

No. 606,971.

**Patented July 5, 1898.**

**U. S. JAMES.  
ORE FEEDER.**

(Application filed Apr. 22, 1897. Renewed Jan. 26, 1898.)

(No Model.)

**2 Sheets—Sheet 1.**

Fig. 1.

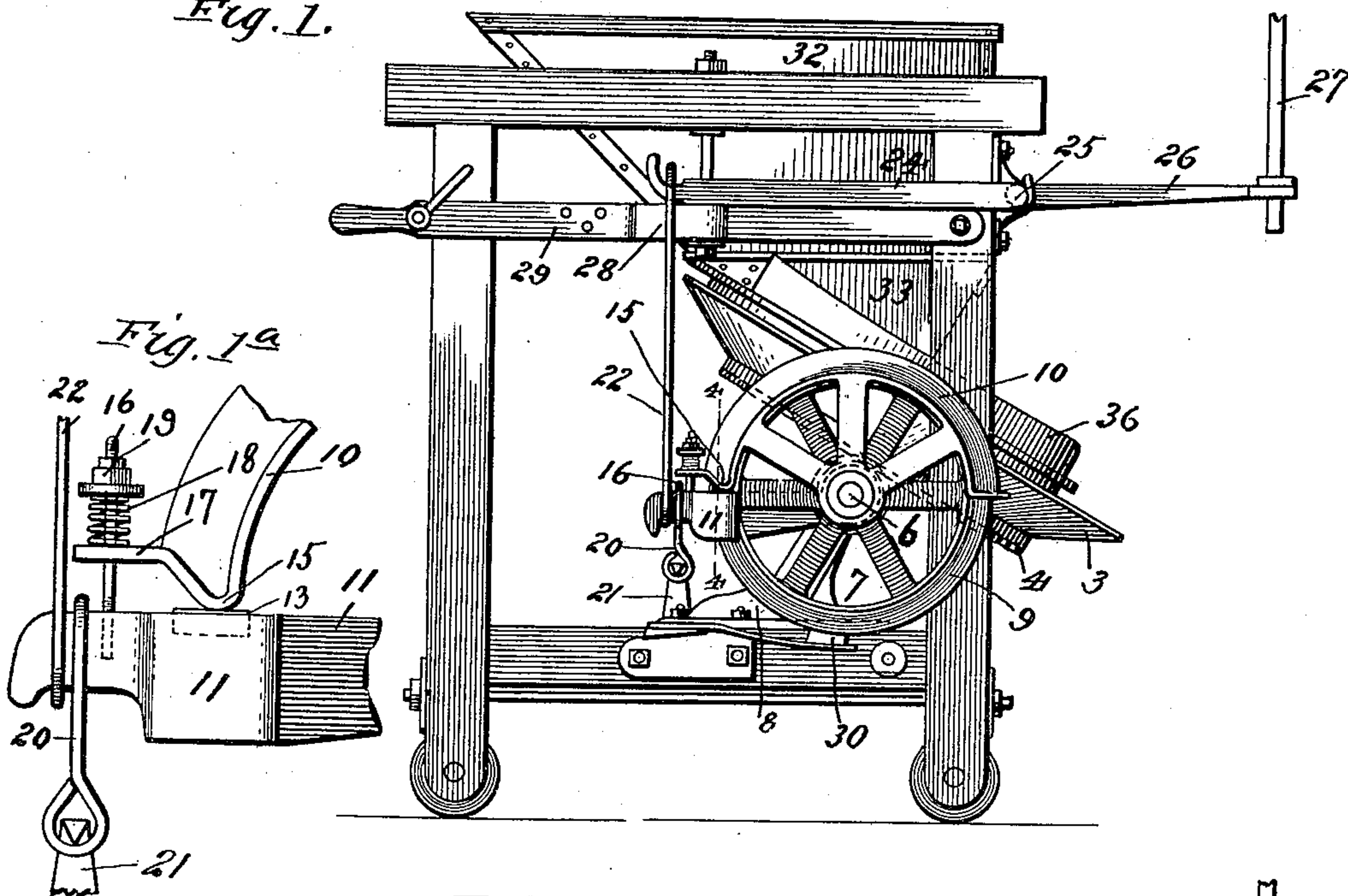
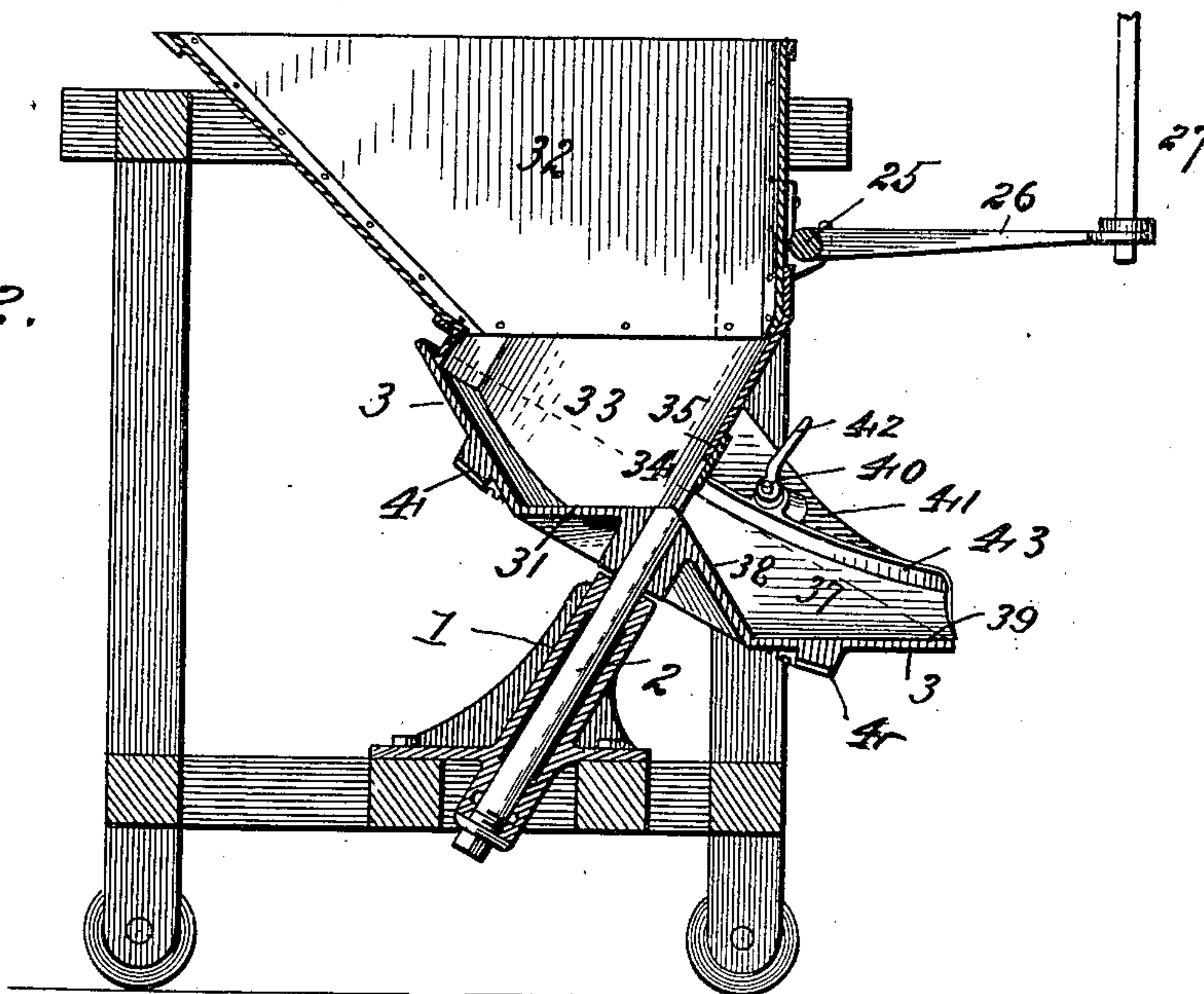


Fig. 2.



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Fig. 3.

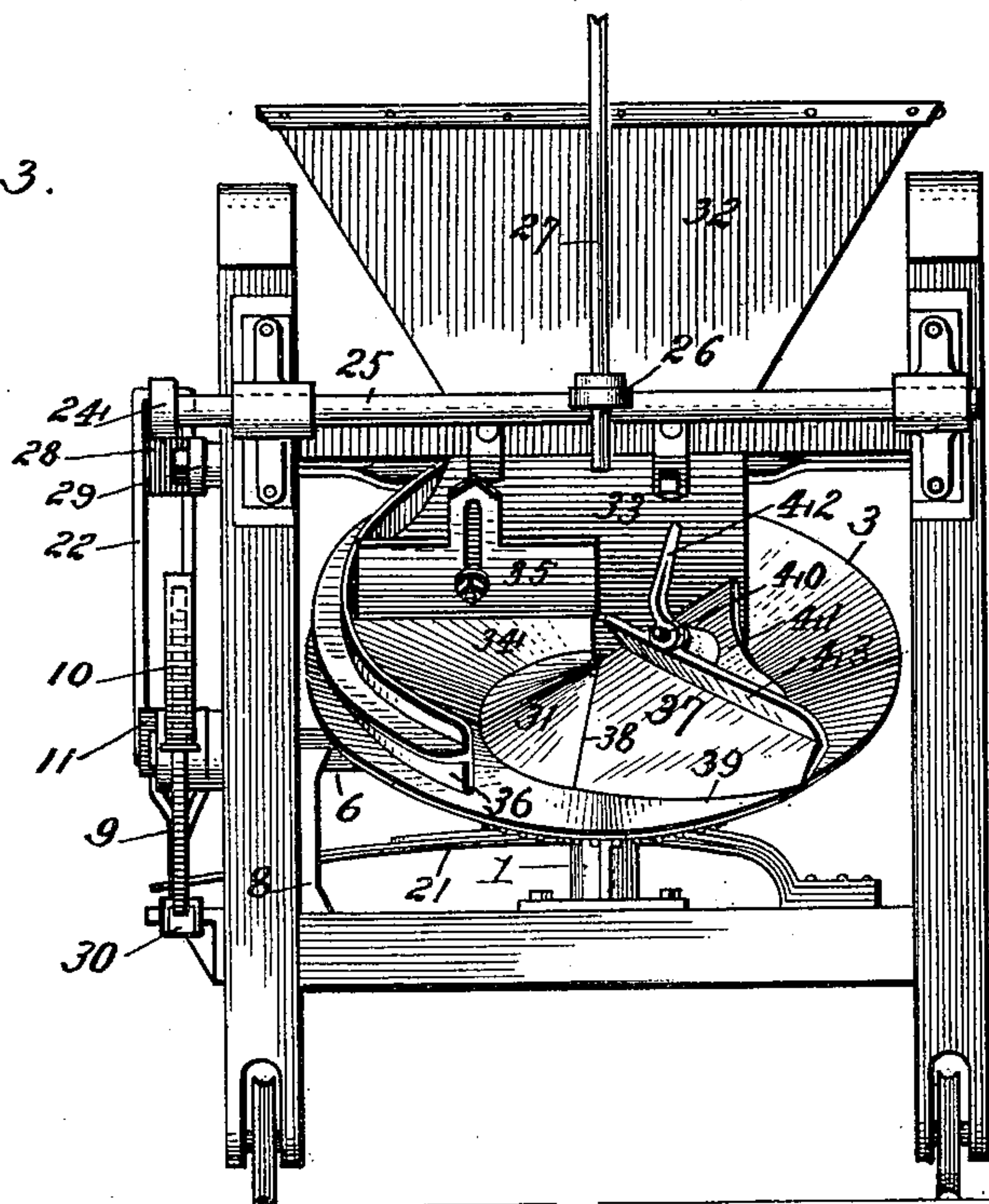


Fig. 4.

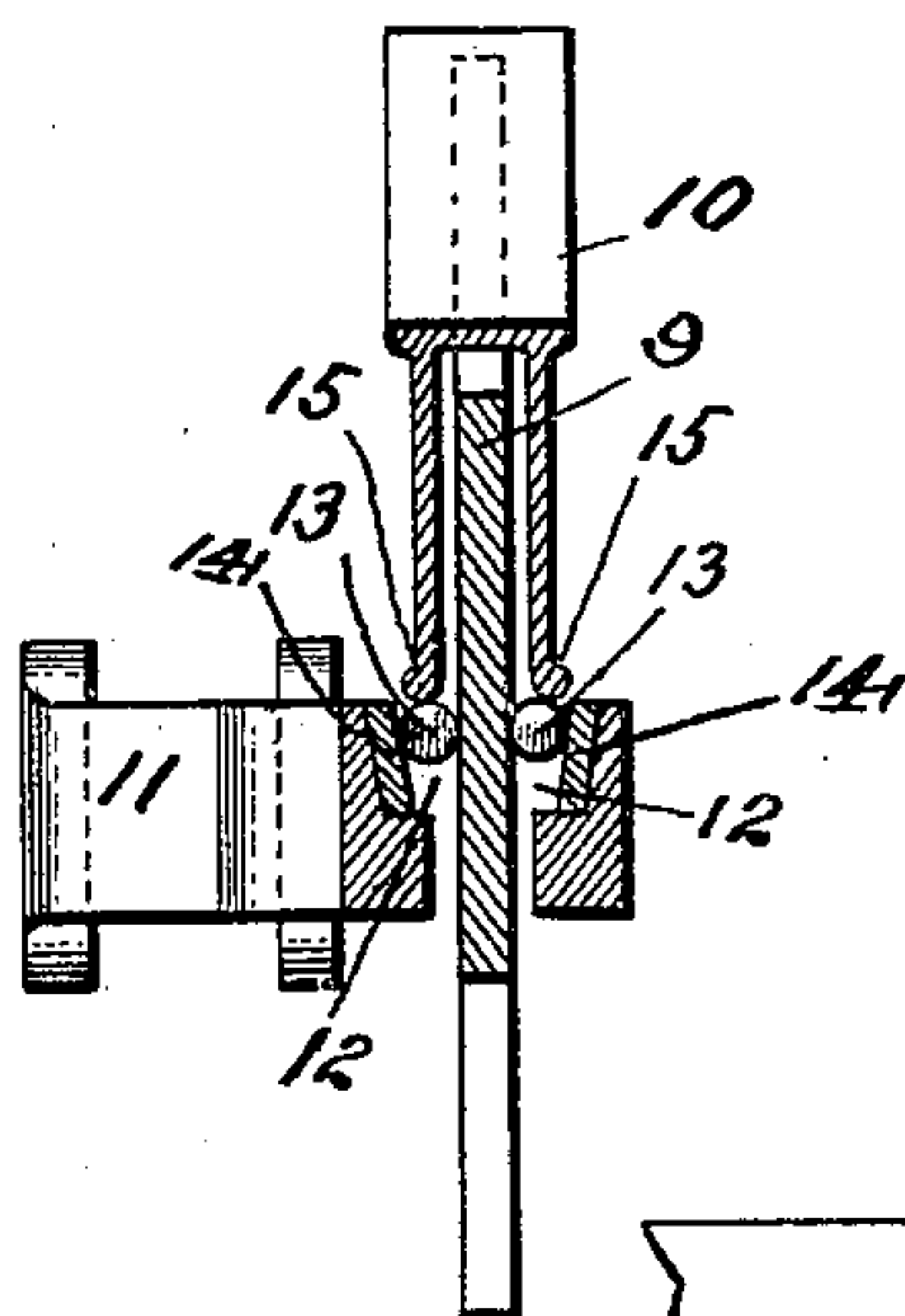
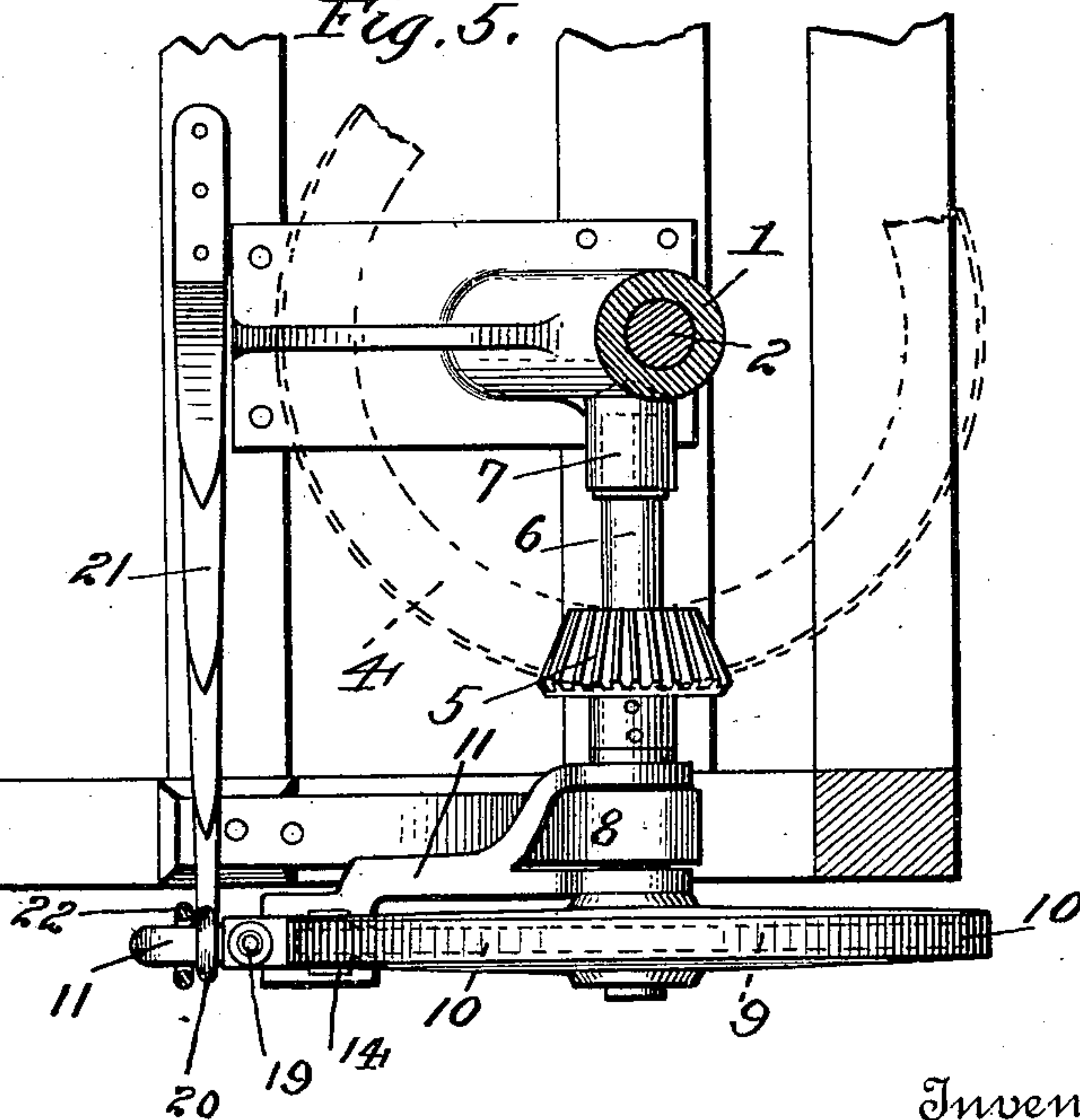


Fig. 5.



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# UNITED STATES PATENT OFFICE.

ULYSSES S. JAMES, OF HELENA, MONTANA, ASSIGNOR TO LEWIS H. GRAVES,  
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## ORE-FEEDER.

SPECIFICATION forming part of Letters Patent No. 606,971, dated July 5, 1898.

Application filed April 22, 1897. Renewed January 26, 1898. Serial No. 668,083. (No model.)

*To all whom it may concern:*

Be it known that I, ULYSSES S. JAMES, a citizen of the United States, residing at Helena, in the county of Lewis and Clarke and State of Montana, have invented certain new and useful Improvements in Ore-Feeding Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 In the drawings annexed, Figure 1 is a side elevation of the machine; Fig. 1<sup>a</sup>, a detail side view of a portion of the friction grip devices; Fig. 2, a vertical sectional view of the machine; Fig. 3, a front elevation thereof; 15 Fig. 4, a detail vertical section on the line 4-4 of Fig. 1; and Fig. 5, a horizontal section of a portion of the machine, showing more clearly the grip devices.

This invention is designed to produce a machine of simple construction which will feed the ore-stuff evenly, irrespective of whether the stuff be very wet or very finely powdered, as more fully hereinafter set forth.

20 Journaled in an inclined stationary bearing 1, mounted in a suitable framework, is a shaft 2, which is set obliquely, inclining upward and forward, and fastened on the extreme upper end of this shaft above the bearing 1 is a dished feed-disk 3, having formed on its 25 lower side a circular rack 4. Meshing with this rack is a beveled pinion 5, secured on a horizontal shaft 6, this shaft being journaled at its inner end in a bearing or socket 7, carried by the pedestal 1, and at its outer end in a 30 bearing 8, bolted to the frame at one side. Secured on the projecting end of the shaft 6 is a wheel 9, which has a smooth flat rim, and embracing and protecting the upper half of this wheel is a hood 10, this hood being piv- 35 otally mounted on the shaft 6. Pivoted on the shaft 6 and extending rearward is an arm 11, this arm being bifurcated at its forward end, where it is pivoted to the shaft, to embrace the bearing or pedestal 8. The rear 40 end of this arm is slotted or bifurcated to embrace the smooth rim of wheel 9 at a point about on a level with the shaft 6. Resting loosely in recesses 12, formed in the bifurcated parts of the arm 11, one recess being 45 on each side of the wheel-rim, are the friction-rollers 13, one roller lying in each recess.

Each recess 12 tapers downward, so that the roller will normally rest against the adjacent smooth face of the rim, and in each recess rests a bearing-plate 14 to receive the thrust 55 of the roller, this bearing-plate being readily removable for the purposes of repair and renewal. Formed on the rear lower ends of the hood are projecting heels 15, which normally rest upon the rollers and keep them pressed 60 down in the tapering recesses. To resiliently connect the pivoted hood 10 to the swinging arm 11, so that the pressure on the rollers 13 will be a yielding one, I attach a bolt 16 to arm 11 and pass the same up through an ex- 65 tension 17 on the hood and place a coil-spring 18 on the bolt above the extension and hold the spring in place by a suitable adjustable nut 19. By this little device the pressure on the rollers may be readily regulated. 70

Depending from the rear end of arm 11 is a link 20, pivotally connected at its lower end to a flat spring 21, which serves to normally draw the arm 11 and attached hood 75 downward. To limit the downward movement of the arm 11 is a vertical link 22, pivotally connected at its upper end to an arm 24, projecting rearward from one end of a rock-shaft 25, journaled in tubular bearings on the front of the machine and provided 80 about midway its length with a forwardly-projecting arm 26. Engaging this arm 26 is a rod 27, which may be reciprocated to depress the arm 26 by any suitable mechanism. To limit the downward movement of the arm 85 24 is a stop 28, this stop being carried by a suitable lever 29, pivoted on the frame at one end and adjustably clamped thereto at its other end, this adjustment permitting the stop 28 to be raised or lowered. 90

It will be observed that by the mechanism above described the feed-disk 3 will receive an intermittent rotary movement when the rod 27 is reciprocated. The reciprocations 95 of the rod 27 will be communicated to the link 22, and this link will vibrate the arm 11 and attached hood 10, the arm 11 being normally drawn down by the spring 21 against the lifting action of the link 22. As the arm 11 rises the rollers 13 normally grip the wheel 9 100 and rotate it, the hood 10 moving in unison therewith, thus imparting a slight rotary



movement to the feed-disk; but when the arm 11 is drawn down the rollers loosen their grip on the wheel, permitting the same and the feed-disk to remain stationary, a spring brake-block 30 serving to prevent the friction-wheel 9 from turning while the rollers are loosening. Of course the tension on the spring 18 will not be sufficient to prevent the rollers from rising in their recesses when the arm 11 is lowered. The frequency of the intermittent movements of the disk 3 will of course depend upon the rapidity of the reciprocations of the operating-rod 27.

The feed-disk 3 is peculiarly constructed. It is set on an incline of about thirty degrees, and its rim portion is dished or flared upward and outward, and its center is elevated to form a cone 31, whose apex is slightly below the plane of the upper edge of the rim. The bodily inclination of the disk is secured by mounting its shaft in an oblique position. The front portion of the disk projects beyond the frame of the machine, and it is from this edge that the ore-stuff is fed, being of course delivered into any suitable receptacle. Mounted in the frame of the machine is a hopper 32, whose lower end is almost entirely closed by the feed-disk, an extension 33 of the hopper having its depending sides fitting closely the contour of the upper face of the disk, a portion of the front wall of this extension being cut away at 34 at one side of the center of the cone 31 to form a feed-opening, the oblique sides of the rim and cone making this feed-opening of substantially a triangular shape. A vertically-adjustable gate 35 enables this opening to be regulated in size.

Secured to the lower portion 33 of the hopper at one side of the gate 35 is a suitable arm or flange 36, which extends forward and rests against the upper face of the disk, near its edge, the arm being curved to conform to the edge of the disk and terminating near the front or feed edge, whereby this flange will serve to retain the material on the disk until it reaches the feed edge. Secured on the hopper opposite the flange 36 is a scraper 37, whose rear edge extends the full height of the cone and serves to scrape the material therefrom as the disk revolves and whose lower front edge 39 is curved and inclined to bear upon the dished rim of the disk, this scraping edge 39 inclining forward and away from the flange 36, as shown more particularly in Fig. 3. This scraper is pivoted on a bolt 40, carried by a bracket 41, projecting forward from the lower portion of the hopper, and is clamped in its adjustable positions by clamp-lever 42, threaded on bolt 40. The upper edge of the scraper is provided with a flange 43, which serves to prevent the material being pushed up over the scraper.

The advantages of the above-described peculiarly-formed feed devices are obvious. The obstruction presented to the passage of the ore-stuff by the formation of the disk and

hopper greatly increases the friction, and thereby prevents a too rapid feed even when handling very wet or very fine ores, the friction holding it back until it reaches the feed-edge. This is a difficult thing to do, and I am not aware of any machine that will feed uniformly all kinds of ore-stuff, whether wet or dry or fine or coarse. The cone in the center has several advantages. It holds the ore and prevents it flowing out too fast; but it also serves to carry the stuff nearer to the feed edge of the disk, and thereby enables the scraper to be made shorter, and consequently set at a greater angle, than would be the case if the scraper extended to the center of the disk. Thus setting the scraper at a greater angle than usual, the ore is prevented from packing against the scraper. It will also be seen that the ore that comes out on the cone passes onto the scraper over edge 38 and meets the stream of material coming against the scraper over edge 39. This peculiar action also prevents packing against the scraper, as the ore coming on the scraper over edge 38 meets and pushes along lengthwise of the scraper the stuff that comes over the main scraping edge 39.

It will be observed that the lower edge of the hopper bears against only the rear or upper half of the disk, leaving the front or lower half free, and, as said before, the lower edge of the hopper conforms to the contour of the cone and beveled rim. The lower portion 33 of the hopper preferably inclines rearward, as shown most clearly in Fig. 2, to increase the obstruction to the passage of the ore-stuff.

The object in setting the arm 36 in from the edge of the disk is to prevent any material that may escape under the arm from passing off the disk before it reaches the feed-point, it being obvious that should any of the stuff work its way under the arm the disk will have revolved sufficiently to bring the stuff to the feed-point before the stuff reaches the edge of the disk.

It is obvious that changes in the detail construction may be made without departing from the spirit of this invention, and it is also obvious that the machine may be used for feeding materials other than ore-stuff, if desired.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a feeder for ores, &c., the combination of a hopper, a feed-disk supported thereunder, this disk being inclined bodily and provided with an upwardly-projecting cone in the path of the feed means for imparting movement to the feed-disk, and a scraping edge for the cone and another for the disk.

2. In a feeder for ores, &c., the combination of a hopper, a dished feed-disk mounted thereunder and provided with a central cone in the path of the feed, means for imparting movement to said disk, and a scraper having scrap-



ing edges bearing against the disk and the cone.

3. In a machine for feeding ores, &c., the combination of a hopper, a bodily-inclined feed-disk forming the bottom thereof and provided with a cone in the path of the feed, means for rotating the disk, and a scraper provided with scraping edges working against both the disk and the cone.

4. In a machine for feeding ores, &c., the combination of a hopper provided with a feed-opening in its front side, a dished feed-disk closing the lower end of the hopper except the feed-opening, the front half of the disk projecting in front of the hopper, said disk being provided with a central cone partially obstructing the feed-opening, a scraper projecting forward from the feed-opening to the feed edge of the disk and having two scraping edges, one scraping the cone and the other the rim, a curved arm extending forward from the hopper and terminating near the feed-point.

5. In a machine for feeding ore, &c., the combination of feed mechanism and means for intermittently rotating the same, said means consisting of a shaft carrying a friction-wheel, a pivoted arm and means for vibrating the same, a movable grip device carried by said arm and adapted to normally engage the friction-wheel, means for normally pulling said

arm down and means for intermittently lifting it, and means for normally pressing down upon said grip device to force it against the friction-wheel, this latter means consisting essentially of a pivoted part adapted to swing in unison with said arm and having its free end bearing against said grip device, and an adjustable spring-tension device connecting said pivoted part to said pivoted arm and adapted to vary the pressure on the grip device, substantially as described.

6. In an ore-feeder, the combination of a feed-disk, and means for intermittently rotating said disk, said means consisting of a shaft carrying a pinion, engaging the disk, and a friction-wheel, a pivoted, vibrating arm carrying gravitating friction-rollers gripping the rim of the friction-wheel, a pivoted part or hood embracing the friction-wheel and provided with projections resting on said rollers to normally hold them against the friction-wheel, means for normally drawing down the vibrating arm, and means for lifting said arm, as and for the purpose set forth.

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

ULYSSES S. JAMES.

Witnesses:

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