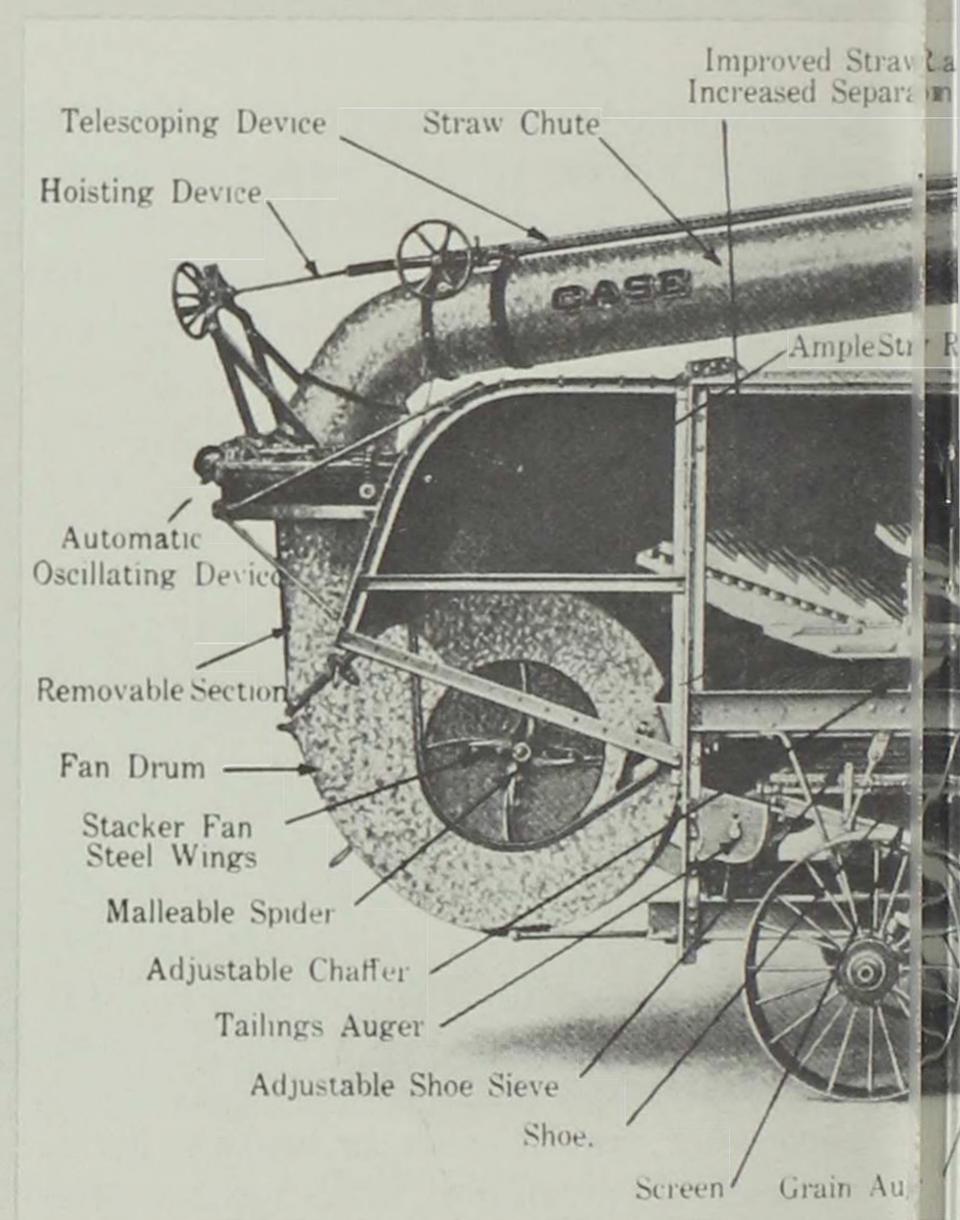
The many models of steam-powered threshing machines in use in the Midwest at the turn of the twentieth century had all evolved from designs patented as early as 1788. The older machines passed grain through beater-cylinders, which loosened the grain from the straw and deposited it — along with the chaff — on the ground. Such machines were a vast improvement over hand methods, but they had one major flaw: they were stationary.

In 1837, Hiram and John Pitts patented a portable machine employing a fanning mill, a device that blew the chaff away from the grain. The Pitts' machine was called a "separator" because it separated the grain from the straw and chaff. Separation took place when bundles of wheat passed over a perforated apron; the smaller, heavier grain fell through the holes, while an elevator at the rear of the machine expelled the straw. Inventors later developed an alternative method of separation in which the grain was shaken loose from the straw by means of an agitator. After a brief but intense rivalry, proponents of the agitator principle prevailed. By the early twentieth century, they had improved efficiency and productivity to a point where their machines could thresh from three to four thousand bushels of grain per day.

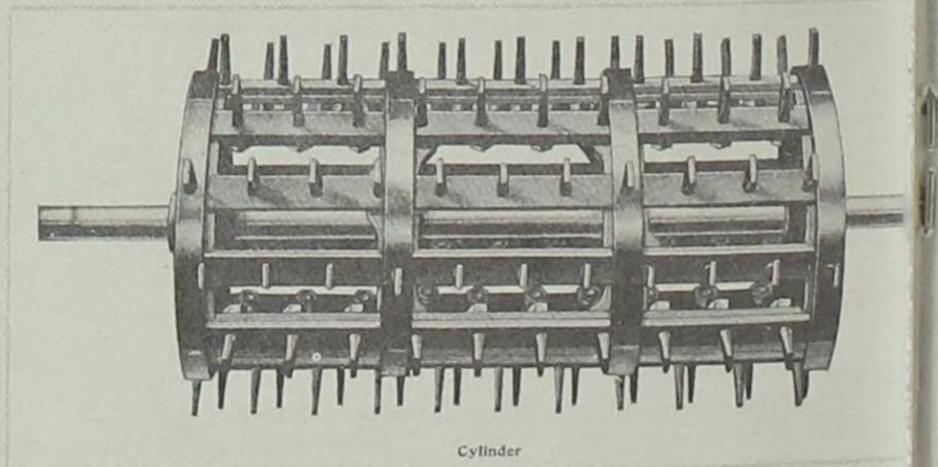
In spite of their apparent diversity, most of the threshing machines were similar in structure to the one shown in the accompanying diagram, a J. I. Case Steel Threshing Machine introduced in 1904. The threshing process followed in the various machines was essentially the same.

First, the threshing crew fed wheat bundles into the feeder, which carried them to the cutter bars, where the bundles were cut open. Then the wheat was carried to a retarder mechanism, which regulated the movement of the wheat into the machine. Most of the grain was then separated from the straw by passing the wheat through a cylinder and concave device that allowed the grain to fall through and passed the straw along to a series of racks.

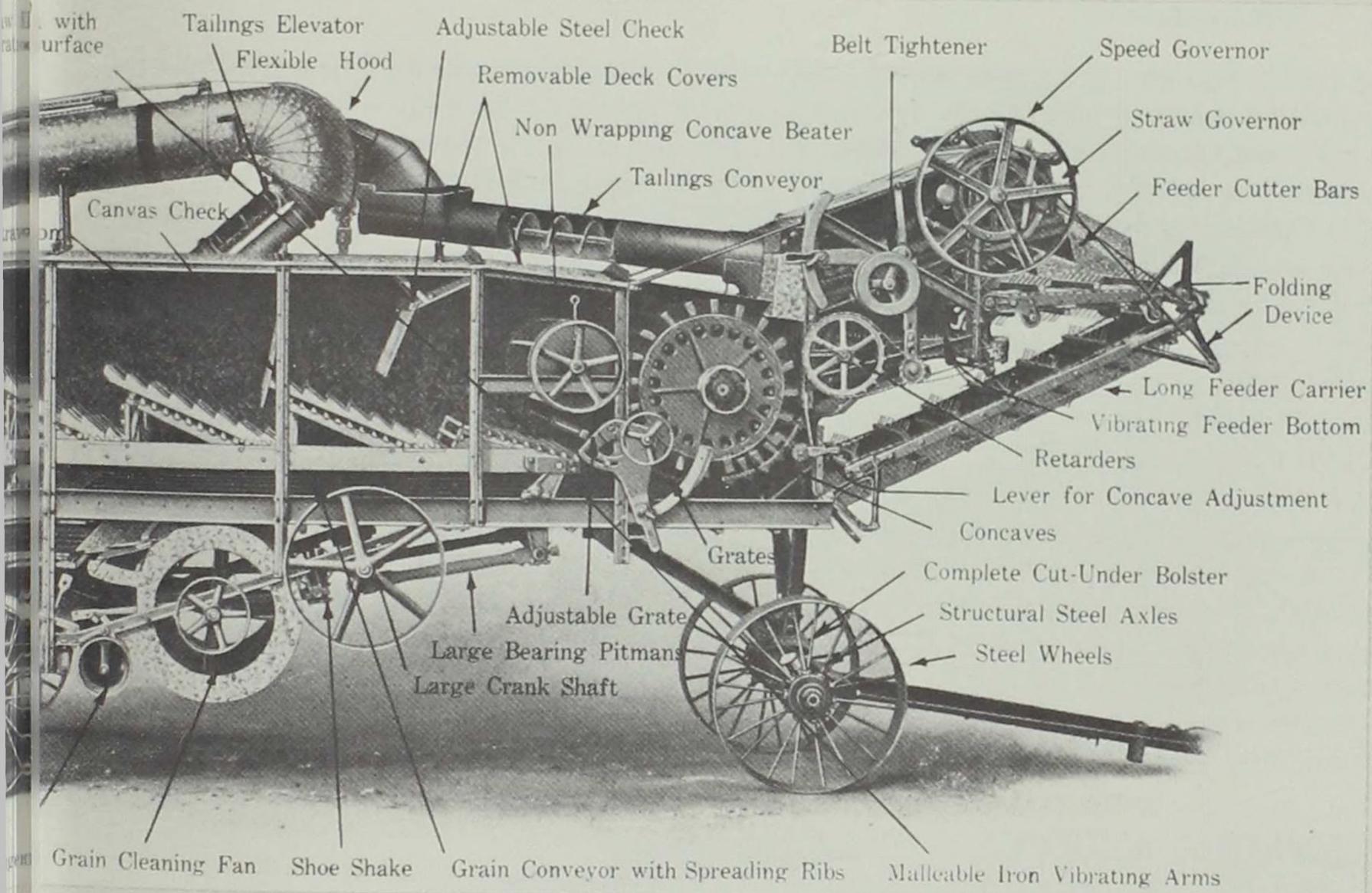
The racks shook loose any grain still attached to the straw, and this grain was combined with that from the cylinder and con-



cave. Then the grain fell through two screens called a "chaffer" and a "sieve." Any remaining chaff was then blown away from the grain by a grain cleaning fan, and the grain was finally fed out of the threshing machine by a grain auger. Meanwhile, the straw was carried back along the racks to the "stacker fan," which propelled it into the "wind stacker" (labelled the "straw chute" in the accompanying diagram). Finally the straw shot out the end of the stacker and onto the growing straw stack.

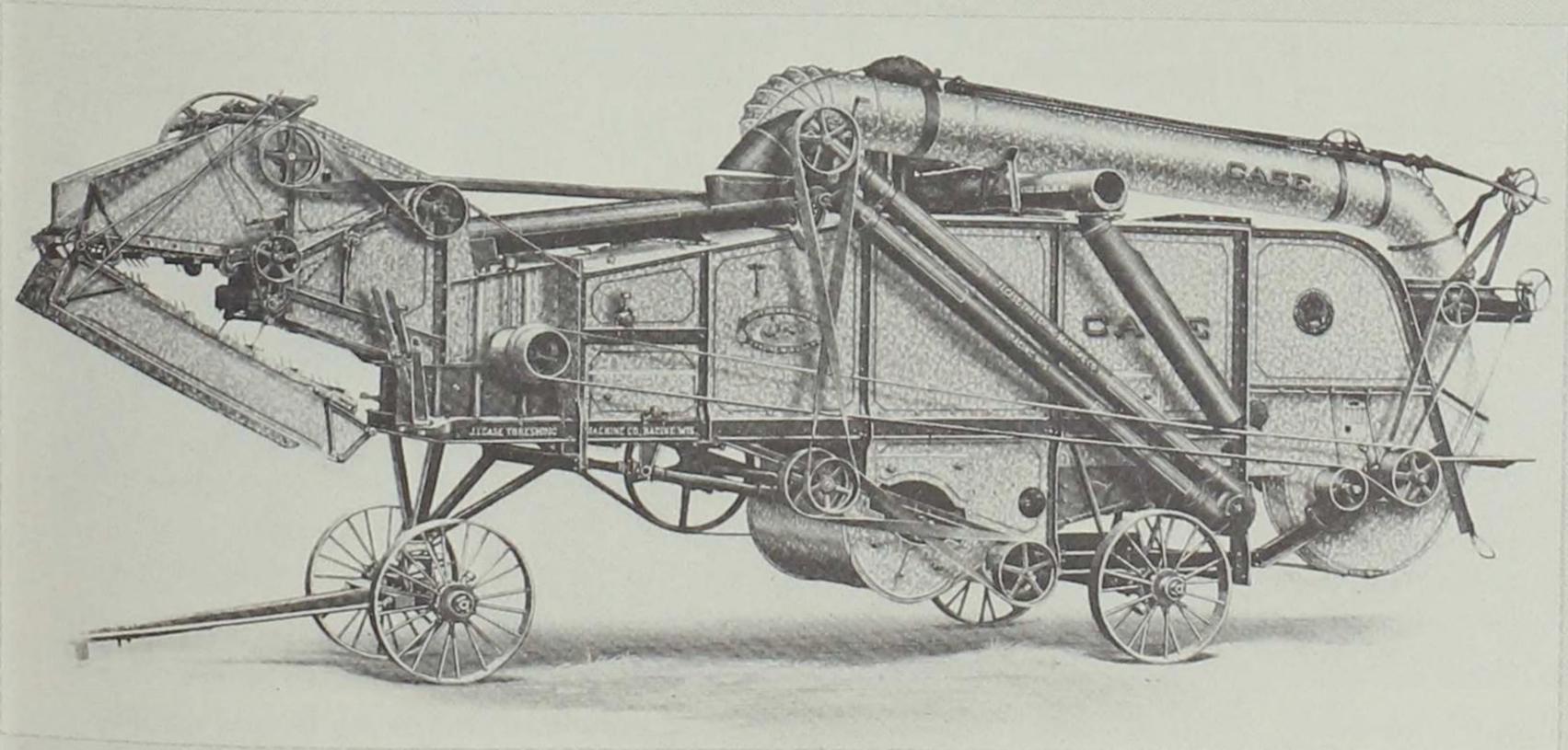


How the Steam Threshers Worked



Grain Cleaning Fan Shoe Shake Grain Conveyor with Spreading Ribs Malleable Iron Vibrating Arms

A Case threshing machine manufactured in 1915 (below); the same machine in a cross-sectional view (above). The cylinder pictured below left was manufactured in 1889 by the Advance Threshing Company of Battle Creek, Michigan. (Thresher photos courtesy J. I. Case; cylinder photo reprinted from the Advance Company's 1909 catalog)



cially under the hand of an experienced engineer, would make it possible to re-reverse and start the flywheel off in the desired direction. Occasionally, however, the crankshaft and flywheel would stop on dead center, in which case the flywheel had to be turned by hand a few degrees to position the piston to receive a steam-power impulse.

The engine's whistle was used to send a variety of messages. The engineer was usually the first man up and around in the morning, kindling a fire under the boiler. When he thought the appropriate time had arrived, he gave a long blast on the whistle to let the neighbors know that operations were starting. At noon, and again at the end of the afternoon operation, it was customary to announce the closedown by a long whistle blast that could be heard for two miles or more. A

single short blast was used to warn the separator feeders (the men who were pitching bundles onto the traveling feeder) that they were overloading the machine. This situation was usually accompanied by a groaning noise from the separator concaves and cylinder, and it could happen easily when the grain was a trifle damp, as it sometimes was in early morning. Some of the younger men in the threshing crew thought it a "smart" trick to overload the machine, with the result that the drive belt might be thrown off, the cylinder clogged up, and considerable time lost by the shutdown.

When the grain had completed its trip through the thresher, it was hauled to the storage bin in two wagons. One was filled from the grain spout of the accumulator box that measured and dumped the grain into the



A typical threshing team, or "ring," consisted of about twenty men and thirty horses, usually drawn from five or six neighboring families. This team poses at the J. F. Duncan Farm in Oakville. (courtesy Midwest Old Threshers)



The traction engine pictured in this threshing scene has an upright boiler — odd in appearance, but a common sight around the turn of the century. The engine appears to have chain drive. (SHSI)

wagon in half-bushel lots while the other wagon was being unloaded. In order to keep up with the thresher, two men were needed to scoop the grain into the storage bin. Because of the limited length of the wagon box, the men faced each other and one scooped right-handed and the other left-handed, with alternating and synchronized thrusts of the scoop into the grain and shots upward over the side of the bin. Occasionally, the scoops would bump in mid-air in the rush to get the wagon unloaded and back to the thresher by the time the other wagon was loaded.

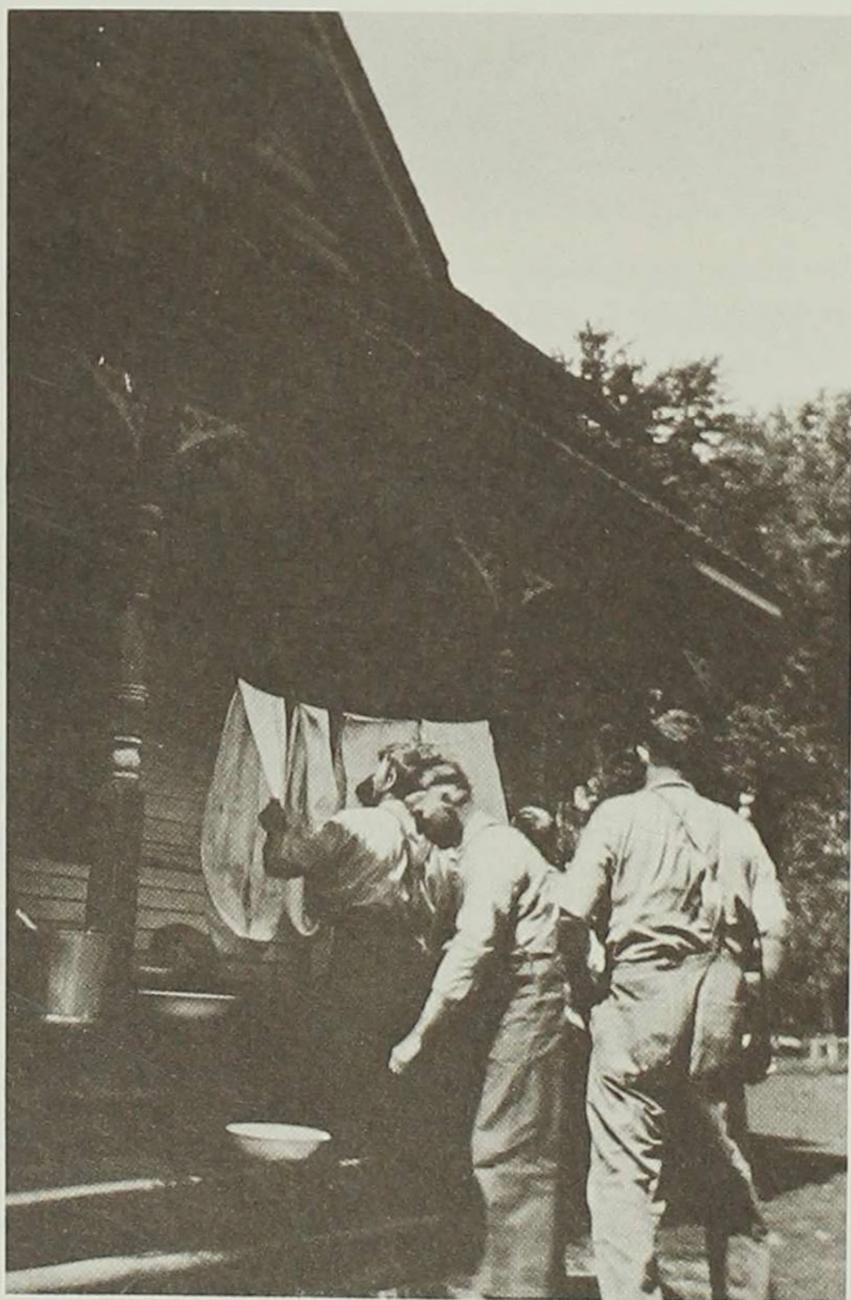
All of these operations had to proceed in unison, and an interruption in one stopped all. All of the men in the threshing crew were working in complete harmony to get the work done.

As a boy, my job was to supply fresh, cool drinking water to all the men, not only around the threshing machine but out in the grainfield as well. This I did by making the

rounds on my pony, Nell, with a fresh jug of water hung by a strap from the saddle horn. I often picked up interesting bits of news and gossip, and sometimes relayed messages, too.

A more substantial means of keeping the human side of the power supply in operation was the massive threshing dinner. Those dinners were really something for the men to look forward to at noon. Farm women had an annual opportunity to demonstrate their culinary accomplishments as they vied with each other to set out the most abundant, attractive, and tasty meals. Their reputations as cooks were on the line, or so they seemed to think. The threshing crews were worthy, prodigious, and appreciative consumers of these feasts. Their capacity for gorging themselves was notable. The end of the threshing season brought welcome relief to the women, who tried to provide ever new and tastier dishes to add to their reputations as cooks.

What was the glamour of operating an old steam thresher? For me, it was a combination of many things. There was the smell of coal smoke, mixed with steam and the engine oil, and the smell of the newly-threshed straw and the newly-separated grain. There was the sound of the puffing engine, responsive to the control of the governor, which caused the engine to snort harder when the load increased and to taper off almost to silence when under no load at all. Then there was the sound of the whistle, with each engine's whistle having its own distinctive pitch and tone. I remember the sound of the whir-



Threshing was a hot, dirty job. This threshing crew is probably preparing for one of the legendary feasts prepared by the wives and daughters of the men on the threshing crew. (SHSI)

ring belts and pulleys and the chomping of the knives that cut the bundle twine as the bundles entered the cylinder. And there was the groan of the cylinder as heavy loads of damp grain were attacked, the rattle of the straw shakers, and the blast of the straw blower as it sent the straw streaming out its open, hooded end, to be deposited on the growing straw stack.

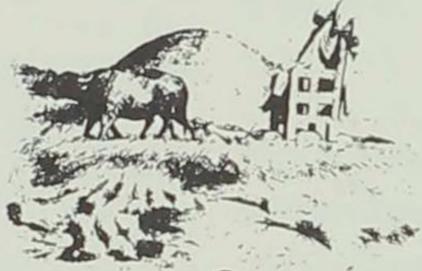
There was also an overall rhythm to the whole process: the speed of the engine and the thresher; the steady, regular pitching of grain bundles from the bundle wagons into the extended threshing-machine feeder; the incessant reaching out of the bundle knives to slice the twine, distribute the bulk of the bundles, and thrust them into the threshing-cylinder; the periodic dumping of the grain-measuring device, and the delivery of the threshed grain into the grain wagon.

After 1920 there were very few steam threshers left. The gasoline- and fuel-oil-powered tractor engines that replaced steam engines were designed for smaller separators that required, in turn, fewer men in the threshing crew. By 1940 combines had made great inroads into the threshing operation. Originally, combining (in which harvesting and threshing were completed in one operation) had been considered useful only in dry, level country, but changes in design of the machinery and dates of harvesting made it not only possible but practical to combine grain under nearly all circumstances.

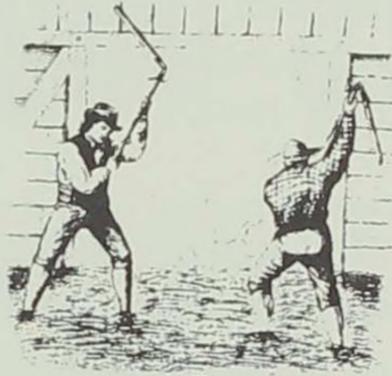
When the steam engines were replaced by internal combustion engines, the glamour of threshing, for me at least, was lost. The old puffing, snorting steam thresher engines had seemed almost animate beings, with their automatic responses to the need for a quick increase in power output under the control of their flyball governors. The combines had nothing to compare to the sense of living power in the steam engines at threshing time. □



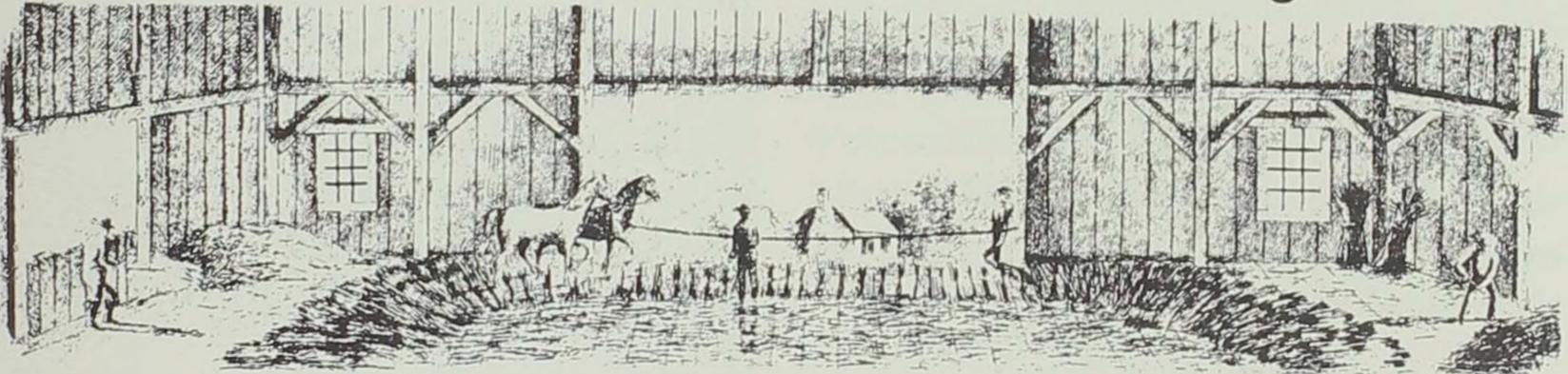
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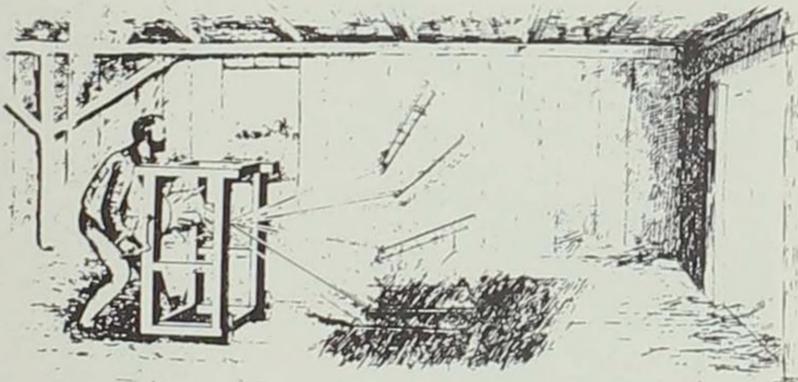
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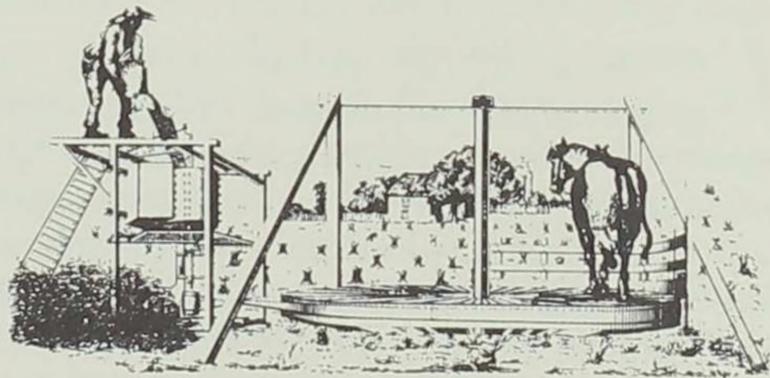
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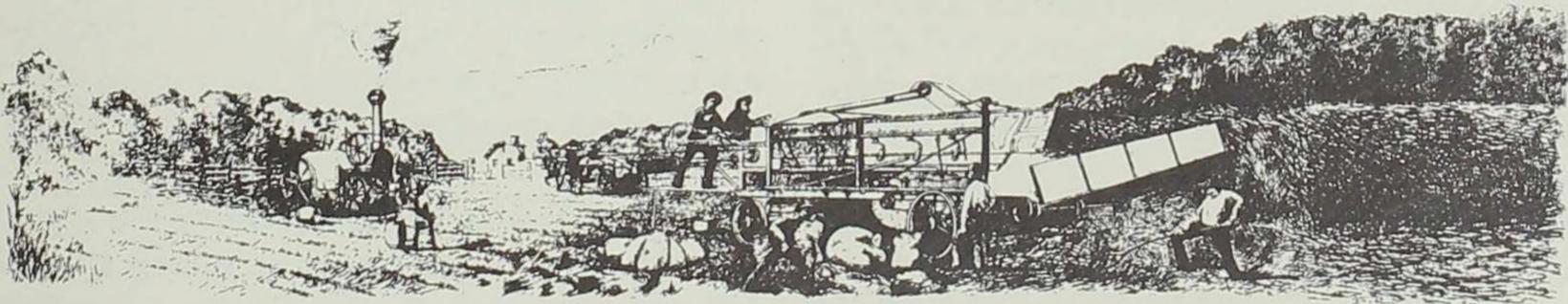
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Changes in techniques of threshing and cleaning grain are depicted in this illustration, which appeared originally in Benjamin Butterworth's *The Growth of Industrial Art*, published in 1892. The sequence includes: 1) the Egyptians, 1500 B.C.; 2) Roman tribulum, 100 B.C.; 3) Hand flail; 4) Horse thrashing; 5) Flail thrashing machine; 6) Horse power, circa 1834; and 7) steam power, circa 1883. Butterfield noted that there were nearly twenty thousand threshing machines manufactured in the United States in 1880 alone, and that in 1883 American farmers threshed 1.5 billion bushels of grain. (SHSI)