

(No Model.)

2 Sheets—Sheet 1.

H. BOLTHOFF.
ORE FEEDER FOR STAMP MILLS.

No. 563,217.

Patented June 30, 1896.

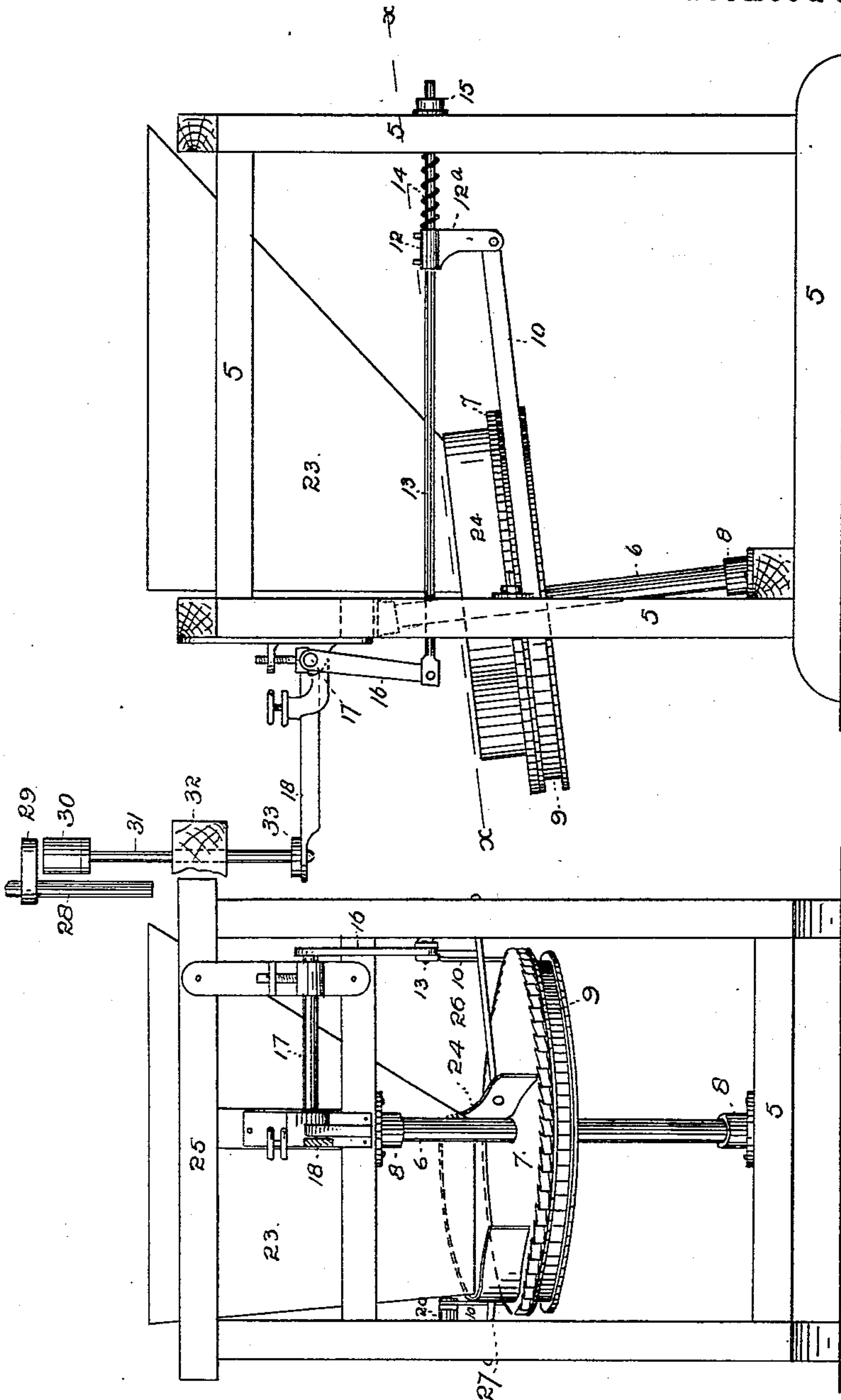


FIG. 2.

FIG. 1.

WITNESSES
Chas. E. Dawson
G. J. [Signature]

INVENTOR
H. Bolthoff
BY *[Signature]*
ATTORNEY

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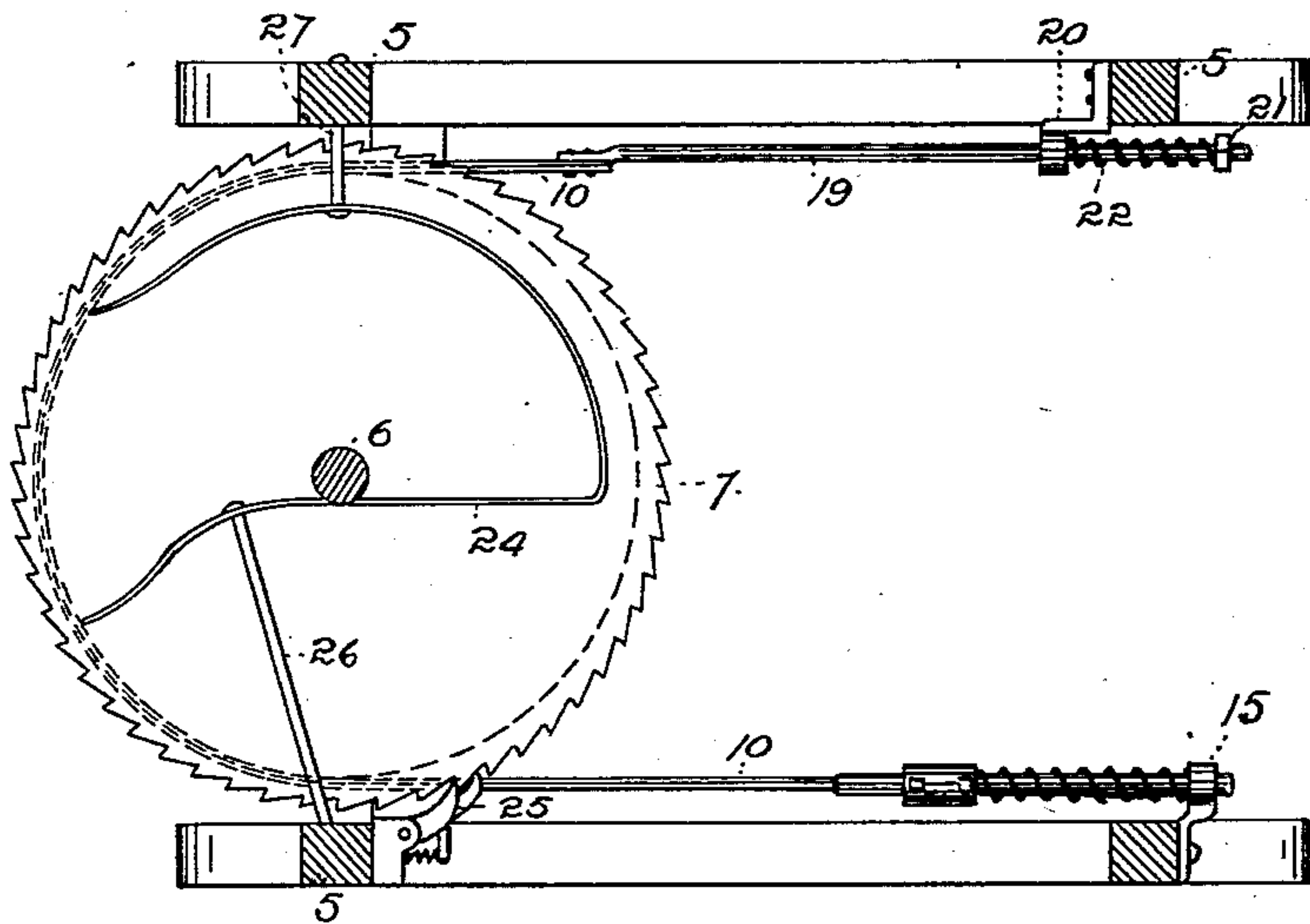


FIG. 3.

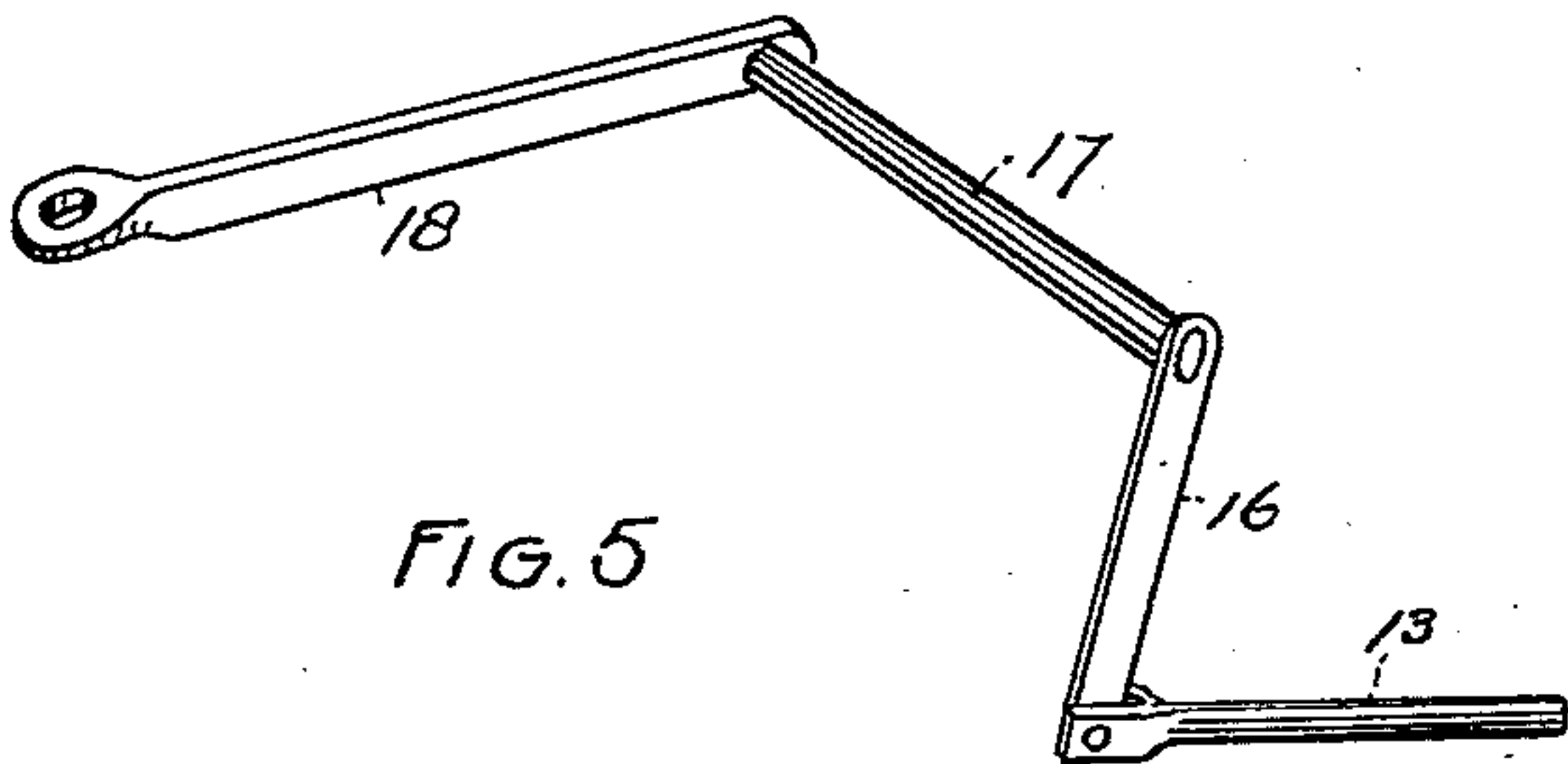


FIG. 5.

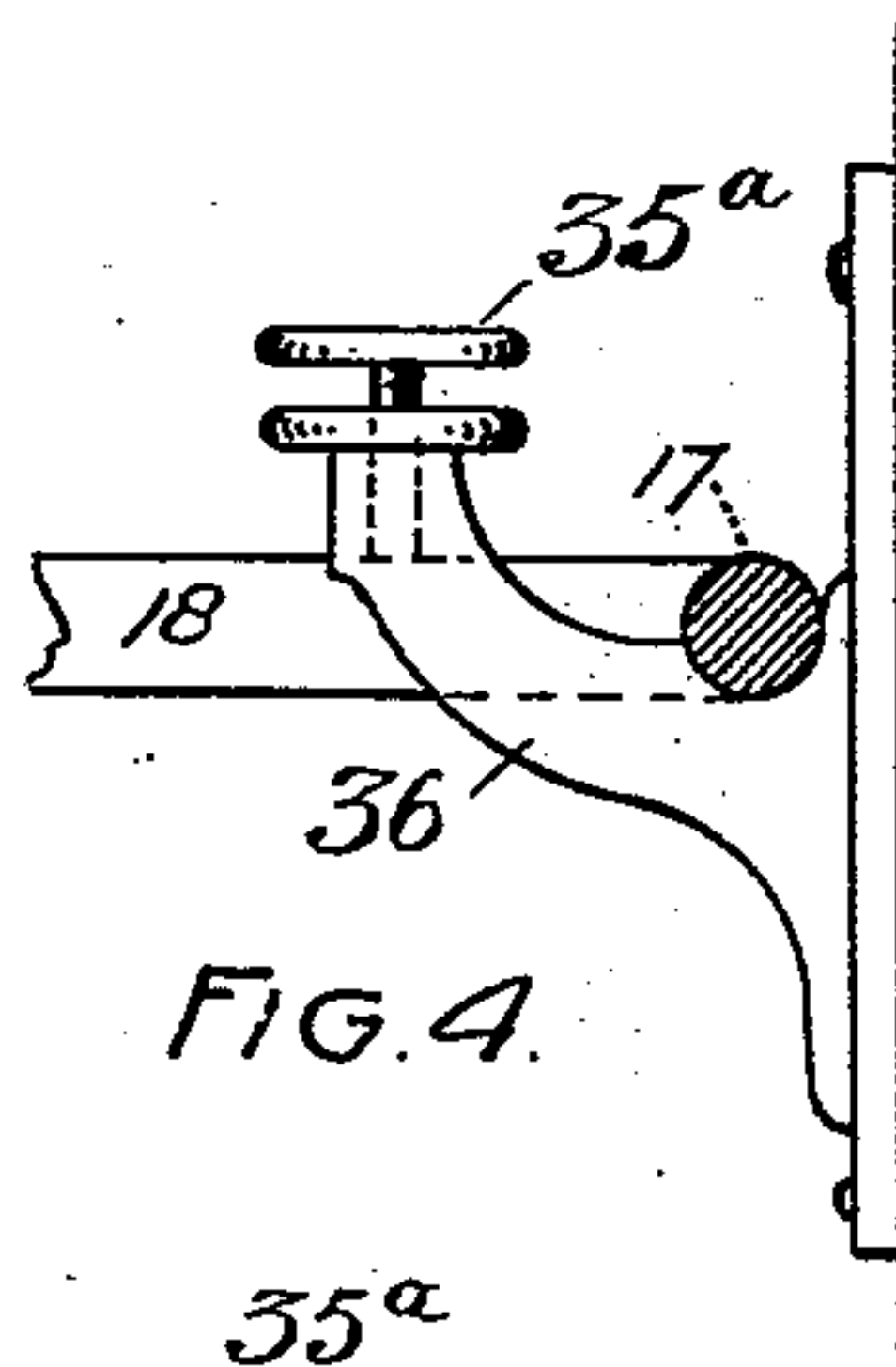


FIG. 4.

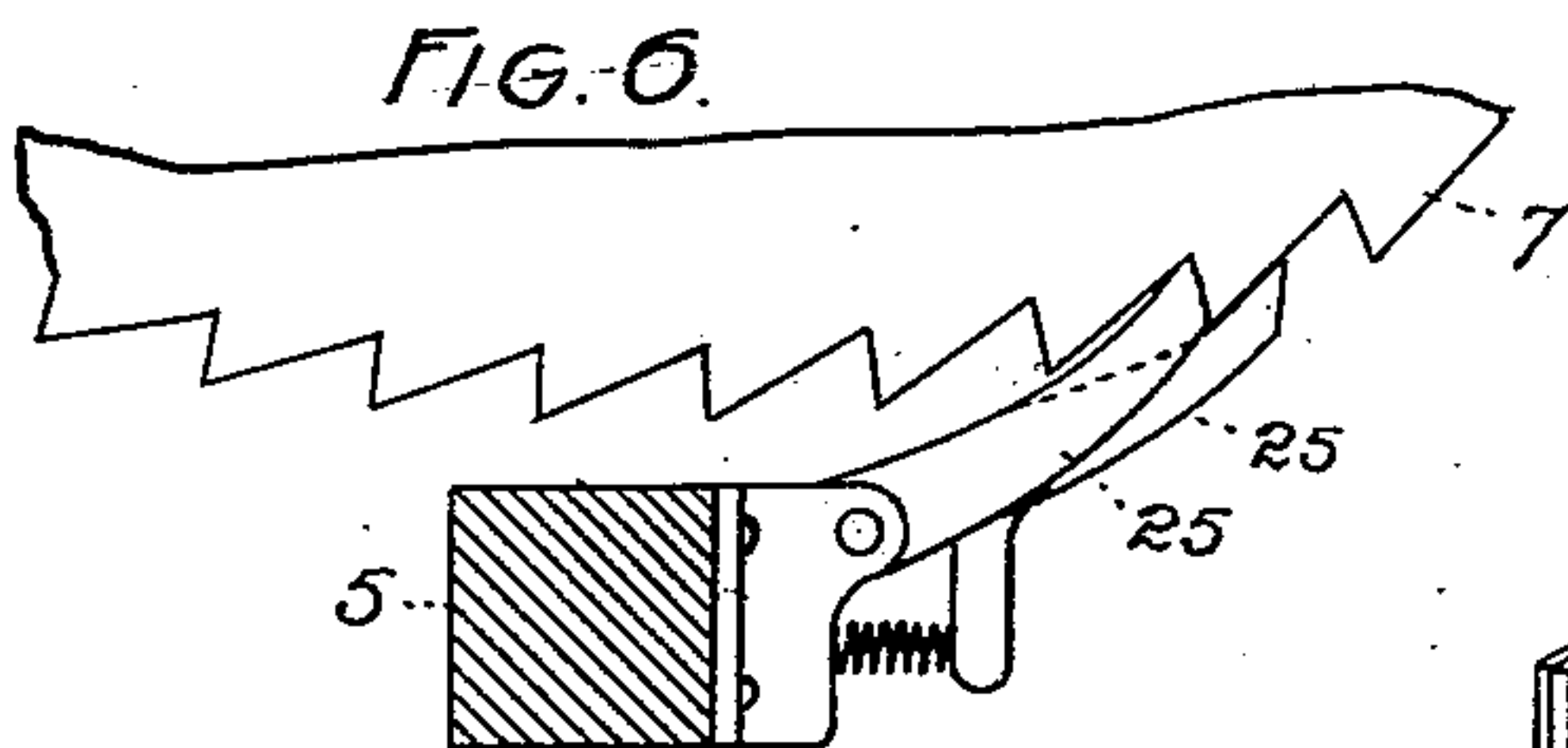


FIG. 6.

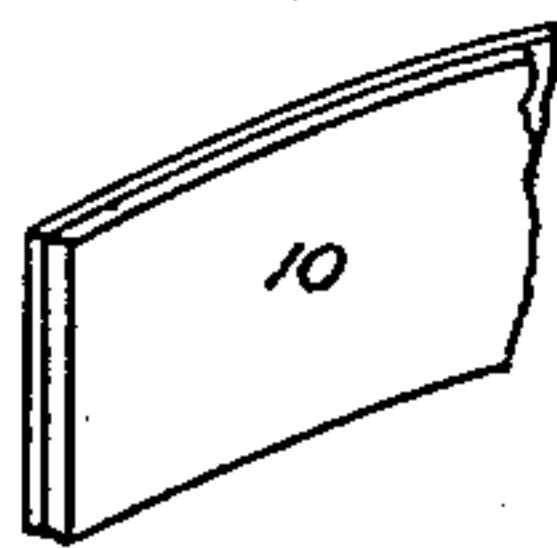


FIG. 8.

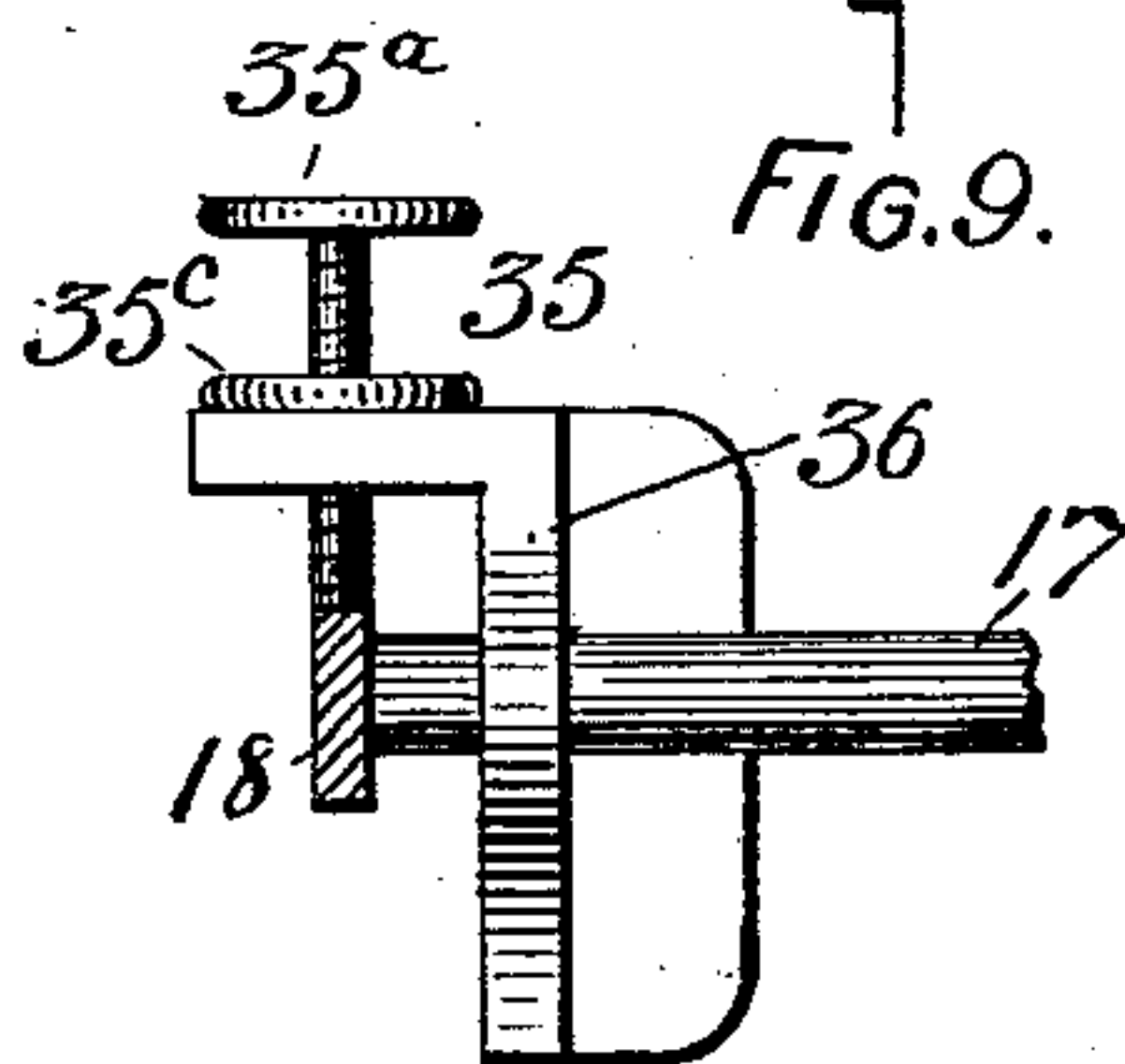


FIG. 9.

WITNESSES:
Chas. E. Dawson
C. J. [Signature]

FIG. 7.

INVENTOR
H. Bolthoff

BY [Signature]
ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY BOLTHOFF, OF DENVER, COLORADO.

ORE-FEEDER FOR STAMP-MILLS.

SPECIFICATION forming part of Letters Patent No. 563,217, dated June 30, 1896.

Application filed April 27, 1895. Serial No. 547,325. (No model.)

To all whom it may concern:

Be it known that I, HENRY BOLTHOFF, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore-Feeders for Stamp-Mills; 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 figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in ore-feeders for stamp-mills; and it consists of the features hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a front elevation of my improved ore-feeder. Fig. 2 is a side elevation of the same, illustrating its connection with the stamp-stem. Fig. 3 is a section taken on the line X X, Fig. 2, looking downward. Fig. 4 is a fragmentary view showing the rock-shaft in section and the adjacent parts in elevation. Fig. 5 is a perspective view illustrating the rock-shaft and connections. Fig. 6 is a fragmentary top view illustrating the disk and its engaging dogs, the parts being shown on a larger scale. Fig. 7 is a side elevation of the same. Fig. 8 is a fragmentary perspective view illustrating the belt or band which engages the circumferential flange or drum of the disk. Fig. 9 is a fragmentary front view illustrating the rock-shaft, the arm made fast thereon, and the set-bolt attached to the bracket and engaging the arm.

In ore-feeders as heretofore constructed the feed-disk is operated by gearing and the mechanism is quite complicated.

My object is to provide a feeder which shall be simple in construction, as compared with the machines of this class heretofore used, and at the same time reliable, durable, and efficient in use. Simplicity is a desideratum in this class of machines, since it reduces to a minimum, not only the cost of construction, but also the power necessary for operating the

mechanism. As these ore-feeders are operated from the stamp, the power of the blow delivered to the ore in the mortar is reduced to the extent of that expended in operating the feeder. In my improved construction the feed-disk is mounted on a shaft which passes through the center of the disk, the extremities of the shaft being journaled in the framework both above and below the disk, whereby the disk is securely and firmly maintained in position. The disk is provided with a circular flange or narrow friction-drum, which is engaged by a band having spring-held extremities. This band is operated from the stamp through the medium of suitable mechanism intermediately located, whereby the forward partial rotation is imparted to the disk. The band is returned to its normal position after each forward movement by the recoil of the springs connected with the parts to which its extremities are attached. The disk is prevented from making the reverse movement through the instrumentality of dogs engaging ratchet-teeth formed on its periphery.

Having thus briefly outlined the construction and its objects, I will now proceed to describe the same in detail.

Similar reference-characters indicating corresponding parts in these views, let the numeral 5 designate the framework, in which is journaled the shaft 6, passing through the center of the disk 7, in which it is made fast. This shaft extends a suitable distance both above and below the disk and its extremities engage boxes 8. Made fast to the lower side of the feed-disk is a circular flange or narrow drum 9, which is engaged by a band or belt 10. One extremity of this band is secured to the depending projection 12^a of a lug 12, made fast on a rod 13. One extremity of this rod passes through a suitable bracket 15, made fast to the framework 5, and is surrounded by a coil-spring 14, located between the lug 12 and the said bracket. The opposite extremity of the rod 13 is pivotally connected with the lower end of an arm 16, whose upper extremity is made fast to a rock-shaft 17, to which is also made fast the arm 18. The opposite extremity of the band 10 is secured to a rod 19, supported by a bracket 20, through which it passes. The bracket is made fast on the

framework. The connection between the rod and the bracket is such that the former slides freely in the latter. To the outer extremity of the rod 19 is applied a tension-nut 21. Between this nut and the bracket 20, and surrounding the rod 19, is located a coil-spring 22. The crushed ore passes to the feed-disk from a hopper 23, suitably supported on the framework above the disk. Below the mouth of the hopper, and also supported on the framework by means of rods 26 and 27, is a sort of chute 24, which occupies a position close to the upper surface of the disk and is adapted to direct the ore to the mortar of the stamp-mill. (Not shown.) The periphery of the feed-disk is toothed to engage spring-held dogs 25, pivoted on the framework. The function of these dogs is to prevent the disk from making a reverse movement after each partial forward rotation. As shown in the drawings, two dogs of unequal length are employed in order to lock the disk after a movement equal to one-half of the distance between the ratchet-teeth on its periphery, thus giving the same result as if twice the number of teeth were formed on the disk. The stem 28 of the stamp is provided with a short arm 29, made fast thereon and adapted to engage a buffer 30, made fast to the upper extremity of a rod 31, movably mounted on a beam 32 of the stamp-mill frame. The lower extremity of the rod 31 projects through an aperture in the outer extremity of the arm 18, the rod being provided with a collar 33, which engages the arm 18 around said aperture. Hence, the stamp operates the arm 18 through the medium of the said parts, whereby the arm 18 is depressed every time the stamp falls. This movement of the arm 18 actuates the rock-shaft 17, which is suitably journaled in the framework, thrusts the lower extremity of the arm 16 toward the right, (referring to Fig. 2,) and imparts a corresponding movement to the connecting-rod 13. This movement of the last-named rod actuates the band 10 and gives the feed-disk a partial rotation by virtue of the friction between the band and the flange or drum of the disk. This movement of the disk, which is suitably inclined, feeds the ore to the mortar-box. (Not shown.) As the stamp rises and releases the arm 18, the parts 13, 16, 17, 18, 19, and 31, and their attachments, as well as the band 10, are returned to their normal position by the recoil of the springs 14 and 21. This said reverse movement of the elements 13, 16, 17, 18, 19, and 31 is limited and controlled by a set-bolt 35, engaging a threaded aperture formed in a bracket 36, secured to the stationary framework. To the upper extremity of this bolt is made fast a hand-wheel 35^a. Another hand-wheel 35^c is threaded to engage the set-bolt, and performs the function of a lock-nut. The hand-wheel 35^c is screwed downward to engagement with the bracket when the bolt is properly adjusted. The lower extremity of this bolt lies in the path of the arm 18 when making its upward

movement after it has been released by the stamp. Hence, after the arm 18 engages the set-bolt, its upward movement, and the corresponding movement of all the parts connected therewith, must cease. Assuming that the arm 18 is in engagement with the set-bolt, the friction between the band 10 and the drum 9 is determined by the tension of the spring 22. The tension of this spring is regulated by the nut 21. Now it is evident that when the arm 18 is depressed by the downward movement of the stamp the band 10 will be moved in such a direction as to compress the spring 22 and increase its tension. As the tension of this spring increases, the friction between the band and the drum increases to a corresponding extent; and it is easy to so regulate this friction that it will be sufficient to impart a partial rotary movement to the feed-disk every time the stamp falls. Again, as the band moves in the reverse direction under the influence of the recoiling springs 14 and 22 the friction between the drum and the band diminishes, and the band moves easily over the drum, the disk and drum being locked from movement in the reverse direction by the dogs, as already explained.

Having thus described my invention, what I claim is—

1. In an ore-feeder for stamp-mills, the combination with the stamp-stem and a suitable framework, of the feed-disk journaled in the framework and provided with a circular flange or drum, a band engaging said drum, a rod attached to one end of the band, a bracket to which the rod is movably attached, a tension-nut attached to the rod, a coil-spring located between the bracket and the nut, another rod movably supported on the framework, the opposite extremity of the band being suitably attached to said rod, an arm to which the last-named rod is pivoted, a rock-shaft to which said arm is made fast, another arm attached to the rock-shaft, and suitable means located intermediate the stamp-stem and said last-named arm whereby the downward movement of the stamp depresses the arm, as and for the purpose set forth.

2. In an ore-feeder for stamp-mills, the combination with the stamp-stem and a suitable framework, of the feed-disk journaled in the framework and provided with a circular flange or drum, a band engaging said drum, a rod attached to one end of the band, a stationary bracket to which the rod is movably attached, a tension-nut attached to the rod, a coil-spring located between the bracket and the tension-nut, and suitable means for actuating the band and operating the feed-disk, said means being connected with the opposite extremity of the band and actuated from the stamp-stem, substantially as described.

3. In an ore-feeder for stamp-mills, the combination with the stamp-stem and a suitable framework, of the inclined feed-disk

5 journaled in the framework and provided
with a circular flange or drum, said disk hav-
ing a toothed edge, a locking-dog engaging
the teeth of the disk, a band engaging said
10 drum, a rod attached to one end of the band,
a bracket to which the rod is movably at-
tached, a tension-nut attached to the rod, a
coil-spring located between the bracket and
nut, and suitable means for actuating the
15 band and operating the feed-disk, said means
being connected with the opposite extremity
of the band and actuated from the stamp-
stem, substantially as described.

4. In an ore-feeder, the combination with
15 the framework, of the inclined shaft having
its extremities journaled therein, the feed-
disk fast on the shaft, said disk having a
friction flange or drum, a band engaging said
20 flange, spring-held rods to which the extren-
ties of the band are attached, and means for
actuating the band whereby a partial rotary

movement is imparted to the disk at suitable
intervals, substantially as described.

5. In an ore-feeder for stamp-mills, the
combination with the framework, of the ro- 25
tatable disk journaled therein and having a
friction flange or drum, a band engaging said
drum, spring-held rods to which the extren-
ties of the band are attached, a rock-shaft,
an arm connecting one of said rods with the 30
rock-shaft, another arm attached to the rock-
shaft and suitable means engaging said arm
and actuated by the stamp-stem whereby the
arm is operated by the movement of the
stamp, substantially as described. 35

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

HENRY BOLTHOFF.

Witnesses:

CHAS. E. DAWSON,
ALFRED J. O'BRIEN.