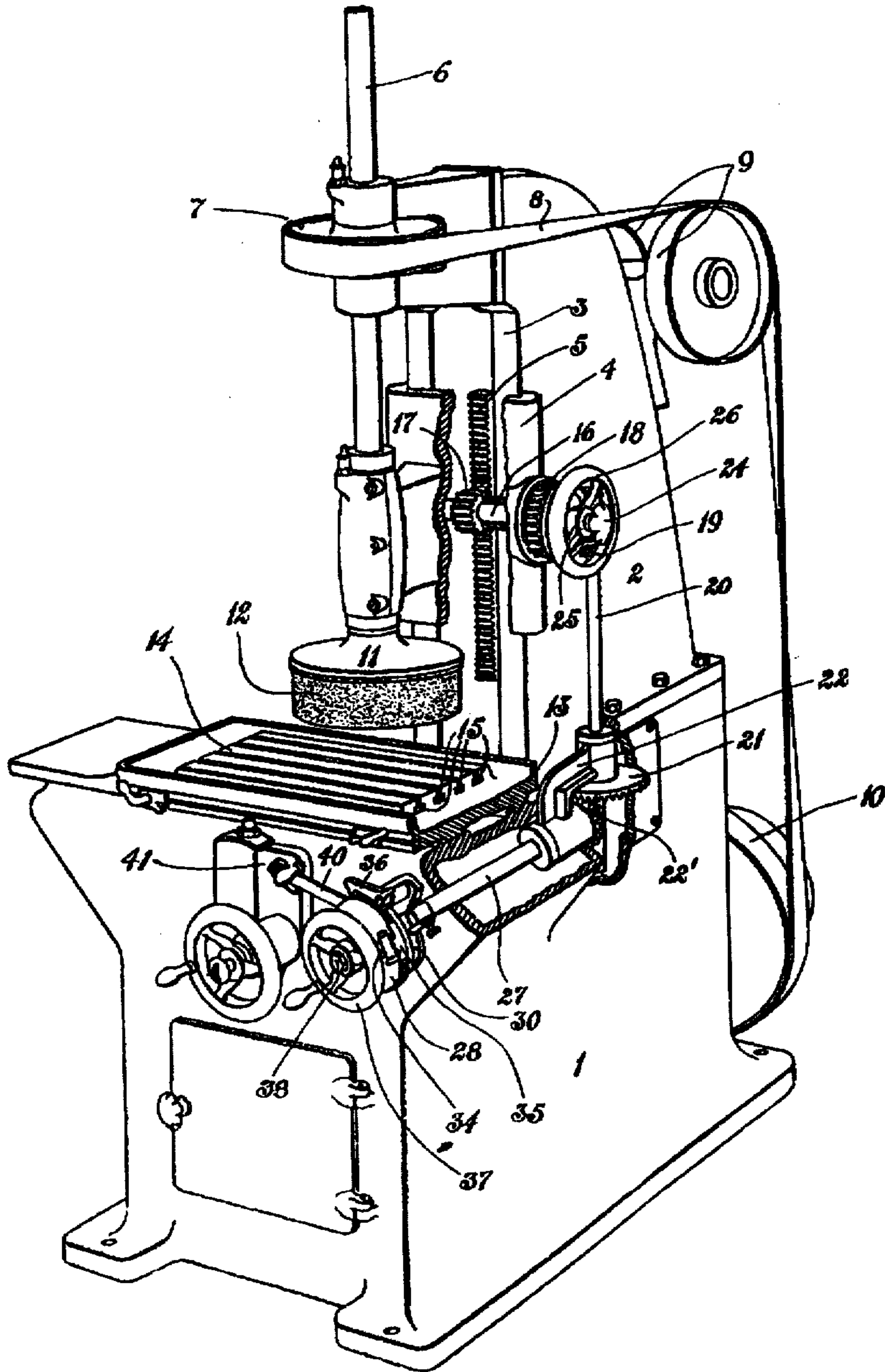


B. M. W. HANSON.
REDUCING MACHINE.
APPLICATION FILED JULY 1, 1907.

945,455.

Patented Jan. 4, 1910.
2 SHEETS—SHEET 1.

Fig. 1.



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Fig. 2.

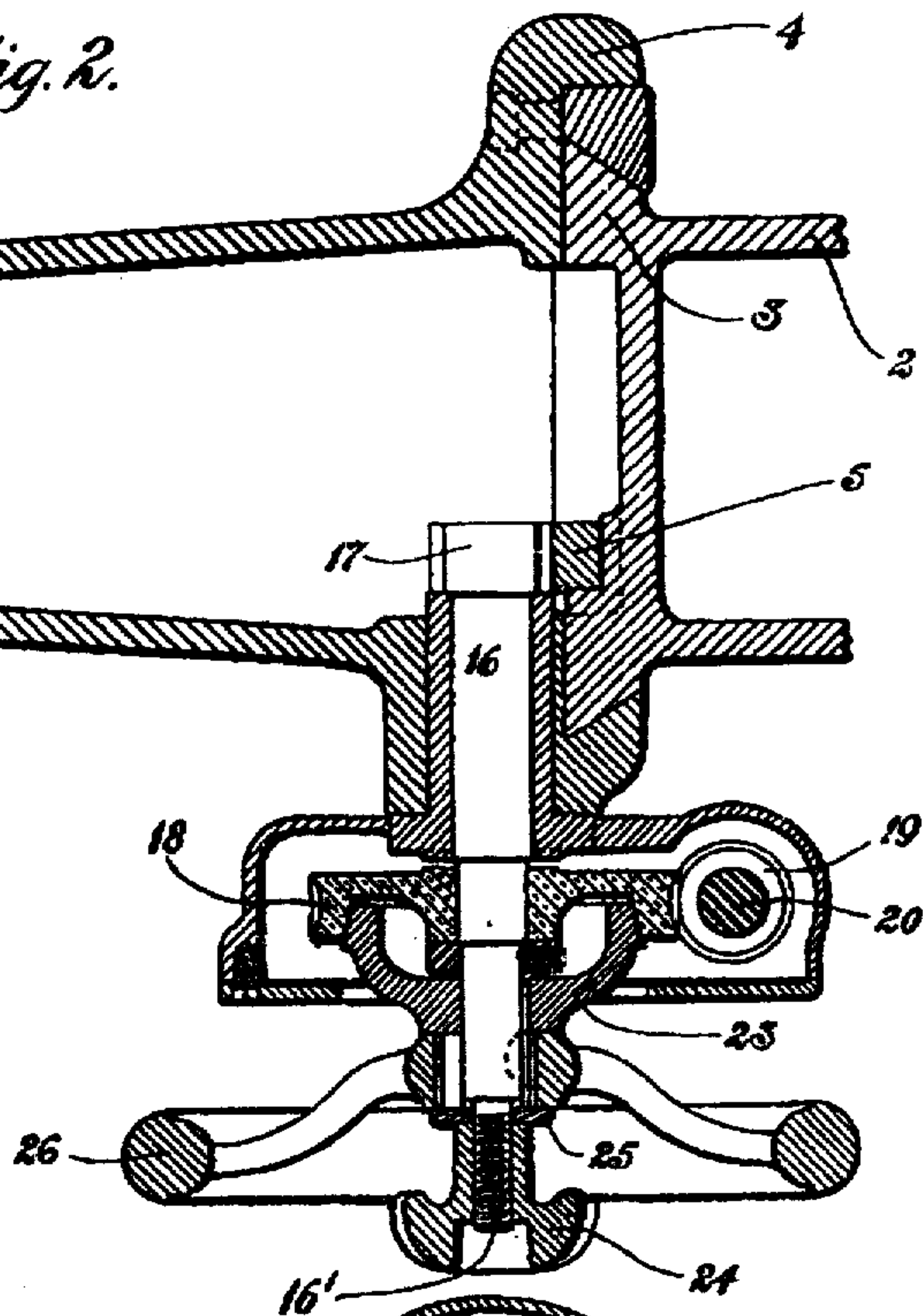
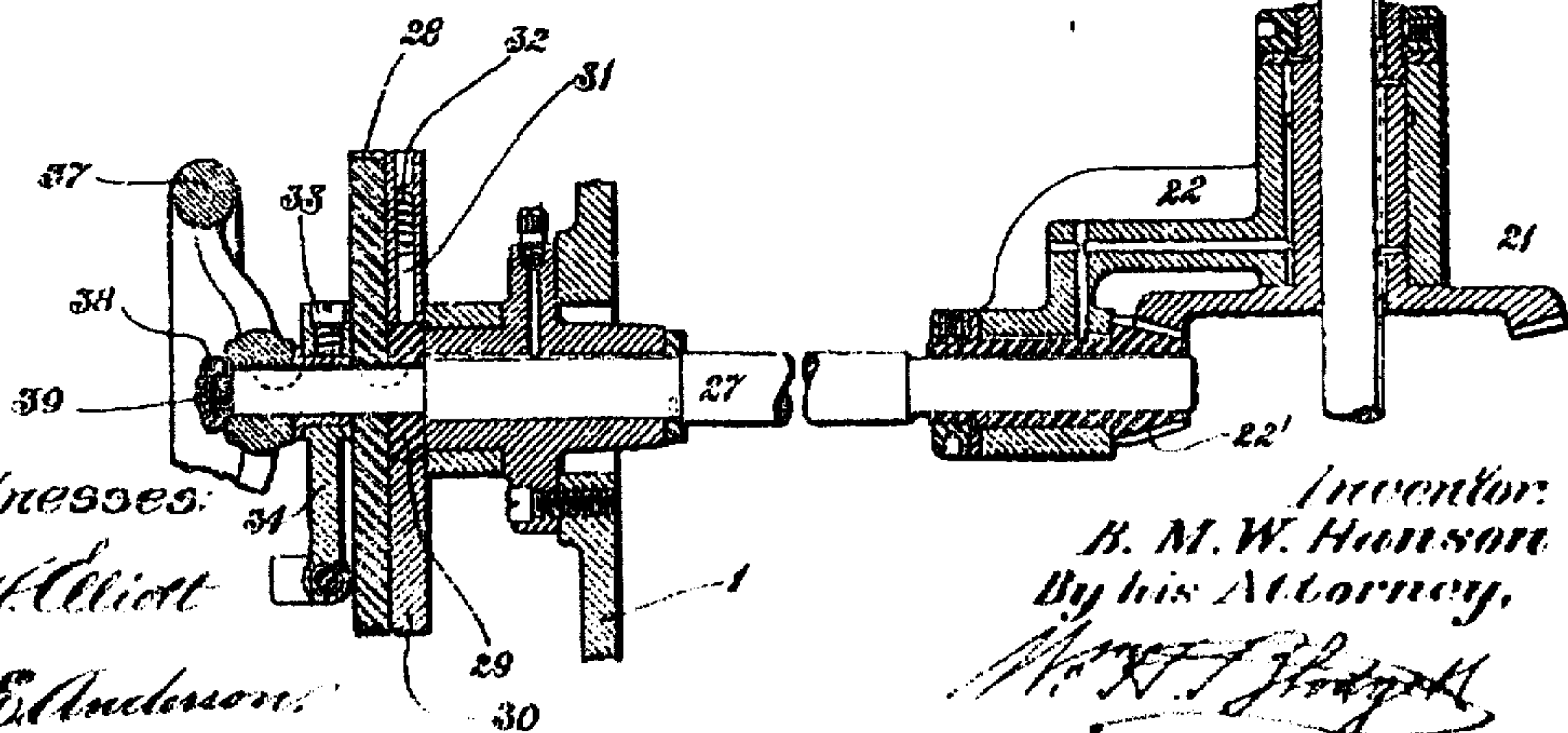


Fig. 3.



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UNITED STATES PATENT OFFICE.

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REDUCING-MACHINE.

945,455.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed July 1, 1907. Serial No. 381,643.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Reducing-Machines, of which the following is a specification.

This invention relates to reducing machines and more especially to that class of such machines in which a vertical spindle is employed for carrying the reducing or grinding-tool.

Mainly the object of the invention is the provision of a machine in which the carrier for the reducing-tool may be operated either manually or automatically, as will hereinafter appear.

Other objects of the invention will be set forth in the detailed description.

In the accompanying drawings, Figure 1 is a perspective view of a machine involving my invention; and Fig. 2 is a sectional detail view of the slide, rack and pinion mechanism, and certain cooperating parts, and, Fig. 3 is a like view of a pair of connected shafts, worm gearing associated with one of said shafts and power and hand operable means for the other shaft.

Like characters refer to like parts throughout the several figures.

Referring to the drawings, the numeral 1 designates the base of the machine from which rises a column 2 the latter having a guideway 3 on which is fitted a slide 4 the column 2 having a rack 5 meshing with a pinion on said slide as will hereinafter appear. Designated by 6 is the vertical spindle of the machine driven by a pulley 7 over which passes a belt 8 leading over idlers 9 to the main driver 10. At the lower end 11 of the spindle 6 is fitted the grinding disk or shell 12, all of the elements just mentioned being conventional, and constituting no part of the present invention.

Upon ways of the bed 1 is fitted a carriage 13 carrying a work-support 14, provided with T-grooves 15 in which may be fitted T-bolts for securing the usual work-support.

Designated by 16 is a shaft journaled in a bearing of the slide 4, and provided with a pinion 17 in mesh with the rack 5 of slide 4. A worm-wheel 18 is loosely mounted on the shaft 16, and in mesh with said worm-wheel is a worm 19 carried by a vertical

shaft 20, the latter being journaled in bearings of the frame and having at its lower end a beveled gear 21; a bracket 22 projects from the frame, and serves as a support for said gear 21, and in mesh with the gear 21 is a similar beveled gear 22'.

For connecting the worm 18 to shaft 16 any desired means may be employed, that shown comprising a cup-shaped friction-clutch 23 movable toward and from said worm-wheel by means of a hand-nut 24 threaded upon the end 16' of the shaft, and bearing through an intermediate washer 25, against the hub of the hand-wheel 26, the latter being in slidable splined connection with said shaft 16, and being placed between the washer 25 and the hub of the splined clutch 23, so that when nut 24 is adjusted it will, through its washer, bear against the hub of the wheel 26, and through the same force the clutch to engage the worm-wheel 18, as illustrated in Fig. 2, thus locking said worm-wheel to its shaft. It will thus be seen that when the clutch is out of engagement with the worm-wheel and when it is desired to rotate the shaft 16 by hand, and thus manually to adjust the position of the slide carrying the grinding-wheel by means of the wheel 26 this may readily accomplished at a point above the base 1 of the machine.

Designated by 27 is the shaft bearing the bevel pinion 22', said shaft being journaled in bearings of the frame, at right angles to the vertical shaft 20. On the shaft 27 is keyed a ratchet-wheel 28, and loosely mounted upon either a collar 29 or it may be a hub projecting from the ratchet wheel 28, is a crank-arm or disk 30 held against too free rotative movement by means of a brake-shoe 31, backed by a spring 32, as illustrated in Fig. 3. To the left of the ratchet-wheel 28, and adjustably secured to a thimble, with the shaft 27 by a screw 33 is an arm 34 carrying a shoe 35 for throwing a pawl 36 pivoted to the crank-arm or disk 30 out of engagement with the ratchet teeth on said disk when the limit of movement of said disk has been accomplished by the automatic feed mechanism of the machine; and beyond the arm 34 a hand-wheel 37 is keyed to the end of shaft 27 and is held in place on said shaft by a nut 38, threaded upon a reduced end 39 of the shaft. By adjusting the arm 34 around the thimble on the shaft 27,

and then locking it in place by the screw 23 the throw-off of the pawl 36 can be regulated to occur at any desired point.

Articulated to the crank-arm or disk 30 is a link 40 connected at its opposite end to an oscillatory lever or carrier 41, which is automatically actuated by power-mechanism (not shown), whereby the shaft 27 may be driven automatically and, through the connections described, will gradually lower the feed-slide 4 by means of gearing (not shown) in which the grinding-spindle 6 is journaled, and constituting no part of the present invention.

In machines of this kind it is important to be able to immediately arrest the automatic feed of the grinding-wheel at any desired point, and it is also important to control the movement of the automatic feed-devices. Provision is, therefore, made in the present machine for accomplishing the results mentioned and this is readily done either by hand wheel 26 above the base of the machine and its connections with the rack 5, or by means of the hand-wheel 37 projecting from the forward part of the base, and so connected that it may be manipulated when the pawl 36 is tripped or thrown out of action, to rotate said shaft 27, and through the gearing 22, 21, shaft 20, worm 19, and worm-wheel 18, cause the proper manual movement of the slide 4.

It is sometimes necessary in fine reducing work to manipulate the slide 4 carrying the reducing disk or wheel with the utmost nicety, and this may be readily accomplished in either of the ways described so that a skilled workman always has at hand proper means for manipulating the grinding-wheel slide at different points and for running back said slide when desired without the necessity of reversing mechanism.

My invention is not limited to the precise devices illustrated and described for changes may be made without departure therefrom.

Having thus described the invention, what I claim is:

1. The combination of a slide, a rack and pinion means for operating said slide, a shaft, automatic means for operating said

shaft, hand operable means for turning said shaft, operative connections between said shaft and said rack and pinion means, and manually-operable means active independent of said hand-operable means for also operating said rack and pinion means.

2. The combination of a bed, a column rising from said bed, a slide supported for movement by and along said column, rack and pinion means for operating said slide, a shaft supported by said bed, automatic means for operating said shaft, manually-operable means for also turning said shaft, operative connections between said shaft and rack and pinion means, and manually-operable means supported by said column for operating said rack and pinion means to effect the movement of said slide independently of either said automatic means or first mentioned manually operable means.

3. In a machine of the class described, the combination, with framework, of a slide mounted thereon, a spindle carrying a reducing-tool, and journaled in said slide; a rack carried by the machine-frame; a shaft; a pinion secured to said shaft, and in mesh with the rack; a worm-wheel loose upon the pinion shaft; a clutch for connecting said worm-wheel to the pinion shaft; and means carried by the pinion shaft for operating the feed when the clutch is disengaged, said means including a hand-wheel, and means for forcing the hand wheel against the clutch.

4. The combination of a slide, rack and pinion means for operating said slide, a shaft to which the pinion of said rack and pinion means is connected, a hand-wheel, means for clutching said hand-wheel to said shaft at will, a second shaft operatively connected with the first mentioned shaft, and automatically-operative and manually-operative means for turning said second mentioned shaft.

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

BENGT M. W. HANSON.

Witnesses:

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F. E. BLODGETT.