

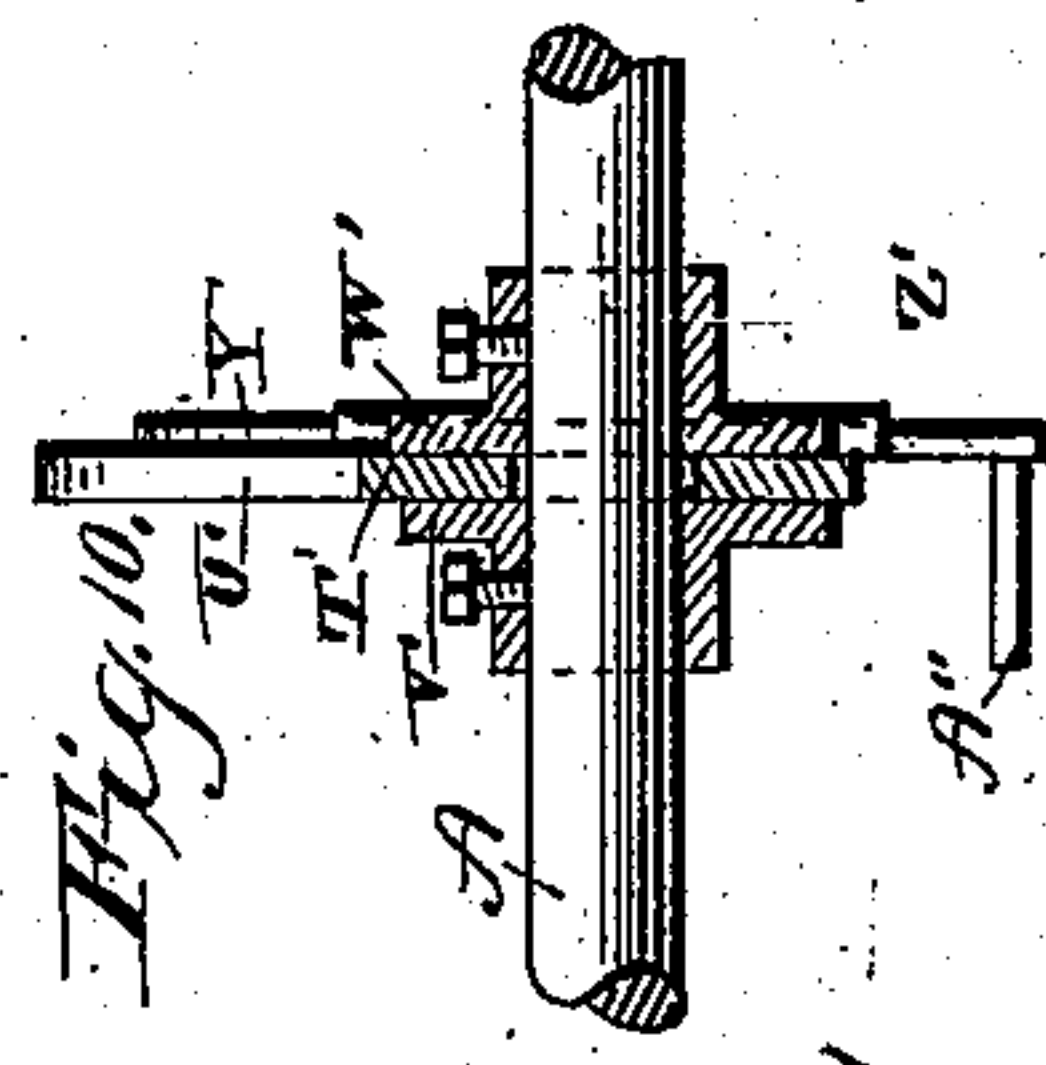
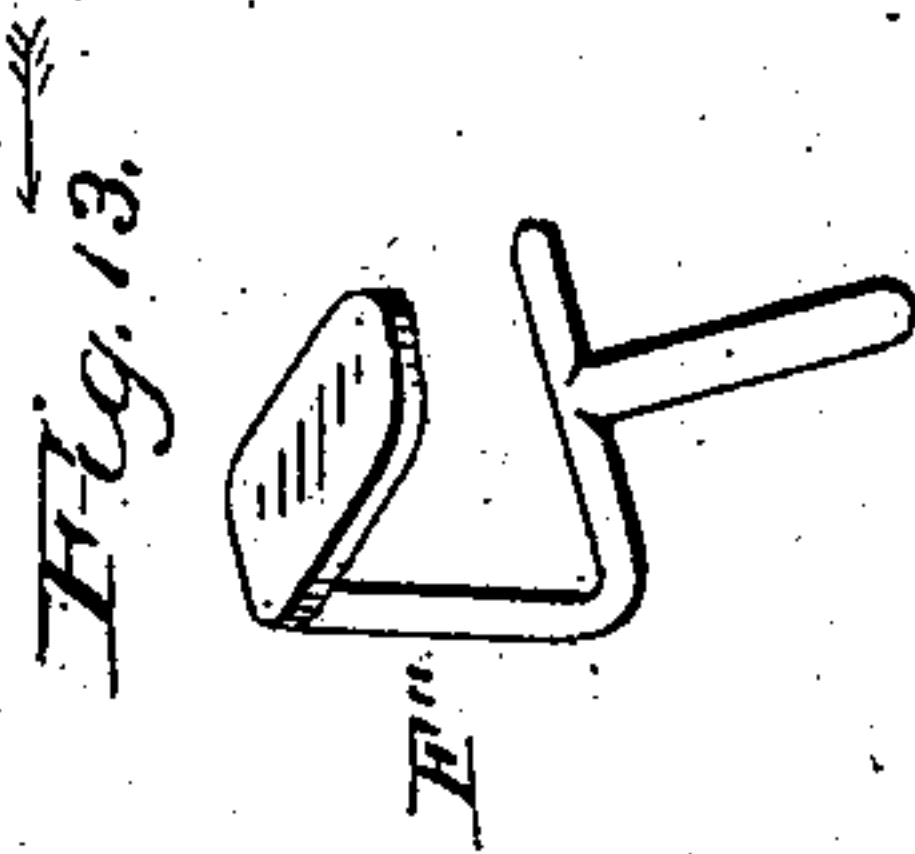
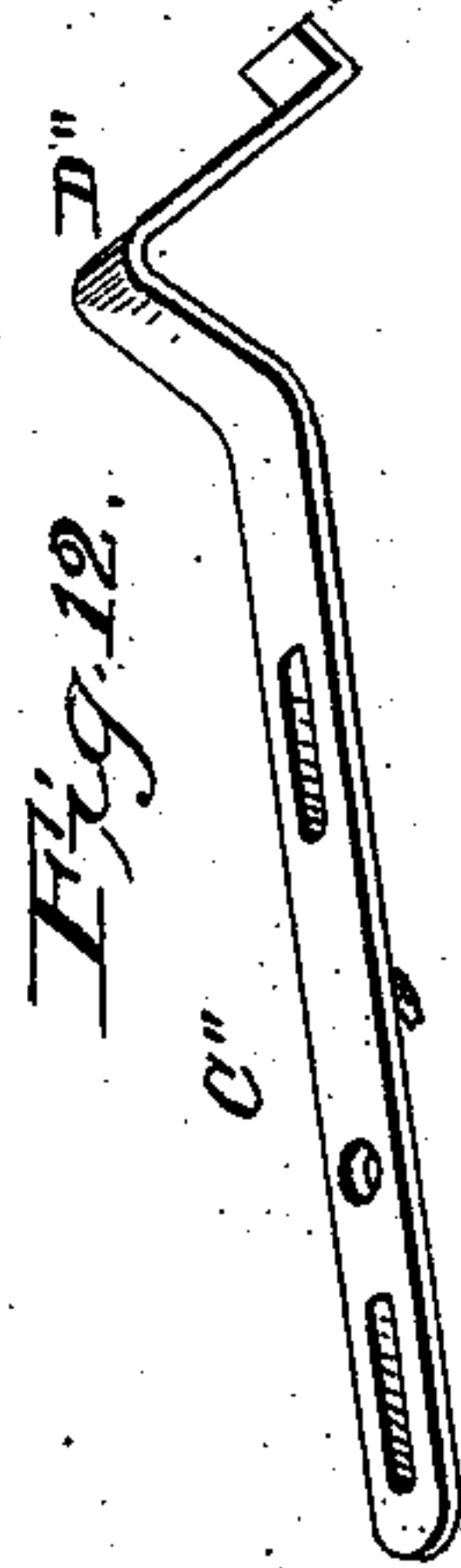
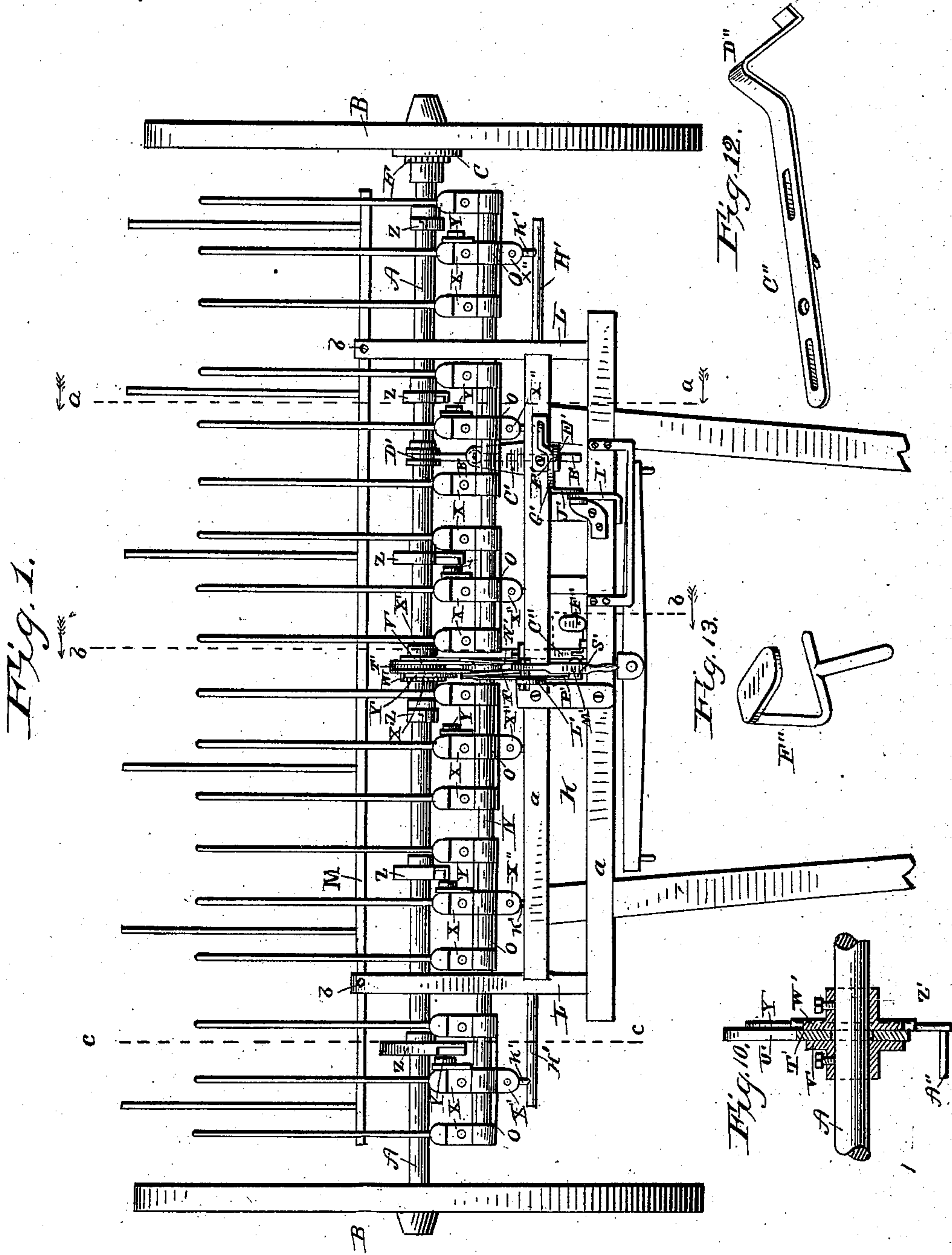
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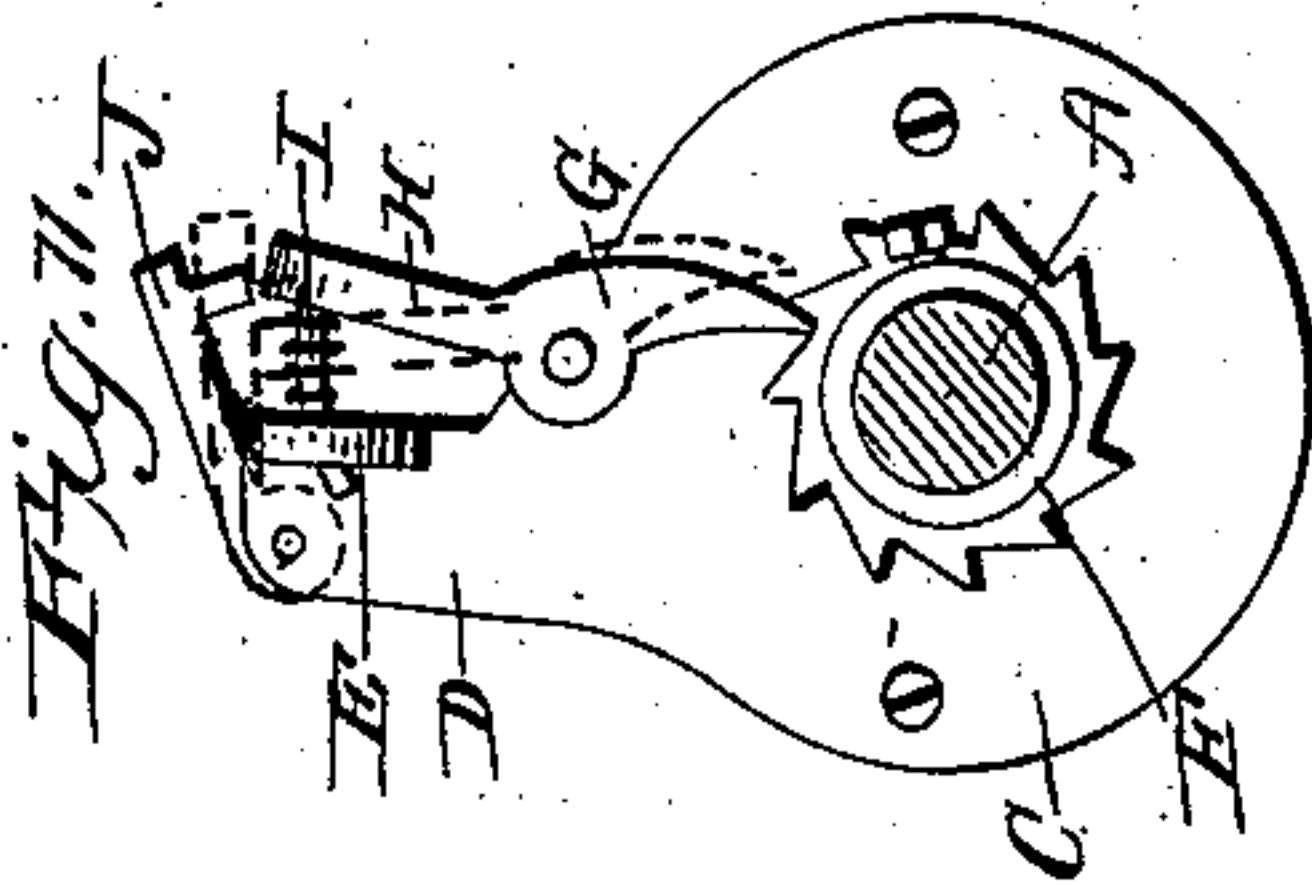
I. L. LANDIS & A. ISKE.
COMBINED HAY RAKE AND TEDDER.

No. 380,122.

Patented Mar. 27, 1888.



WITNESSES
John S. Finch
C. D. Davis



INVENTORS.
I. L. Landis & Albert Iske.
By C. W. Alexander
Attorney.

(No Model.)

4 Sheets—Sheet 2.

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Fig. 2.

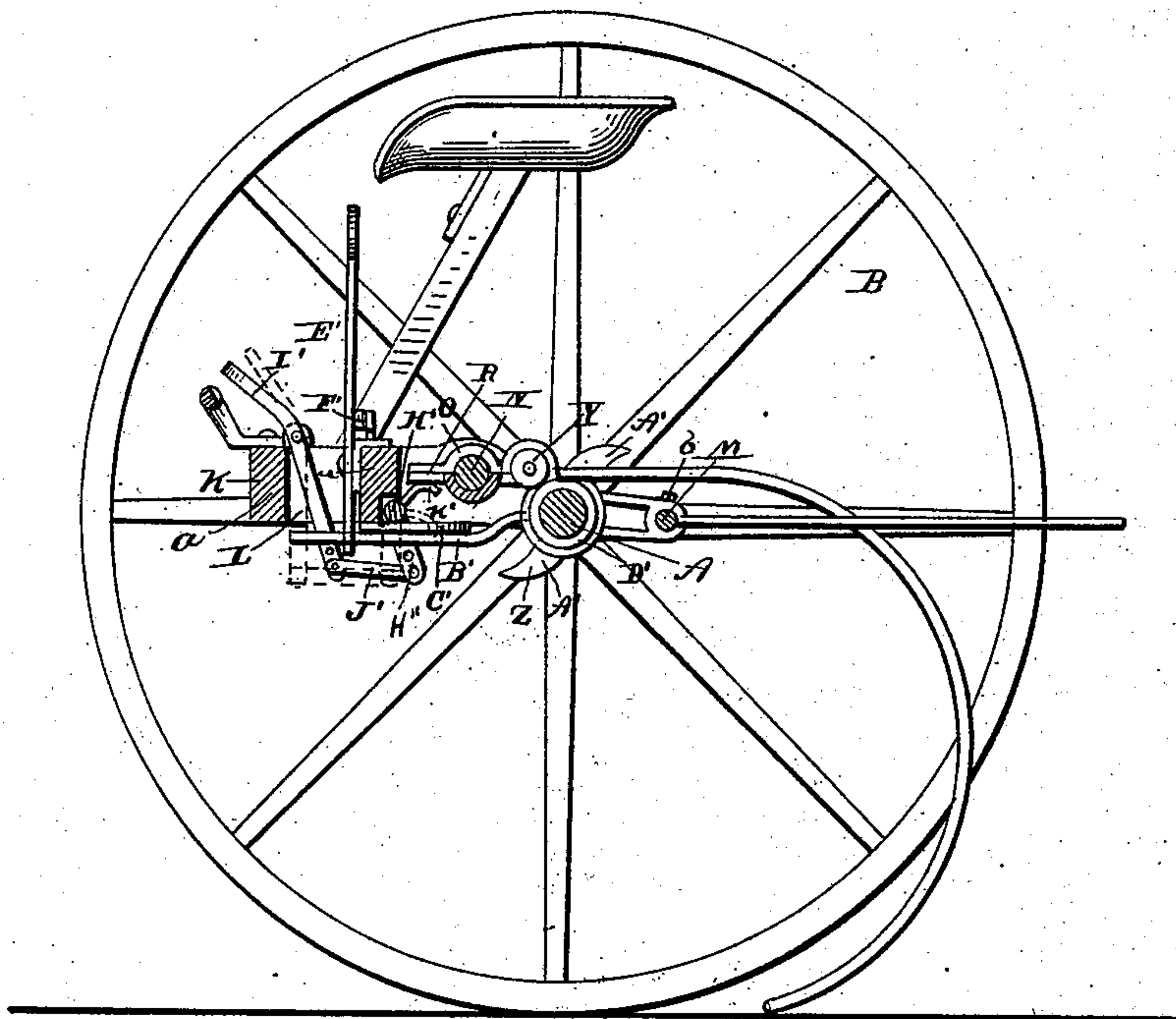
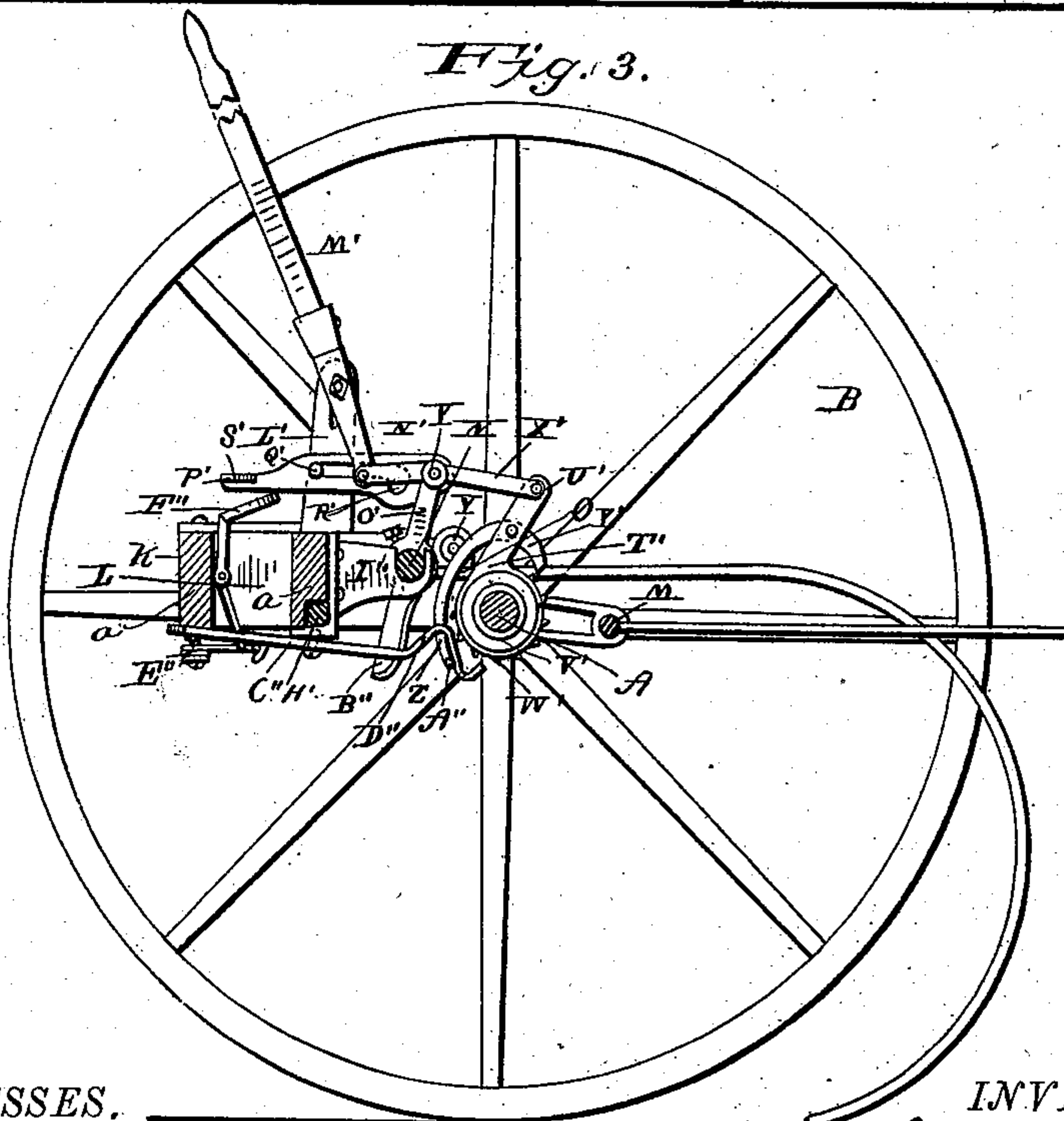


Fig. 3.



WITNESSES.

Jno. S. Finch Jr.
C. W. Davis

INVENTORS,

I. L. Landis & A. Iske

By C. M. Alexander
Attorney.

(No Model.)

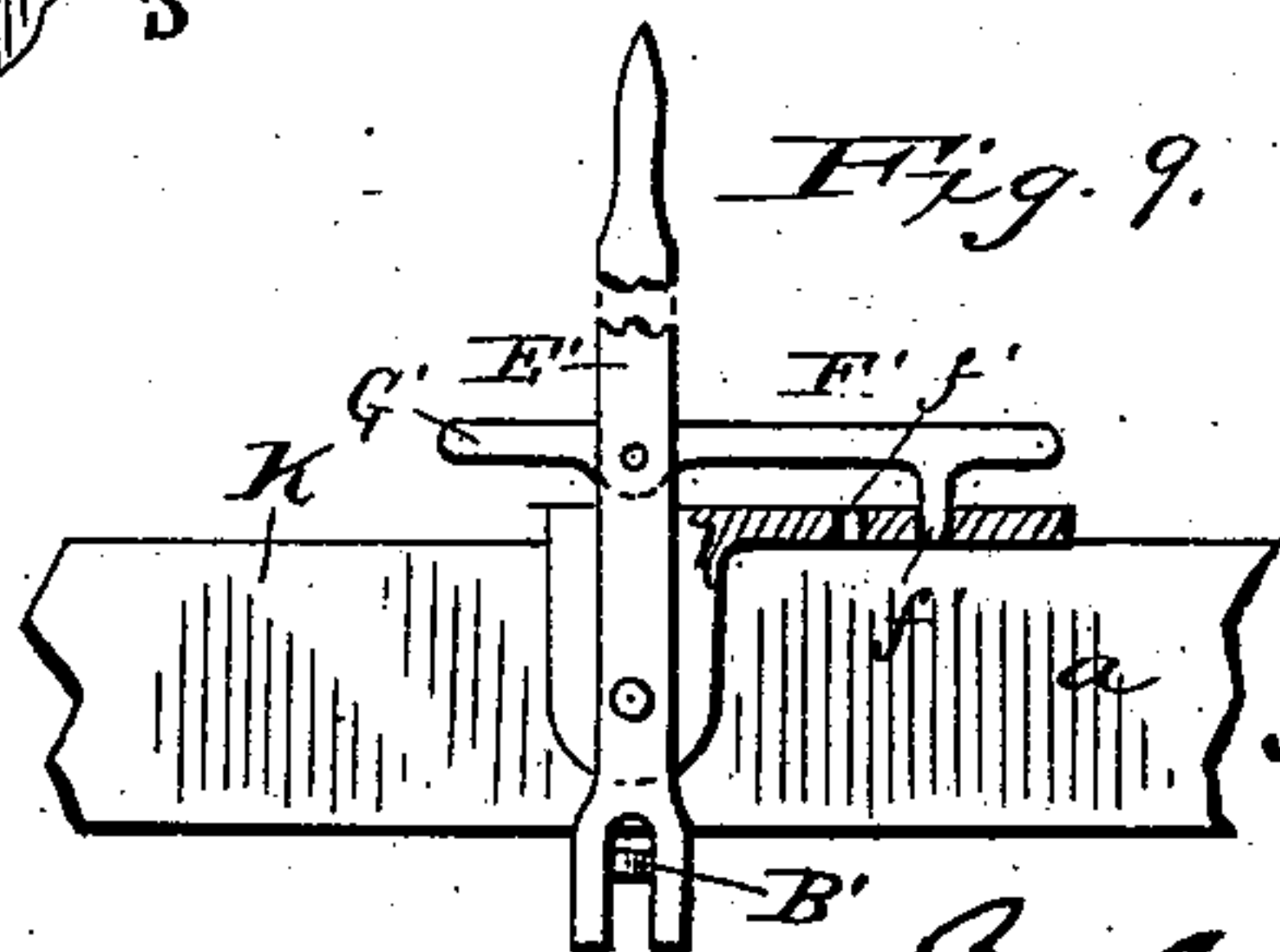
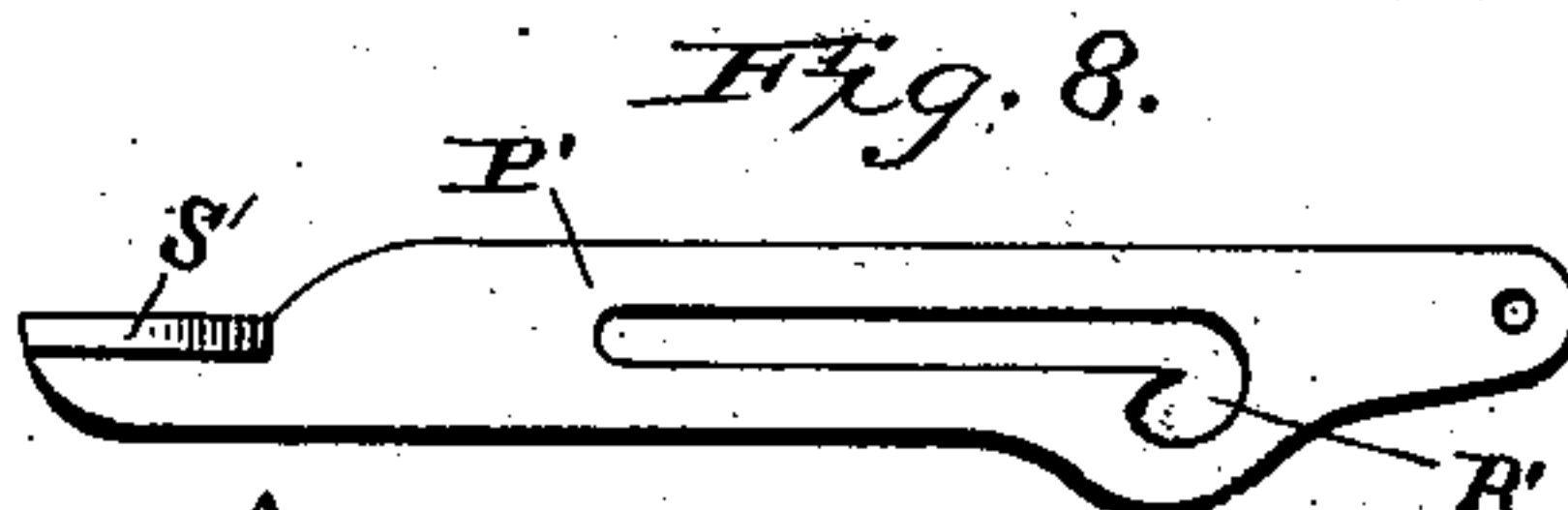
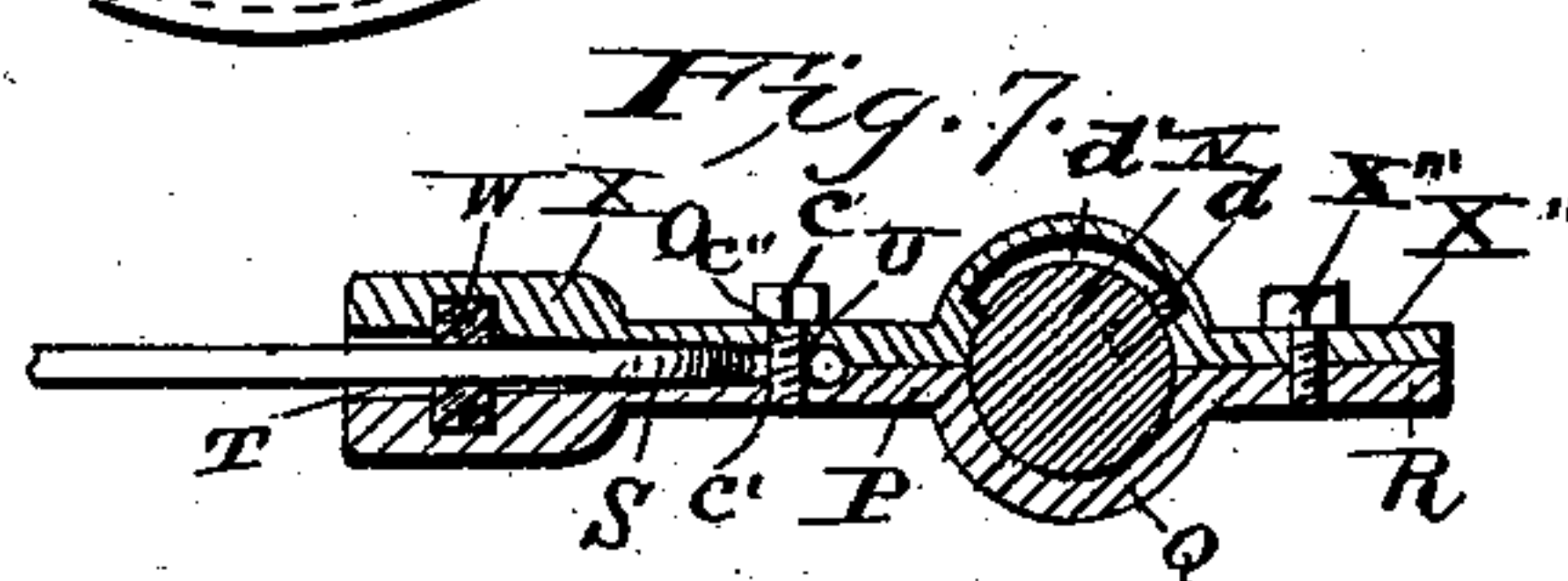
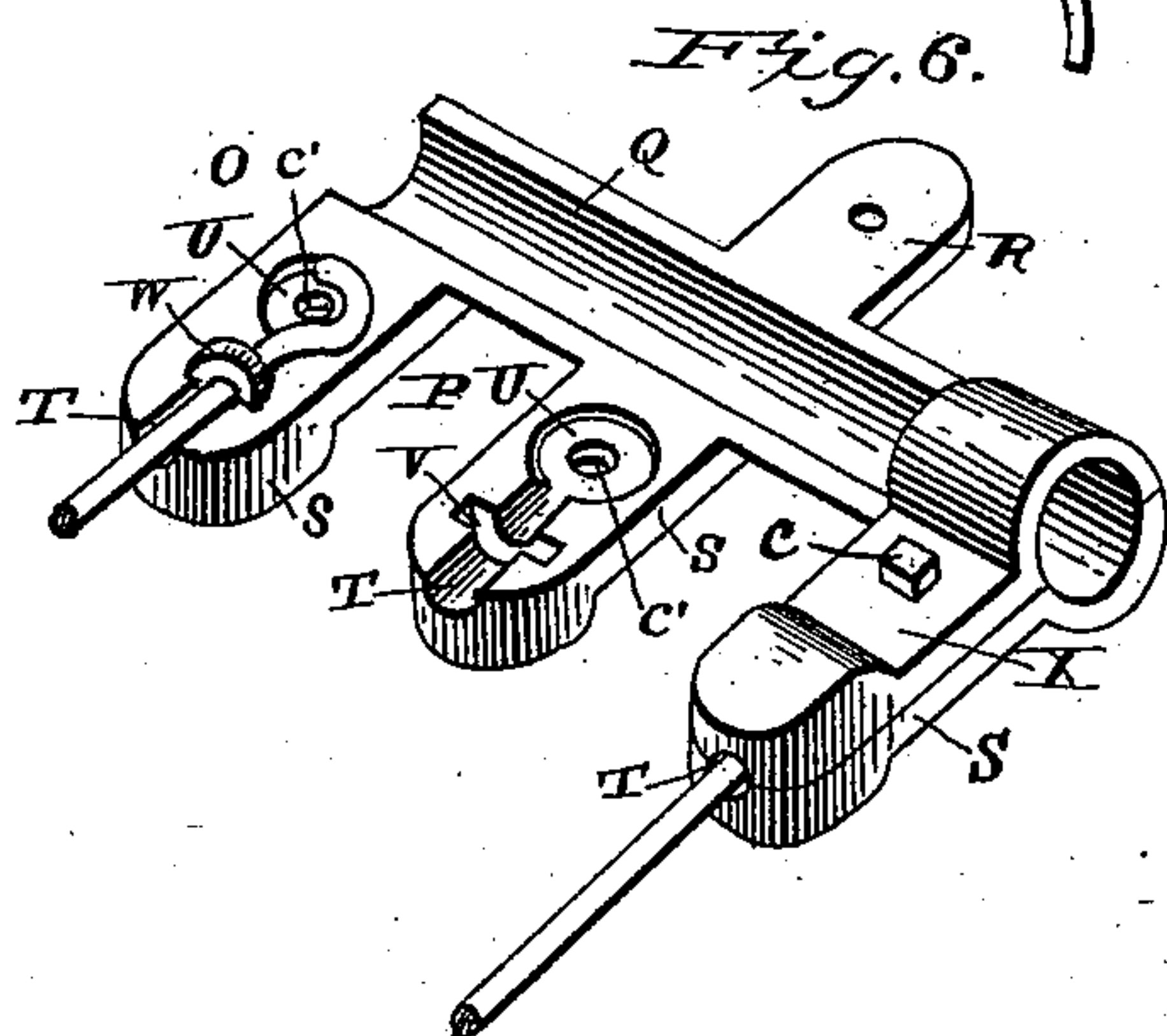
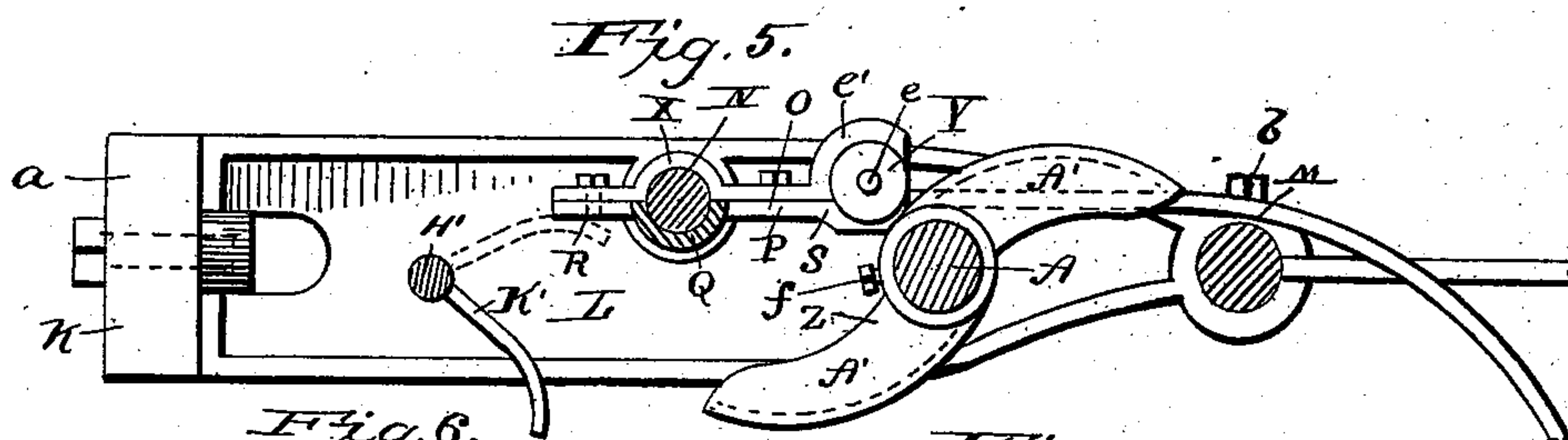
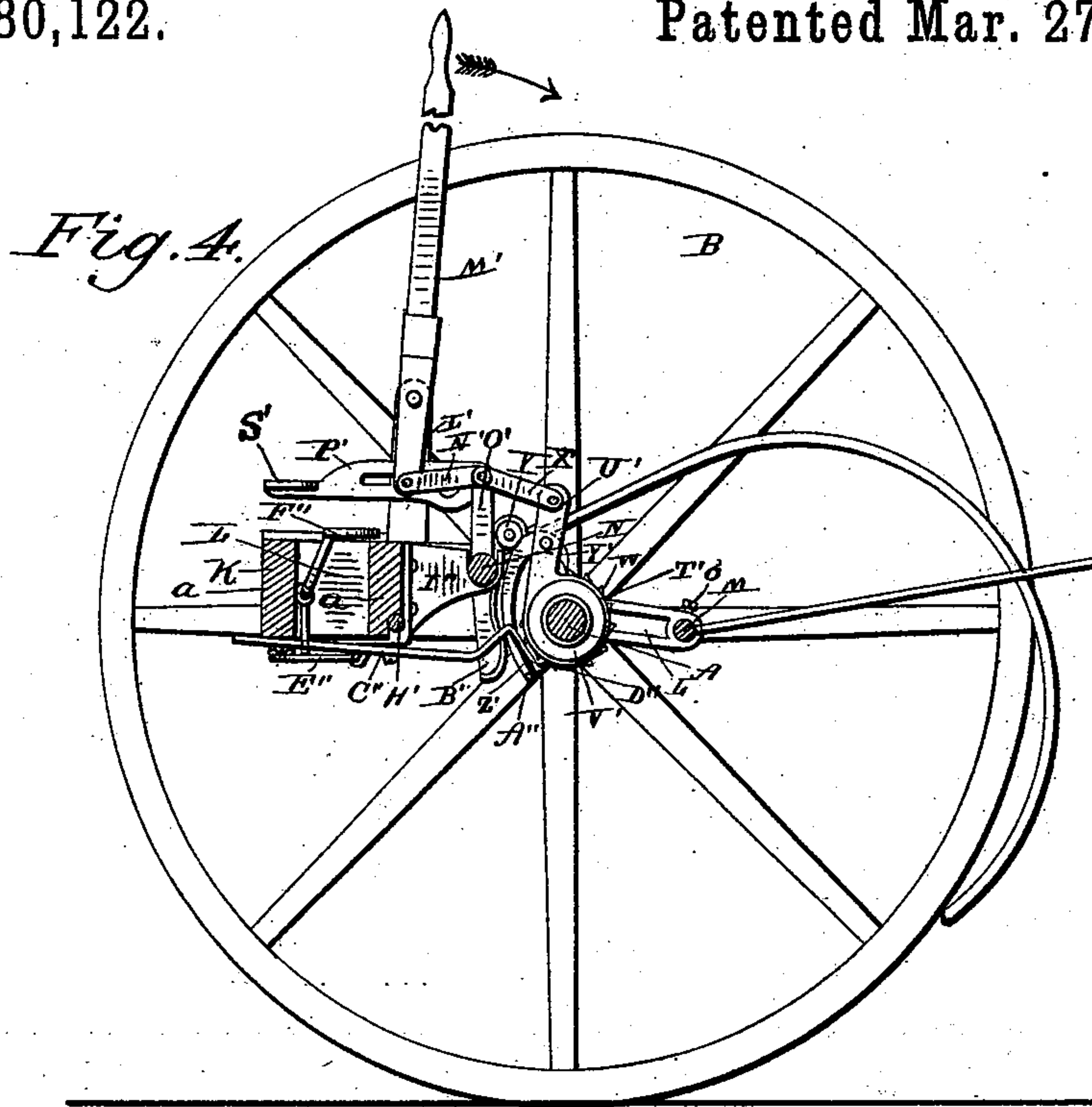
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WITNESSES

Jno. S. Finch Jr.
C. D. Davis

INVENTORS,

J. L. Landis and
Albert Lake

By *C. M. Hayward*
Attorney.

(No Model.)

4 Sheets—Sheet 4.

I. L. LANDIS & A. ISKE.
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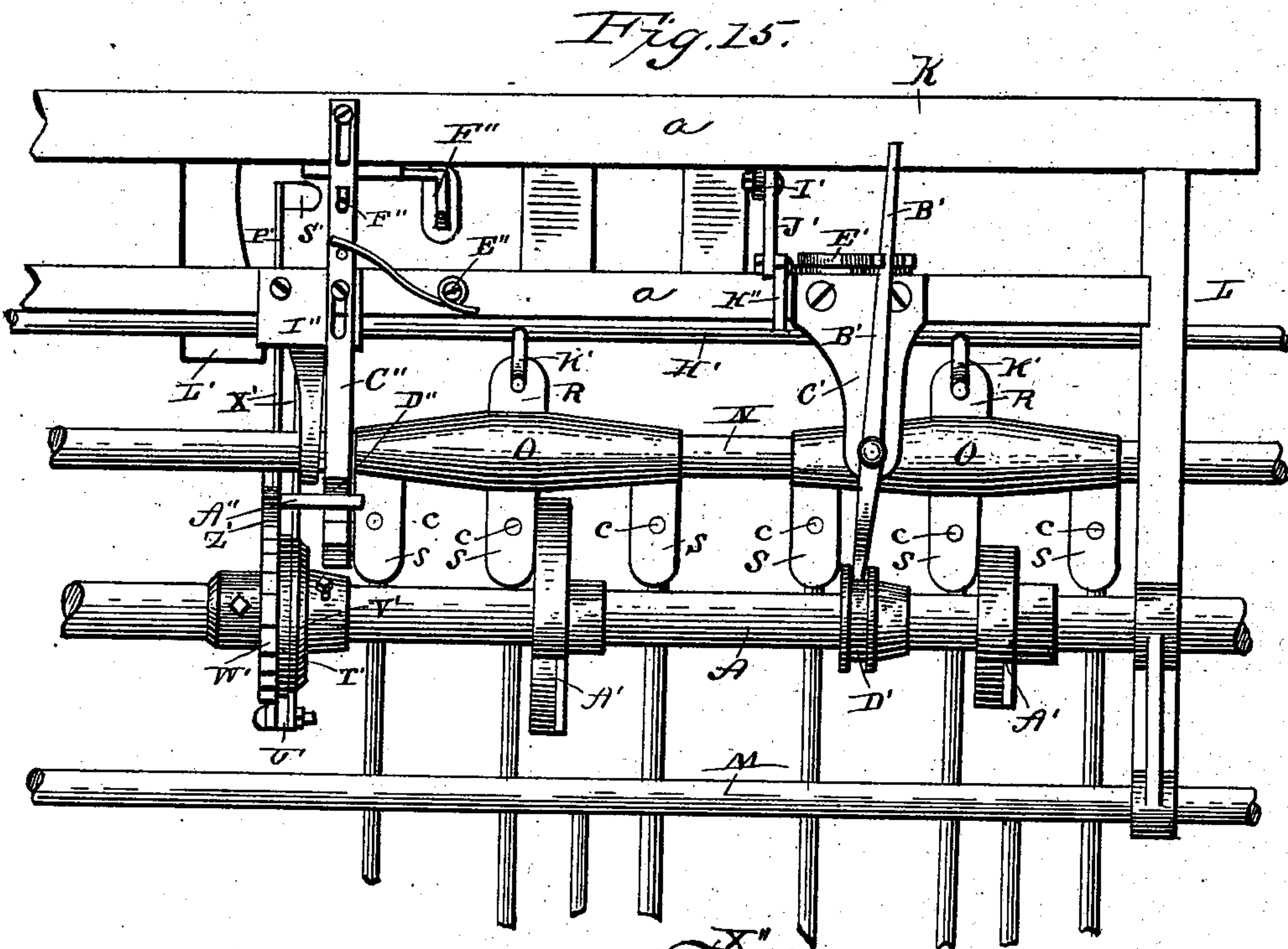
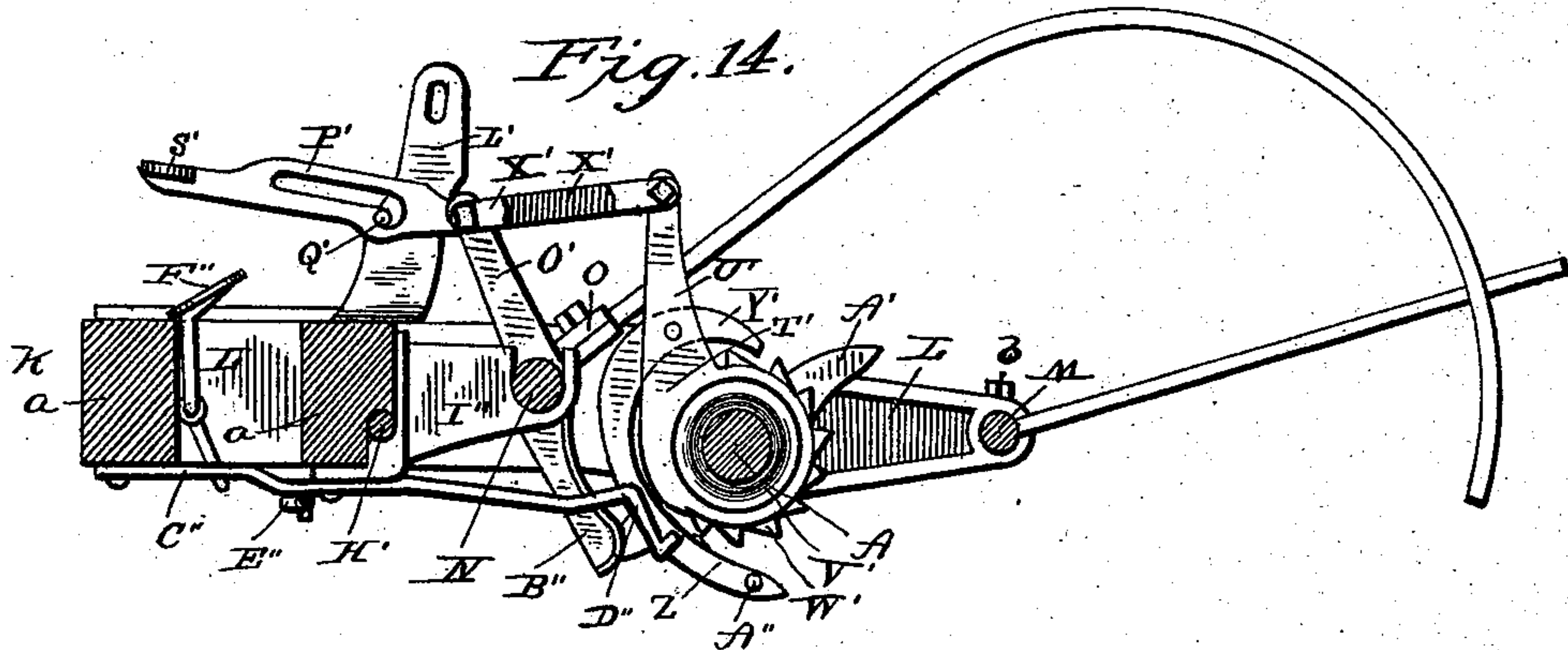
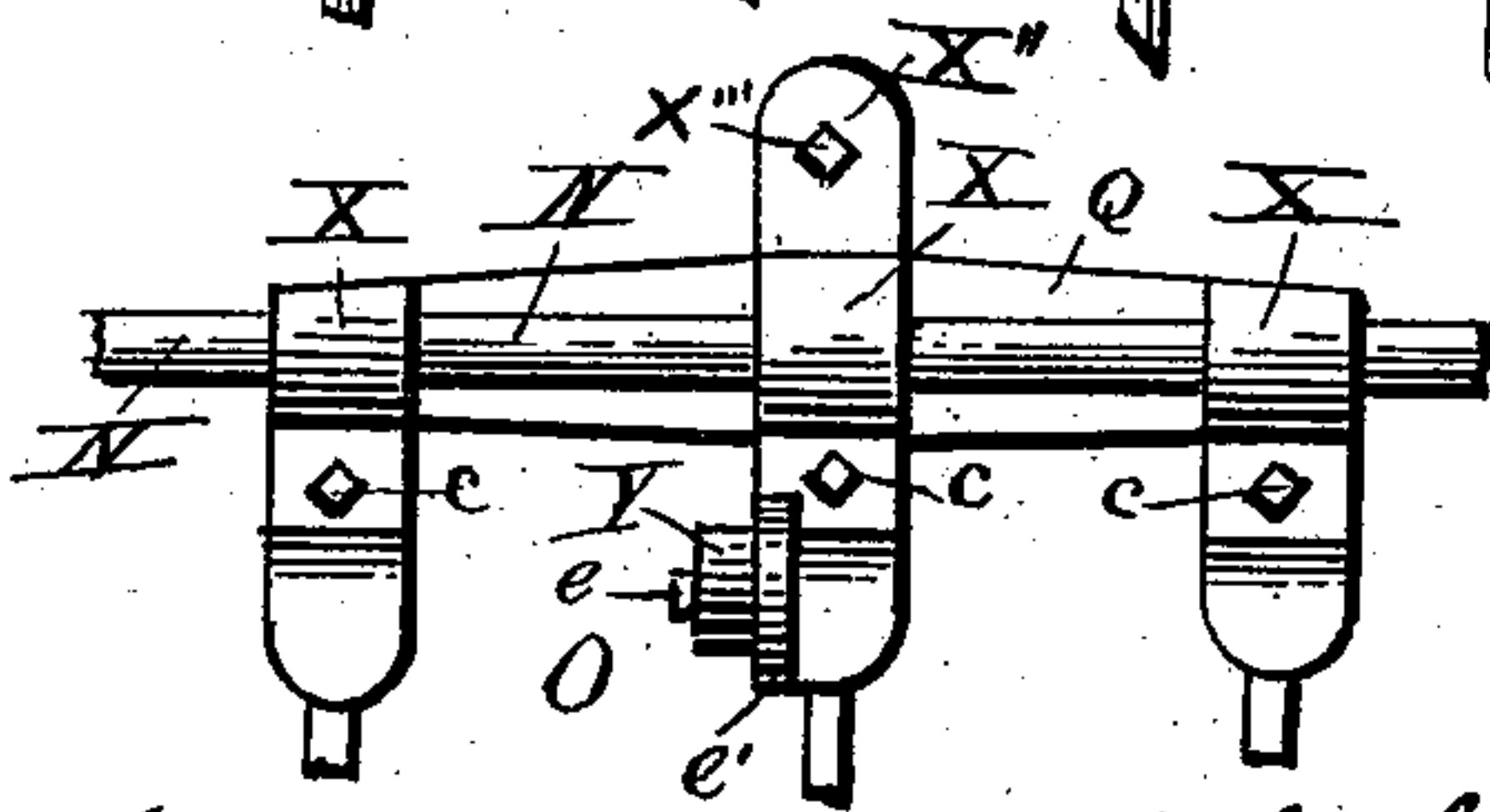


Fig. 16.



Witnesses:
John S. Finch
L. H. Davis.

Inventors:
I. L. Landis & A. Iske.
By *C. M. Alexander*
Attorney.

UNITED STATES PATENT OFFICE.

ISRAEL L. LANDIS AND ALBERT ISKE, OF LANCASTER, PENNSYLVANIA;
SAID ISKE ASSIGNOR TO SAID LANDIS.

COMBINED HAY RAKE AND TEDDER.

SPECIFICATION forming part of Letters Patent No. 380,122, dated March 27, 1888.

Application filed October 27, 1887. Serial No. 253,529. (No model.)

To all whom it may concern:

Be it known that we, ISRAEL L. LANDIS and ALBERT ISKE, citizens of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Combined Hay Rakes and Tedders, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a plan view of our improved machine adjusted for raking purposes, the driver's seat being removed; Fig. 2, a vertical transverse sectional view of the same, taken in the plane indicated on Fig. 1 by dotted line *a a*; Fig. 3, a similar view taken on the line *b b*; Fig. 4, a similar view showing the machine in the act of dumping. Fig. 5 is a detail transverse sectional view, slightly enlarged, on the line *c c* of Fig. 1, showing more clearly the relative positions of the tappet-bearing axle, the rake-shaft, and the shaft for applying pressure to the rake-teeth; Fig. 6, a detail perspective view of a portion of one of the rake-heads; Fig. 7, a detail sectional view of the rake-head, showing the manner of securing the teeth therein; Fig. 8, a detail view of the slotted bar used to hold the rake-teeth in an elevated position; Fig. 9, a detail view of the lever used to shift the machine from a rake to a tedder; Fig. 10, a detail sectional view of that portion of the dumping mechanism attached to the axle of the machine; Fig. 11, a detail view of the ratchet and pawl used to render the machine inoperative when backing or whenever desired; Fig. 12, a detail perspective view of the sliding bar used to throw the dumping mechanism into engagement; Fig. 13, a detail perspective view of the foot-lever for operating the last-named bar. Fig. 14 is a transverse sectional view of the machine on the line *b b*, Fig. 1, showing the rake-teeth locked in an elevated position, the operating-lever *M'* and connecting-links *N'* being removed to show more clearly the locking-plate. Fig. 15, a bottom plan view of a portion of the machine. Fig. 16 is a detail plan view of a rake-head section and a portion of the rake-shaft, showing more clearly the attachment of the anti-friction roller.

Our invention has relation to certain new

and useful improvements on that class of machines which are convertible either into a rake or tedder at the will of the driver, and it has particular reference to that character of machines covered by Letters Patent granted on the 13th day of December, 1887, and numbered 374,795, as will be more fully hereinafter set forth.

The invention consists in certain novel features of construction and combinations of parts, that will be fully understood from the following description and appended claims, when taken in connection with the annexed drawings.

In order to enable others to fully understand and construct our invention, we will now proceed to describe its construction.

Referring to the annexed drawings by letter, *A* designates the axle, on which are loosely journaled the ground or drive wheels *B*. Upon the inner end of the hub of one of the ground-wheels is secured a disk or plate, *C*, which has a radial extension, *D*, formed on it, this extension being provided with a perforated ear, *E*. Pivoted to the face of the plate *C*, so as to engage the teeth of the ratchet-wheel *F*, secured upon the axle, is a pawl, *G*, which has an outwardly-extending arm, *H*, provided with a curved pin, *I*, which passes freely through the perforated ear *E* on the extension of the disk. Between the ear *E* and the arm of the pawl, and surrounding the curved pin *I*, is a spiral spring, which serves to keep the pawl in constant engagement with the ratchet-wheel on the axle when the machine is in operation and moving forward, as shown clearly in Fig. 11 of the drawings.

Pivoted to the outer end of the extension *D* is a hook, *J*, which is designed to hold the pawl out of engagement with the ratchet-wheel when it is desired to render the machine inoperative, as shown in dotted lines in Fig. 11, where it will be seen the hook engages the end of the arm of the pawl. It will be observed that by this arrangement of the pawl-and-ratchet devices the machine may be backed without communicating motion to the axle, and also that it may be rendered inoperative when it is transported from place to place, or for any other purpose.

Supported upon the axle of the machine, so as

to be capable of a slight reciprocatory movement thereon, is the frame K, which is composed of the longitudinal beams *a a*, to which the thills are attached, and the rearwardly-extending end beams, L L. These end beams, L L, are preferably metal castings and are provided with holes near their rear ends for the free passage of the axle of the machine. The extreme rear ends of these end beams of the frame support the usual clearer-shaft, M, this clearer-shaft being adjustably held by means of the set-screws *b*, tapped into the ends of the beams L L. Parallel with the axle, and slightly above and a short distance in front of it, is the rake-shaft N, which is loosely journaled also in the metallic end beams, L, of the frame. Secured upon this shaft N are the independent rake heads or sections O, which have a partial rotary movement thereon, as fully shown and explained in our patent mentioned above. The rake-sections are each preferably provided with three curved rearwardly-extending rake-teeth. The rake-heads, as shown in Fig. 6, are each constructed of the main or lower plate, P, consisting of the portion Q, which is longitudinally grooved for the reception of the rake-shaft and provided with the forwardly-extending projection R, located about midway its length, and the three rearwardly-extending arms S, all preferably cast integral. Each one of these arms S is provided on its face with a longitudinal groove, T, for the reception and retention of a rake-tooth, the groove terminating in a circular depression, U, for the reception of the bent end of the rake-tooth. In the face of each of these arms, intersecting the groove, is also formed a recess, V, for the reception of an elastic collar or block, W, secured on the rake-teeth near their bent ends. When the rake-teeth are placed in position on their arms, as shown in Fig. 6, the hooked or bent end of each tooth resting in the depression U and the elastic collar resting snugly in its recess, the cap sections or plates X, which are preferably correspondingly grooved and recessed, are bolted to the arms, the front ends of the cap-plates being curved to embrace the rake-shaft, and the clamping-bolts *c* passing through the perforations *c'* in the center of the depressions U and perforations *c''* in the cap-pieces. The grooves in these arms are somewhat larger in diameter than the rake-teeth, for the purpose of allowing them a slight play or movement therein. The center cap-plate has a forward extension, X'', (see Fig. 7,) corresponding with the extension R upon the portion Q, and through these two projections is passed a clamping-bolt, X'''. It will thus be seen that at the same time the rake-teeth are secured to the heads the heads are attached to the rake-shaft.

To prevent the rake-heads moving endwise on the shaft N, and at the same time allow them a limited rotary movement thereon, the shaft is provided with pins *d*, which work in internal segmental grooves *d'* in the cap-plates

X of the rake-heads. It will be perceived by reference to Fig. 7 that while the rake-teeth are in a lowered position the pins *d* on the rake-shaft rest at the forward end of the segmental groove *d'* in the rake-head, so that when the rake-shaft is rocked by means of the lever M' the pins will cause the rake-heads to move with the shaft, and thereby raise the rake-teeth from the ground. This feature of our invention is fully set forth and claimed in our former patent, No. 374,795, and is therefore not claimed in this case.

The principal object in bending the ends of the rake-teeth into the shape of a hook and passing the securing-bolts through the centers of the depressions in which these hooks rest is to prevent the teeth from being withdrawn or pulled out of the heads, as is evident, and the object in slightly enlarging the grooves in which the teeth rest and passing the teeth through elastic collars or bearing-blocks set in the recesses in the arms S of the head is to give the teeth a yielding elastic movement in all directions, as is also evident. The peculiar importance of this feature of our invention will be fully appreciated when it is known that when the teeth are clamped in the ordinary manner rigidly and firmly between two metallic plates they quite frequently break off close up to the clamping-plates when subjected to a sudden or unusual strain or shock. By my method of securing the teeth this difficulty will be entirely obviated, as the elastic collar or cushion will relieve the teeth when they are subjected to a sudden or heavy strain.

Preferably upon the center arm of each rake-head is journaled an anti-friction roller, Y, which is somewhat larger than those usually employed in this class of machines, and is located near the rear end of the arm on which it is journaled. The rollers Y are journaled upon a pin *e*, projecting horizontally from the right side of the rear end of the arm, on which is formed a lug or enlargement, *e'*, preferably being cast integral with the arm to afford a support for the journal pin of the roller. Secured adjustably upon the axle by means of set-screws *f*, one to each rake-head, and in close proximity to the anti-friction rollers on the same, are the tappets Z, each of which consists, preferably, of the two oppositely-curved cam-shaped arms A', (shown in Fig. 5,) without rollers or other obstructions to become entangled with the hay. The advantages derived from this arrangement of tappets and rollers are, first, the weight of the rollers, placed, as they are, to the rear of the rake-shaft and of the rear projecting rake-head sections, is utilized to keep the teeth down close to their work, which is especially desirable where the ground is rough, as in that case the teeth have a tendency to spring up or vibrate too freely; secondly, just one-half the number of rollers are used than when they are placed on the ends of the tappet-arms, which is quite an item in the manufacture of a number of machines; and, finally, the rollers are

not so liable to become entangled with the hay as when they are placed on the tappet-arms.

In order to convert the machine from a rake to a tedder, the frame is shifted upon the axle, this shifting of the frame bringing the rollers upon the rake-heads in a position to be operated upon by the tappets, as fully set forth in our former patent, mentioned hereinbefore. This shifting of the frame is accomplished by means of a horizontal lever, B', which is pivoted on a bracket, C', secured to the under side of the frame. The rear end of this lever is inserted in a grooved collar, D', secured upon the axle, and its forward end is engaged by the bifurcated lower end of an upright hand-lever, E', also pivoted to the frame of the machine within reach of the driver. By means of these levers the frame may be readily moved back and forth upon the axle by the driver without moving from his seat. Pivoted to the hand-lever E' is a gravitating hook or catch, F', which engages with apertures f' in a plate on the frame, whereby the machine may be locked or held securely, whether it be working as a rake or a tedder. This pivoted hook has a lateral extension, G', by means of which the driver may readily disengage the hook from the perforated plate with the toe of his boot while he operates the lever by hand.

Running parallel with and below the rake-shaft, and journaled in the frame of the machine a short distance in front of the same, is a rock-shaft, H', to which a rocking movement is imparted by means of a foot-lever, I', which is pivoted to the frame near the driver's seat, so that the driver may conveniently operate it. This foot-lever at its lower end is connected to an arm, H'', on the rock-shaft by means of the link J', and this link is made adjustable by means of perforations in the lower end of the foot-lever and in the arm on the rock-shaft. Projecting rearwardly from this rock-shaft are a series of curved arms, K', which are so disposed upon the shaft that when it is partially revolved they impinge or press upwardly upon the lower sides of the forward projections R of the rake-heads, as shown in Figs. 2 and 5 of the drawings. By means of this arrangement of devices the driver may instantly apply any degree of pressure to the rake-heads by simply operating the foot-lever by his foot without leaving his seat. This method of applying any desired degree of pressure to the rake-teeth is superior to the usual method of locking all the teeth securely together, for the reason that at times, when raking, the driver finds that it is necessary to press the teeth forcibly down to their work, which cannot be done by the usual manner of locking the teeth, while at other times it may be necessary to exert only a slight pressure upon the teeth; or in some cases, particularly where the ground is very rough and the teeth-sections should accommodate themselves to the unevenness thereof, he may find it necessary to remove the pressure entirely.

Bolted to the frame, in close proximity to the driver's seat, is a standard, L', to which is pivoted the hand-lever M', used for dumping while raking. This lever is connected at its lower end by means of suitable links, N', to an upwardly-extending arm, O', secured upon the rake-shaft N, whereby when the upper end of the hand-lever is moved by the driver in a rearward direction the rake-shaft will be partially revolved in its bearings in the end beams, L, of the frame, and will raise the rake-teeth from the ground, as shown in Fig. 4.

Pivoted to the upper end of the arm O' upon the rake-shaft and extending forwardly therefrom, passing, preferably, between the hand-lever and the standard, is a bar or plate, P', which is provided with a longitudinal slot, through which a pin, Q', on the standard passes. The rear end of this slot is turned downwardly and slightly forward, forming a short hook-shaped slot, R'. The forward end of this slotted plate is provided with a foot-plate, S'. The object of this slotted bar P' is to hold the teeth in an elevated position whenever it is desired, this being accomplished by first elevating the teeth by means of the dumping-lever, then with the toe of the foot lifting the bar, so that the pin Q' on the standard will enter the short slot R', as shown in dotted lines in Fig. 14, when the lever may be released, and the teeth will remain in an elevated position.

In addition to the above-described method of dumping the machine by means of the hand-lever M', we have provided another, whereby the motion of the axle of the machine is utilized for that purpose, the dumping devices being thrown into engagement by a slight pressure of the foot upon a foot-lever located near the driver's seat, as will presently appear. Secured loosely upon the axle of the machine, directly behind the hand-lever M', is a plate or disk, T', which is provided with an upwardly-extending arm, U', and is held in its place on the axle between a collar, V', on the axle and a ratchet-wheel, W'. Connecting the upper end of the arm U' with the arm O' on the rake-shaft are links X', which cause the two arms to move simultaneously. Pivoted to the arm U', so as to engage with the ratchet-wheel secured on the axle, is a pawl, Y', which has a curved arm or extension, Z', which extends downwardly in front of the axle and is provided with a laterally-projecting pin, A'', at its lower end. Immediately in line with this arm of the pawl and secured on the rake-shaft, preferably formed integral with the arm O', is a depending arm, B''. Secured to the under side of the frame and projecting rearwardly therefrom is a bar, C'', which is provided at its rear end with a hook or bent portion, D'', which engages with the pin A'' on the arm of the pawl. This bar C'' is kept normally backward in the position shown in Fig. 3 by means of a spring, E''. This bar C'' is secured to the frame by means of bolts which pass through slots in the bar, and is capable, by reason of these slots, of a limited backward and forward

movement. Pivoted to the frame and engaging with an aperture in the sliding bar C'' is the foot-lever F'', which is located in close relation to the driver's seat for convenience, and by means of which a forward movement may be imparted to the sliding bar C''. When it is desired to dump the machine, all that is necessary to do is to press with the foot lightly upon the foot-lever F'', which will impart a forward movement to sliding bar C'', the rear bent end of the sliding bar engaging with the pin A'' and throwing the pawl Y' into engagement with the ratchet-wheel upon the revolving axle, after which the foot-lever may be released and the sliding bar will be carried backward by its spring to its normal position. As the axle revolves, the loose disk with its arm will be carried around a short distance with it by reason of the pawl and ratchet, and by means of the connecting-links between the disk arm U' and the arm O' on the rake-shaft a partial rotary movement is imparted to the latter, thereby elevating the rake-teeth from the ground and dumping or releasing the hay therefrom. When the teeth have been elevated sufficiently to release all the raked hay, the depending arm B'' on the rake-shaft, by reason of the rocking movement imparted to this shaft, will contact with the depending arm Z' of the pawl Y' and disengage the same from the ratchet-wheel upon the shaft, when the rake-teeth will be released and fall to the ground, their own weight being sufficient to carry them down the instant they are released, and all the parts will assume their normal position, ready for another operation.

The principal advantage in so constructing the dumping mechanism that the motion of the machine will serve to elevate the rake-teeth whenever desired is that a small boy or very weak person may serve as a driver, all that is required of him being simply to press with his foot lightly upon the foot-lever, while the usual method of dumping by a hand-lever requires a man of some strength for the purpose.

It is evident that we may do away entirely with the hand-lever for dumping the rake and use exclusively the foot mechanism.

The letter I'' designates a bracket projecting from the rear side of the frame of the machine to serve as an additional support or brace for the rake-shaft.

It will be observed that by our construction of the rake-heads practically all the metal used in constructing them, including the rollers thereon, is disposed to the rear of the rake-shaft, whereby it is utilized to keep the teeth down closely to the ground and thereby perform the raking operation in a more thorough manner. It will also be observed that by reason of the rake-sections being independently attached to the rake-shaft they may readily accommodate themselves to the uneven character of the ground without affecting the operation of each other in the least, which cannot be the case in most of the machines now

in use, where a weight-bar or locking-bar is used to weight down or lock the teeth together.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the axle provided with a ratchet-wheel, of the ground-wheel journaled upon the axle and having secured to it the plate C, the latter being provided with the extension D and perforated ear E, the spring-actuated pawl pivoted to the plate C and engaging the ratchet-wheel on the axle and provided with the outwardly-extending arm H and curved pin I, which latter passes through the perforated ear E, the spring for actuating the pawl, and the pivoted hook J, all arranged substantially as and for the purpose set forth.

2. The combination of the rake-shaft, the rake-heads composed of clamping-plates bolted together so as to embrace the rake-shaft and be held thereon, said clamping-plates being provided with recesses V in their contiguous faces, perforated yielding bearing-blocks inserted in the recesses in the contiguous faces of the clamping-plates, and rake-teeth passing through the perforations in the bearing-blocks and held between the clamping-plates, whereby a limited yielding movement of the rake-teeth is permitted, substantially as described.

3. The combination of the clamping-plates provided with enlarged grooves T in their contiguous faces for the reception of the rake-teeth, these plates being also provided with recesses V, located near their rear ends and intersecting the grooves T, the perforated elastic bearing-blocks W, inserted in the recesses V, and the rake-teeth passing through the perforations in the said bearing-blocks and resting in the enlarged grooves T, whereby the rake-teeth are allowed a limited yielding movement, substantially as described.

4. The combination of the clamping-plates provided on their contiguous faces with enlarged grooves T, terminating at their forward ends in circular depressions U, the said plates being also provided with recesses V, located near their rear ends and intersecting the grooves T, perforated elastic bearing-blocks inserted in the recesses V and held between the clamping-plates, the rake-teeth resting in the enlarged grooves T and passing through the perforated elastic bearing-block and having their rear ends bent so as to fit the depressions U at the termination of the grooves T, and the bolts c, passing through the center of the depressions U and serving to secure the clamping-plates together and hold the rake-teeth in place, substantially as and for the purpose described.

5. The combination of the axle mounted upon wheels and provided with tappets, the frame mounted on the axle and endwise movable thereon, the grooved collar D', secured upon the axle, the horizontal lever B', pivoted to the frame and engaging the grooved collar upon the axle, the upright hand-lever E', piv-

oted to the frame and engaging with the said horizontal lever, the gravitating locking-hook F', pivoted to the said upright lever E' and provided with the extension G', and the rake-shaft and the rake-heads, substantially as described.

6. The combination of the frame suitably mounted, the rake-shaft N, journaled in the frame, the independent rake-sections, each one of which is provided with a forward extension, R, the rake-shaft H', journaled in the frame of the machine in front of the rake-shaft and running parallel therewith, the said shaft H' being provided with the rearwardly-extending arms K', which are adapted to impinge upon the under side of the forward extensions R of the rake-sections, and the foot-lever I', pivoted to the frame and connected to the rock-shaft H', whereby the same is operated, substantially as described.

7. The combination of the frame mounted upon suitable wheels, the rake-shaft journaled in the frame and provided with the arm O', the lever M', connected to the arm O', the rake-sections upon the said rake-shaft, the standard mounted upon the frame and provided with a pin, Q', and the plate P', connected to the said arm O' and provided with a longitudinal slot terminating at its rear end in short downwardly-directed slot R', the said pin Q' being adapted to work in the slots in this plate, substantially as described.

8. The combination of the axle, the loose

disk mounted thereon and provided with an arm, U', the pawl pivoted to this arm and provided with the downwardly-extending arm, which in turn is provided with a lateral pin, A'', the ratchet-wheel upon the axle adjacent to the said loose disk, the rake-shaft provided with the upwardly-extending arm O' and the depending arm B'', the former being connected to the arm U' and the latter being adapted to strike the downwardly-extending arm of the pawl Y', the rake-sections upon the shaft, the spring-actuated sliding bar C'', for engaging the pin A'', and the foot-lever for operating the said bar C'', all substantially as described.

9. The combination of the axle, the ratchet-wheel secured thereon, the pawl Y', pivoted on an arm, U', loosely supported upon the axle, means for throwing said pawl into engagement with the ratchet-wheel, the rake-shaft provided with an upwardly-extending arm, O', and a depending arm, B'', the latter being adapted to strike the pawl Y' and disengage it from the ratchet-wheel, and the links X', connecting the said arms U' and O' together, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

ISRAEL L. LANDIS.
ALBERT ISKE.

Witnesses:

P. DONNELLY,
ANTHONY ISKE.