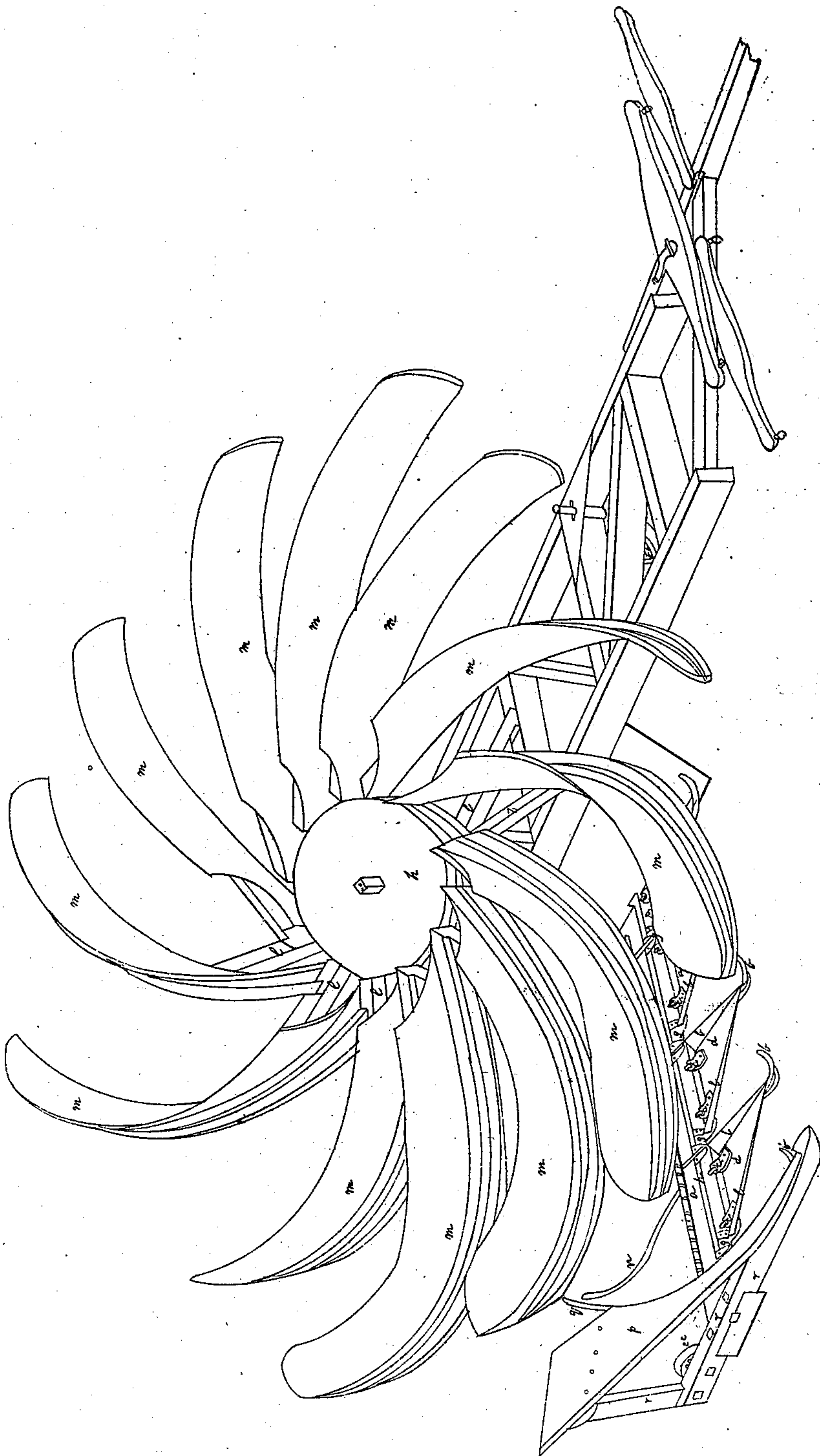


No. 13,460.

PATENTED AUG. 21, 1855.

J. L. HARDEMAN.  
HEMP CUTTER.

3 SHEETS—SHEET 1.

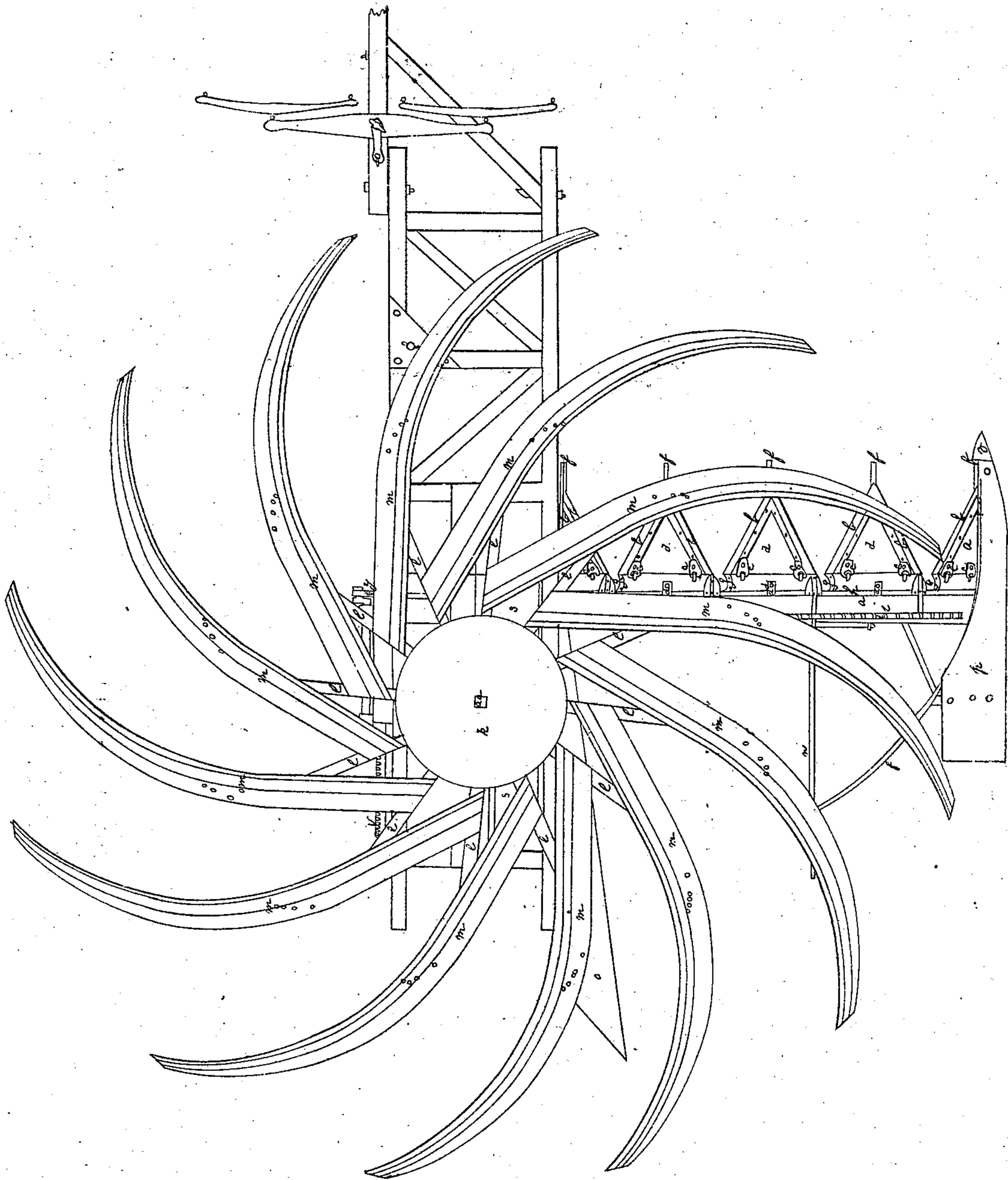


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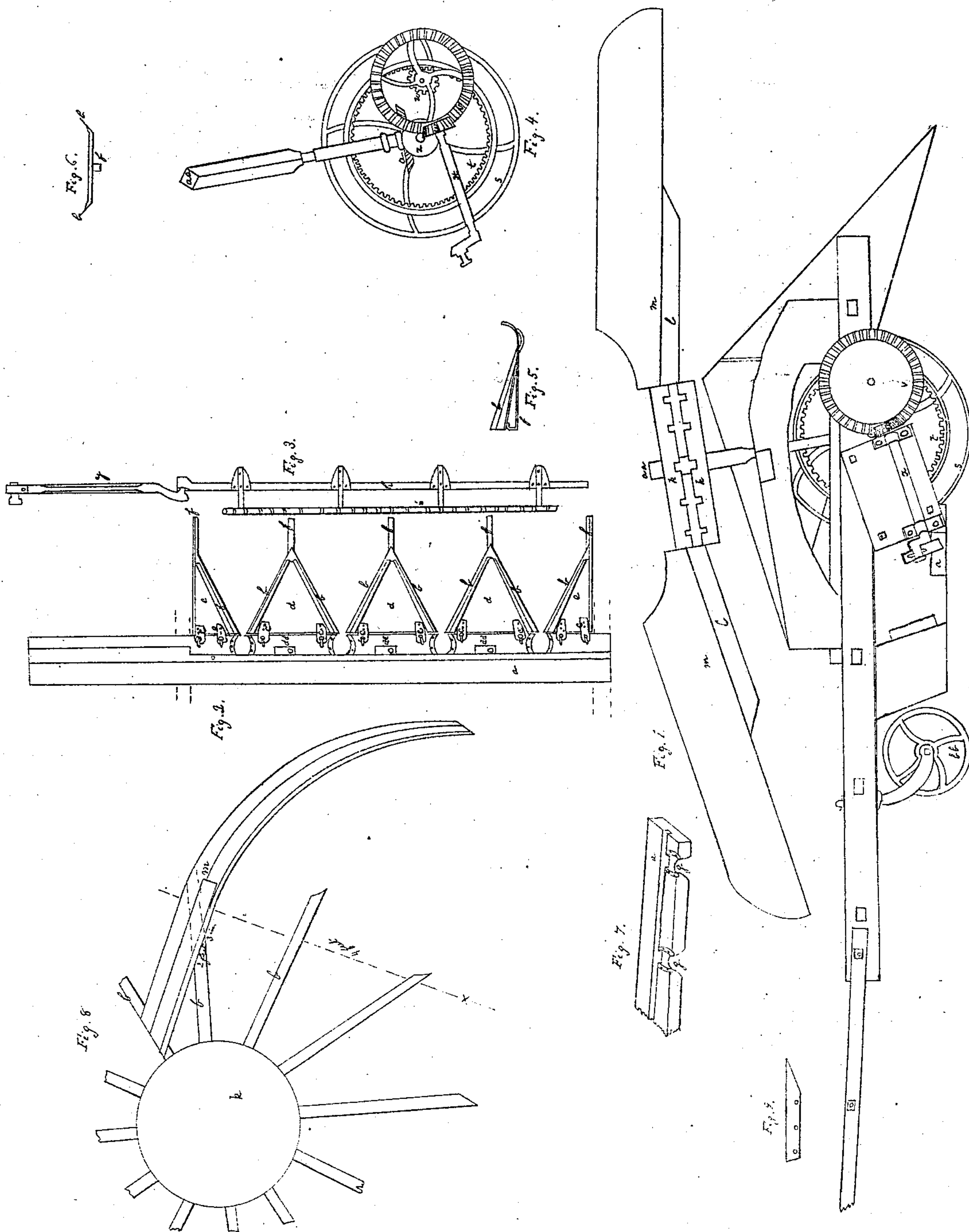
J. L. HARDEMAN.  
HEMP CUTTER.

3 SHEETS—SHEET 2



J. L. HARDEMAN.  
HEMP CUTTER.

3 SHEETS—SHEET 3





# UNITED STATES PATENT OFFICE.

J. L. HARDEMAN, OF ARROW ROCK, MISSOURI.

## IMPROVEMENT IN HEMP-CUTTERS.

Specification forming part of Letters Patent No. 13,460, dated August 21, 1855.

*To all whom it may concern:*

Be it known that I, JOHN LOCKE HARDEMAN, of Arrow Rock, in the county of Saline and State of Missouri, have invented a new and useful machine for the cutting of hemp by horse-power, entitled "Hardeman's Improved Hemp-Cutter;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Plate 1 is a perspective view; Plate 2, a ground view; and Plate 3 contains parts of the machine, in which Figure 1 is a side view; Fig. 2, the arm with points attached; Fig. 3, the cleaning-shears, bar, riddle-rod, and pitman; Fig. 4, the combination of gearing; Fig. 5, a longitudinal view of a form cut transversely through the center with blade attached; Fig. 6, an end view of the same; Fig. 7, a section of the arm in perspective; Fig. 8, a diagram for obtaining the curvature of the reel-arm, and Fig. 9 a scythe.

Like letters refer to the same parts in all the figures.

*a* is the arm; *b*, the scythes; *c*, hinges; *d*, forms; *e*, half-forms; *f*, brace or guard; *g*, shears; *h*, shear-bar; *i*, riddle-rod; *j*, reel; *k*, reel-heads; *l*, arm-supports; *m*, reel-arms; *n*, gathering-rod; *o*, flanking-board; *p*, separator; *q*, separator-rod; *r*, separator-frame; *s*, traveling-wheel; *t*, spur-wheel; *u*, spur-pinion; *v*, bevel-wheel; *w*, bevel-pinion; *x*, crank-shaft; *y*, pitman; *z*, bevel-pinion for driving the reel; *&*, bevel-wheel matching the same; *aa*, reel-shaft; *bb*, caster-wheel; *cc*, tail-wheel, and *dd* shear-fastenings; all the drawings on a scale of one inch to the foot.

My improvement consists in the invention of an entirely new reel and a different cleaning-shear, being improvements upon the method of cutting hemp, &c., described in the specification of patent granted to me, dated 20th August, 1850.

The improved machine is thus constructed:

A straight arm or beam extends from the frame of the machine six feet four inches into the hemp to be cut at a right angle with the course of the team. Of this arm *a*, Plates 1 and 2, about one-quarter is used merely for the purpose of securing it to the frame-work across and underneath, which it passes and is made

fast into joggles by strong iron bolts. It is furnished with eight small scythes, *b*, Plate 2, narrowing near the point to fit the angle of junction, (see Plate 3, Fig. 9,) and are screwed beneath to a number of forms attached by hinges *c*, Plate 2, to the arm *a*, Plate 2. Three of these, *d*, Plate 3, Fig. 2, are triangular, the base of which rests against the arm *a*, Plate 3; Fig. 2. A section of one is shown in Plate 3, Fig. 6. The sides are turned up at an angle of thirty degrees, so as to form rests for the support of the blades. To the flat part of the base the hinges are attached. The apex directed forward is fourteen inches in height. With the blades attached the space occupied on the arm, Plate 3, Fig. 2, is sixteen and a half inches, leaving one-and-a-half inch opening between each series of blades, the whole, with the cleaner, cutting a swath six feet wide. The other two forms, *e*, Plate 3, Fig. 2, which occupy the right and left hand sides of the series, are half-points, with the sides opposite the scythes turned up to a perpendicular three inches in height.

The hinges *c*, Plate 3, Fig. 2, are a simple hook and eye, so that the forms, with their blades attached, can be readily taken off the arm for the purpose of sharpening the blades, or substituting others already sharp. A curved bar of iron, *f*, Plate 3, Fig. 5, is fixed to the under side of the forms, which serves as a brace and guard to prevent the blades from entering the ground when the same is unequal, the hinges allowing it to rise and fall for that purpose. The hemp not cut by the scythes drives back into the shears *g*, Plate 2, which are made by circular openings in the arm *a*, Plate 2, of three inches in depth and two inches wide on the front of the arm. The edges of the opening are covered by plates of steel, which make the nether shear and triangular blades with a square point form the upper shear fastened upon the bar *h*, Plate 2, working in a groove in the arm. They are made to play over the openings with a reciprocating motion obtained by a crank and gearing, hereinafter described.

In connection with the bar *h*, Plate 2, is a riddle-rod, *i*, Plate 2, of wood corrugated, in order to impart a slight degree of motion to the hemp after it is cut, so as to cause it to slip more easily off the arm, over which it has fallen. The upper shears, bar, riddle-rod and pitman



are shown in Plate 3, Fig. 3, apart from their working-place on the arm, Plate 3, Fig. 2, upon which are shown the fastenings *d d*, Plate 3, Fig. 2, turned around, so as to admit of the bar being removed.

The hemp is sustained and brought up against the scythes by a horizontal reel, *j*, Plate 2, having twelve curved arms, *m*, Plate 2, and is constructed as follows: A nave or center is formed of two grooved heads to match, *k*, Plates 2 and 3, Fig. 1, made of plank, which are bolted together. Twelve supports, *l*, Plate 2, extending from the verge of the heads and having a dip downward from the head to their points, are made secure in this nave in the form of radiating spokes. A like number of curved arms *m*, Plate 2, are secured at their heel (touching the head) upon a support and resting upon the point of the next one forward. To form these, a curve is first worked out of one-inch plank. Two feet three inches is straight and six inches wide. From that to the point it is the segment of a circle of four feet radius, narrowing to one and a half inch, Plate 3, Fig. 8, the center of which is at a right angle with the termination of the straight part of the arm. This curve is covered with another thickness of plank half the width of the first, except the straight part of the arm, which is scantling for the purpose of more securely bolting the arms to the support. To the inner side of the curve is bent and secured a plank to form the face or working part of the arm. This reel also greatly aids in the separation or removal of the hemp that has been cut, the operation being such that it scarcely disturbs the standing hemp; but the moment the cutting takes place it sweeps it off, directing its fall backward, while that at the end of the arm is thrown across the gathering-rod, *n*, Plate 2, which trails behind the arm. This gathering-rod is made of a rod of one-inch round iron. Eighteen inches of its length lies parallel to and close along the back edge of the arm, kept in its place by hooks. The rest of the rod is bent backward at an angle of ninety degrees and curved downward to the ground at six inches; at two feet rises at an angle of thirty degrees, forming an inclined plane to raise the hemp out of the stubble, and the end three feet six inches from the arm turned up to a perpendicular to prevent the hemp drifting over it. By the progress of the machine this rod straightens the hemp into a narrow continuous swath, leaving a space for the team and machine to travel in its succeeding course. This swathing process is further aided by a triangular flanking-board, *o*, Plate 3, Fig. 1, fastened to the frame-work and projecting downward at an angle of fifteen degrees, to throw the hemp into the swath from the side opposite the gathering-rod. A circular plank, *p*, Plate 2, is secured at an angle of thirty-five degrees to the scantlings *r*, Plate 1, at the end of the arm. This plank, with its

rod *q*, Plate 2, serves to separate the cut hemp from that which is left standing.

The system of gearing that drives the cleaner and reel is as follows: A traveling-wheel, *s*, Plate 3, Fig. 4, is hung upon a shaft crossing under the frame-work and supporting the machine. It has within it and bolted to its arms, which are placed to one side of the center for the purpose of giving room, a spur-wheel, *t*, Plate 3, Fig. 4, of sixty-eight cogs, matching and driving a pinion, *u*, Plate 3, Fig. 4, of twelve cogs, overhung on a shaft, upon the other end of which is a bevel-wheel, *v*, Plate 3, Fig. 4, of fifty cogs, matching and driving a pinion, *w*, Plate 3, Fig. 4, of thirteen cogs, upon the crank-shaft *x*, Plate 3, Fig. 4, with a crank, connecting by the pitman *y*, Plate 2, with the shear-bar, giving motion to the upper shear-blades and riddle-rod. Upon the same shaft with the traveling-wheel is a bevel-pinion, *z*, Plate 3, Fig. 4, of twelve cogs, matching into and driving a wheel, *&*, Plate 3, Fig. 4, of twenty-four cogs, hung upon the lower end of a shaft, *a a*, Plate 3, Fig. 4, round to the upper bearing and square from that to the top, upon which the reel is hung. This shaft stands thirteen inches from the working side of the machine, and at an angle of ten degrees forward of a perpendicular. The frame-work is made of oak, put together as in the drawings, and balanced upon the traveling-wheel. The caster-wheel is shown at *b b*, Plate 3, Fig. 1, and the tail-wheel at *c c*, Plate 1.

Thus it will be seen that the operation of this machine is such that the cutting is done after the manner of mowing or reaping scythes, having a glancing and upward stroke, and requiring but little power to propel them forward. The side reel both sustains the hemp against the scythes and disposes of it in a direction to be swathed always out of the way of the team and machine, which passes continually around the hemp, millet, or other article to be cut. The breadth of kerf is six feet, which, allowing for inaccuracies in driving, will cut ten acres for fifteen miles of travel, and is drawn by two or four horses.

I am aware that horizontal arms to act as cradles are used with revolving cutters, and also that small horizontal reels have been used as track-cleaners, also with revolving cutters; but

What I regard as new, and claim as my invention, is—

1. The side reel constructed and applied, as above set forth, for hemp, grain, or other articles of like nature, such reel having curved arms, be the curvature more or less.
2. The cleaning-shears, constructed and operating substantially as above set forth and described.

J. LOCKE HARDEMAN.

Witnesses:

E. M. BRADFORD,  
SAML. J. HERRON.