

No. 688,955.

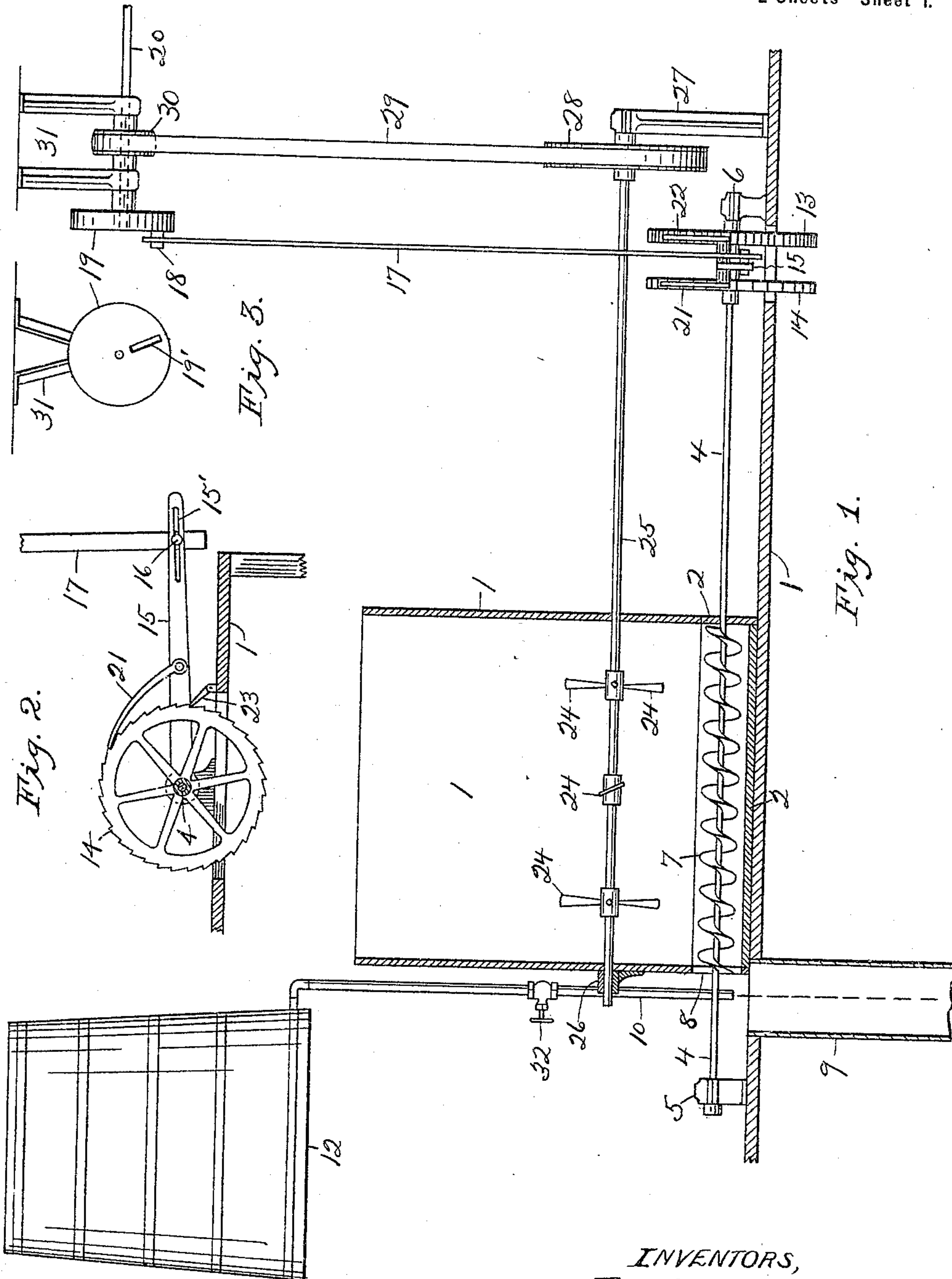
Patented Dec. 17, 1901.

T. A. KENDRICK, J. W. SAPPINGTON & W. N. PHILLIPS.  
MACHINE FOR FEEDING ABRASIVE MATERIAL.

(Application filed Mar. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:  
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By Higdon & Higdon,  
ATT'YS.

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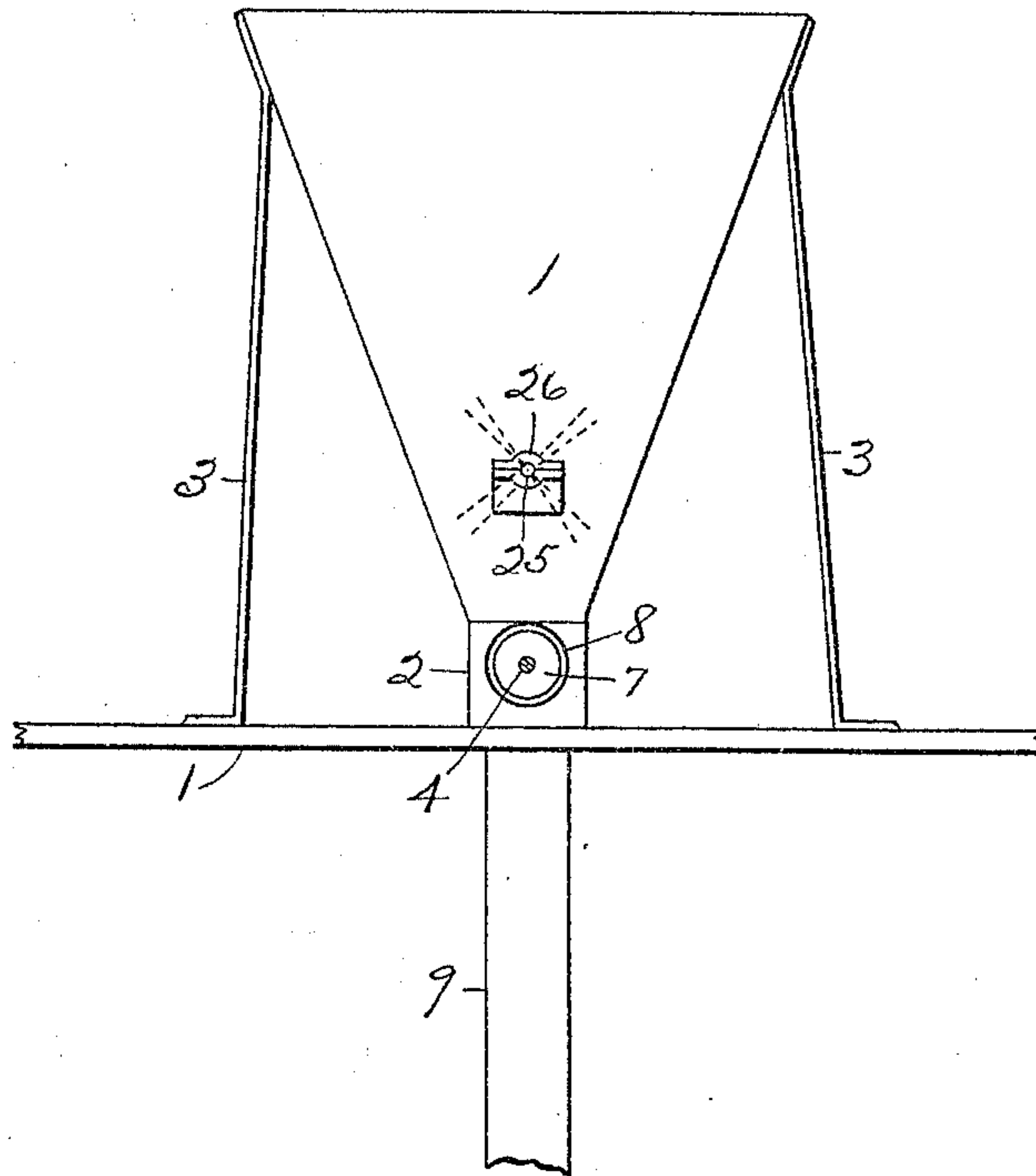


Fig. 4.

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# UNITED STATES PATENT OFFICE.

THOMAS A. KENDRICK, JOSEPH W. SAPPINGTON, AND WILLIAM N. PHILLIPS,  
OF CARTHAGE, MISSOURI.

## MACHINE FOR FEEDING ABRASIVE MATERIAL.

SPECIFICATION forming part of Letters Patent No. 688,955, dated December 17, 1901.

Application filed March 22, 1901. Serial No. 52,350. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS A. KENDRICK, JOSEPH W. SAPPINGTON, and WILLIAM N. PHILLIPS, citizens of the United States, and residents of Carthage, in the county of Jasper and State of Missouri, have invented new and useful Improvements in Machines for Feeding Abrasive Material, of which the following is a specification.

Our invention relates to a machine for automatically, continuously, uniformly, and adjustably feeding abrasive materials—such as chilled shot, crushed steel, or sand—in proper quantities to gangs of stone-saws, polishing-beds, or to polishing-machines in general.

The operation of feeding the abrasive material to stone-saws has heretofore been done by hand—that is, a workman shovels the material into a receptacle below the saws or beds, from which receptacle it is carried by a stream of water into the usual pump employed for raising the water charged with the abrasive to the distributing devices above the saws or beds. This shoveling of the material is done irregularly, the result of which is that the pump is often clogged by the large amount of material and sometimes stopped. At such times a large portion of the abrasive material is discharged through the overflow-opening of the pump, and thereby scattered. Another disadvantage of the old method of feeding is that the quantity of abrasive fed to the saws is thereby caused to fluctuate from time to time instead of being uniform, as it should be.

The object of the present invention has been stated above, and we accomplish this object by providing a receptacle for the abrasive material, a screw conveyer located in the bottom thereof, agitator-arms revolving above the conveyer, and mechanism for actuating the conveyer at any required speed or slowness, all of which will be fully described hereinafter, and embodied in the appended claim.

We will proceed to describe our invention with reference to the accompanying drawings, in which—

Figure 1 is a side or front elevation of the preferred embodiment of our invention, the receptacle or hopper being in central vertical section, the floor being in section, and the receiving-spout in section and broken away.

Fig. 2 is a detail view showing one of the ratchet-wheels and the device for actuating it, the pitman being broken away and the floor in section. Fig. 3 is a detail view showing the slot in the crank-wheel. Fig. 4 is an end elevation of the discharge end of the hopper and its trough, the receiving-spout being broken away.

Referring to Figs. 1 and 4, 1 designates a hopper, into which the abrasive material, either sand, steel, or chilled shot, is dumped. The open bottom of this hopper rests on top of a conveyer-trough 2, approximately square in section and of the same length as the hopper 1. Said hopper and trough may be constructed of either wood or metal, as preferred. The hopper 1 is made separate from the trough 2, so as to be removable therefrom. The hopper is braced by rods 3, though any other preferred form of braces may be used for this purpose. The conveyer-shaft 4 extends longitudinally through the trough 2, passing through a round hole in one end thereof and having its adjacent end journaled in a boxing 5 and its opposite end journaled in a boxing 6. Keyed to or integral with shaft 4 is a screw conveyer 7 of a well-known type, having a single flight arranged helically around said shaft. One end of the conveyer 7 extends into or through a circular opening 8, formed in the end of the trough 2. (See Fig. 4.) The purpose of conveyer 7 is to feed the abrasive material slowly through the opening 8, from which it falls into a receiving-spout 9. This spout may be extended to any point desired, as to the usual pump employed for elevating the abrasive to the saws or polishing-beds. A water-supply pipe 10 is provided, having its lower end above the mouth of spout 9 for supplying water to the abrasive material in said spout. The water acts as a vehicle for carrying the abrasive through horizontal tubes or around bends, &c., and also provides means for elevating the abrasive by a pump, as stated hereinbefore. The supply-pipe 10 is preferably connected to a water-tank 12, which is filled when necessary in any preferred manner.

The means for rotating the conveyer-shaft 4 is as follows: Keyed on said shaft near boxing 6 is a pair of ratchet-wheels 13 14, pref-



erably having a common or integral hub between them; but the hubs may be separate and secured in contact with each other to form a fulcrum for an arm, to be described hereinafter. The teeth of both of said wheels point in the same direction; but one of the wheels 13 has more, and therefore smaller, teeth than the other wheel 14, the teeth of wheel 14 being preferably twice as coarse as those of wheel 13 for a reason which will be apparent.

Referring especially to Fig. 2, an oscillatory arm 15 has one end thereof mounted rotatably on the hub or hubs of ratchet-wheels 13 14 between said wheels. Arm 15 extends outwardly to a suitable length and in its outer end portion is formed a longitudinal slot 15'. Through said slot extends a wrist-pin or bolt 16, on one end of which is pivotally mounted the lower head of a pitman 17. The wrist-pin or bolt 16 is so constructed that it may be secured at any point in the slot 15', while permitting free relative motion between itself and the pitman-head. There being a number of well-known constructions for adjustable wrist-pins, no particular detail thereof is described. The upper pitman-head of pitman 17 is mounted on a wrist-pin 18, which is adjustably secured in a radial slot 19' in the crank-wheel 19, mounted on a counter-shaft 20. The purpose of slot 19 in the crank-wheel and of slot 15' in the arm 15 is to provide means for adjusting the length of stroke of said arm, the purpose of which will now be described. Pivotaly secured to the opposite sides, respectively, of arm 15 are two pawls 21 and 22, one of which engages ratchet-wheel 13, the other engaging ratchet-wheel 14. The wrist-pins 16 and 18 are so adjusted in their respective slots that the stroke or throw imparted to arm 15 by crank-wheel 19 through pitman 17 is just sufficient to cause one of the pawls to move its ratchet-wheel the space of one tooth on the wheel. Therefore the stroke for pawl 21 would be one-half the length of stroke required for the other pawl 22. By this means and by regulating the speed of the counter-shaft 20 the conveyer 7 may be turned at any suitable speed or degree of slowness to meet varying conditions of the work and different kinds of abrasive material. A pawl or dog 23 may be provided for each ratchet-wheel 13 14 for preventing backward rotation of said ratchet-wheels. The number of teeth in wheel 14 may be any even divisor of the number of teeth in the other wheel 13—as one-half, one-third, or one-fourth of the number. Both of the pawls 21 22 may remain in engagement with the ratchet-wheels 13 14 at all times, the operation of neither pawl being affected by that of the other, as will be readily understood.

The abrasive material when sand or crushed

steel would be liable to pack or choke at or near the bottom of the hopper 1 were it not that we provide a plurality of agitator-arms 24, having hubs keyed on a shaft 25, one end of which is journaled in a box 26, secured to one end of the hopper, the other end of said shaft being journaled in a bearing at the top of a standard 27. Near this bearing a pulley 28 is secured on shaft 25, said pulley being driven by a belt 27 from a smaller pulley 30 on counter-shaft 20, of which 31 designates two of the hangers.

To return to the agitator-arms 24, each set thereof is staggered relatively to the adjacent sets, as shown. Only two arms are shown on each hub; but one or any preferred number may be employed, and any required number of sets may be employed. The arms are preferably set obliquely, as shown, or substantially thereas. The purpose of said arms is to agitate the mass of abrasive material to prevent its choking or packing in the hopper 1 or trough 2.

The stream of water from pipe 10 may be regulated or shut off by a valve 32.

While the drawings show the preferred embodiment of our invention, certain changes in details of construction or arrangement may be resorted to without departing from the spirit of the invention.

Having now fully described our invention, what we claim as new, and desire to secure by Letters Patent of the United States, is—

In a machine of the class described, a receptacle for abrasive material, having an opening in one end thereof, a receiving-spout having its upper end below said opening, a water-supply tube having its discharge end above said spout, a shaft extending through said receptacle, a screw conveyer secured on said shaft within the receptacle, a pair of ratchet-wheels having a common hub or two hubs in abutment secured on said shaft, an arm having one of its ends mounted pivotally on said hub or hubs, two pawls carried by said arm and engaging the teeth of said ratchet-wheels respectively, the number of teeth on one of said ratchets being an even divisor of the number of teeth on the other ratchet, a longitudinal slot in said arm, a pitman connected to a wrist-pin secured adjustably in said slot, a crank-wheel having a radial slot therein, and a wrist-pin adjustably secured in said slot and connected to said pitman, all substantially as described.

In testimony whereof we affix our signatures in the presence of two witnesses.

THOMAS A. KENDRICK.  
JOSEPH W. SAPPINGTON.  
WILLIAM N. PHILLIPS.

Witnesses:

JNO. W. GLASS,  
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