

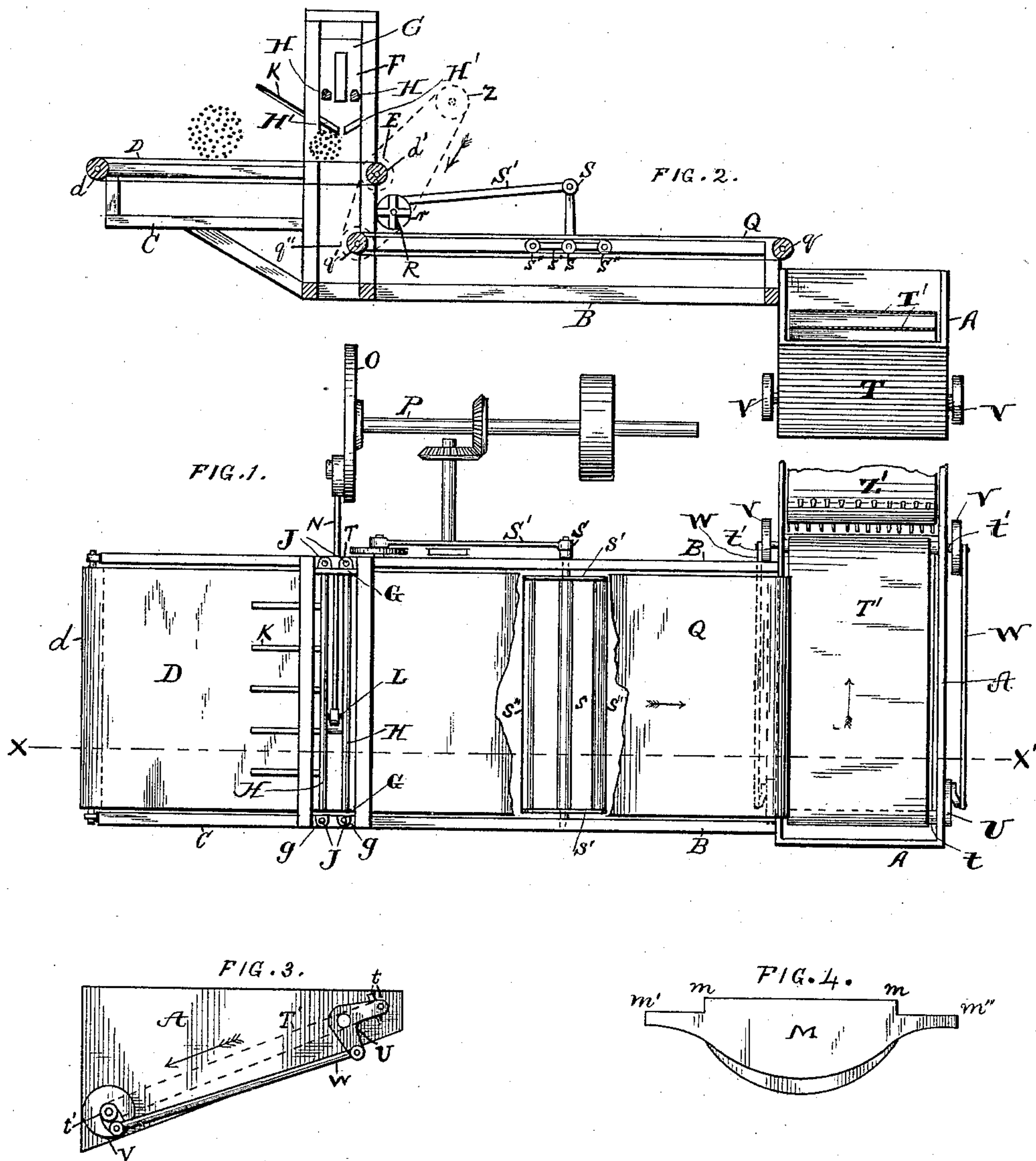
(No Model.)

3 Sheets—Sheet 1.

H. L. EARLE.
BAND CUTTER AND FEEDER.

No. 409,461.

Patented Aug. 20, 1889.



WITNESSES:

E. J. Mackess

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(No Model.)

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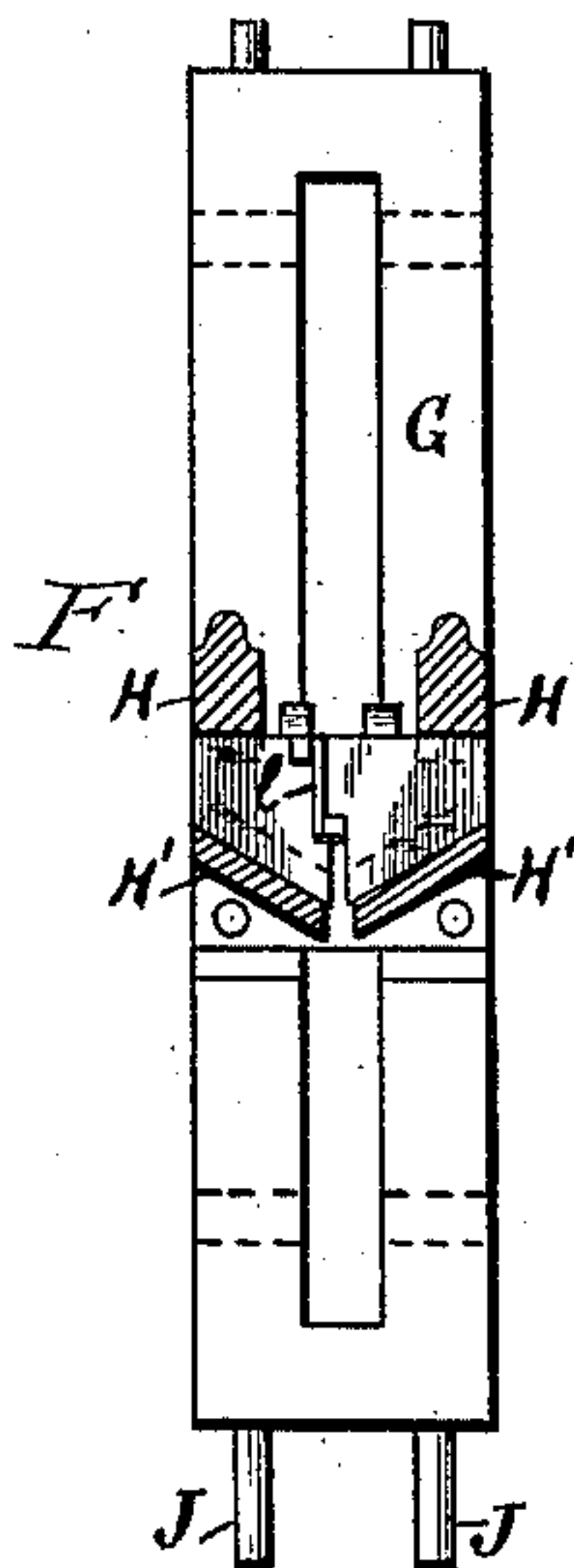


FIG. 6.

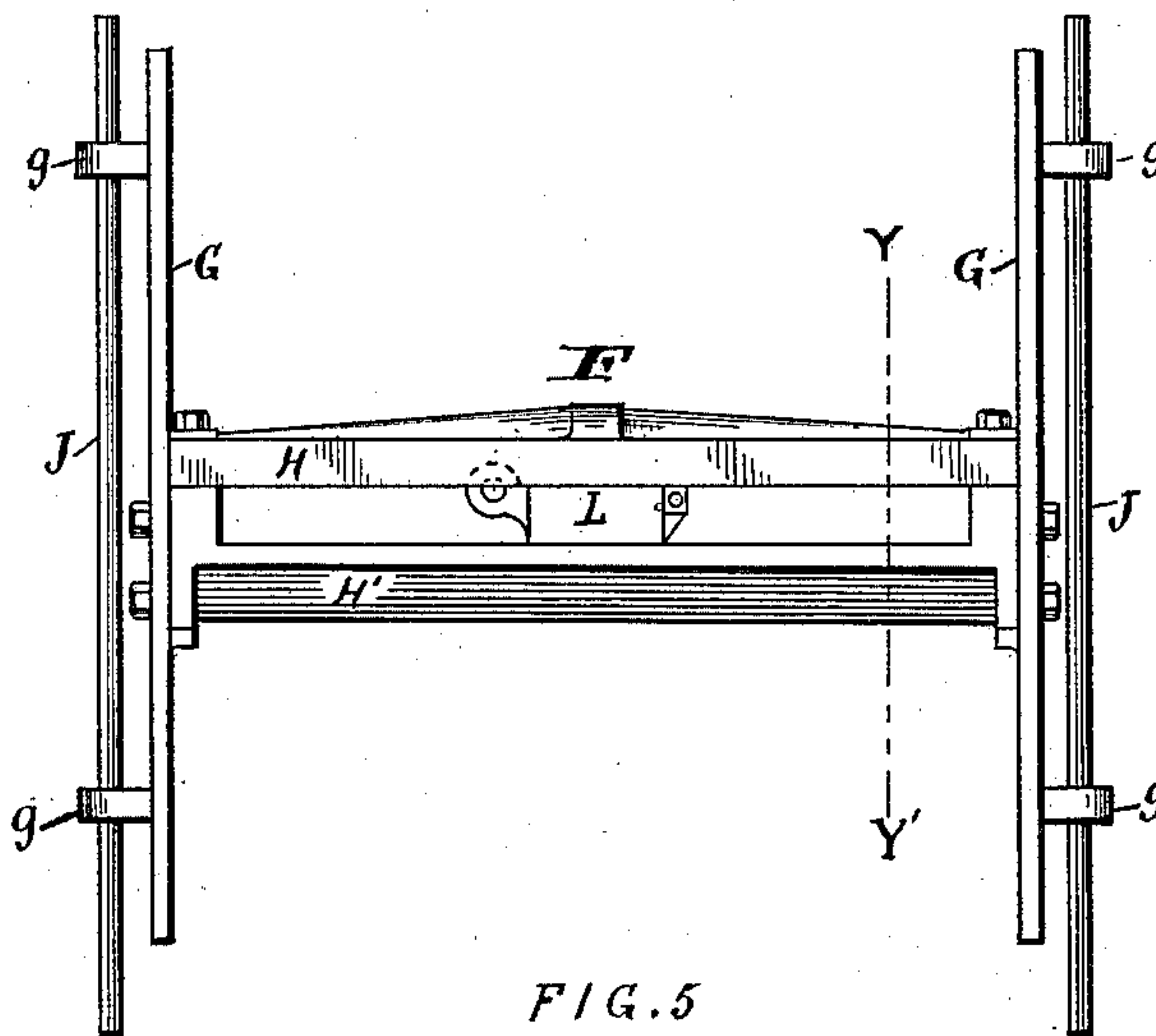


FIG. 5

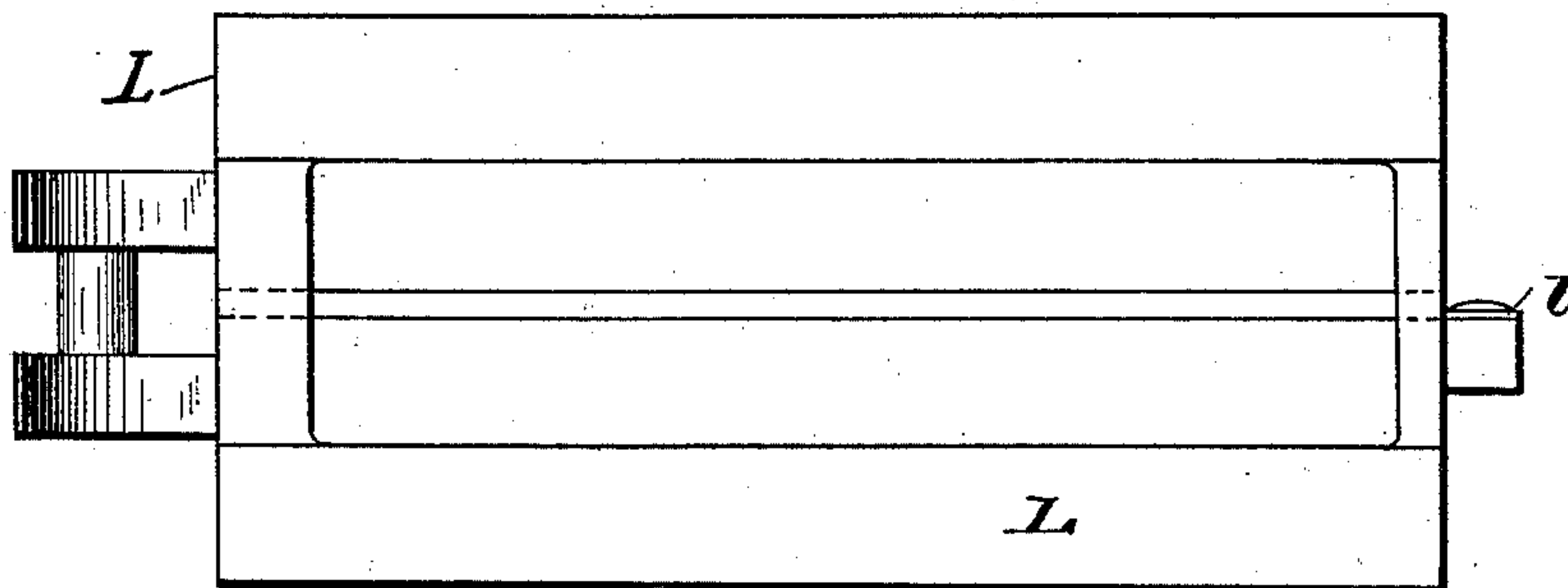
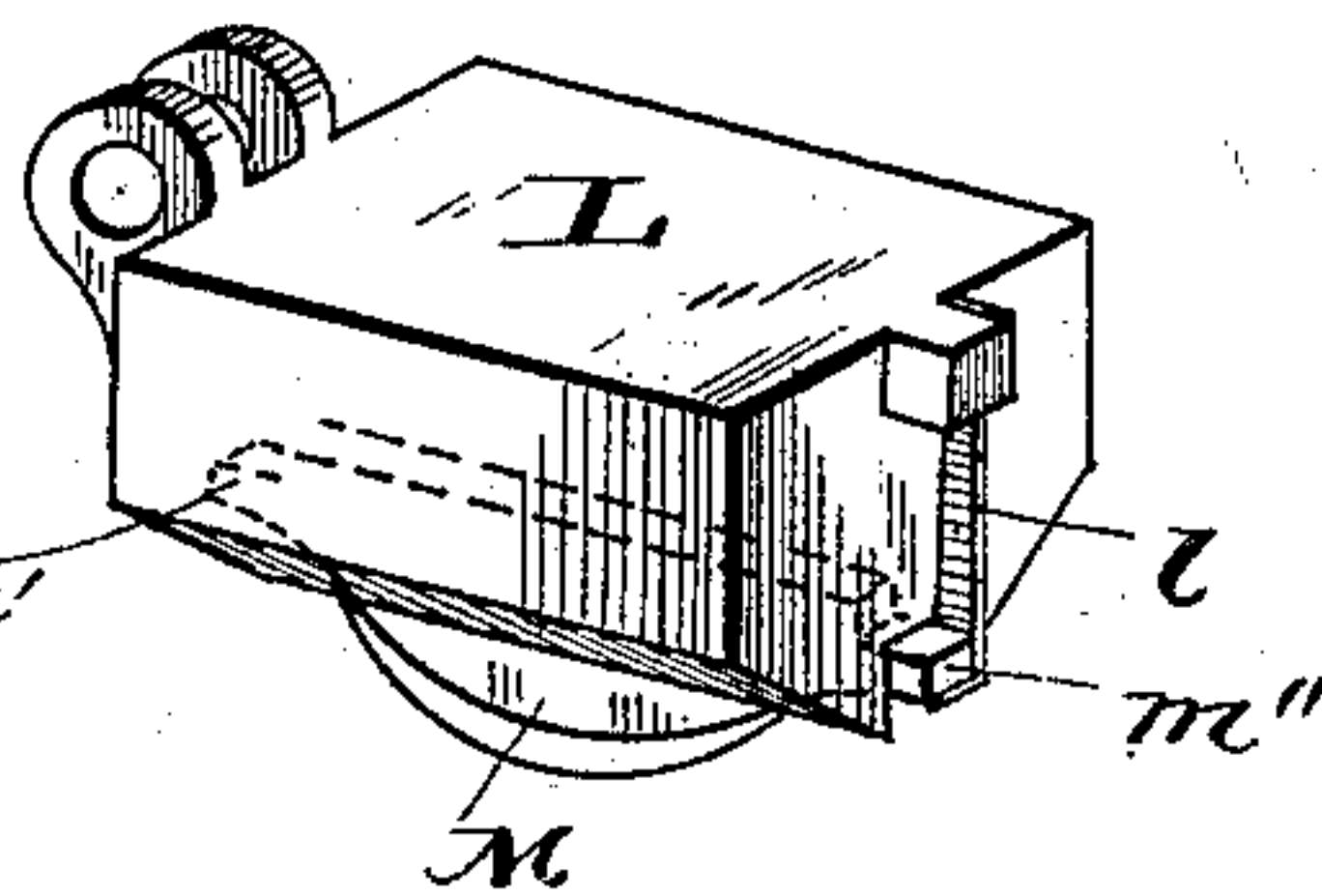


FIG. 7.

Fig. 10



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Fig 8

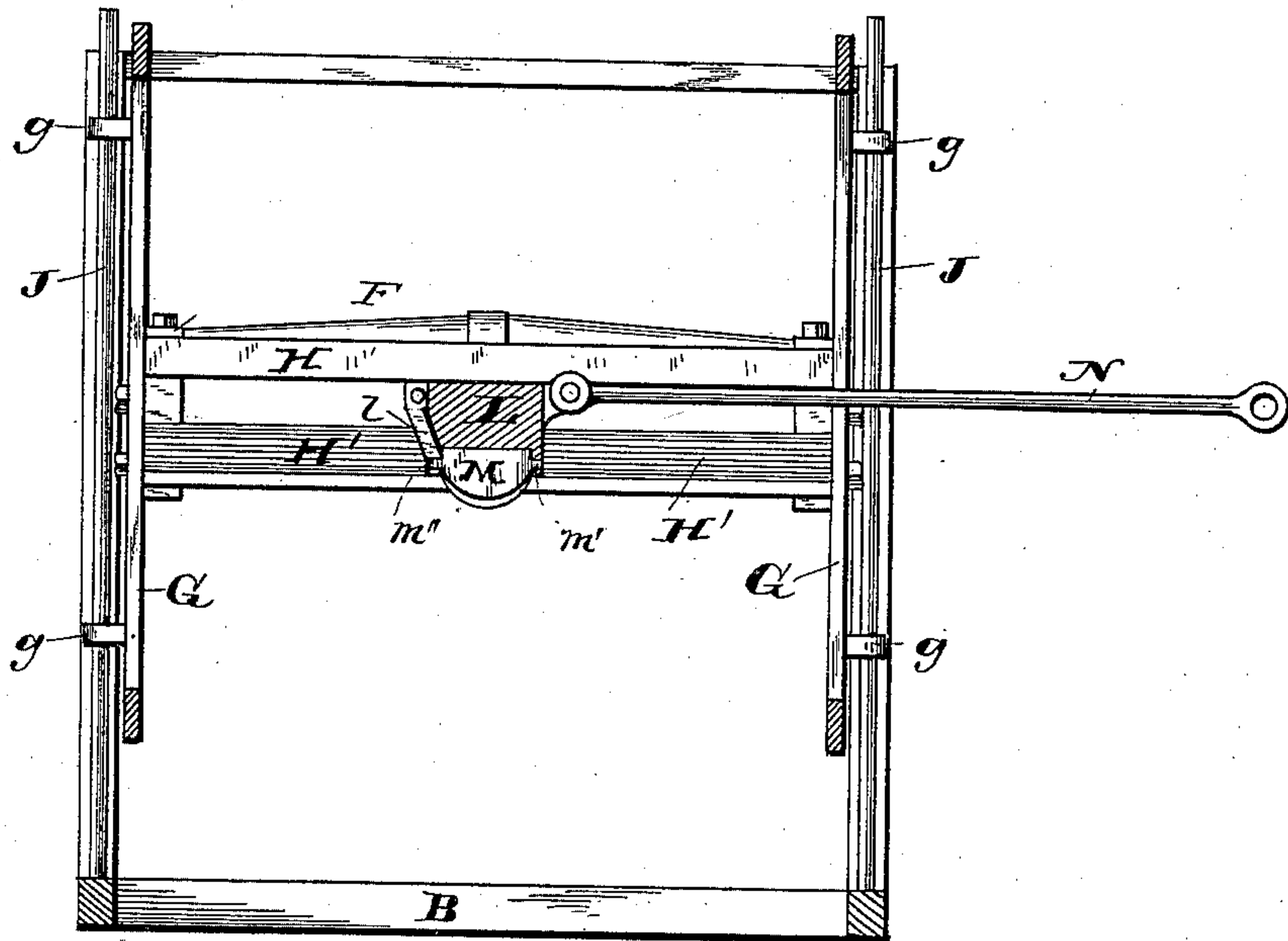
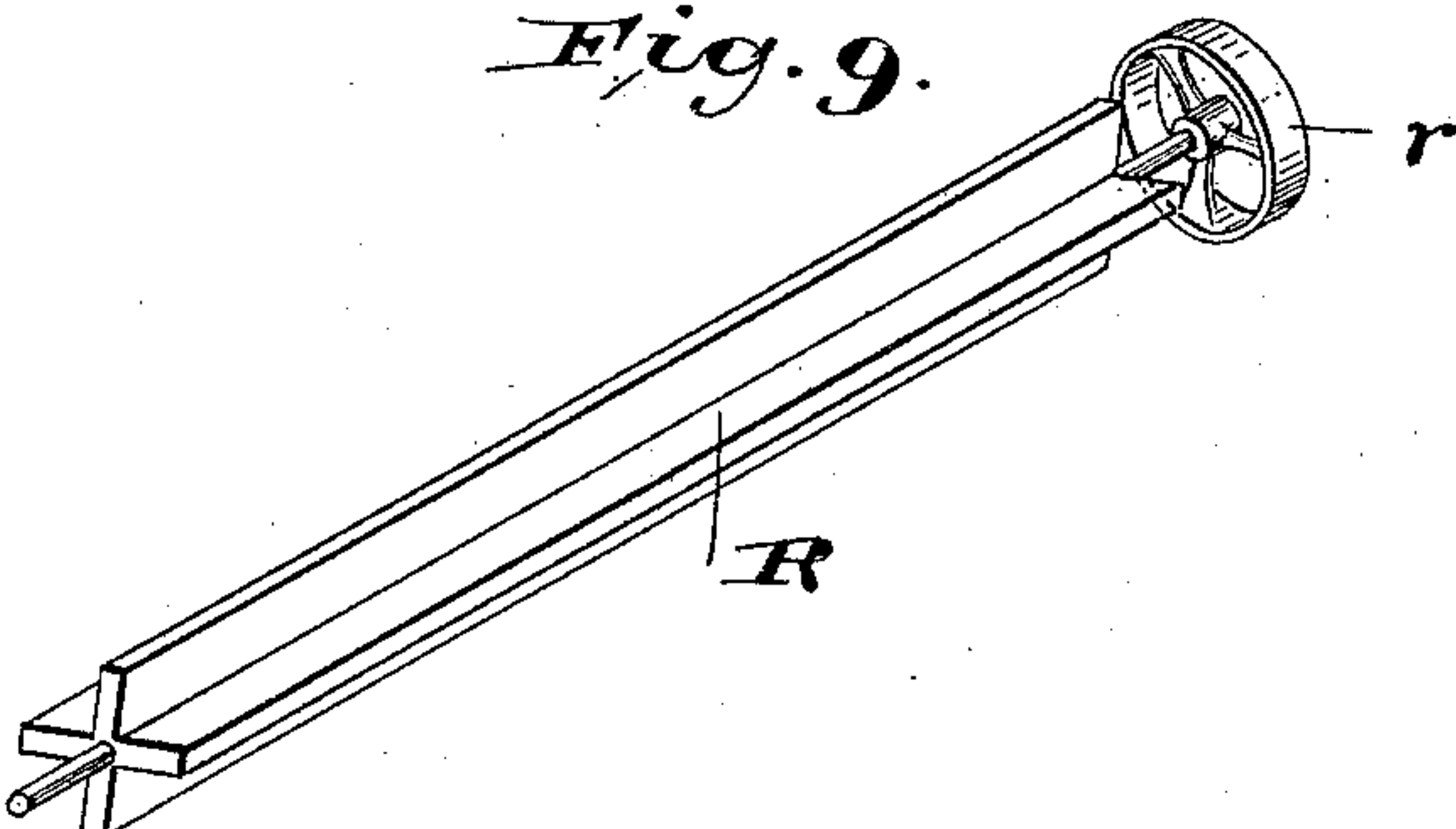


Fig. 9.



Witnesses:

E. M. W. K. K.
L. M. P. H. K. K.

Inventor
Harry L. Earle
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UNITED STATES PATENT OFFICE.

HARRY L. EARLE, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE EARLE MANUFACTURING COMPANY, OF SAME PLACE.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 409,461, dated August 20, 1889.

Application filed December 27, 1886. Renewed April 1, 1889. Serial No. 305,630. (No model.)

To all whom it may concern:

Be it known that I, HARRY L. EARLE, a citizen of the United States, residing at Minneapolis, county of Hennepin, State of Minnesota, have invented a certain new and useful Band-Cutter and Feeder, of which the following is a specification, reference being had to the accompanying drawings.

My invention has for its object to improve band-cutters and feeders; and it consists in the construction hereinafter fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which like letters refer to like parts throughout.

Figure 1 is a plan view of my mechanism in position for working. Fig. 2 is a section on the line $x x'$ of Fig. 1. Fig. 3 is a side elevation of the feeder detached. Fig. 4 is a detail showing the knife. Fig. 5 is a front elevation of the vertically-adjustable band-cutter carriage. Fig. 6 is a section of Fig. 5 on the line $y y'$. Fig. 7 is a bottom plan of the cross-head or cutter-head. Fig. 8 is a vertical section of the band-cutter carriage and its supporting-frame in the plane of the knife. Fig. 9 is a perspective of the beater, and Fig. 10 is a perspective of the cross-head detached.

A is a part of the casing constituting the feeding-table in front of the thrashing-cylinder.

B is the main supporting-frame on which the band-cutting mechanism is placed. This frame is arranged at right angles to the casing A, and may be supported at the desired height in any suitable way.

C is the sheaf-receiving table or frame, consisting of an endless carrier D, traveling around rollers $d d'$, having their journals resting in boxes on opposite sides of the frame. Motion is imparted to the carrier D by a pulley E on the roller d' .

F is a vertically-adjustable band-cutter carriage, consisting of vertical side pieces G, provided with eyes or loops g , and pairs of cross-head guides H H and H' H', rigidly secured to the side pieces G.

J are vertical guides consisting of rods attached rigidly to the main frame B at right angles to the carrier D, and extending above the same directly over its delivery end. There are four of these rods, two on each side of the

carrier D, each passing through the eyes or loops g on the side pieces G, and serving to support and allow the vertical adjustment of the carriage F and its connecting mechanism. The lower pair of cross-head guides H' H' are set at an obtuse angle to each other and at an acute angle to the path of the bundles, and have space enough between them to allow the free passage of the knife.

To the under side of the guide H', and pressing the uncut bundles, are attached a series of spring-fingers K K, having the same angle to the carrier or path of the bundle as guides H'. The weight of the band-cutter carriage F co-operates with the endless carrier D to feed and hold the uncut bundles under the band-cutter. The inclined guide H', facing the uncut bundle, and the spring-fingers assist in this respect, but the carriage alone will do the work. The guide and the fingers are accessories, rendering the action more perfect. The holding of the uncut bundle positively in the most favorable position to be cut by the reciprocating knife is a very important function served by this carriage.

L is a cutter-carrying cross-head slotted on its under surface from one end to a point near to the other end, and provided with a lug-seat in one end directly opposite to its slot.

M is a band-cutter or knife proper. Its cutting-edge is in shape like the arc of a circle. On its upper surface it is provided with shoulders $m m$, and has longitudinally-projecting lugs $m' m''$. To the outer end of the cross-head, adjacent to the vertical slot in the same, is secured a spring-catch l . The knife M is placed with the lug m' in the lug-seat opposite to the slot, and the lug m'' is engaged by the hook on the catch l . In this manner the knife M is detachably held in the cross-head L.

N is a connecting-rod pivotally attached at one end to the cross-head L, and to the other to a crank-disk O on the shaft P. The shaft P is coupled to a source of motion. (Not shown.)

Q is an endless carrier traveling around rollers $q q'$, to which motion is imparted by a pulley q'' on the roller q' , and is placed intermediate the carrier D and the mouth of the thrasher and at a lower level than carrier D.

The rollers q q' are journaled in boxes on the main frame. Intermediate the carriers D and Q is placed a beater R, which is composed of wings attached to end pieces which are supported in suitable bearings on the main frame. The beater R is provided with a pulley r , communicating with a source of motion. This beater R is placed just below the delivery end of the carrier D and above the receiving end of the carrier Q. It is thus directly in the path of the cut bundle, and serves to loosen up the grain as it comes from the carrier D.

S is the canvas or carrier agitator, placed intermediate of the top and bottom of the carrier Q. It consists of a rock-shaft s , journaled in boxes on the sides of the main frame, and end pieces s' , rigid with the rock-shaft, and the cross-rod s'' , parallel with the shaft s and rigidly attached to the end pieces s' .

S' is a pitman or connecting-rod attached at one end to the rock-shaft s and at the other to the crank-disk on the beater R; or it may be an eccentric on the shaft of the same. By this construction the rotary motion from the beater R will be converted into a rocking motion in the agitator S' , striking and agitating the top and bottom of the carrier Q.

T is the feeder taken as a whole.

T' is an endless carrier traveling in the direction shown by the arrow around the rollers t t' . The roller t' is journaled in boxes fixed in the sides of the casing A. The roller t , or upper roller, is journaled in boxes in the outer extremities of the upper arms of the bell-crank levers U, the journals of these rollers passing through slots in the side pieces of the casing A. These levers U are pivotally attached at their elbows to the sides of the casing A, adjacent to the slots in the same. To the lower arms of these bell-crank levers are attached connecting-rods W, which at their other ends are connected to crank-disks on the roller t' . Motion is imparted to the whole by pulleys on the lower roller t' communicating with a source of motion. The effect of this mechanism is, in addition to revolving the carrier T', to give a tilting motion to the upper end of the carrier on the journals of its lower roller as a pivot. The grain falling on the carrier T' from the carrier Q is given a motion precisely similar to that imparted by hand-feeding. Motion is imparted to the driving-pulley of the carriers D Q and the beater R by a belt Z, communicating with a source of motion. The carrier D has a comparatively rapid motion. The vertically-adjustable block F is free to rise by the pressure of the bundles and falls by its own weight. It may be made of sufficient weight to give the requisite pressure, or tension may be added by springs suitably applied. The cross-head, with its knife, is driven very rapidly.

The operation is as follows: The bundle is received on the carrier D. By this the bundle is carried forward under and into contact with the fingers K of the front guide-block

H'. If the bundle should not be straight across the carrier, it will be brought to that position by the joint action of the fingers K, the guide-block H', and the band-cutter carriages F. The fingers and block will tend to retard the progress of the bundle, and if one end be presented before the other it will be checked and the rapidly-moving carrier D will bring the other end of the bundle up in line with the cutter. The bundles are thus always presented on a line parallel with the track of the cutter and the bands are presented at right angles to the same. By the co-operation of the carrier D and the vertically-adjustable carriage the bundles are forced under the cutter by sure and positive feed. The knife being reciprocated very rapidly the bands are in every case cut. Having passed the cutter the band-cut bundle is delivered over the beater R, by which it is loosened up and spread apart and thence to the carrier Q. By the vertical agitation given to the carrier Q by the agitator S the grain becomes thoroughly loosened and is delivered to the feeders in a uniform and even stream. Here it is carried downward toward the cylinder and the butts are tilted up as if by hand by the tilting movement imparted to the upper end of the feeder through the bell-crank levers U and connecting-rods W. Z' represents a part of the thrashing-cylinder in proper position with reference to the feeding-belt T'.

In practical use two band-cutters and two sets of carriers are used, one on each side of the separator. This tends to supply the grain to the feeder in a uniform stream.

The side pieces G of the band-cutter carriage F may be dispensed with and the eyes or keepers g may be attached directly to the ends of the carriage. The inclined under sides of the guide H', facing the uncut bundle, serves as a bundle-guide and will of itself suffice, in co-operation with the bundle-carrier D, to bring the uncut bundle under the knife M without the guard or spring-finger K.

Changes may be made in many of the minor features of the construction herein shown and described without departing from the spirit of my invention.

It should be noted, as hereinbefore stated, that the vertically-movable block F is not only a band-cutter carriage but is a bundle-feeding and a bundle-holding device. It assists to bring the bundles to the proper position under the reciprocating knife and it holds them there until the bands are cut. This a very important and a distinguishing feature of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows;

1. The combination, with a supporting-frame, of a bundle-carrier mounted in said frame, vertical guides secured to said frame and extending above said carrier, a band-cutter carriage movable upward in said guides by the pressure of the bundles, a band-cutter

mounted on said carriage, and a bundle-guide secured to said carriage at an acute angle to the plane of said carrier, substantially as described.

5 2. The combination, with a supporting-frame, of a bundle-carrier mounted in said frame, vertical guides secured to said frame and extending above said carrier, a band-cutter carriage movable upward in said guides
10 by the pressure of the bundles, a band-cutter mounted on said carriage and reciprocating transversely to the path of the bundles, and a bundle-guide secured to the under side of said carriage at an acute angle to said carrier and provided with spring guards or fin-
15 gers extending outward over the path of the uncut bundles, substantially as described.

3. The combination, with a supporting-frame, of a bundle-carrier mounted in said
20 frame, vertical guides secured to the opposite sides of said frame and extending above said carrier, a band-cutter carriage movable upward in said vertical guides by the pressure of the grain, cross-head guides length-
25 wise of said carriage, a cross-head movable between said cross-head guides, a band-cutter or knife secured to said cross-head and projecting below said carriage, a crank-shaft coupled to a source of motion, and a connect-
30 ing-rod pivotally attached to said cross-head and crank, substantially as described.

4. In a band-cutter, the combination, with the slotted cutter-head L, having at one end a lug-seat and at the other a spring-catch *l*,
35 directly in line with said slot, of the knife M, fitting said slot and provided with the lug *m'*, adapted to fit said lug-seat, and with the lug *m''*, adapted to be engaged by said catch *l*, substantially as described.

40 5. The combination, with a suitable supporting-frame, of the vertical guiding-rods J, rigidly secured to said frame, the cutter-carriage F, having keepers *g*, sliding on said rods, the pairs of cross-head guides H H and H' H',
45 arranged and shaped, as described, the cross-

head L, the band-cutter M, attached to said cross-head, and the connecting-rod N, coupled to a source of motion, substantially as described.

6. The combination, with the frame B, of 50 bundle-carrier D, guiding-rods J, carriage F, provided with keepers *g*, embracing said rods, cross-head guides H H and H' H', as described, guards K, attached to one of the guides H', facing the uncut bundle, cross-head L, detach- 55 able arc-shaped cutter M, attached to said cross-head, connecting-rod N, crank-disk Q, and driving-shaft P, substantially as described.

7. The combination, with a thrashing-cyl- 60 der and a suitable supporting-frame arranged in front of said cylinder, of a feeding-belt mounted on driving-rollers and supported on said frame at an incline to said cylinder, fixed bearings in said frame for the lower of said 65 driving-rollers, bell-crank levers pivoted at their elbows to said frame and having bearings in their outer arms for the upper of said driving-rollers, a crank-shaft coupled to a source of motion, and connecting-rods from 70 said crank-shaft to the lower arms of said bell-crank levers, substantially as described.

8. The combination, with a thrashing-cyl- 75 der, of an inclined slotted casing in front of said cylinder, a feeding-belt mounted on driving-rollers supported on said frame at an incline to said cylinder, fixed bearings in said casing for the lower of said rollers, bell-crank levers pivoted at their elbows adjacent to the slots in said casing and having bearings in 80 their outer arms for the upper of said rollers, a crank-shaft coupled to a source of motion, and connecting-rods from said crank-shaft to the lower arms of said bell-crank levers, substantially as described.

HARRY L. EARLE.

In presence of—

EMMA F. ELMORE,
J. F. WILLIAMSON.