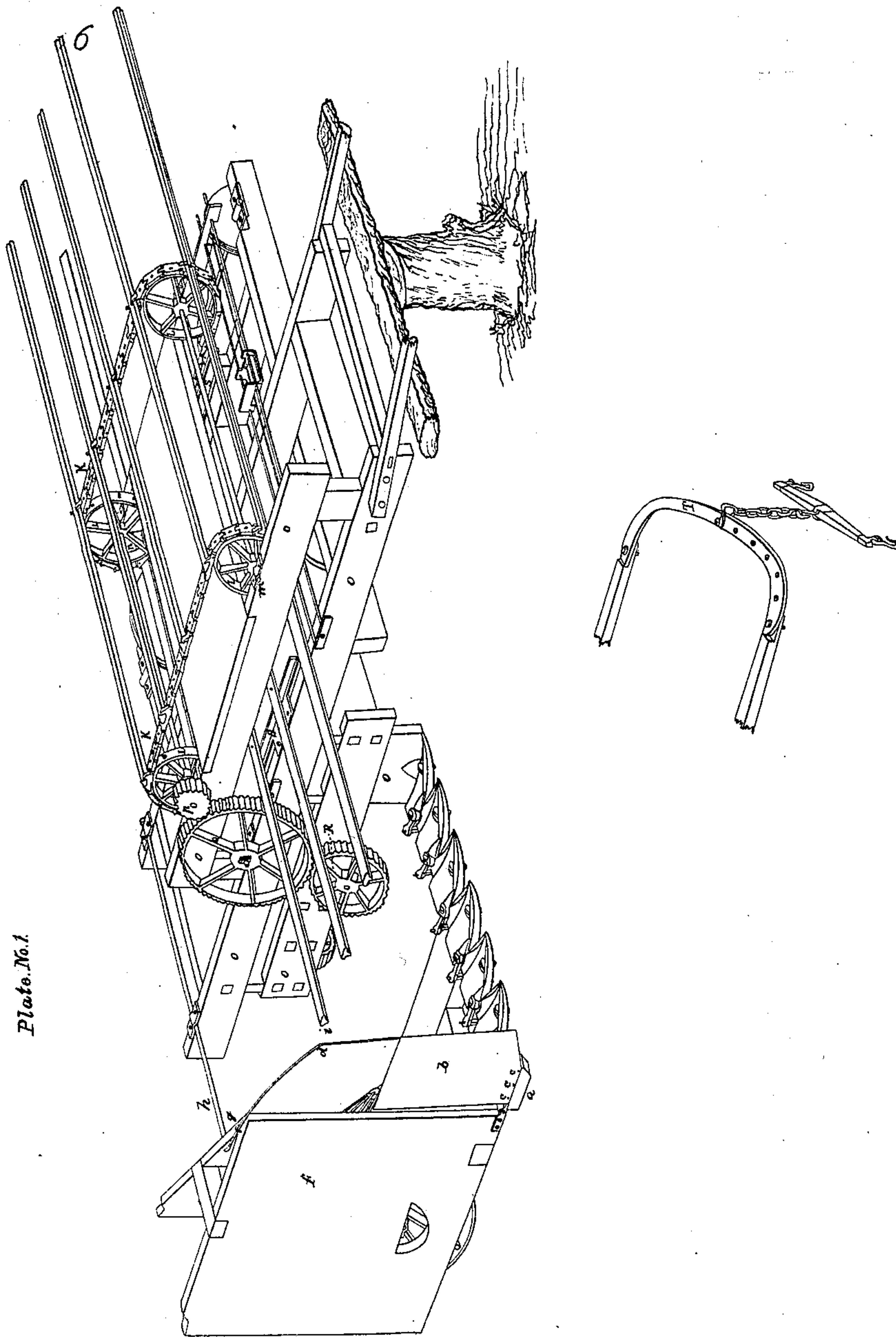


J. L. HARDEMAN.
HARVESTING MACHINE.

No. 7,578.

Patented Aug. 20, 1850.



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Plate No. 3

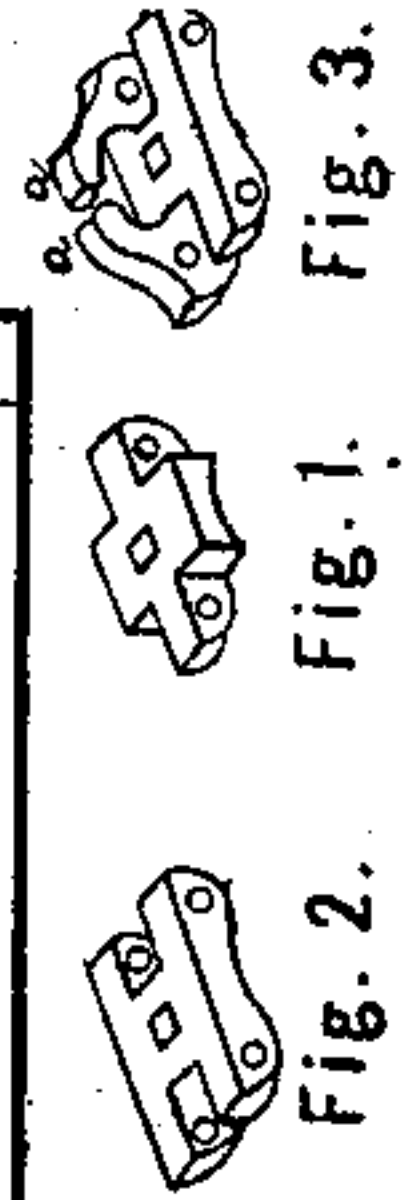
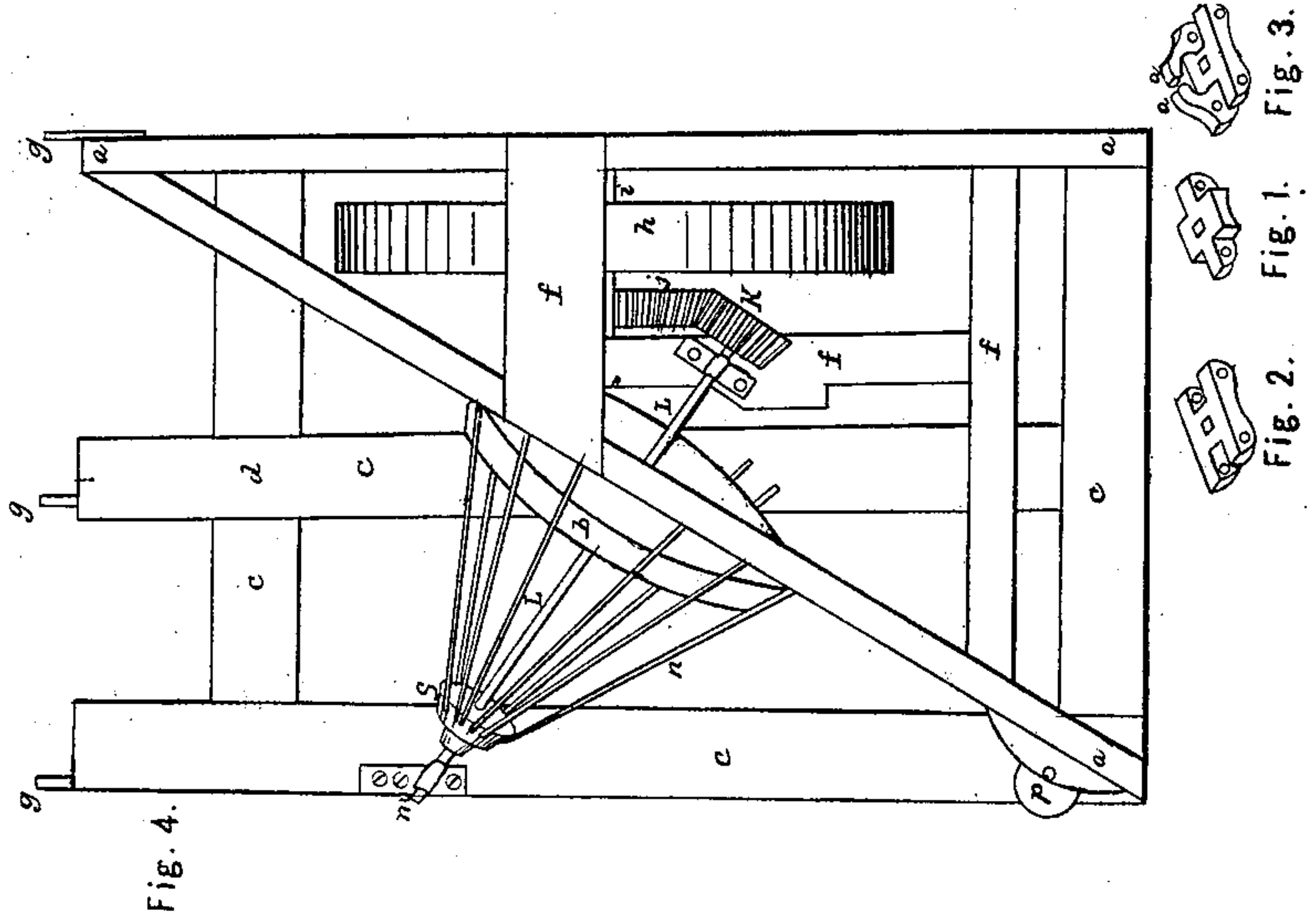


Plate No. 2.

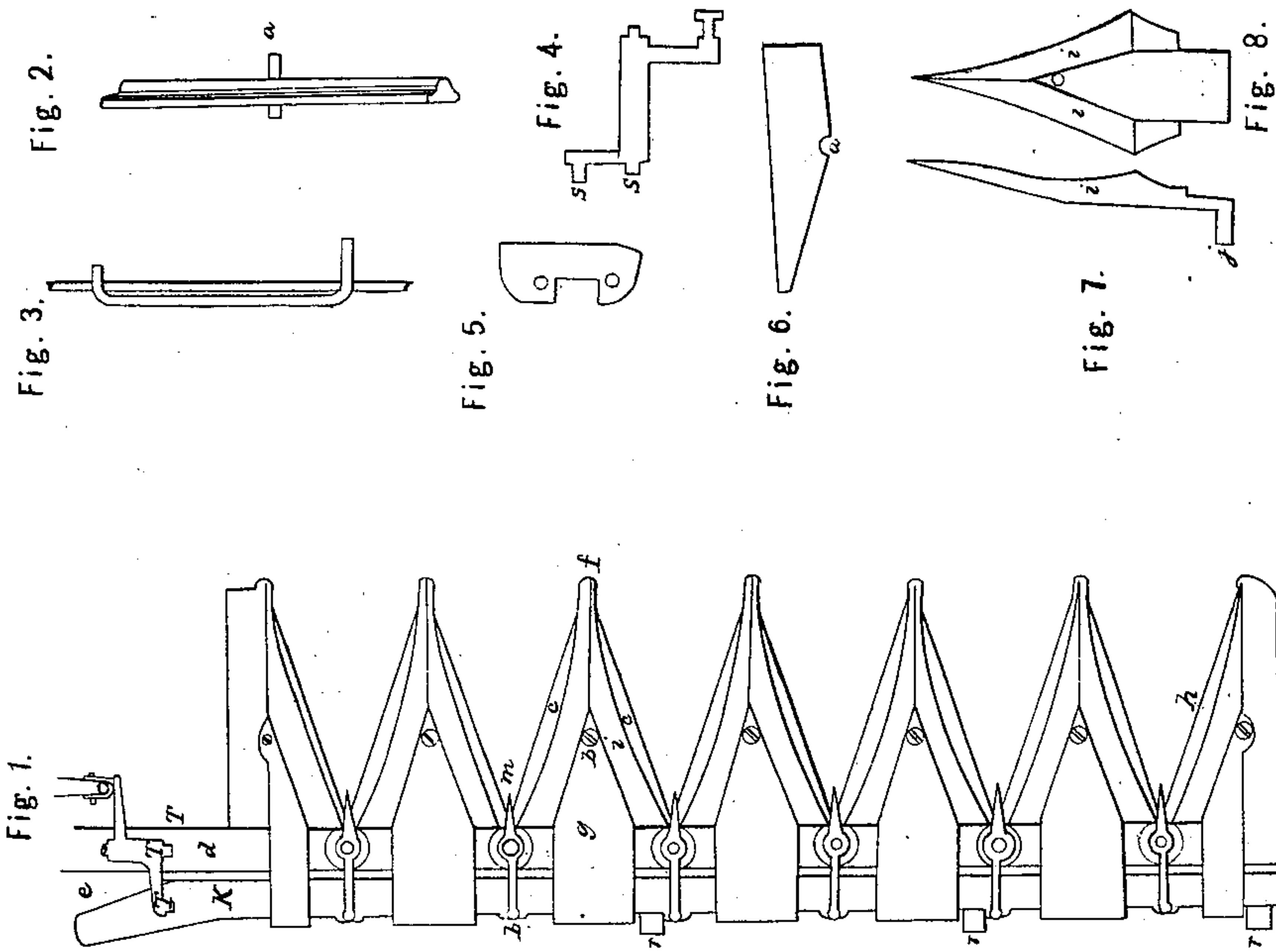


Fig. 2.



Fig. 3.

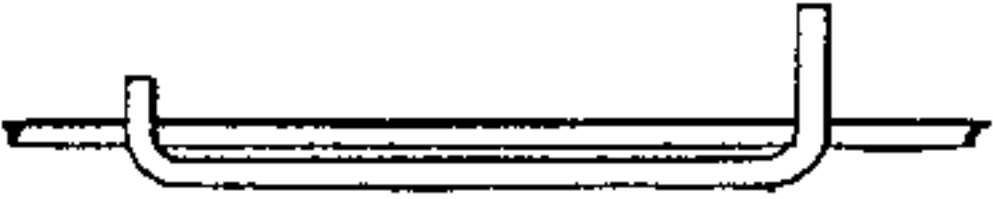


Fig. 5.

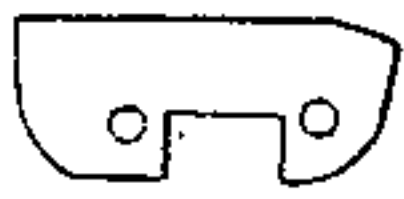


Fig. 4.

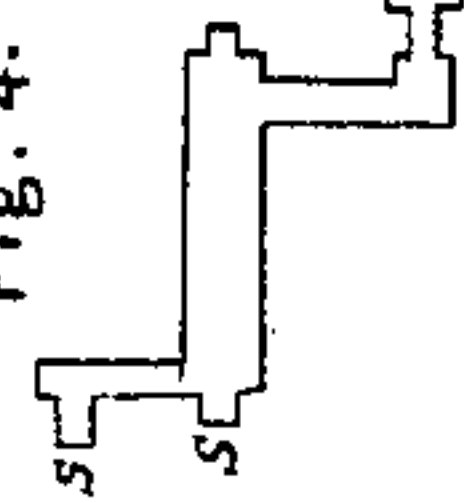


Fig. 6.



Fig. 7.

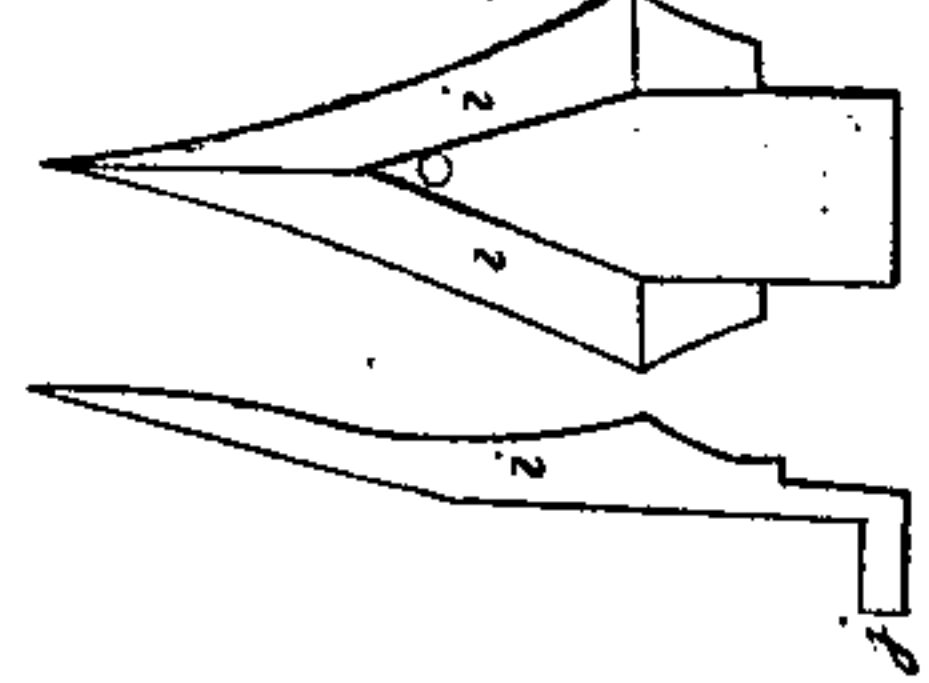
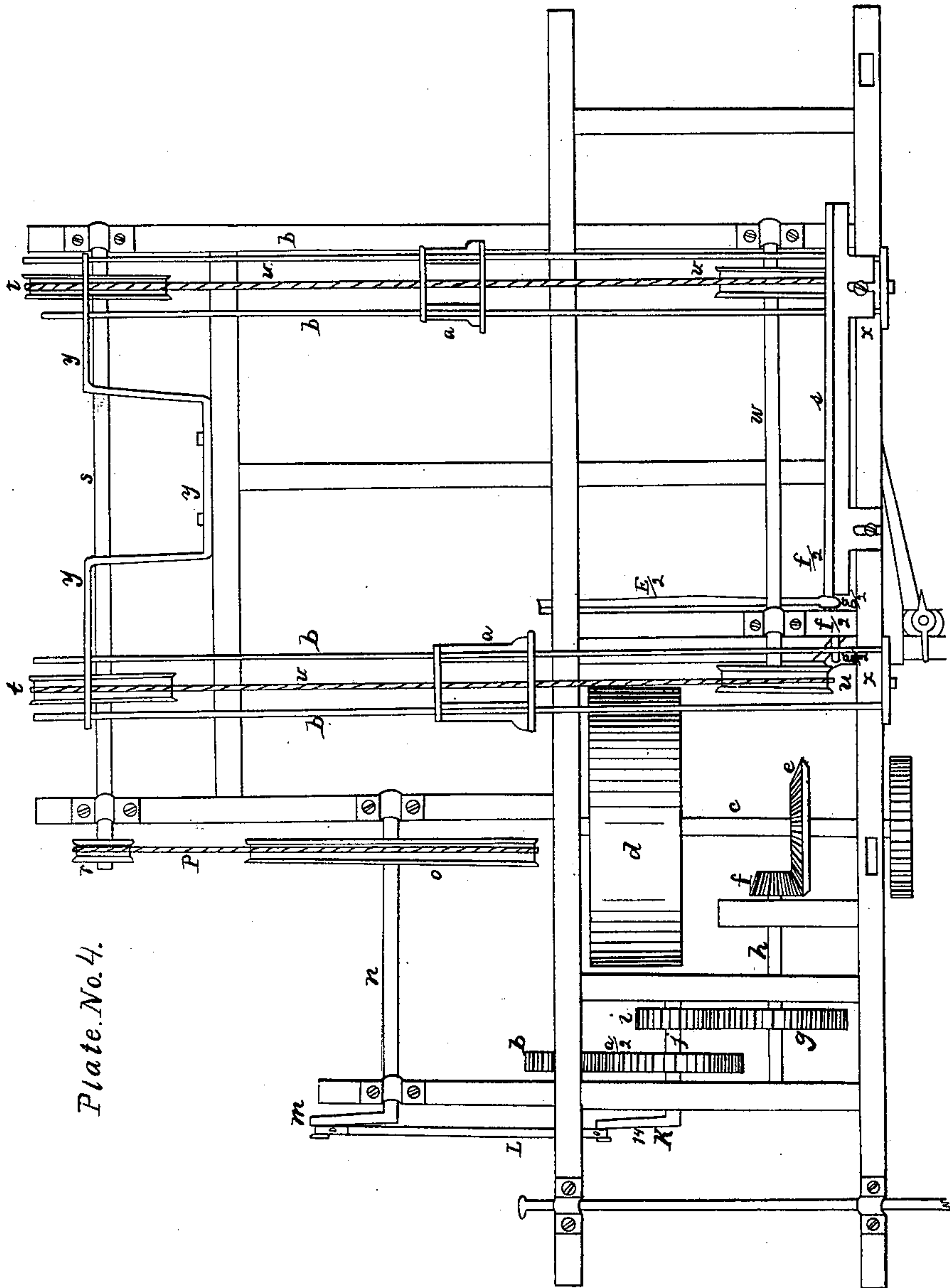


Fig. 8.

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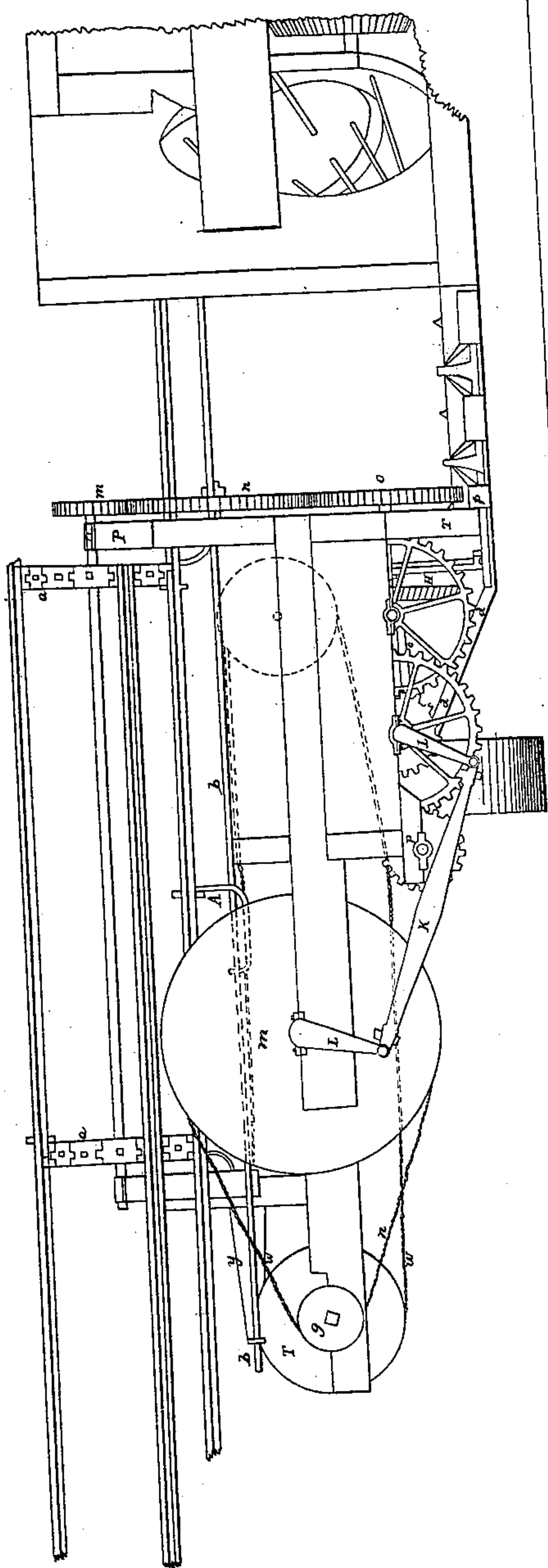
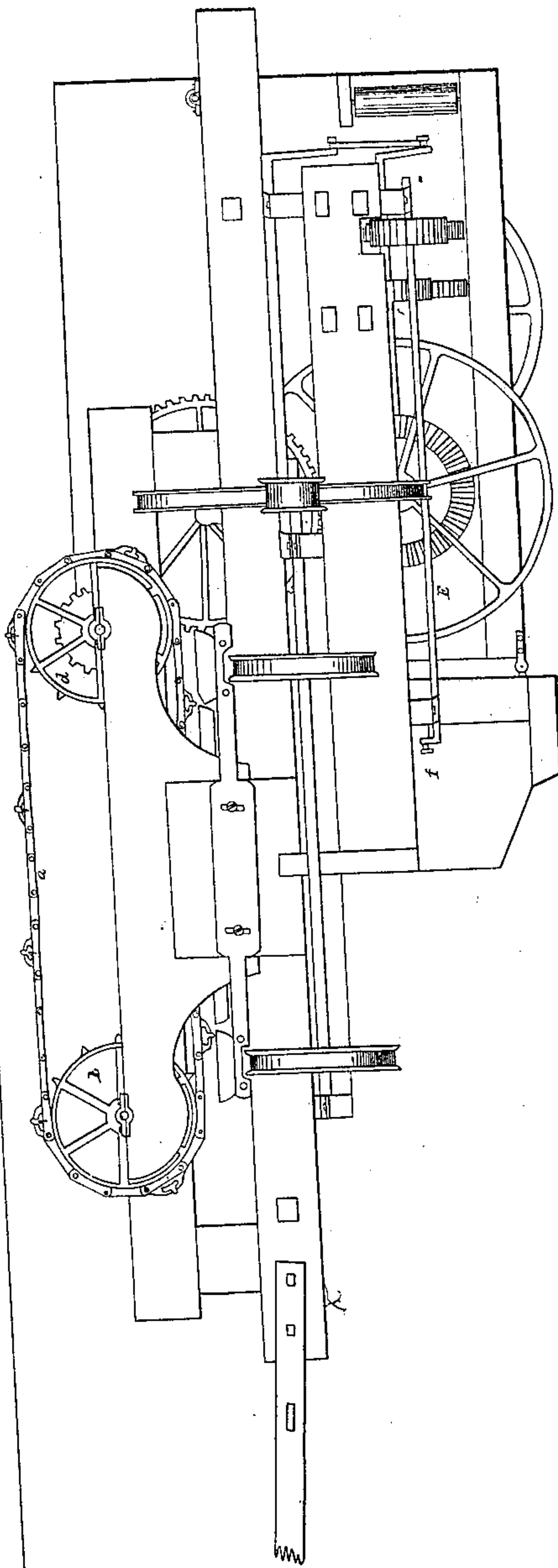


Plate. No. 5.

Plate No. 6.

UNITED STATES PATENT OFFICE.

J. LOCKE HARDEMAN, OF SALINE COUNTY, MISSOURI.

IMPROVEMENT IN MACHINES FOR CUTTING HEMP.

Specification forming part of Letters Patent No. 7,578, dated August 20, 1850.

To all whom it may concern:

Be it known that I, JOHN LOCKE HARDEMAN, of Saline county, near Arrow Rock, and State of Missouri, have invented a new and Improved Mode of Cutting Hemp; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in the construction of a machine by which the hemp is cut and deposited in bunches out of the way of the succeeding course of the team of horses by which it is drawn and the track of the machine.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

My invention consists of three parts: first, the cutting; second, the separating and bunching; third, the rack or comb. Of these in their order—

First. The cutting is performed by means of thin steel blades twelve inches long and two and a half inches wide. Their form (see Plate 2, Figure 6) is straight and sharp on the cutting-edge, two and a half inches wide for one-half their length, then sloped toward the cutting-edge, leaving the other end half an inch wide and one-eighth of an inch thick on the back. From the back, at the center, is cut a semicircle, *a*, Fig. 6, Plate 2, to admit of the screw *b*, Fig. 1, Plate 2, passing between the backs of the blades *c c*, Fig. 1, Plate 2, when placed upon the arm *d*, Fig. 1, Plate 2, in which place they occupy a space of eight inches on the arm, and terminating together in a point. The arm *d*, Fig. 1, Plate 2, is constructed of cast-iron, four feet long, four inches wide, and two inches thick, having a rabbet, *e*, Fig. 1, Plate 2, cut from the upper and back corner, two inches wide and three-quarters of an inch deep. On the front side of this arm *d*, Fig. 1, Plate 2, are seven projecting points, *f*, Fig. 1, Plate 2, to receive the blades *c c*, Fig. 1, Plate 2, which projecting points are troughed or channeled, so as to form, with the cap *g*, Fig. 1, Plate 2, and Fig. 8, Plate 2, jaws, by which the blades *c c*, Fig. 1, Plate 2, are firmly held in their position at an angle of about forty degrees from a level, which is the position of the blade in the common hemp-cradle when cutting, the only difference being that my blades are in pairs, back to back, in a V form. At each end of the arm there are single blades *h h*, Fig. 1, Plate

2, right and left. The arm is so placed as to be at right angles with the track of the horses, and extends four feet into the standing hemp on the right-hand side, where it is supported by a slide, *a*, Plate 1, which supports it two inches above the ground. It is also extended two and a half feet on the left hand in an upward direction, *d d*, Plate 5, across and into the frame-work P P, Plate 5, to which it is attached, and is a plain bar without rabbet or points. The cap *g*, Fig. 1, Plate 2, and Plate 2, Figs. 7 and 8, is of cast-iron, formed so as to confine the blades *c c*, Fig. 1, Plate 2, by being pressed firmly down upon them and fastened by the screw *b*, Fig. 1, Plate 2, the angle of the sides *i i*, Plate 2, Figs. 1, 7, and 8, corresponding to the angle of the sides of the projecting points *f*, Plate 2, Fig. 1, the two forming jaws, in which the blade is held as in a vise, the lower surface of the cap being the counterpart of the upper face of the projecting points. Plate 2, Fig. 8, represents the upper surface of a cap, and Fig. 7, Plate 2, a section of the same cut longitudinally and vertically, exhibiting the heel or claw *j*, Plate 2, Fig. 7, which passes over and behind the arm *d*, Plate 2, Fig. 1, and forms, with the rabbet *e*, Plate 2, Fig. 1, a covered channel for a sliding bar, *k*, Plate 2, Fig. 1, four feet long, one inch wide, and half an inch thick, having six projecting points, *l*, Plate 2, Fig. 1, elevated so as to work the cleaners *m*, Plate 2, Fig. 1. The cleaners are small knives, sharp on both sides, terminating in a point. The blades are two inches long, one and a quarter wide at the widest part. The remainder of the cleaner is a shank or handle four inches long, having a hole through the end, where it is attached to the projecting point *l*, Plate 2, Fig. 1, of the bar *k*, Plate 2, Fig. 1. There is also a hole through the widest part, through which it is secured by the screw *n*, Plate 2, Fig. 1, to the arm *d*, Plate 2, Fig. 1, and on which it works, like a shear, over the junction of the blades *c*, Plate 2, Fig. 1, which form the lower part of the shears.

Second. The separator consists of a sheet-iron plate, *b*, Plate 1, one foot four inches wide, two feet high, and securely fastened by rivets *c c c*, Plate 1, to the right-hand end of the arm, having a strong wire or rod, *d*, Plate 1, three-eighths of an inch in diameter in the front edge, rising two feet, and extending upward and back to the wedge *f*, Plate 1, to which it is attached

by a small loop, *g*, Plate 1, through which it passes. The conveyer consists of a wedge, *a a*, Plate 3, Fig. 4, and a cone, *b*, Plate 3, Fig. 4, both resting on a frame-work, *c c c c*, Plate 3, Fig. 4, which is made of four pieces of timber three by six inches, two of them four feet long and the others two feet six inches long, joined by mortises and tenons, except at *d*, where they are halved together. The wedge *a a a*, Plate 3, Fig. 4, is formed of plank three feet high with cross-timbers *f f f*, Plate 3, Fig. 4, to strengthen it and form supports for the shafts, with an opening in the left-hand side for the cone *b*, Plate 3, Fig. 4, the whole being attached by a set of simple hinges, *g g g*, Plate 3, Fig. 4, to the back of the arm *d*, Plate 2, Fig. 1, at the points *r r r*, Plate 2, Fig. 1. Within the wedge is a cast-iron wheel, *h*, Plate 3, Fig. 4, two feet in diameter and four inches broad, which supports the conveyer. Upon its shaft *i*, Plate 3, Fig. 4, which is two inches square, is placed a bevel-wheel, *j*, Plate 3, Fig. 4, twelve inches in diameter, thirty-six cogs, driving a pinion, *k*, Plate 3, Fig. 4, of twelve cogs. Its shaft *l l*, Plate 3, Fig. 4, passes through the cone forward and downward to the left-hand side for its bearing at *m*, Plate 3, Fig. 4. The cone is formed by a head or base, *b*, Plate 3, Fig. 4, made of one-and-a-half-inch plank, one foot six inches in diameter, and an apex, *s*, also of wood, placed two feet apart on the shaft *l l*, Plate 3, Fig. 4, with eight rods, *n*, Plate 3, Fig. 4, two feet six inches long, arranged at equal distances around the circumference and extending beyond the base. The lower side of the cone is parallel to the frame-work below. The cone revolves backward and removes the butt-ends of the hemp to the left, after being dropped by the sustaining-rod *h*, Plate 1, which is withdrawn by the hand of an attendant whenever a bundle of convenient size has accumulated. A small roller, *p*, Plate 3, Fig. 4, twelve inches long and three in diameter, is placed vertically at the left-hand corner of the wedge to prevent the hemp from being entangled and drawn forward by the machine.

Third. The rack or comb is intended to sustain the hemp while being cut and until the motion of the machine forward shall have given the butt-ends of the hemp a sufficient inclination forward to insure its falling back upon the sustaining-rod *h*, Plate 1. Two endless chains, *a*, Plates 5 and 6, are made of thirty-six links of cast-iron each, three inches in length between rivets, three inches wide, and one inch thick. Of these one-half are represented by Fig. 1, Plate 3, one-fourth by Fig. 2, Plate 3, each having a square mortise in the center to fit the points on the wheels *b* and *d*, Plate 6. The remaining fourth are represented by Fig. 3, Plate 3, and are similar to those represented by Fig. 2, Plate 3, with the addition of spines *a a*, Plate 3, Fig. 3, on the outer surface of the link, through which the swords *b*, Plate 5, and *i*, Plate 1, pass, making one sword for every four links, or nine swords in all. These swords, a section of which is represented by Fig. 2,

Plate 2, are formed of steel, eight feet long, one and a half inch wide, and ribbed, like a bayonet, to secure the requisite amount of strength. A cross-pin, *a*, Plate 2, Fig. 2, projects from the center, one inch on each side, by which it is moved backward and forward, worked by the pallets *a a*, Plate 4, and *A*, Plate 5. Figs. 3 and 5, Plate 2, represent a side and end view of the pallets, each of which runs upon two rods, *b b b b*, Plates 4 and 5. These endless chains *k k*, Plate 1, are worked by four wheels, *l l l l*, Plate 1, each having twelve points on the circumference working into the mortises in the links of the chains. The two forward wheels, *m*, Plate 1, are hung on a shaft four feet four inches long and one and a quarter inch in diameter, the hindmost wheels, *n*, Plate 1, on a shaft one and a half inch in diameter, four feet seven inches long, and projecting over the frame-work *o o o o*, Plate 1, far enough to receive the pinion *p*, Plate 1, six inches in diameter, eighteen cogs, driven by an auxiliary wheel or pinion, *q*, Plate 1, fifty-four cogs, which is driven by a wheel, *r*, Plate 1, twelve inches in diameter, thirty-six cogs, placed upon the main shaft *c*, Plate 4, of the machine. The driving-wheel *d*, Plate 4, two feet in diameter and ten inches wide, is of cast-iron, (as are all the wheels,) and supports the machine. Upon the same shaft, *c*, Plate 4, two feet three inches long, two and a half inches square, is a bevel-wheel, *e*, Plate 4, one foot in diameter, thirty-six cogs, matching into a pinion, *f*, Plate 4, twelve cogs. Its shaft *h*, Plate 4, is one foot ten inches long, with a wheel, *g*, Plate 4, upon it, of one foot diameter, thirty-six cogs, matching into a pinion, *i*, Plate 4, of eighteen cogs, hung upon a shaft, *j*, Plate 4, one foot long, one and a quarter inch square, having a crank, *k*, Plate 4, and *l*, Plate 5, five inches long, on the outer end, which works a pitman, *l*, Plate 4, and *k*, Plate 5, two feet long, attached to and working another crank, *m*, Plate 4, and *l*, Plate 5, seven and a half inches long. The shaft *n*, Plate 4, of this crank is three feet five inches long, one and a quarter inch square, and has upon it a light wooden wheel, *o*, Plate 4, and *m*, Plate 5, thirty-two inches in diameter, driving, by a cord, *p*, Plate 4, a small pulley, *r*, Plate 4, and *g*, Plate 5, three inches in diameter. The shaft *s*, Plate 4, is four feet five inches long, one and a quarter inch square, has upon it, besides the small pulley *r*, Plate 4, two wooden wheels, *t t*, Plates 4 and 5, eleven inches in diameter, with cords *w w*, Plates 4 and 5, passing from these wheels over two similar wheels, *v v*, Plate 4, upon a shaft, *w*, Plate 4, three feet four inches long, and connecting with pallets *a a*, Plate 4, and *A*, Plate 5. Just above these wheels *t t* and *v v*, Plate 4, and on each side, are parallel rods *b b b b*, Plates 4 and 5, three-eighths of an inch in diameter, upon which the pallets slide. These rods are sustained on the right, *x x*, Plate 4, by the frame-timbers and on the left by an iron support, *y y y*, Plates 4 and 5. Now, the manner

of operating the rack is thus: It will be seen that the driving-wheel *d*, Plate 4, puts in motion two sets of gearing—first, the revolving rack or comb, imparting to it a motion just equal to the progress of the machine forward; consequently the lower side of the chains are stationary with regard to the ground or standing hemp; secondly, the wheels, cranks, &c., which work the pallets, giving to them a back-and-forth motion, which is obtained by the unequal lengths of the cranks employed, and the pallets are used alternately in thrusting in and withdrawing the swords from the hemp, as seen in Plate 1, two of the swords being at all times in the hemp, while the others are carried forward over the wheels to the point, where they are again introduced into the hemp. Guide-rails S S, Plate 1, are placed under the swords to insure the working of the pallets. Upon the shaft *j*, Plate 4, there is a wheel, *a*², Plate 4, one foot in diameter, thirty-six cogs, matching into a pinion, *b*², Plate 4, eighteen cogs, upon a shaft, E, Plate 6, three feet four inches long, one and a quarter inch square, with a crank, *f*, Plate 6, upon the forward end, two inches long, which works a pitman, *e*², Plate 4, twenty-two inches long, connected with a rocking shaft, Plate 2, Fig. 4, T T, Plate 2, Fig. 1, which is shown in perspective, and X, Plate 5, which is underneath the cross-timbers at *f*², Plate 4. The arms (shown right and left) are two inches long, the lower one connected with the sliding bar *k*, Plate 2, and the arm *d*, Plate 2, by its journals *s s*, Fig. 4, Plate 2, at T T, Plate 2, Fig. 1, by which the cleaners are worked.

The frame-work is of solid oak timber two inches thick, and joined, as in the Plates, which are on a scale of two inches to the foot, except Plate 4, which is one and a third inch to the foot.

The machine is drawn by two horses tandem, the leading horse being attached to a bow, T, Plate 1, connecting the points of the shafts in front of the breast of the other horse, and is so constructed as to equalize the resistance by means of a movable clevis, the driving-wheel being placed as far as possible to the left for the same purpose.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The attaching a series of blades upon an arm, back to back, in a V form, their edges elevated in order to give a smooth glancing stroke upward through the stalk of hemp, after the manner of the cutting performed by the common scythe in hemp or grain.

2. The introduction and use of a cleaning-shear over the crotch or junction of the blades to remove such hemp as may be imperfectly cut or pulled up, substantially in the manner as herein set forth.

3. The method of separating and bunching the hemp, after it has been cut, by means of a wedge or inclined plane and a revolving cone.

4. The invention and use of the revolving rack as a substitute for the overhead reel in supporting the hemp while being cut.

J. LOCKE HARDEMAN.

Witnesses:

GEO. F. BICKNELL,
RICH. C. VAUGHAN.