

(No Model.)

2 Sheets—Sheet 1.

M. A. SMITH.
BAND CUTTER AND FEEDER.

No. 418,592.

Patented Dec. 31, 1889.

Fig. 1.

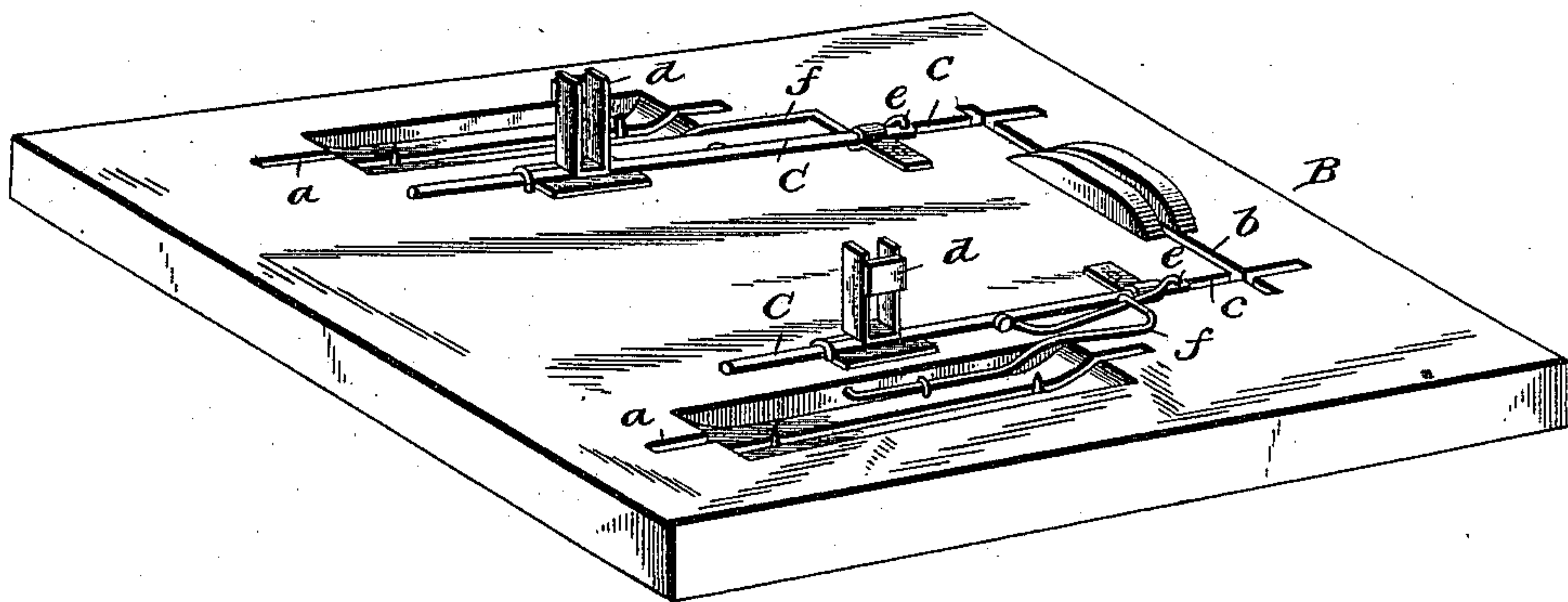
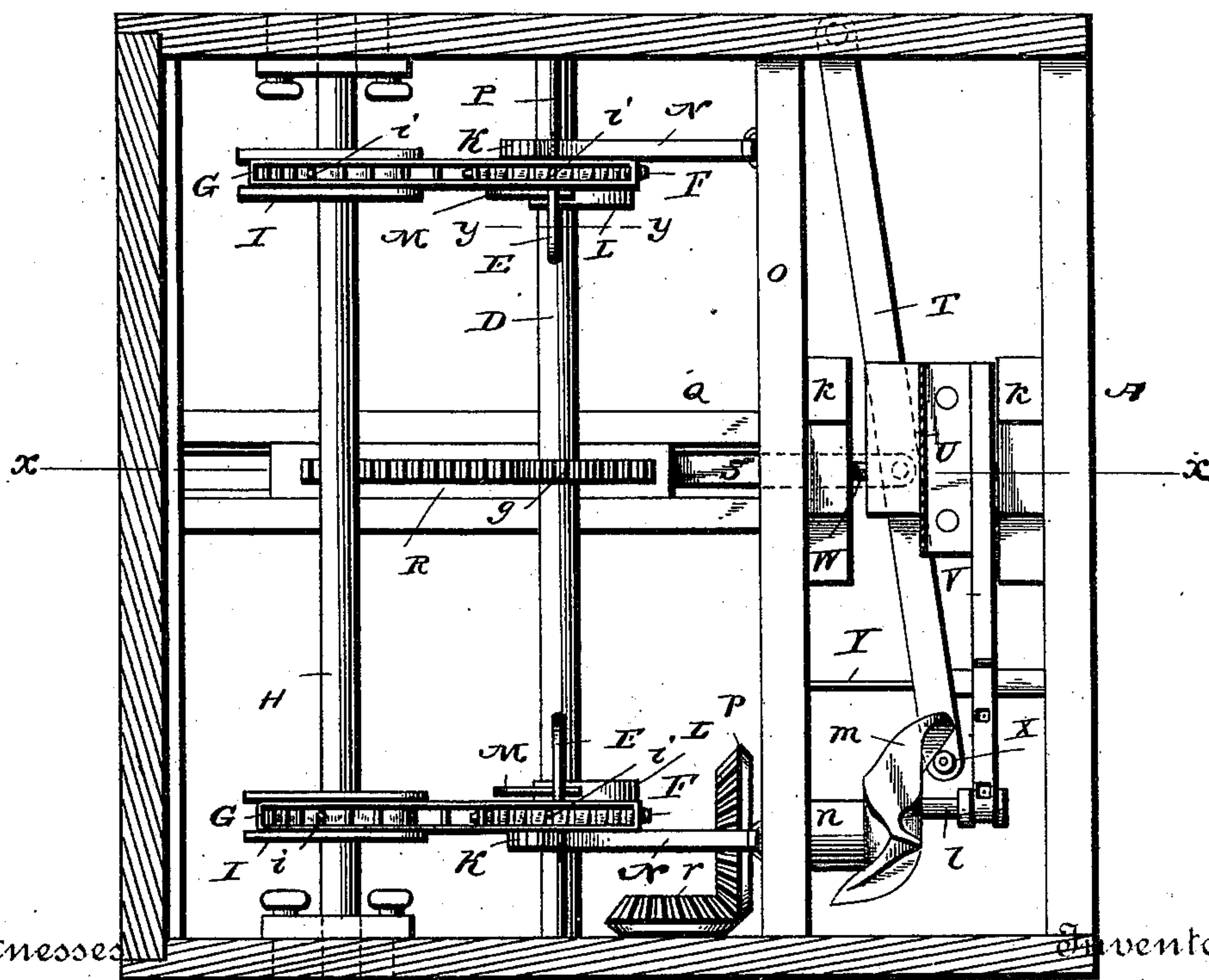


Fig. 2.



Witnesses

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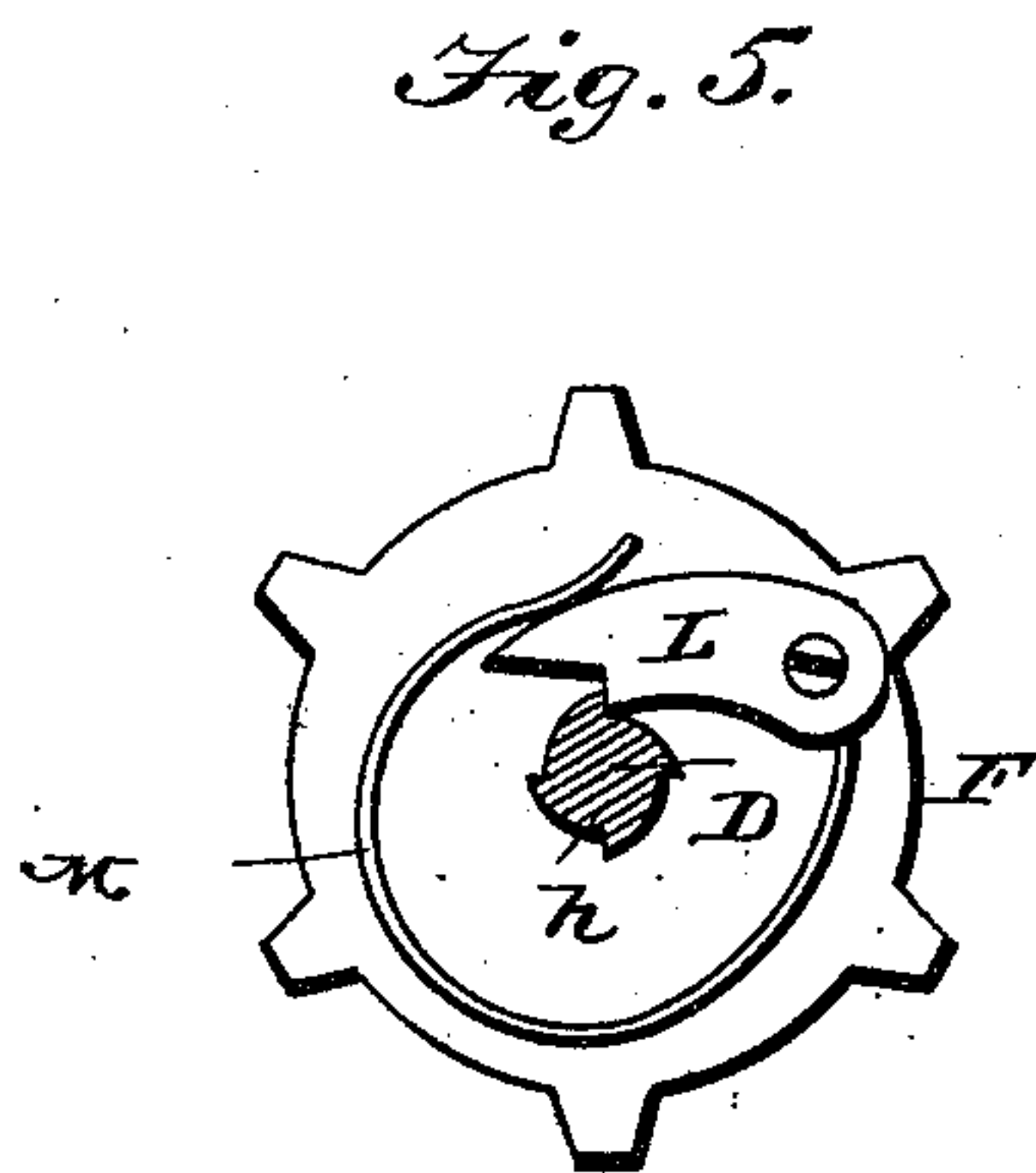
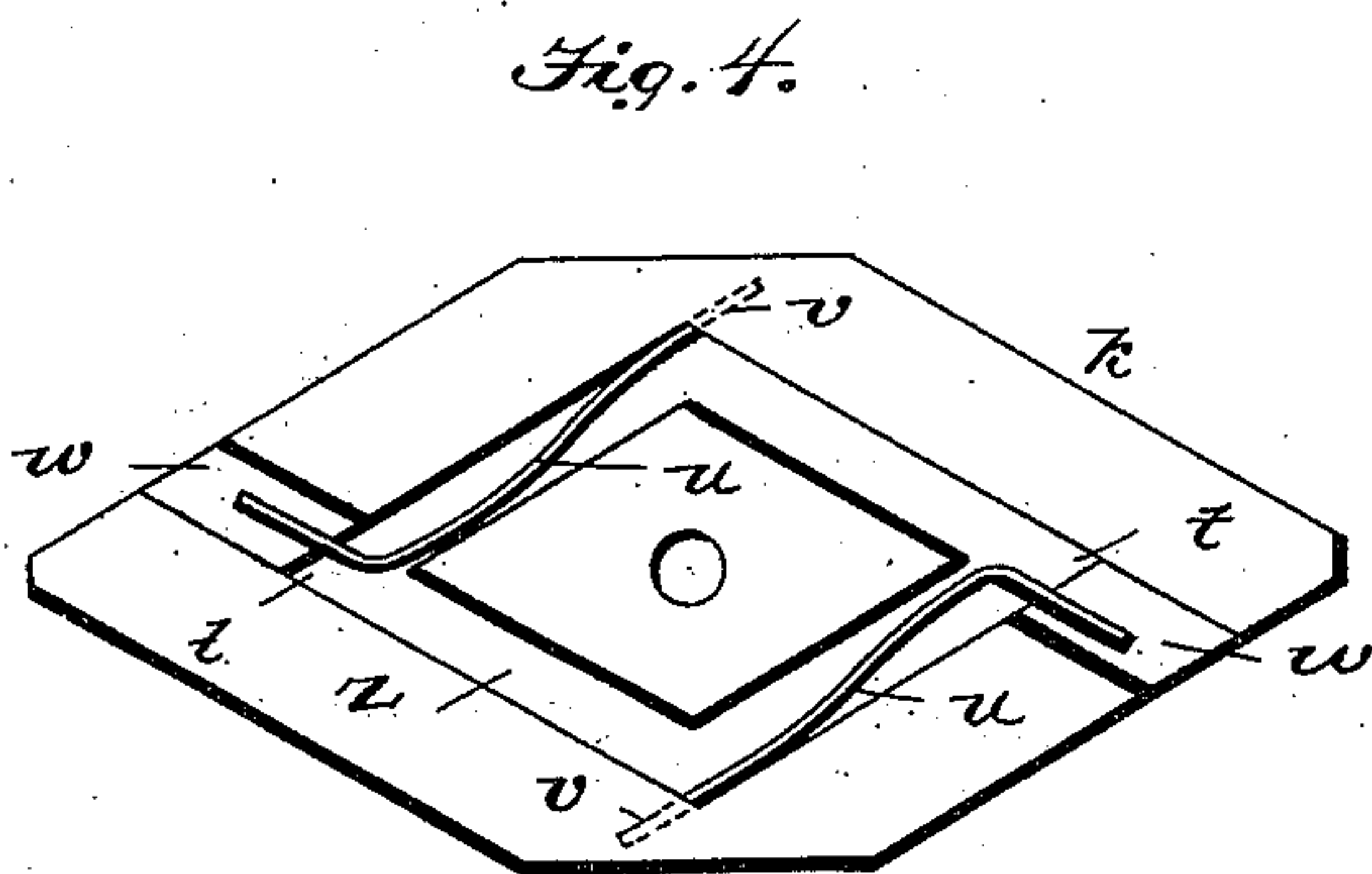
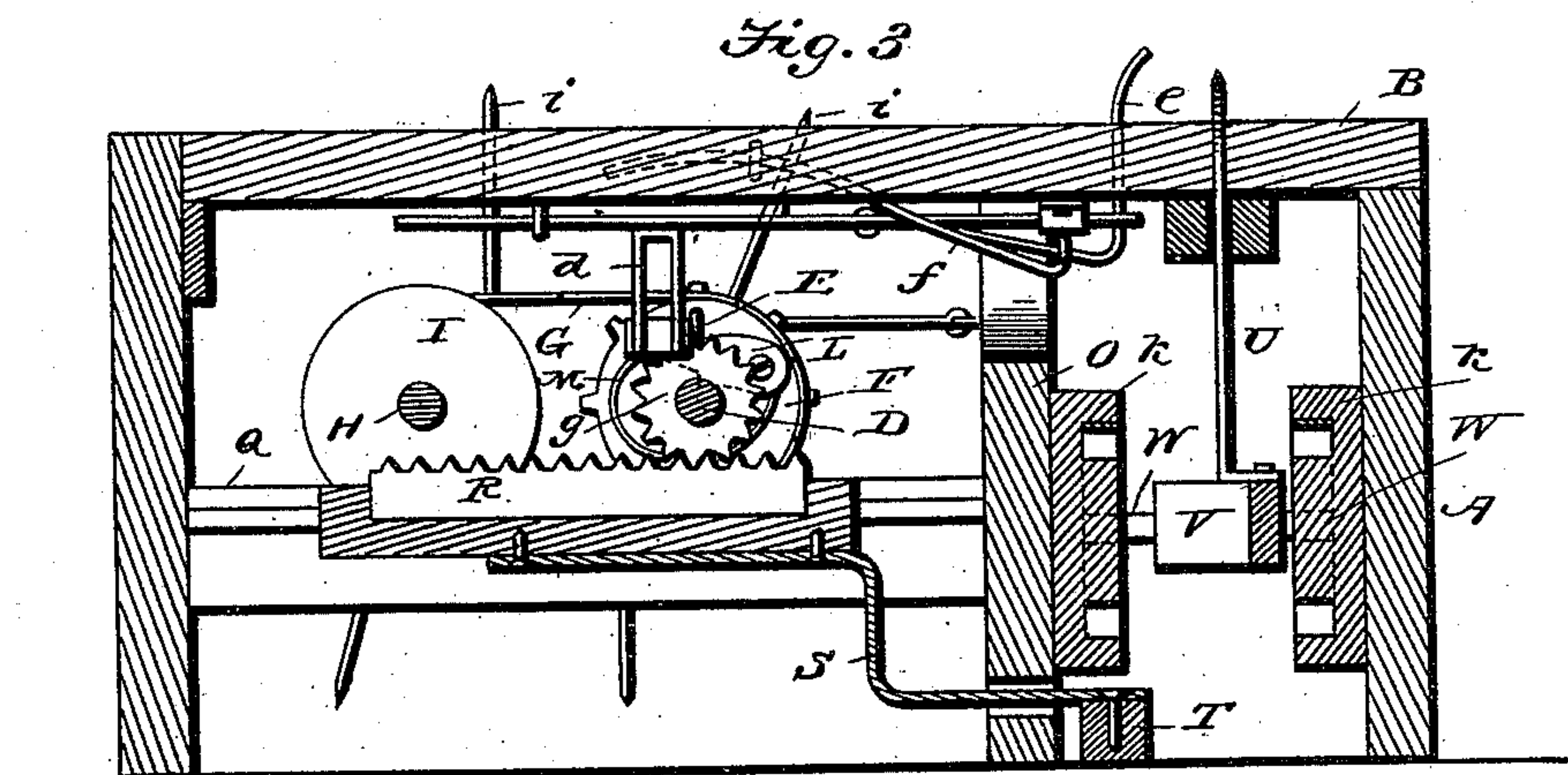
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2 Sheets—Sheet 2.

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Witnesses

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Inventor

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James J. Shuler.

UNITED STATES PATENT OFFICE.

MARTIN A. SMITH, OF ATLANTIC, IOWA.

BAND-CUTTER AND FEEDER.

SPECIFICATION forming part of Letters Patent No. 418,592, dated December 31, 1889.

Application filed April 23, 1889. Serial No. 308,323. (No model.)

To all whom it may concern:

Be it known that I, MARTIN A. SMITH, a citizen of the United States, residing at Atlantic, in the county of Cass and State of Iowa, have invented certain new and useful Improvements in Band-Cutters and Feeders; 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.

This invention has relation to improvements in attachments for thrashing-machines, and of the class known as "band-cutters and feeders."

The novelty will be fully understood from the following description and claims, taken in connection with the accompanying drawing, in which—

Figure 1 is a perspective view of the top plate or cover of my improved machine in an inverted position, showing the push-rod for manipulating the fingers and the means for connecting the said rods with the operating mechanism. Fig. 2 is a horizontal sectional view. Fig. 3 is a vertical sectional view taken in the plane indicated by the dotted lines *xx* of Fig. 2. Fig. 4 is a view of one of the grooved plates which guide the knife or cutter. Fig. 5 is a view of one of the sprocket-wheels, showing a pawl thereon and the shaft for supporting it in section.

Referring by letter to the said drawings, A indicates the main frame, which may be of a rectangular or other suitable form and adapted to join the frame of a thrashing-machine in the ordinary manner. B indicates the top of this frame A. This top is provided near opposite sides with parallel slits or ways *a*, for the passage of fingers carried on an endless chain, and adapted to deliver the bundled grain in a position to be acted upon by the knife, as will be presently explained. This top B is also provided in a plane relatively at right angles to the slots *a* with a vertical slot *b*, for the passage of the knife or cutter, and at opposite ends of this slot *b* and in a plane at right angles thereto are two slots *c*, to receive fingers carried by a reciprocated rod, and designed to advance or push the bun-

dle from over the knife-slot after the band has been severed.

Journalled transversely in suitable bearings on the under side of the top B are two reciprocating rods or pushers C, which are adapted to receive motion from the rock-shaft D through the medium of bent arms E on the said shaft, as will be presently described. These reciprocating rods or pushers have depending from their under side at a suitable point a bracket *d*, adapted to receive within them the bent arms E, the brackets being so formed that as the shaft D is partly rotated the bent arms E will freely disengage therefrom at every rotation or rocking movement. These push-rods C carry at their inner ends a finger *e*, which is curved, as shown, and adapted to pass through the slots *c* in the top. These fingers are pivoted to the push-rods C, and are actuated by a flat spring *f*, secured at one end to the under side of the top and connected at their opposite ends with the said pivoted fingers in advance of their pivotal point. By this construction it will be seen that, owing to the formation of the fingers, when the push-rods are moved in their bearings the fingers will enter the slot, and by the action of the spring connected with them they will rise and in the forward stroke engage the bundle immediately after the cord or band has been cut and push the same to the thrasher. When the push-rod has been reversed in its movements, the fingers will travel backwardly in the slots *c* and rise by the action of the spring in time to receive and push forward the next bundle. The springs *f* are preferably connected with the pivoted fingers *e* by means of an eye formed in the forward end of the former, and the said fingers have their forward ends so bent that they will offer no obstruction to the bundle as it is delivered above the knife or cutter.

D indicates the rock-shaft, which carries the arms E to impart a reciprocating motion to the push-rods and fingers carried thereby. This rock-shaft is provided about midway of its length, or any suitable point, with a fixed pinion *g*, and the said shaft is furthermore provided at suitable points with integral

ratchets *h*. Arranged loosely on this rock-shaft, and at suitable points adjacent to the ratchets thereon, are two sprocket-wheels *F*, which are designed to engage the links of
 5 endless chains *G*, which carry fingers adapted to pass through the slot *a* in the top and feed the bundle to the cutter. Journaled in rear of and parallel to this rock-shaft is a rotatable shaft *II*, which carries at a point in the
 10 plane of the sprocket-wheels two pulleys or sheaves *I*, which receive over them the endless chains which carry the fingers *i*. These sprocket-wheels have fixed to one side in a vertical position a ratchet-wheel *K*, and have
 15 journaled on their opposite sides a pawl *L*, the said pawl being pressed by a spring, such as *M*, so that the said pawls may be normally held in engagement with the ratchet *h*, formed on or made fast with the rock-shaft.

20 *N* indicates a detent-arm, which is hinged or secured at one end to a cross-bar *O* of the main frame, and its opposite end is adapted to enter the teeth of the ratchet *K*, secured to the sprocket-wheel. This detent-arm is held
 25 in engagement to the teeth of said ratchet by a spring-arm *P*, which has its outer end secured in the main frame, and there is one of these detents and spring-pressed arms with a ratchet for each sprocket-wheel.

30 As before described, the ratchet-wheels or sprocket-wheels are arranged loosely upon the rock-shaft and carry pivoted spring-pressed pawls, so that they will have an intermittent movement always in one direction,
 35 thereby driving the endless chain and manipulating the fingers which feed the bundle to the knife or cutter. By the employment of the ratchets secured to the sprocket-wheels and the detent-arms *N*, the said sprocket-
 40 wheels will be prevented from reversing their position on the shaft and by giving the latter a rocking motion by means which will be presently described the said wheels and endless chain are given an intermittent rotary
 45 motion.

Q indicates a frame, which is arranged transversely in the main frame *A*, and is designed to receive and guide a sliding rack-bar *R*, the said rack-bar engaging the pinion
 50 *g* on the rock-shaft *D*. This rack-bar receives a reciprocating motion from a cam *m* through the medium of an arm *S*, connected with a pivoted vibratory lever *T*.

U indicates the cutter. This cutter, which
 55 may be arranged at any desired angle and may be of steel or other suitable material to enter the slot *b* in the top of the frame, is secured to an arm *V* by means of bolts or other fastening devices, and is vertically disposed.
 60 This arm is provided with trunnions *W* on opposite sides, which enter ways in bearing-plates *k*, so as to receive a vertical reciprocating motion and impart the same to the cutter. These ways for the trunnions *W* are
 65 of approximately diamond shape in outline, and better shown in Fig. 4 of the drawings. This cutter-arm is connected at one end by

means of a crank-pin *l* with a rotatable cam *m*. The cam *m*, which is vertically disposed, is secured to one end of a shaft *n*, having at
 70 its opposite end a bevel-gear *p*, which meshes with a similar gear *r*, secured to the inner end of a shaft *s*, carrying a pulley or other suitable device for receiving a rotary motion. It will thus be seen that as motion is given
 75 to the shaft *s* it will be imparted through the medium of the gears *r* and *p* to the rotatable cam *m*.

The vibratory bar or arm *T*, which connects with the rack-bar *R* through the medium of
 80 the angular arm *S*, is provided at its free end with a vertical stud or lug *X*, adapted to be engaged by the cam *m* to give the said arm the desired vibratory motion. This arm *T* may be supported in position by means of a cross-
 85 rod *Y*.

The bearing-plates for the trunnions of the knife-bar, as more fully shown in Fig. 4 of the drawings, have diamond-shaped ways *Z*
 90 on their inner sides, and at the angles *t* of these ways are flat springs *u*, having one end secured at the point *v* in the said plates and their opposite angular ends playing in re-
 95 cesses *w*, so that during the stroke of the knife-bar the trunnions may be caused to travel without interruption and the knife or cutter given a proper movement to sever the band.

The springs in the trunnion-ways may have a piece of iron or steel to cover the space
 100 back of them, so that no dirt may clog the same or interfere with their free movement.

In operation, when motion has been given to the machine, as before described, and a bundle of grain placed upon the top *B*, the
 105 fingers on the endless chain, passing through the slots *a*, will feed the bundle toward the knife, and by the action of the cam the knife is reciprocated vertically, so as to come up through the slot *b* and sever the band on the
 110 bundle of grain above it. The fingers *e*, which are spring-actuated and receiving a reciprocating movement from the push-rod *C* through the medium of the arms on the rock-shaft, engage and drive the cut bundle toward the
 115 thrasher, removing it from the slot above the knife, so that another one may be received and its band cut, the whole operation being continuous and simultaneous.

Having described my invention, what I
 120 claim is—

1. A band-cutter and feeder having its top provided with slots, as described, in combination with an endless chain carrying fingers adapted to travel in one set of slots, a recip-
 125 rocating push-rod carrying spring-actuated fingers adapted to travel in another set of slots, a vertically-reciprocating knife adapted to enter a slot in the cover, and a rock-shaft having arms to engage brackets in the push-
 130 rods and operate the same, substantially as specified.

2. In a band-cutter and feeder, the combination, with a vertically-reciprocating cutter,

of a cam-cutter, a vibratory bar having a stud adapted to be engaged by the cam, a reciprocating rack-bar, an arm connecting said rack-bar with the vibratory arm, and a rock-shaft 5 having a pinion to engage the reciprocating rack, and also having means to operate fingers for feeding the bundle to the knife, substantially as specified.

3. The combination, with a reciprocatory 10 rack, of a pinion fixed to a shaft to engage the rack, arms fixed to the shaft and adapted to engage and operate push-rods, the shaft having fixed ratchets, the sprocket-wheels arranged loosely on the shaft, the ratchet-wheel

secured to the sprocket-wheels on one side 15 and the spring-pressed pawls pivoted on the opposite side thereof, the endless chain carrying fingers and passing over the sprocket-wheel, and the detent-arms for preventing a backward movement of the sprocket-wheels, 20 substantially as specified.

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

MARTIN A. SMITH.

Witnesses:

CHARLES D. BEERS,
JNO. E. WARR.