

No. 827,227.

PATENTED JULY 31, 1906.

J. W. FREEMAN.
TUBE CUTTING MACHINE.
APPLICATION FILED SEPT. 6, 1905.

2 SHEETS—SHEET 1.

Fig. 3.

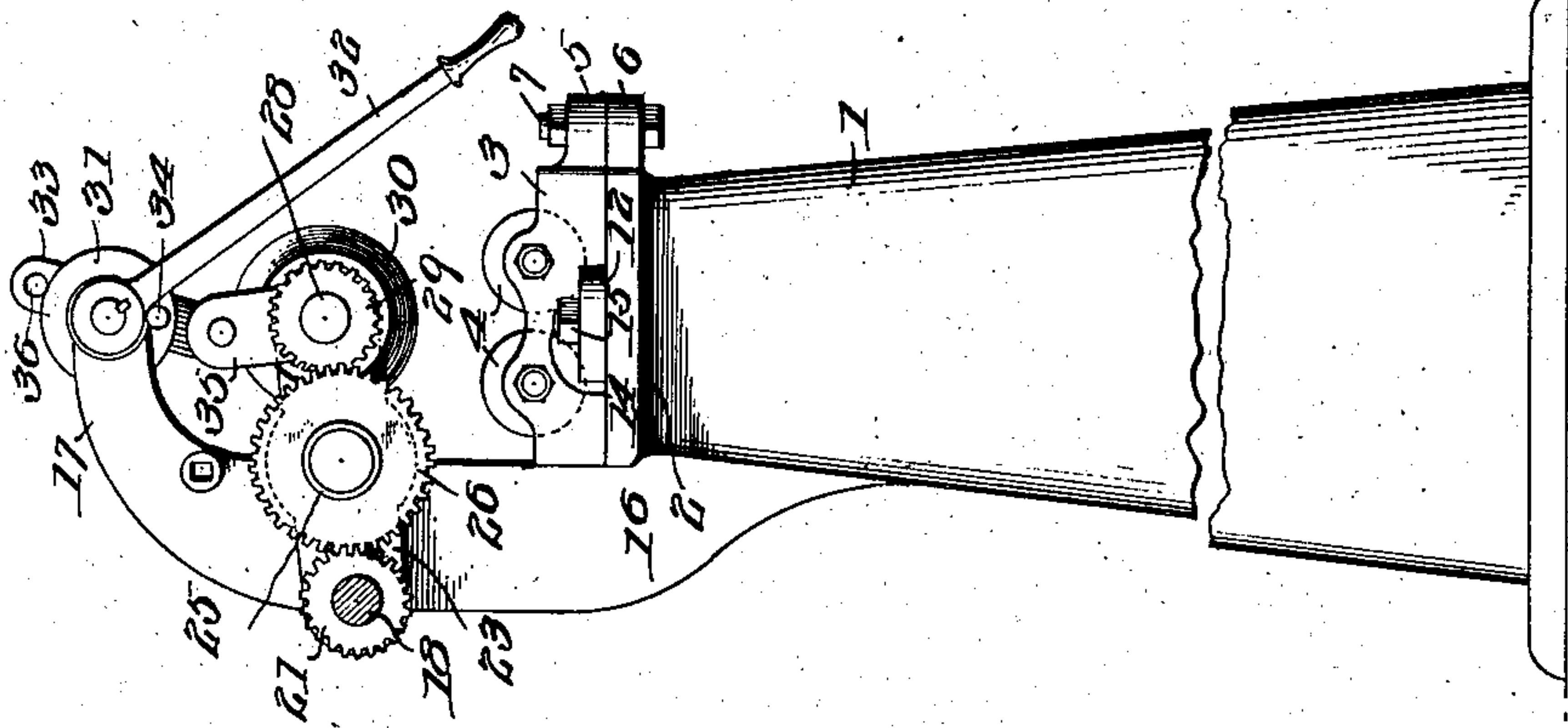


Fig. 2.

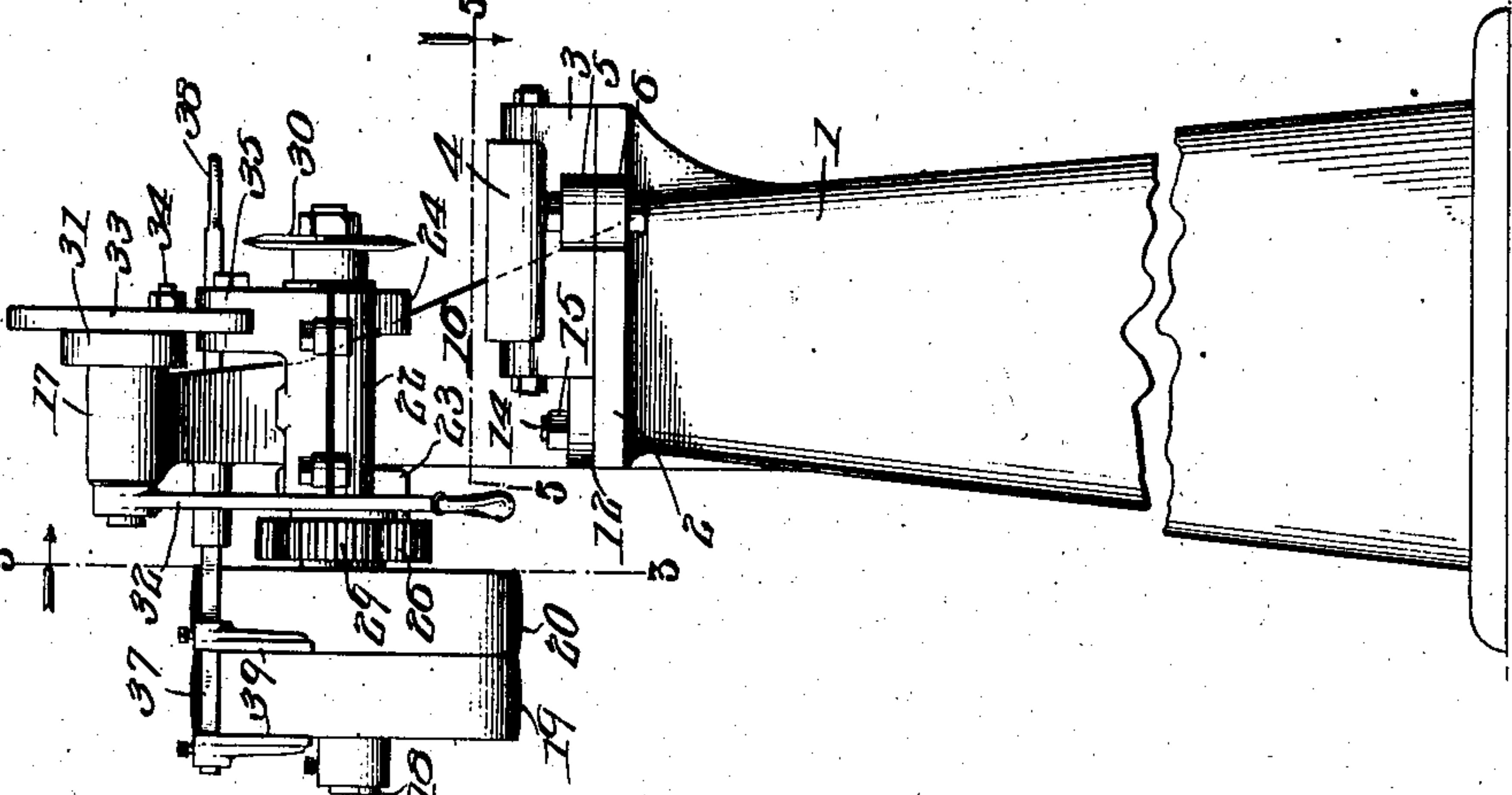
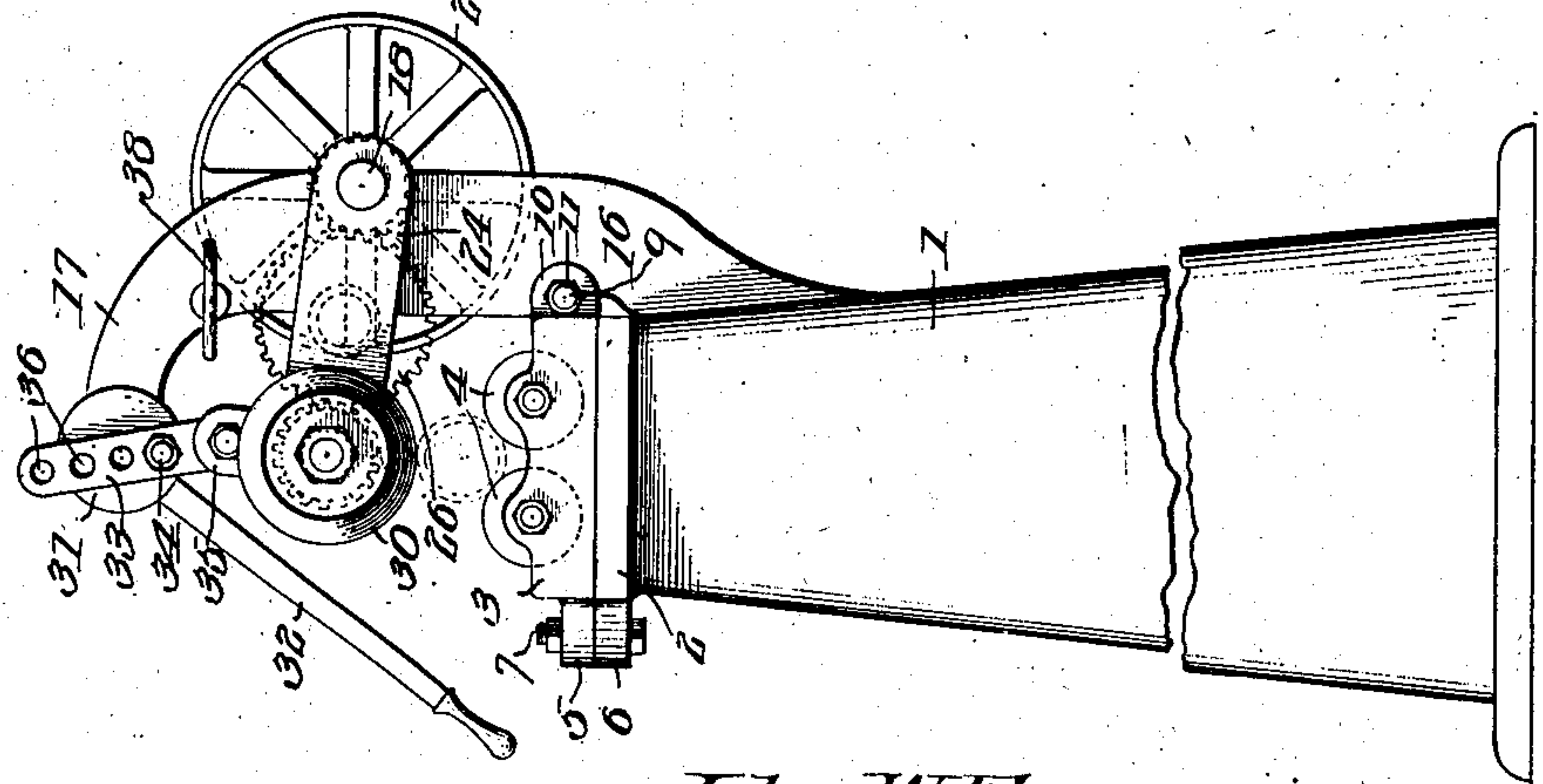


Fig. 1.



Witnesses

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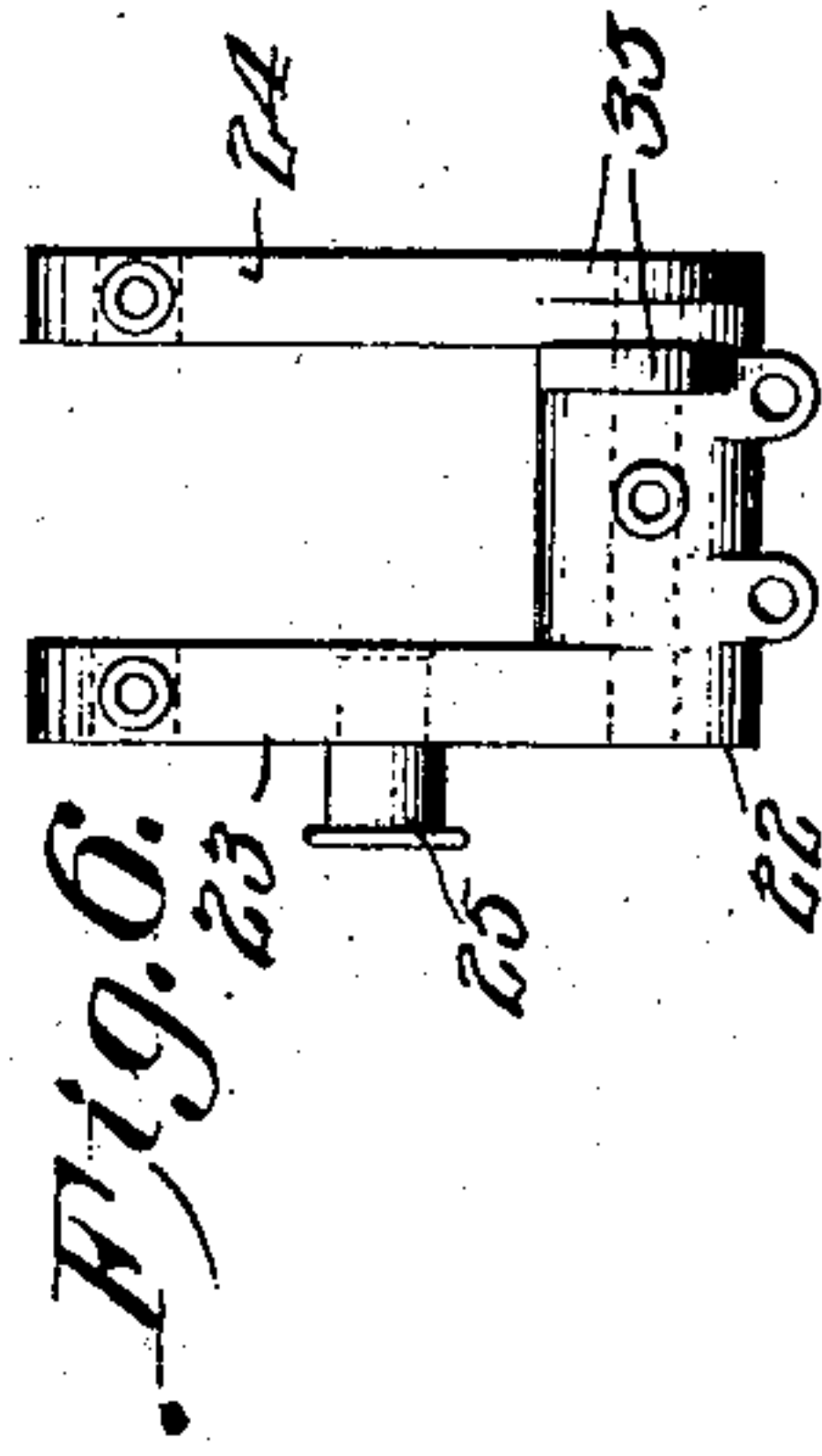
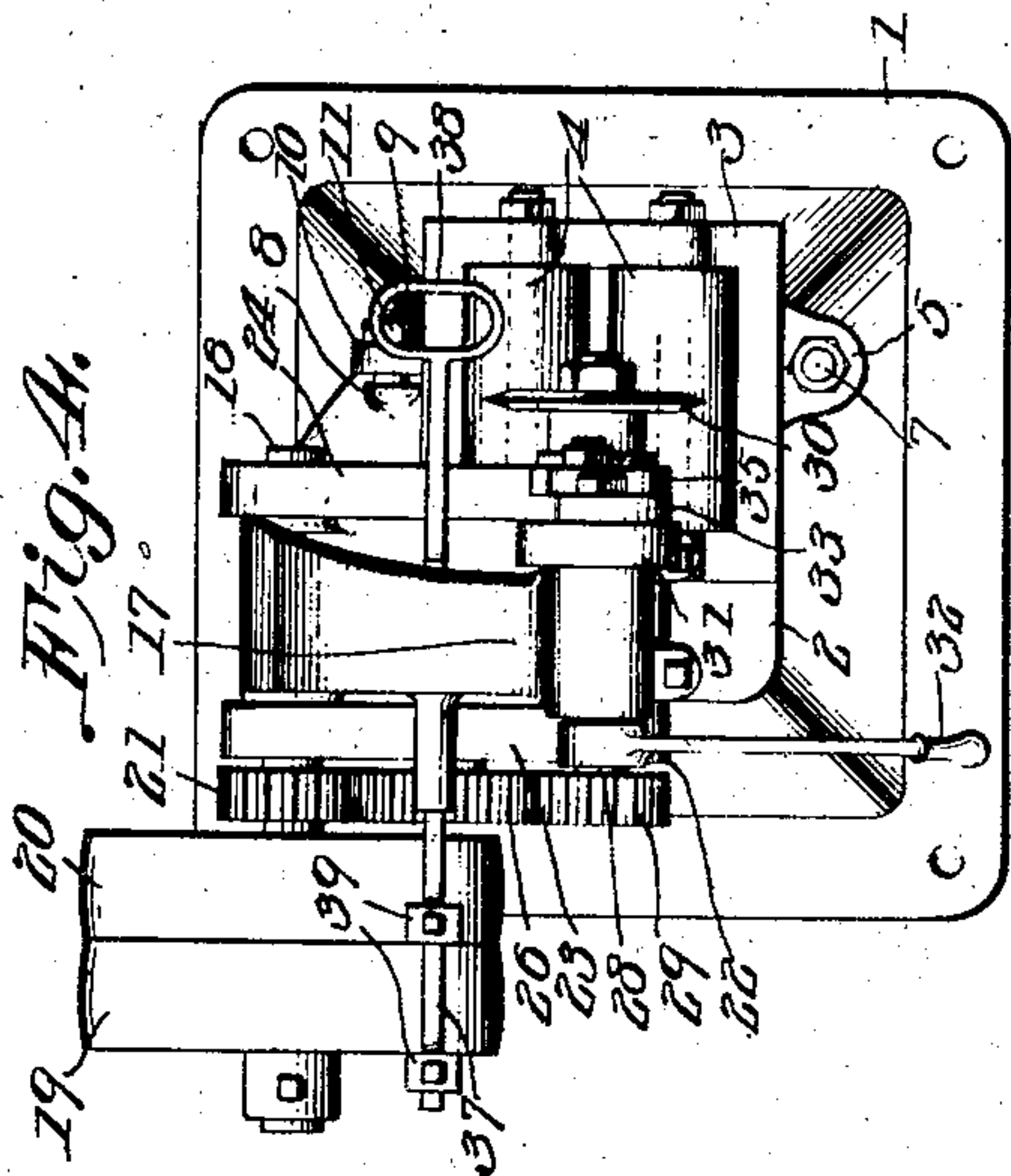
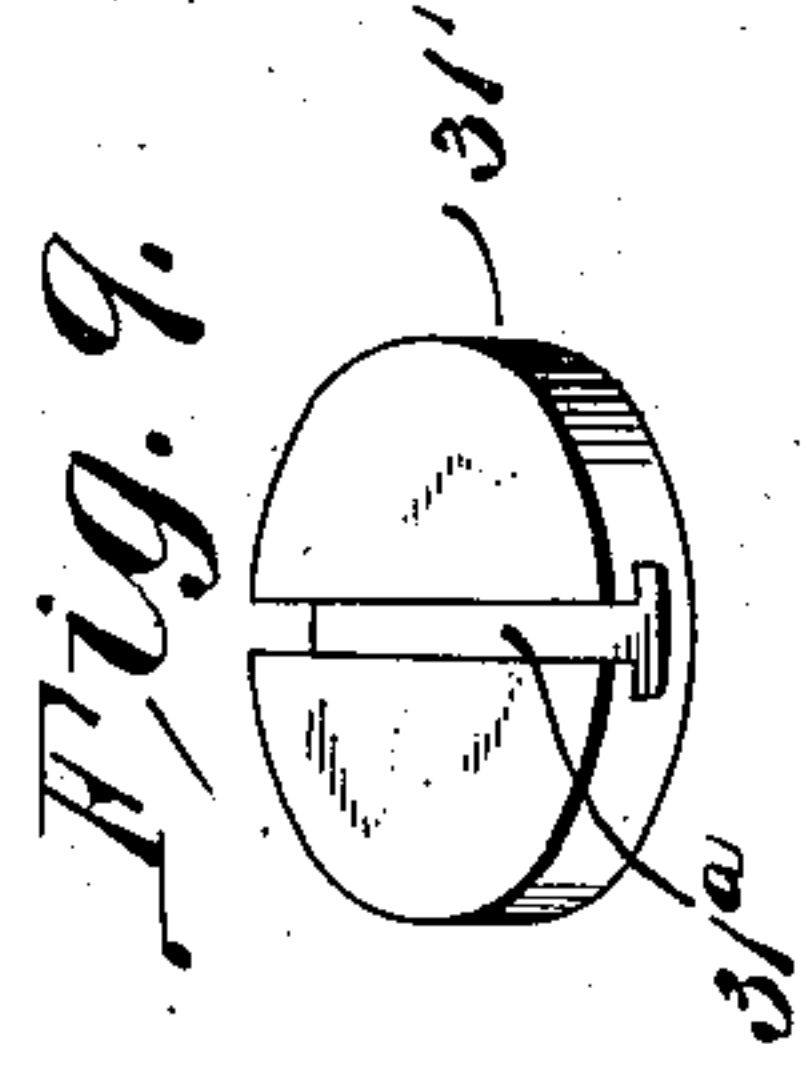
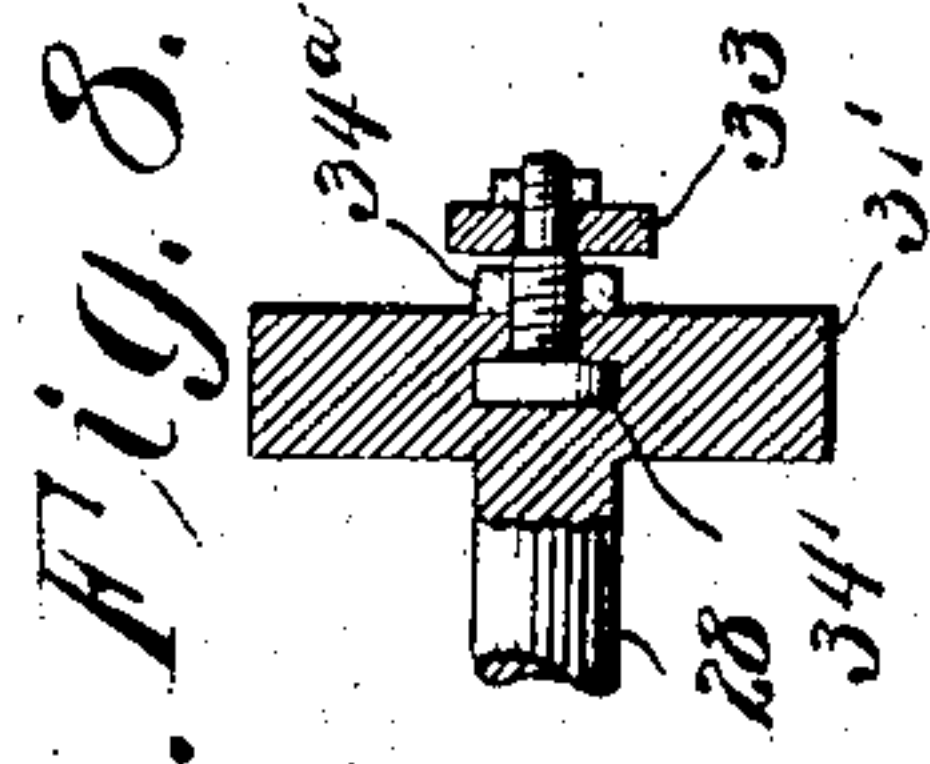
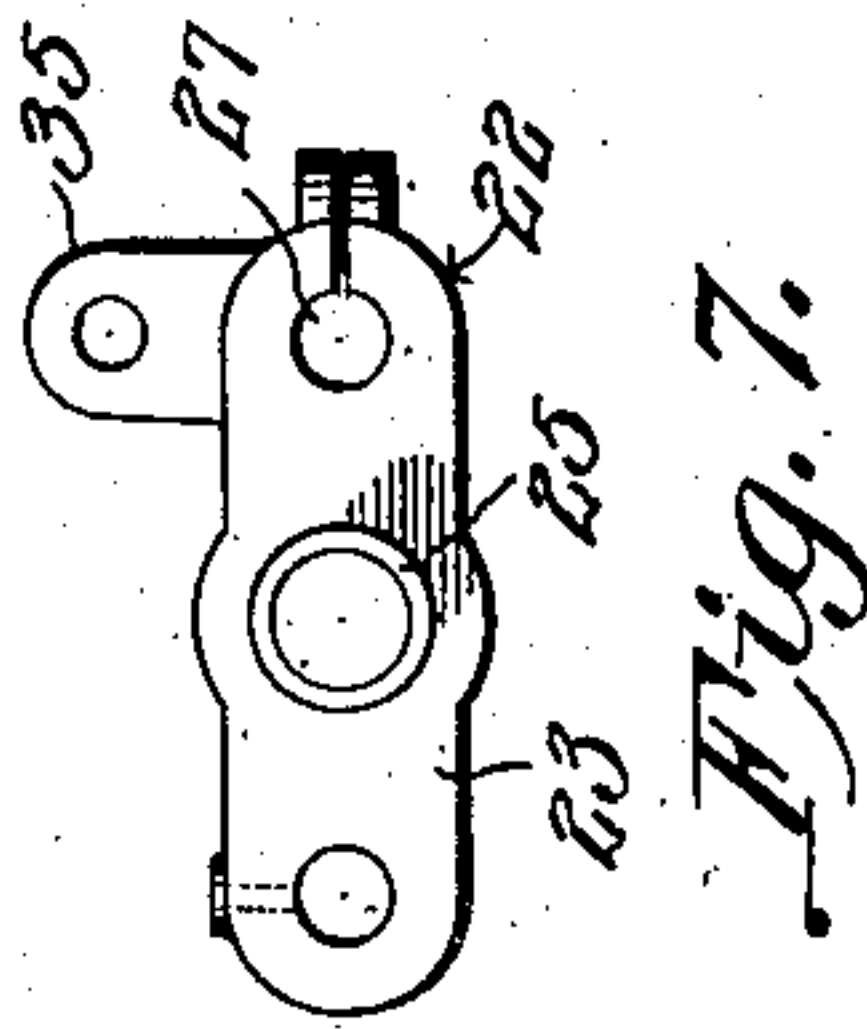
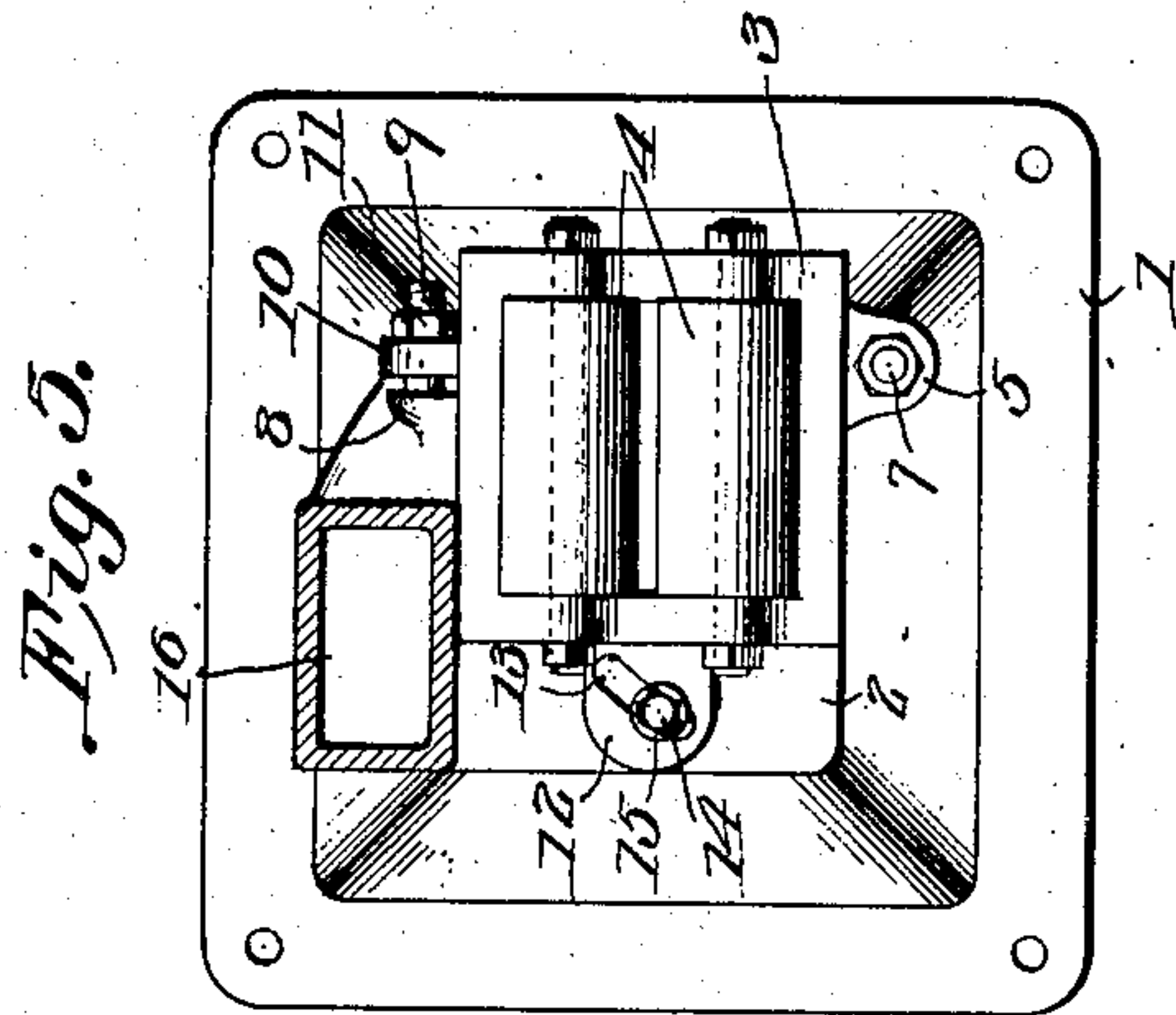
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN W. FREEMAN, OF JOPLIN, MISSOURI.

TUBE-CUTTING MACHINE.

No. 827,227.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed September 6, 1905. Serial No. 277,240.

To all whom it may concern:

Be it known that I, JOHN W. FREEMAN, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented a new and useful Tube-Cutting Machine, of which the following is a specification.

This invention relates to metal-working machines, and has for its object to provide an improved tube-cutting machine wherein all of the parts are compactly assembled and conveniently accessible, so as to facilitate the manipulation thereof.

Another object of the invention is to provide for the convenient adjustment of the work-holder, so as to insure the proper relation of the work with respect to the rotary cutter whereby a true cut may always be obtained.

It is furthermore designed to provide a novel arrangement of the drive connection between the drive-pulley and the rotary cutter, whereby the latter may be brought into engagement with the work and also thrown out of engagement therewith without interrupting the drive connection and without stopping the machine.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is an elevation of a tube-cutting machine embodying the features of the present invention. Fig. 2 is an elevation looking at another side thereof. Fig. 3 is a sectional elevation taken on the line 3 3 of Fig. 2. Fig. 4 is a top plan view of the machine. Fig. 5 is a plan section on the line 5 5 of Fig. 2. Figs. 6 and 7 are detail views of the swinging frame for the support of the rotary cutter and the drive connections therefor. Figs. 8 and 9 are detail views illustrating a slightly-modified construction of the swinging frame-support.

Like characters of reference designate corresponding parts in each figure of the drawings.

The operating parts of the present machine are supported in an elevated position upon a

suitable pedestal 1, which has a bed-plate 2 upon the top thereof. Upon the bed-plate there is a work holder or support made up of a rectangular horizontal frame 3, within which is a pair of substantially parallel rollers 4, which are spaced so as to form a seat for the reception of a tube to be cut. As best indicated in Fig. 5 of the drawings, it will be seen that the frame 3 is provided at one side with a horizontal ear 5, resting upon a similar ear 6, projecting from the bed-plate, there being a bolt or other pivot connection 7 passed through the two ears, thereby to pivotally connect the frame with the top of the pedestal.

Opposite the ears 5 and 6 there is an upstanding boss or shoulder 8, provided upon the top of the pedestal, and from this shoulder there extends a substantially horizontal threaded pin or projection 9, which loosely pierces an ear 10 upon the adjacent side of the frame. A suitable nut 11 is provided upon the outer end of the pin 9 for engagement with the ear 10 to adjustably swing the work-holder upon the pivot-fastening 7 as a center. Upon one of the other sides of the frame there is a substantially horizontal ear 12, provided with an arcuate slot 13, struck from the pivot 7 as a center, and the top of the pedestal is provided with an upstanding threaded pin or projection 14, rising from the slot 13 and provided with a clamping-nut 15 to engage the top of the ear 12, and thereby lock the frame in any adjusted position.

Opposite the pivot-fastening 7 a standard 16 rises from the pedestal and is provided at its upper end with an arm 17, overhanging the top of the pedestal. Across the back of this standard there is a substantially horizontal drive-shaft 18, which projects at opposite sides of the standard and is provided upon what will be termed its "outer" end with the fast and loose pulleys 19 and 20. Between the pulleys and the standards there is a pinion 21, fixed upon the shaft. In front of the standard and between the arm 17 and the top of the pedestal there is a substantially horizontal yoke-shaped frame 22, which has its side bars 23 and 24 straddling the standard and terminally pierced by transverse openings loosely receiving the shaft 18 as a pivotal support. The arm 23 is provided with an intermediate stud or bearing projection 25 for the rotatable support of a relatively large gear 26, in mesh with the pinion 21. The front end of the frame 22 is

cleft or split longitudinally and provided with a cylindrical opening 27, constituting a bearing for a shaft 28, which projects at opposite sides of the frame and carries a gear 29, in mesh with the gear 26, while its other end is provided with a cutting-disk 30, which is disposed in vertical alinement above the work-holder and in a plane at substantially right angles to the axes of the rollers 4.

For the adjustable support of the frame 22 a disk 31 is pivotally supported upon the arm 17 and is provided with a controlling-lever 32. A link 33 is pivotally supported upon a stud 34, carried eccentrically by the disk 31, the lower end of the link being pivotally connected to a pair of ears 35, provided upon the outer free end of the frame 22. By raising and lowering the lever 32 the frame 22 will be swung vertically upon the shaft 18 as an axial support, whereby the rotary cutter 30 may be moved into and out of engagement with the work. The link 33 is provided with a series of openings 36 for individual engagement with the stud 34.

A belt-shifting rod 37 works endwise through an opening in the standard 16 and is provided at one end with a handle 38 and at its opposite end with a pair of spaced fingers 39 to engage opposite edges of the drive-belt for shifting the latter from one to the other of the pulleys, whereby the drive of the machine is under the convenient control of the operator.

In practice the work-holding frame 3 is adjusted upon the pin 7 as a center to bring the rollers 4 at right angles to the cutting-disk 30, after which the tube to be cut is supported between the rollers, as indicated by dotted lines in Fig. 1 of the drawings, and then the handle or lever 32 is depressed, so as to swing the frame 22 downwardly and bring the cutter into engagement with the tube, whereupon the rotation of the cutter will rotate the tube, and thereby cut the latter throughout its periphery. The advantage of the pivotal adjustment of the work-holder will now be understood, as it is essential that the work always be held at right angles to the plane of the cutter in order that the latter may cut in a true circle rather than in a spiral path.

Another important advantage of the present machine resides in the fact that the rotary cutter always remains in connection with the drive-shaft throughout its up and down adjustments, and therefore there is no liability of the drive connection becoming worn and impaired by successive up and down adjustments of the frame 22. Moreover, it is not necessary to stop the operation of the machine when the rotary cutter is thrown out of engagement with the work, which materially facilitates the handling of the machine. It will be noted that the several elements of the machine are compactly assembled, so as to take up comparatively

little space and at the same time to be in convenient reach of the operator both for handling the work and controlling the machine.

In Figs. 8 and 9 is illustrated a slightly-modified construction of the swinging frame. In this case the disk 31' is provided with an undercut groove 31^a, arranged for the reception of the head of a bolt 34', that may be adjusted to any desired distance from the axis of the disk and locked in position by a nut 34^a. The outer end of the bolt serves to receive the link 33, and the parts are so constructed that adjustment may be effected for the cutting of pipes of any diameter. It will here be explained that each form of means for raising and lowering the lever 32 includes elements for positively depressing and elevating the frame without depending upon springs and counterweights, whereby a prompt and effective engagement and disengagement of the cutter with respect to the work is insured.

Having thus described the invention, what is claimed is—

1. A tube-cutting machine having a rotary cutter-disk, a work-holder which is adjustable in a plane at substantially right angles to that of the cutter and provided with a pair of spaced antifriction work-supporting rollers disposed in substantial parallelism with the axis of the cutter-disk, and means to fix the holder when adjusted.

2. A tube-cutting machine having a rotary cutter-disk, a work-holder having a pivotal adjustment in a plane at substantially right angles to that of the cutter and carrying a pair of spaced antifriction work-supporting rollers in substantial parallelism with the axis of the cutter-disk, and means to fix the work-holder when adjusted.

3. A tube-cutting machine having a rotary cutter-disk, an adjustable work-holder, provided with a pair of spaced antifriction work-supporting rollers, and means to adjustably fix the holder to set the same with the rollers disposed at substantially right angles to the plane of the cutter-disk.

4. A tube-cutting machine having a bed-plate, a rotary cutter-disk, a work-holder pivoted upon the bed-plate between the latter and the cutter, and an adjusting device for the holder including a threaded connection between the holder and the bed-plate to swing the holder upon its pivotal connection with the bed-plate.

5. In a machine of the class described, the combination with a bed-plate, of a work-holder pivotally connected to the bed-plate and provided with a pair of ears, one of the ears having an arcuate slot struck from the pivot of the work-holder as a center, a threaded pin carried by the bed-plate and loosely piercing the other ear, an adjusting-nut upon the threaded pin, a threaded pin carried by the bed-plate and projecting

through the slotted ear, and a clamping-nut carried by the pin and engaging the slotted ear.

5 6. In a machine of the class described, the combination with a support, of a drive-shaft mounted thereon, a frame mounted to swing upon the shaft as a pivotal support, a counter-shaft carried by the frame, a cutter carried by the counter-shaft, gearing between
10 the counter-shaft and the drive-shaft, and adjusting means for positively swinging the frame in opposite directions upon its pivotal support.

15 7. In a machine of the class described, the combination with a support, of a drive-shaft carried thereby, a frame pivotally mounted upon the drive-shaft to swing concentrically thereon, a cutter carried by the frame a drive connection between the cutter and the
20 drive-shaft, and means for adjustably swinging the frame consisting of a lever mounted upon the frame and a toggle connection between the lever and the frame.

25 8. In a machine of the class described, the combination with a standard having an overhanging arm, of a drive-shaft carried by the standard, a yoke-shaped frame straddling the standard and pivotally mounted upon the shaft, a rotary cutter carried by the free

end of the frame, a drive connection between
30 the cutter and the drive-shaft, a lever mounted upon the overhanging arm, and a toggle connection between the lever and the frame for swinging the latter upon the drive-shaft.

9. In a machine of the class described, the
35 combination of a pedestal, a standard rising from one side of the pedestal and provided with an arm overhanging the top of the pedestal, a substantially horizontal drive-shaft carried by the standard and projected at opposite
40 sides thereof, a yoke-shaped frame straddling the standard and pivotally supported upon the drive-shaft, a counter-shaft carried by the frame, a rotary cutter upon the counter-shaft, a gear upon the counter-
45 shaft, another gear mounted upon the frame and in mesh with the counter-shaft, a gear upon the drive-shaft and in mesh with the first-mentioned gear, a lever mounted upon the arm, and a toggle connection between
50 the lever and the swinging frame.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN W. FREEMAN.

Witnesses:

JAMES CAMPBELL.
W. S. BOYD