

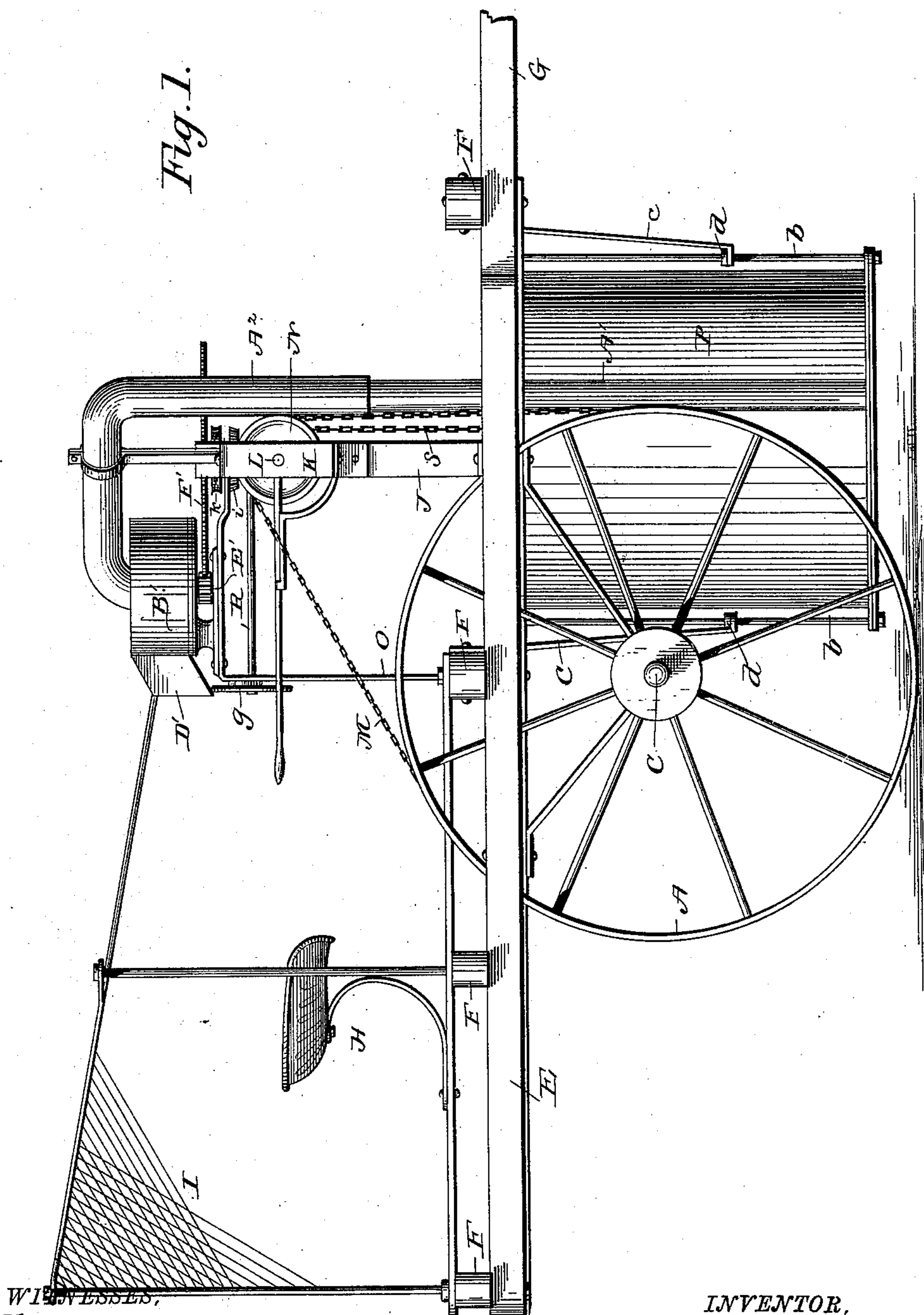
(No Model.)

5 Sheets—Sheet 1.

S. D. T. MANNING.
COTTON HARVESTER.

No. 400,700.

Patented Apr. 2, 1889.



WITNESSES,
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C. H. Ourand

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(No Model.)

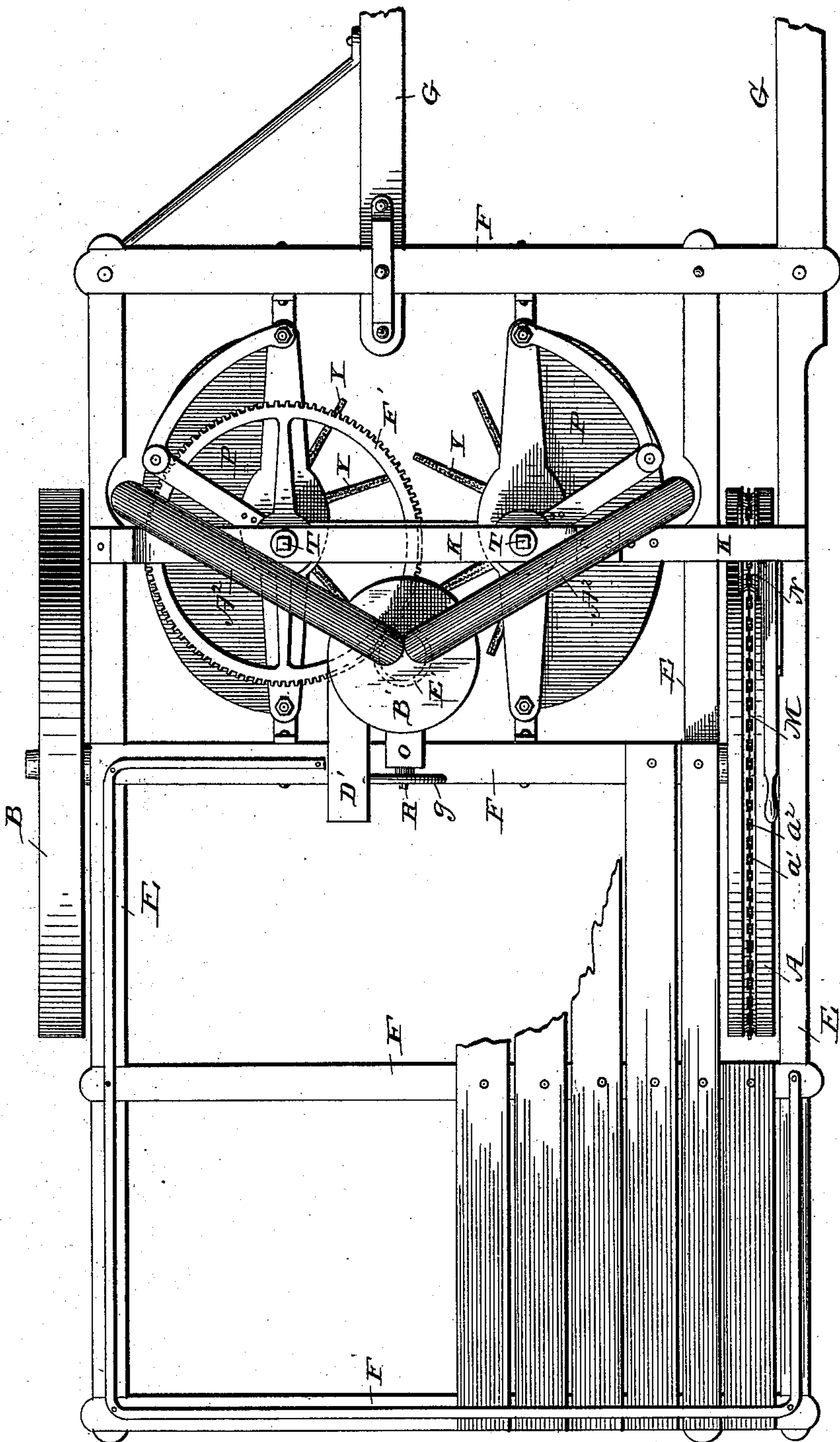
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Fig. 2.



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Fig. 4.

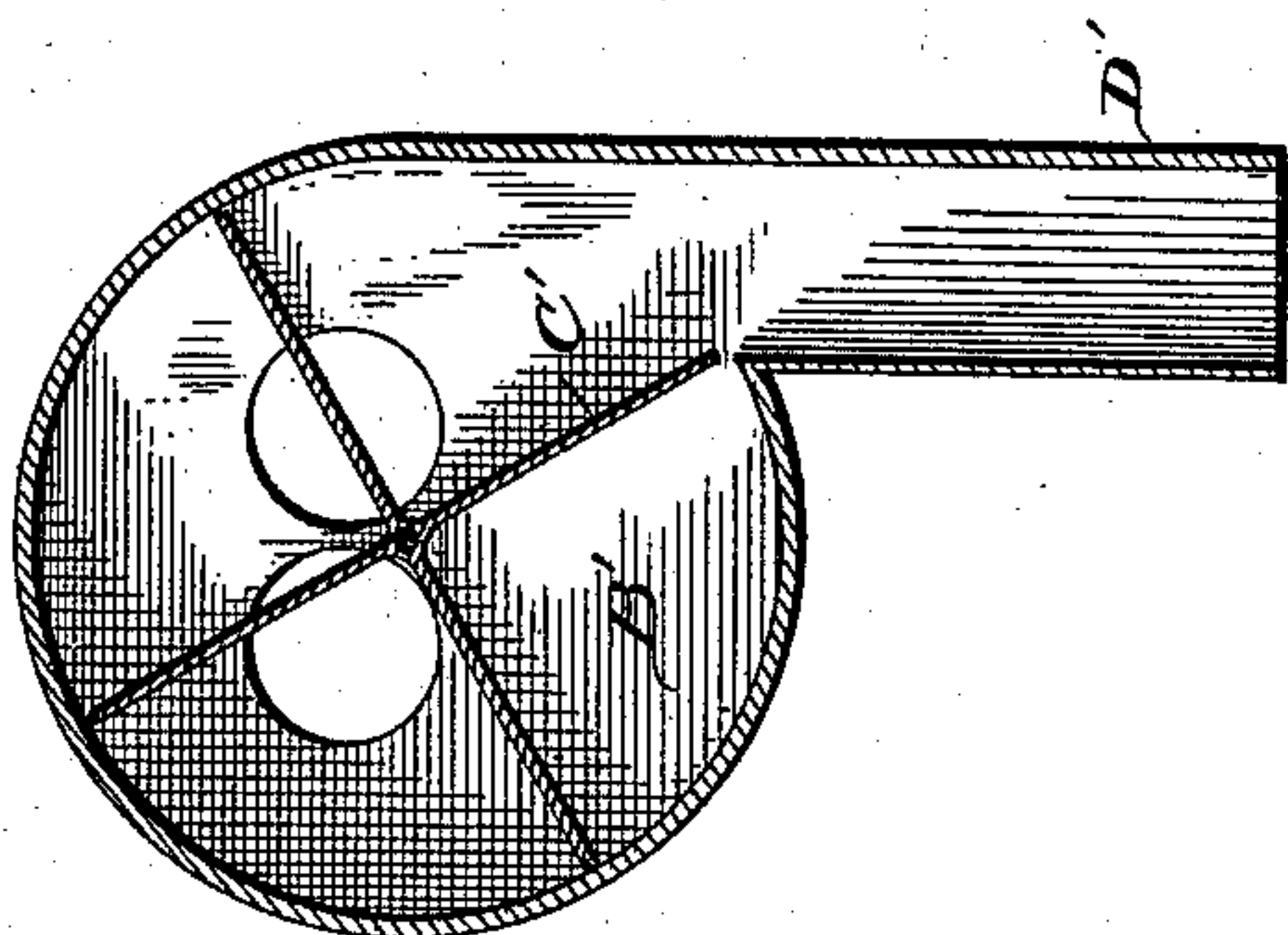
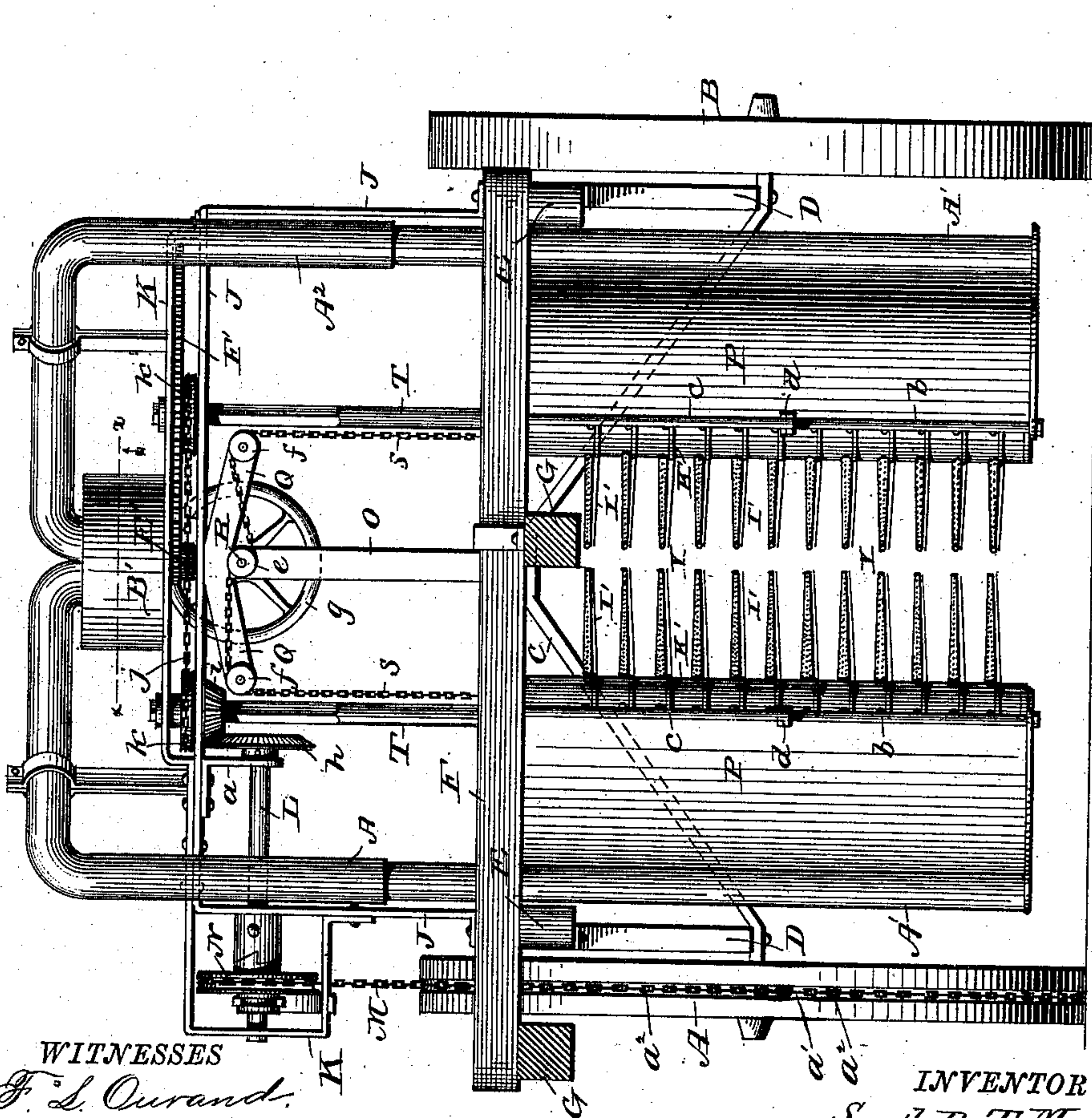


Fig. 3.



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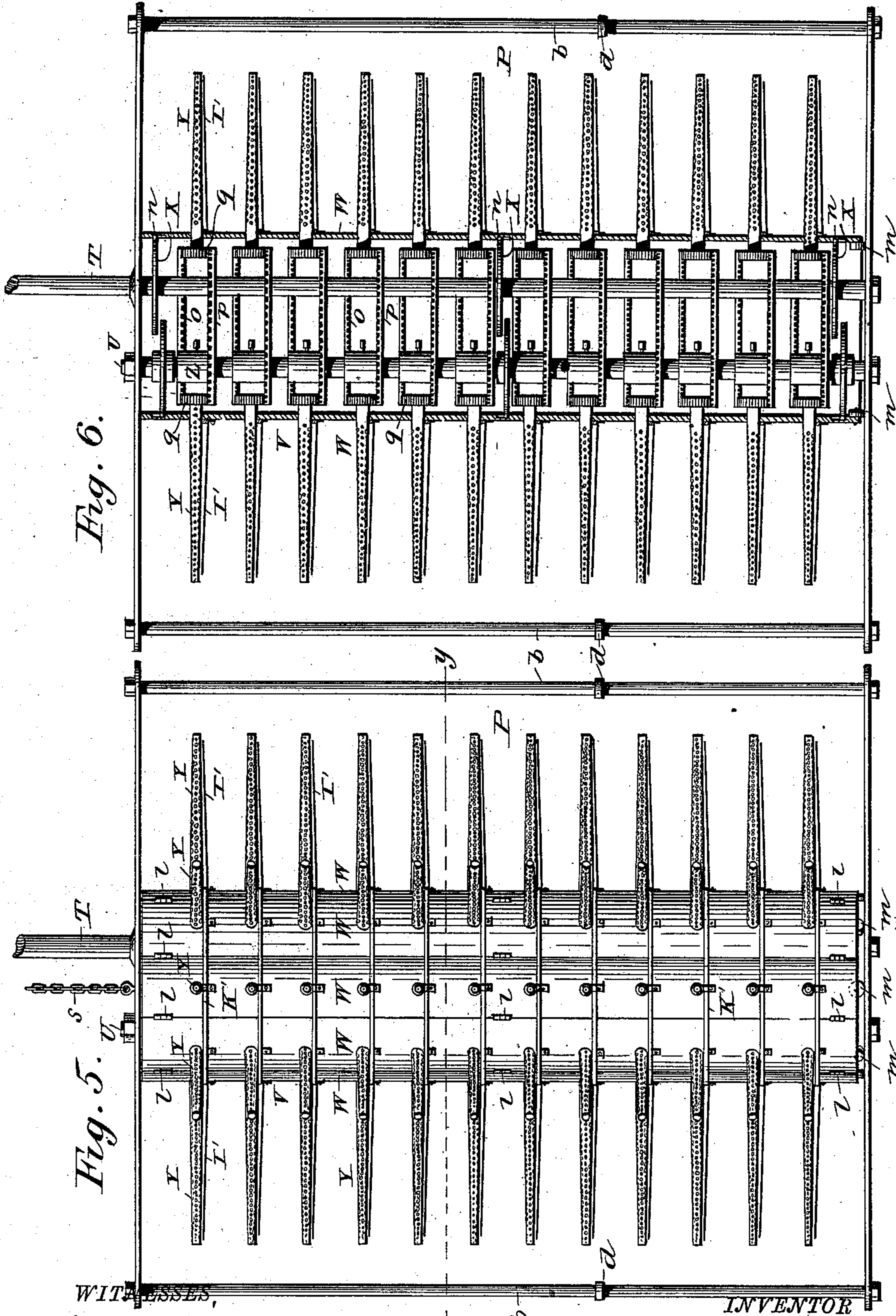


Fig. 6.

Fig. 5.

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Fig. 7.

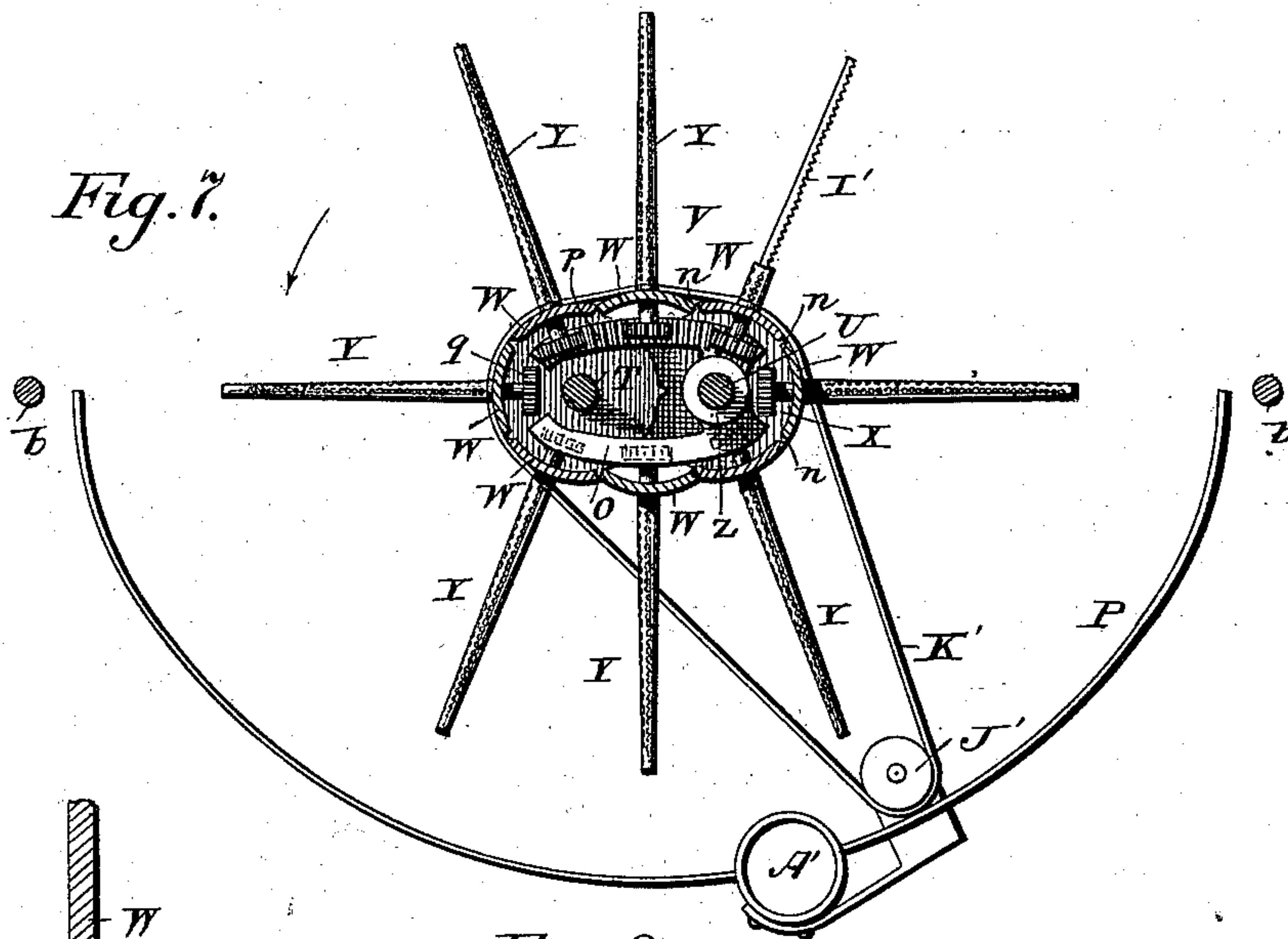


Fig. 8.

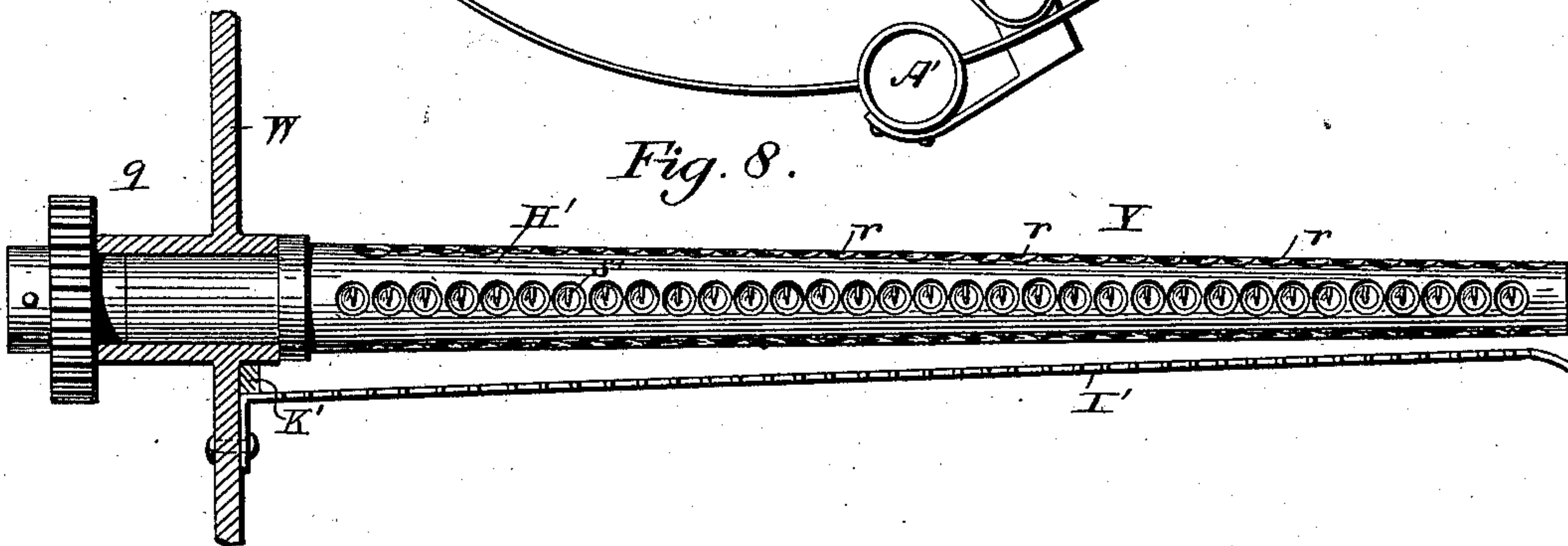


Fig. 9.

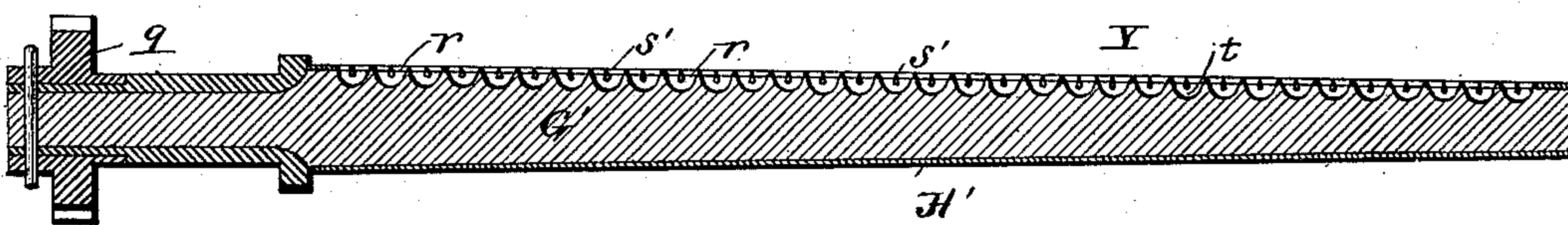
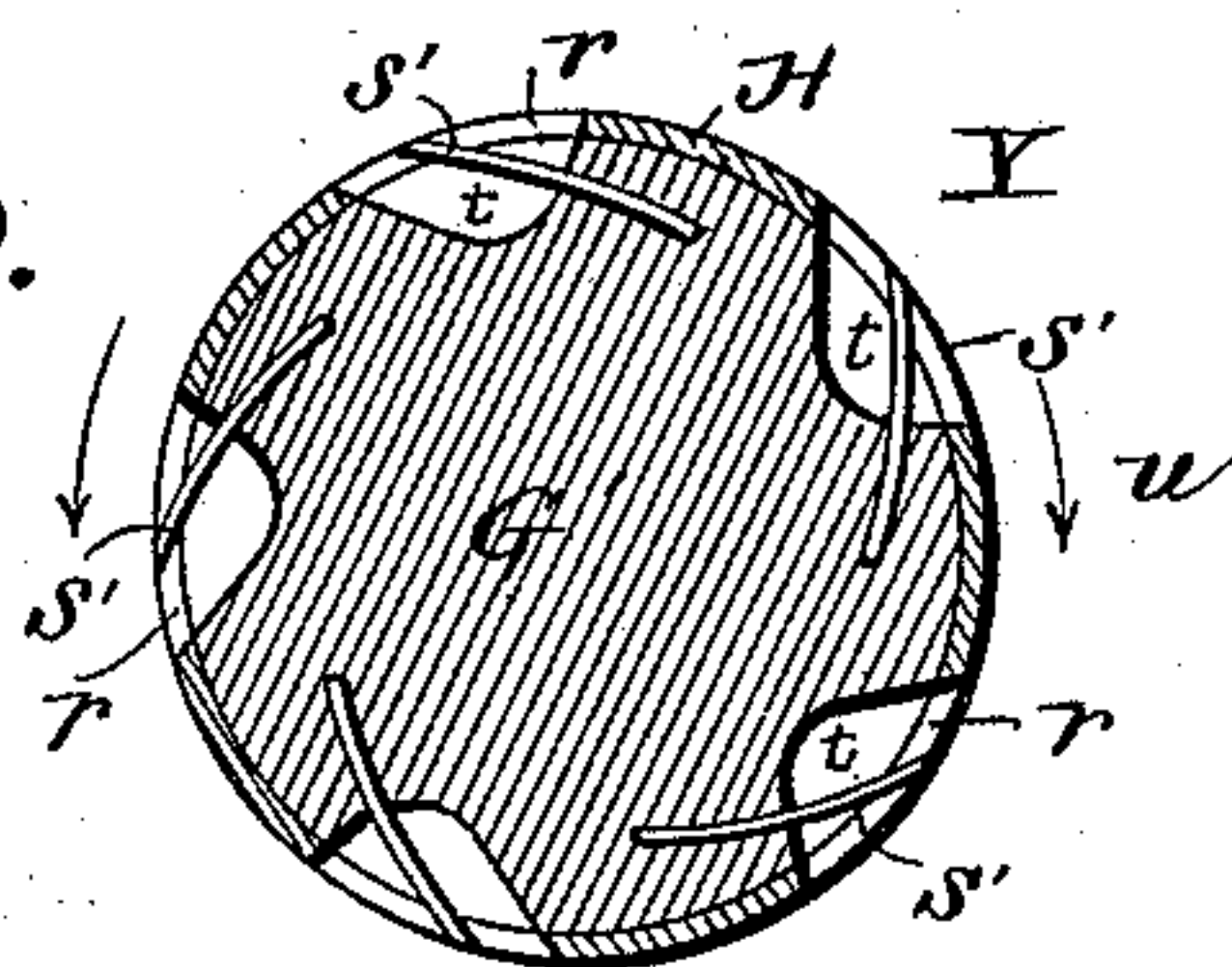


Fig. 10.



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UNITED STATES PATENT OFFICE.

SAMUEL D. T. MANNING, OF PORTSMOUTH, VIRGINIA.

COTTON-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 400,700, dated April 2, 1889.

Application filed November 25, 1885. Serial No. 183,971. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL D. T. MANNING, a citizen of the United States, residing at Portsmouth, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Cotton-Harvesters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

In the drawings, Figure 1 is a side view of the machine; Fig. 2, a plan view, and Fig. 3 a front view, of the same. Fig. 4 is a horizontal section of the fan-blower, in a plane indicated by the line $x x$, Fig. 3. Fig. 5 is a view of one of the picking-boxes, looking toward the open side of the same. Fig. 6 is a central vertical longitudinal section of the same. Fig. 7 is a horizontal section in a plane indicated by the line $y y$, Fig. 5. Fig. 8 is a side view of one of the picking-spindles. Fig. 9 is a central vertical longitudinal section of one of the spindles, and Fig. 10 an enlarged cross-section of the same.

Like letters designate corresponding parts in all of the figures.

The driving-wheels A B are mounted on an upwardly-arched axle, C.

Supported by the crown of the axle and braces D D, secured to the ends of the axle, is the main platform of the machine, composed of longitudinal beams E E and cross-bars F F.

Connected to the front bar F are the thills G G, so arranged that the horse may travel at one side of the machine and the center of the machine travel over a row of cotton-plants.

The operative parts of the machine are supported by the platform forward of the axle, and to counterbalance the weight of the same the driver's seat H is mounted back of the axle and the platform extended for a considerable distance back. Preferably the rear portion of the platform is inclosed by wire-netting, as indicated at I, to constitute a receptacle for the gathered cotton.

An upwardly-arched metallic bar, J, ex-

tends across the machine, being supported by the beams E E. A second metallic bar, K, of irregular shape, is bolted to the bar J, and these two bars J and K support the driving mechanism. The main driving-shaft L is mounted in a horizontal position in bars J and K and a bracket, a , depending from the bar J. The shaft L is driven from one of the wheels A by means of a drive-chain, M, which passes over a chain-pulley, N, on the shaft L. This pulley N is not rigidly connected to the shaft, but is connected therewith by clutch mechanism, as shown.

The drive-wheel A is formed with a groove, a' , on its periphery, in which the drive-chain is held. In this groove a series of sprocket-pins, $a^2 a^2$, are fixed, over which the links of the chain pass in order to keep the chain from slipping.

An L-shaped bar, O, is secured at one end to the center of the central cross-bar, F, and at the other end to the center of the bar J. From this bar O are suspended the two picking-boxes P P. These boxes are semicircular in horizontal section, inclosed at top and bottom and on their circular side, and are open on the straight side, the straight open sides of the two boxes facing each other. These boxes are provided with vertical rods $b b$, and are held in position by guide-rods $c c$, bolted to the cross-bars F F. These boxes are vertically adjustable to enable them to be lifted over any obstruction which may be in their paths. To enable this to be done, the rods $b b$ pass through eyes in the rods $c c$. The downward movement of the boxes is limited by nuts $d d$ on the guide-rods $b b$. The boxes are not suspended directly from the bar O, but from a bracket, Q, attached thereto. In this bracket and in the vertical arm of the bar O is mounted a shaft, R. The forward end of this shaft carries a drum, e . On the outer ends of the bracket Q are mounted pulleys $f f$. The boxes P P are suspended by chains $s s$, attached to the same, which pass over the pulleys $f f$, and are secured to the drum e . To adjust the height of the boxes, the shaft R is turned by means of a hand-wheel, g , secured to the rear end of the shaft. The shaft may be held in any desired position by any of the well-known devices, such as a pawl and ratchet.

Mounted in each gatherer-box P, nearly concentric with its circular side, is a vertical shaft, T. This shaft extends upward through the bars J and K. One of the shafts T is rotated directly from the main shaft L by bevel-pinions *h i*. The other shaft T is driven from the first by means of a chain, *j*, passing over chain-wheels *k k* on the respective shafts T T. To enable the shafts T T to be properly rotated and admit of the vertical adjustment of the boxes, the pinion *i* and wheels *k k* are not rigidly secured to said shafts, but slide upon the upper ends of the shafts, which are squared, as shown.

Parallel with and in front of the shaft T in each box P is a fixed vertical rod, U, and inclosing these is a rotating cage, V, composed of a series of parallel metallic strips, W W, concavo-convex in cross-section, which are hinged together at their edges by hinges *l l*. These strips are preferably eight in number, extend the entire height of the boxes P, and are supported at the bottom by rollers *m m*.

Rigidly secured to the rotating shaft T are a series of horizontal metallic disks, X X, (preferably three in number,) provided with teeth *n n*, which engage in notches cut in the strips W W, and thus rotate the cage. The rod U is provided with similar toothed disks, which, however, are not fixed thereto, but are rotatively mounted thereon.

In each of the vertical strips W are rotatively mounted a series of picking-spindles, Y Y, which extend outward in a horizontal direction perpendicular to said strips. As the cages are rotated, the spindles are carried around within the boxes P P and outside of the same in the open space between the boxes. The spindles are of such length that the ends of the spindles in one box nearly meet the ends of the spindles in the opposite box as they travel, so that the entire space between the boxes is covered by the spindles.

Besides the movement in the box given to the spindles by the rotation of the cage, each spindle is rotated on its own axis in two directions, being rotated in one direction while it is outside of the box, in order to gather the cotton, and being rotated in the opposite direction when inside of the box, in order to discharge therein the gathered cotton. To accomplish this, the stationary rod U is provided with a series of fixed collars, Z Z, corresponding in number with the spindles on each strip W. Each of these collars is provided with a fixed rack, *o*, at its upper part, with the rack-teeth on its under side for a portion of the periphery of the cage V, and with a second fixed rack, *p*, at its lower part, with the rack-teeth on the upper side for the remainder of the periphery of the cage. These racks are engaged in succession by a small pinion, *q*, carried on the inner end of each spindle. When this pinion meshes with the rack *o*, the spindle will be rotated in one direction, and when it meshes with the other rack, *p*, it will be rotated in the opposite direction.

The gathered cotton deposited in the boxes P is carried off from the bottoms thereof by pneumatic means. A pipe, A', of sufficient diameter, opens near the bottom of each gathering-box and telescopes into a second pipe, A², (to permit the vertical adjustment of the boxes,) which pipe A² leads to a casing, B', mounted on the bar O. In this casing rotates a fan, C', which draws air up through pipes A' and A², thus sucking up the cotton and discharging it through the rearwardly-extending funnel D', to the rear end of which suitable receiving-receptacles may be connected. On the shaft of fan C' is a small pinion, E', which meshes with a large gear-wheel, F', carried by one of the shafts T.

Each spindle Y is composed of a wooden core, G', covered with a metallic sleeve, H'. This metallic sleeve is formed with a number of apertures, *r r*, through which are driven into the wooden core sharp-pointed pins *s' s'*. These pins are bent in the direction in which the spindle rotates when gathering cotton, and their sharp points are just flush with the outer surface of the sleeve H². The apertures are large enough to enable the cotton to be held beneath the pins, and in order that the pins may the better hold the cotton the wooden core is hollowed out beneath them, as shown at *r*.

It is important that the picking-pins should not project beyond the surface of the spindles. If they project beyond the spindles, they hold the cotton so tenaciously that it is difficult to remove it, and at the same time the projecting pins interfere with the operation of the stripping mechanism. By making the spindles as described these difficulties are avoided and the cotton is gathered with equal efficiency.

In order that the cotton gathered by the spindles may be stripped from them and deposited in the box, a series of flat rods, I', having teeth on one edge are secured to the strips W immediately beneath the spindles. Within the box in the immediate vicinity of the pipe A' is journaled a vertical roller, J'. Around this roller and around the cage V are arranged a series of stripping-bands, K', which pass between the spindles and the stripping-rods I'. The roller J' is situated near the outer periphery and toward the front of the box, so that the stripping-bands extend across the open space in the box in a diagonal direction. When the spindles are fairly within the box, they are rotated backward, (in the direction of arrow *u*, Fig. 10,) and the cotton on the teeth of the spindles is caught by the teeth of the stripping-rods and removed from the spindles. The stripping-rods are then carried by the rotation of the cage beneath the diagonally-extending portions of the stripping-bands K', which strip the cotton from the rods I' and deposit it at the bottom of the box, where it is drawn off through the pipes A'. These stripping-bars not only serve to assist in stripping the cotton from the spin-

dles when the same are within the picking-box, but they also perform another important function.

When the spindles are outside of the box gathering cotton, there is danger of the cotton being thrown off from the spindles, owing to their great velocity. This is prevented by the stripping-bars. The rotation of the spindles outside of the box brings the cotton against the smooth edge of the stripping-rods which keep the cotton from flying off. The length of the fiber of the cotton is sufficient to hold a part of it at all times between the spindle and the stripping-bar.

The arrangement of the gearing is such that the spindles when passing through the open spaces between the boxes are carried backward, and the speed is so arranged that the forward movement of the machine is exactly compensated by this backward movement of the spindles, so that the cotton-plants may be disturbed as little as possible by the passing of the spindles through them.

I claim as my invention—

1. A picking-spindle composed of an apertured tube, and an interior core provided with picking-pins corresponding with said apertures, said picking-pins being of such length that they do not project beyond the exterior surface of the spindle, substantially as set forth.

2. A rotating cage, and rotating picking-spindles journaled therein and carried thereby, in combination with fixed toothed rods carried by said cage, each of said rods being located immediately beneath one of said spindles, substantially as set forth.

3. A gathering-box open on one side, a rotating cage located therein, and rotating picking-spindles mounted thereon, in combination with stripping-bars located on said cage beneath said spindles, and stripping-bands arranged between said spindles and bars, substantially as set forth.

4. A rotating spindle which has a double rotary motion on its axis, first in one direction and then the other, and also a bodily movement in an approximately-circular path, in combination with a stripping-bar parallel with said spindle, which is carried around with said spindle, said bar being toothed on one edge and flat on the other, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SAML. D. T. MANNING.

Witnesses:

V. O. CASSELL,
JNO. S. SMITH.