No. 715,336. Patented Dec. 9, 1902.

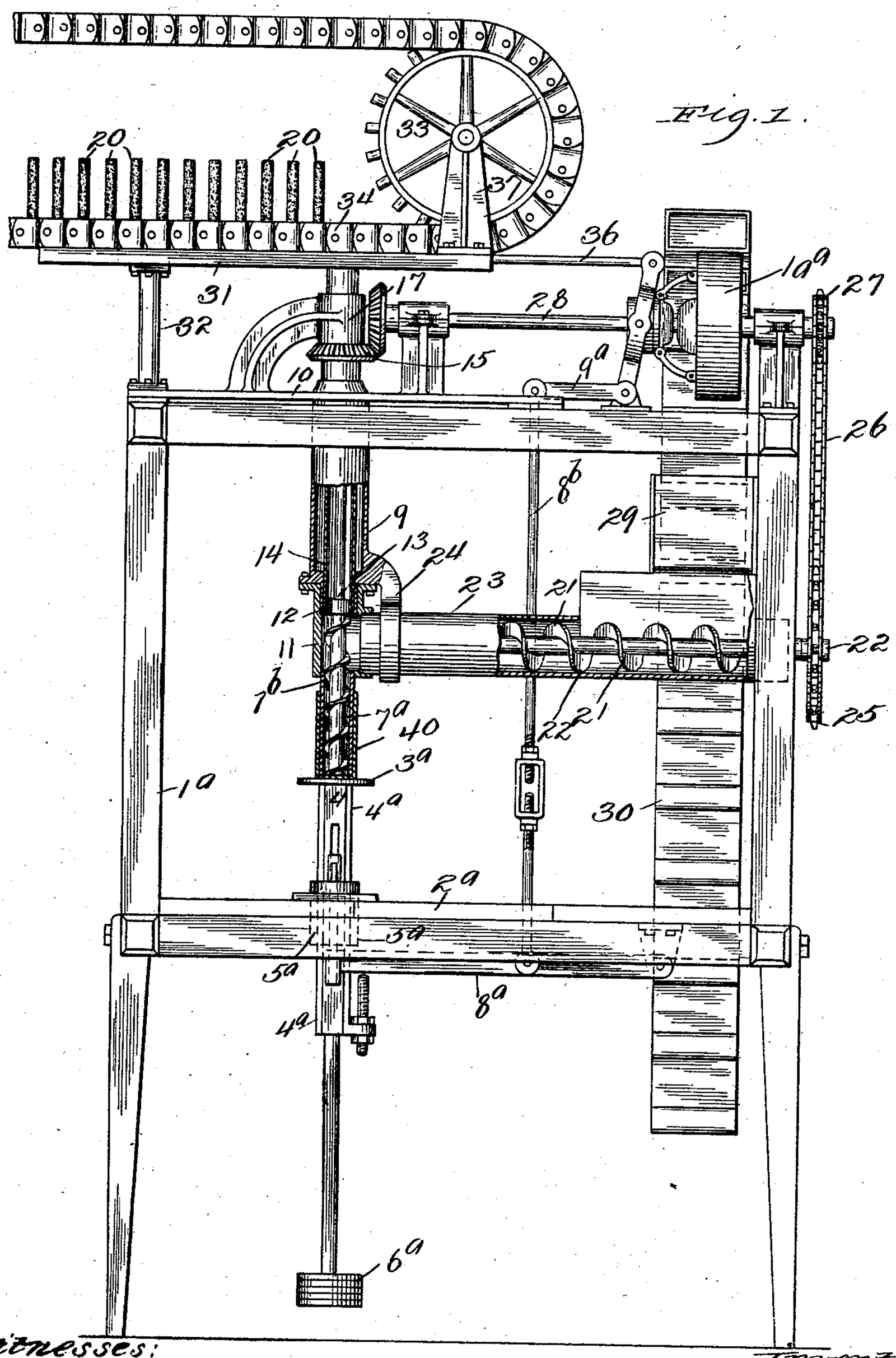
V. G. APPLE.

MACHINE FOR PACKING PULVERULENT AND MASTIC SUBSTANCES.

(Application filed July 19, 1902.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

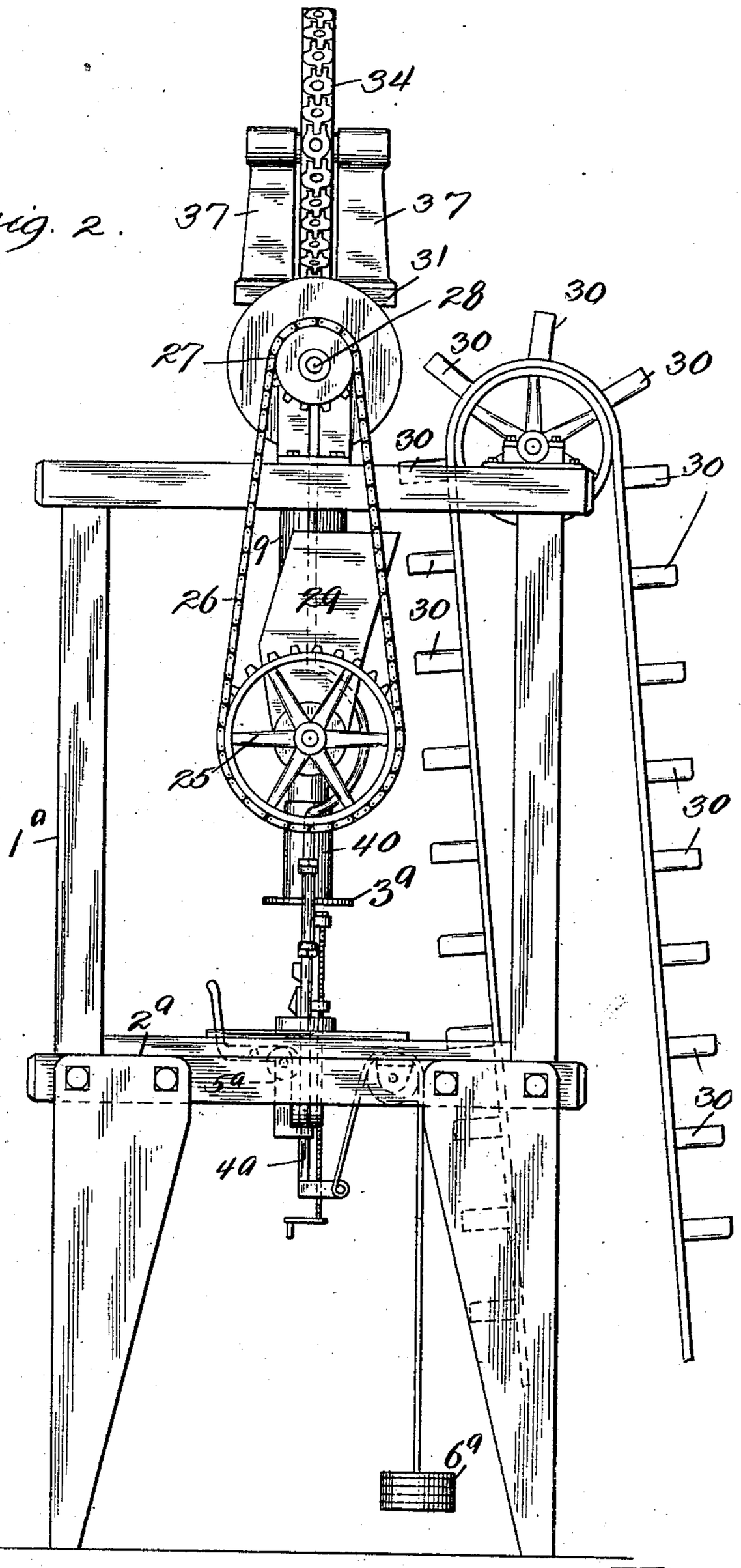

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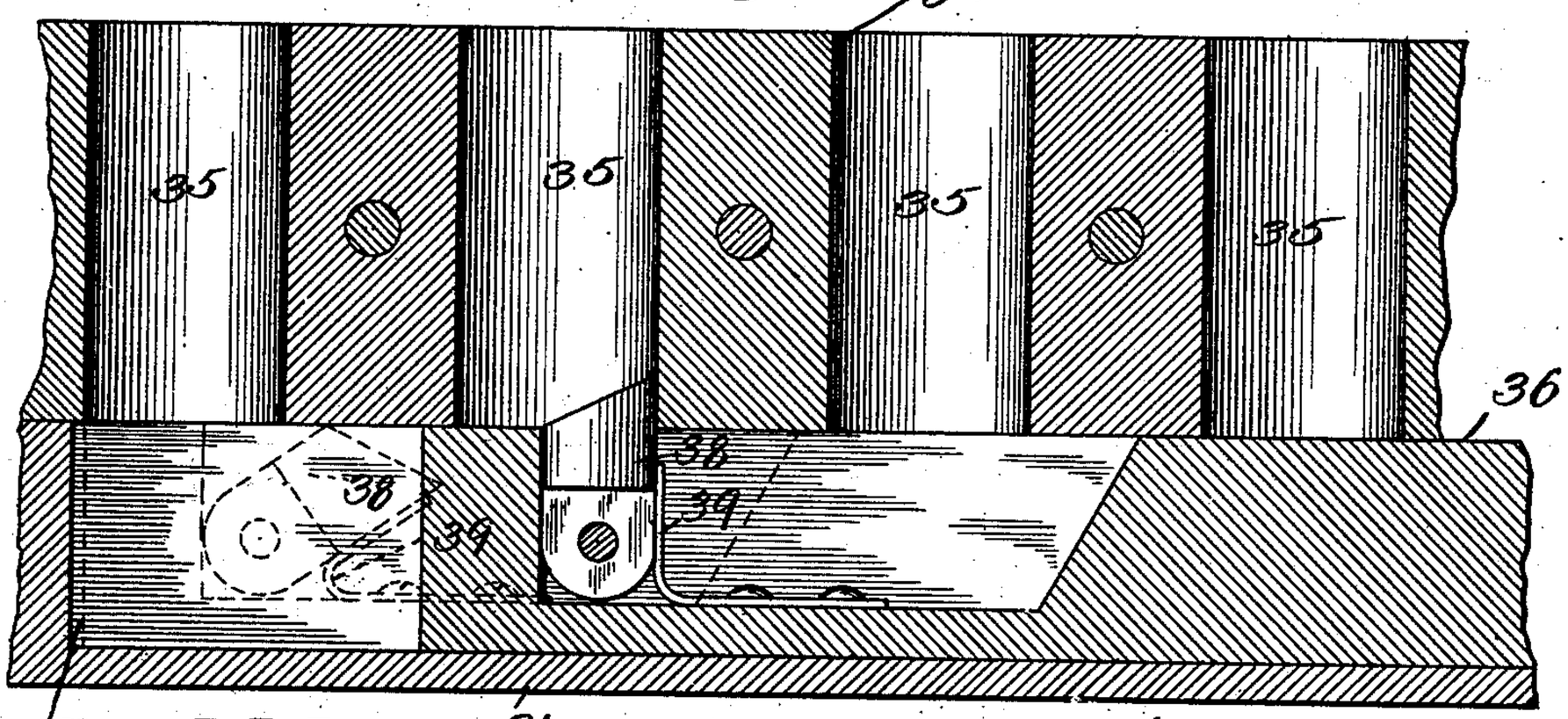
Fig. 6.



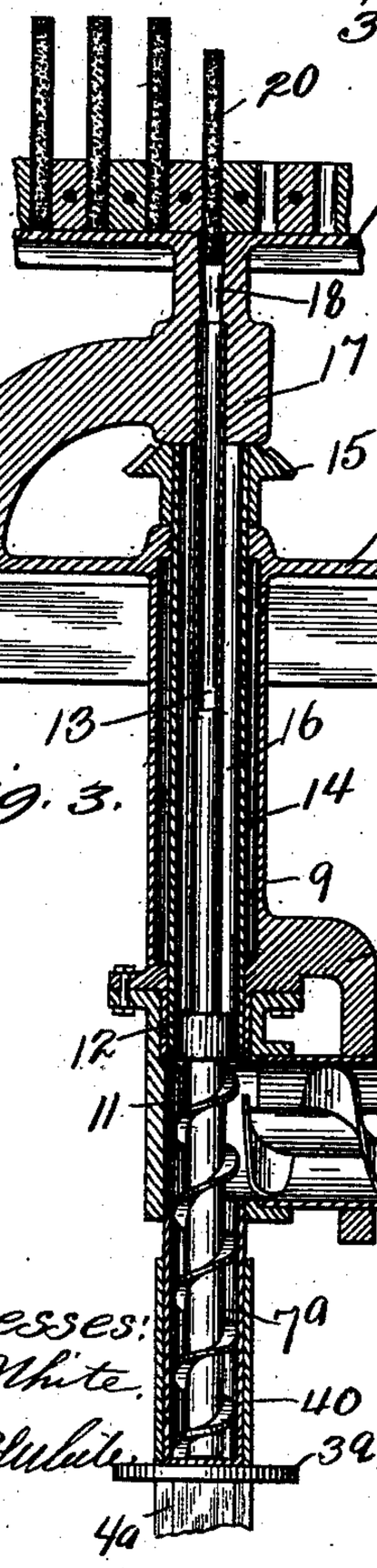


Fig. 3.

Fig. 4.

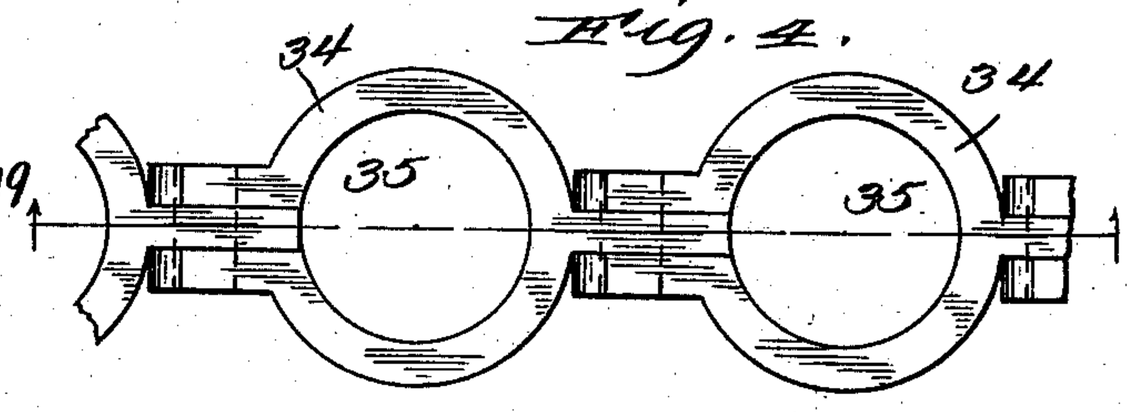
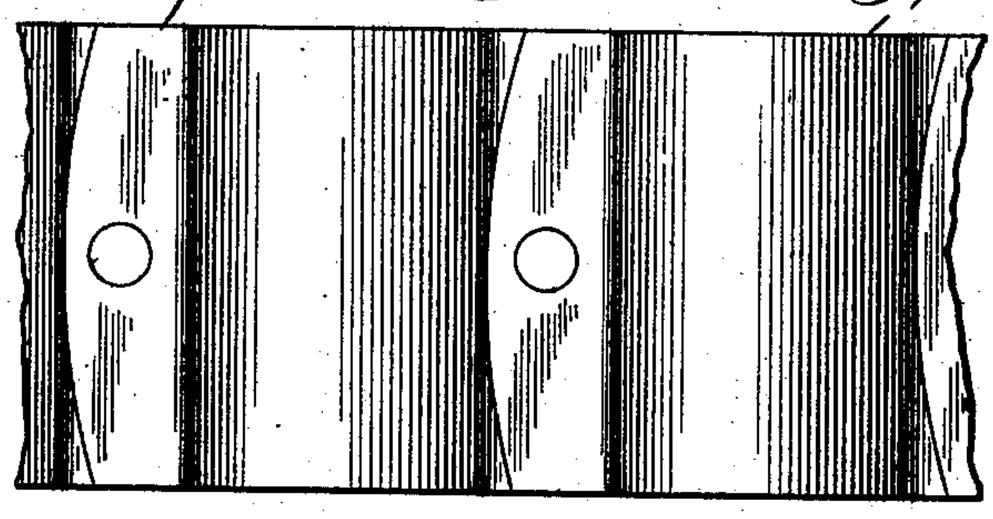


Fig. 5.



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UNITED STATES PATENT OFFICE.

VINCENT G. APPLE, OF DAYTON, OHIO.

MACHINE FOR PACKING PULVERULENT AND MASTIC SUBSTANCES.

SPECIFICATION forming part of Letters Patent No. 715,336, dated December 9, 1902.

Application filed July 19, 1902. Serial No. 116,163. (No model.)

To all whom it may concern:

Be it known that I, VINCENT G. APPLE, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Machines for Packing Pulverulent and Mastic Substances; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in machines for packing pulverulent substances within shells, casings, or other receptacles. It has special reference to that type of machine for which United States Letters Patent No. 571,492 were granted to Charles J. Mattison on the 17th day of November, 1896.

The object of my invention is to mechanically effect the packing of comminuted material that has been made into a mastic or viscous mass into suitable receptacles.

A further object of my invention is to effect the packing of a mastic material around a core within a shell or casing by providing a means for positively feeding such material to the packing-auger or other packing instrumentality.

A still further object of my invention is to provide a means for automatically feeding the cores to be contained within the shells or casings to the packing-machine and into the shells or casings in which they are to be contained.

With these and other objects in view, which will hereinafter appear and become obvious to those persons who are skilled in the art to which my invention appertains, my invention consists in the arrangement and combination of parts about to be described, and specifically pointed out in the appended claims.

In the accompanying drawings an exemplification of my invention is shown, in which—

Figure 1 is a side elevation of a machine, showing the automatically-operated core-feeding mechanism and the positive screw-feed for conveying the mastic material to the packing means. The latter parts are shown plainly in section. Fig. 2 is an end elevation showing the bucket-conveyer for depositing the material to be packed within the hopper communicating with the laterally-extending spiral conveyer. Fig. 3 is a central vertical enlarged section showing a means by which my method of packing a mastic, glutinous, or similar material can be effected and whereby the cores around which such substances are to be packed may be automatically fed into the receptacles in which they are to be contained. Fig. 4 is an enlarged plan view of the chain, each link of which is adapted to contain a core and to convey such core to the machine into which they are automatically fed. Fig. 5 is an elevation of a portion of said chain. Fig. 6 is an enlarged central vertical section through the chain and the means by which said chain is impelled in intermittent movements for feeding the cores into the receptacle within which the packing material is to be contained.

In all of the views the same reference-numerals indicate similar parts.

As illustrated in the drawings, 1^a indicates the framework of a packing-machine, including the table or platform 2^a for holding the unfilled shells or packages and for other purposes. A yielding platform 3^a is secured in a horizontal position to the upper end of the slide 4^a, the downward movement of the said yielding platform being resisted by an alterable counterweight 6^a to obtain the required density of the packing material, which is secured to the lower end of the slide 4^a, which moves vertically in the guides 5^a, the latter being secured to the framework. The packing-auger 7^a, the releasing-lever 8^a, the operating-lever 9^a, drive-wheel and clutch 10^a, all of which are old and well-known construction and form no part of my invention.

9 is a downwardly-depending tubular support fixed to or is made an integral part of the cross-beam 10, flanged at its lower end, to which a casing 11 is attached.

The hollow packing-shaft 16 communicates with and is separable from the tubular center of the packing-auger 7^a.

A driving-tube 14 is fixed by its upper end to a beveled gear 15, by means of which it is rotated. An enlarged extension 12 of the packing-auger 7^a is adapted to fit in and be secured to the driving-tube 14, whereby the packing-auger is rotated. A hollow shaft 16 is coaxially arranged with the hollow center of the packing-auger 7^a and may be rotated or remain stationary. It extends through the

bearing 17 and terminates just below a conical opening 18, extending through and from the upper surface of the table 19. When the cores 20 are placed in the openings 18, they will be fed by means of gravity through the tube 16 into the packing-auger 7^a.

A screw conveyer 21 is fixed to the shaft 22 and is adapted to be rotated thereby in the cylindrical casing 23. One end of the tubular casing 23 is supported in the casing 11 and also by an auxiliary depending annular bracket 24, which is a part of the tube 9. The shaft 22 is rotated by means of the sprocket-wheel 25, the sprocket-chain 26, and the sprocket-wheel 27, the latter being fixed to the main driving-shaft 28.

A hopper 29 is placed immediately over one end of the cylindrical casing 23 for receiving the material to be packed by the packing-auger 7^a into the receptacles. The hopper 29 is located in position to receive the material coming from the elevator-buckets 30.

The table 31 is supported by the brackets 32 and 17 upon the frame of the machine. A sprocket-wheel 33 is supported upon brackets 37 37. There are two sprocket-wheels 33 and two sets of brackets 37 37, only one set being shown in the drawings. A chain 34 of a peculiar form (shown in detail in Figs. 4, 5, and 6) is passed around the sprocket-wheels 33 33 and is adapted to be moved along the upper surface of the platform or table 31. Each one of the links of the chain 34 is perforated, the perforations substantially corresponding with the configurations of the core to be fed into the center of the lower end of the packing-auger. In the illustration shown the cores 20 are of cylindrical form and the perforations 35 within the chain 34 are also of cylindrical form. The successive series of links contained in the chain are adapted to be moved along and over the upper surface of the table 31 in such a manner that the perforations of the links comprising the chain are successively brought into coaxial position with the conical opening 18. (Shown more plainly in Fig. 3.)

A clutch-operating bell-crank lever 9^a is extended upwardly. The extended end is pivotally connected to a longitudinally-movable rod 36. This rod is adapted to be reciprocated when the clutch-operating lever 9^a is moved for the purpose of throwing the clutch in and out of gear. The machine is driven by means of a belt around the driving-pulley associated with the clutch. The free end of the rod 36 enters a groove made into the upper surface of the table 31, the upper surface of the rod coming flush with the upper surface of the table 31. The rod carries upon its extended free end a pawl 38, which is held normally in position shown in full lines in Fig. 6 by spring 39. The pawl 38 is adapted to enter the perforations 35, made through each of the links composing the chain 34. When the operating clutch-lever 9^a is moved for the purpose of disengaging the clutch, the rod 36 is reciprocated a distance sufficient for the pawl 38 to engage with the succeeding perforation 35 in the following link of the chain, and in this manner each link is moved a definite distance each time the clutch-lever 9^a is operated for stopping and starting the machine.

40 is a shell or case for containing the packed finely-divided mastic material and the core after the packing has been accomplished. Said shell may be made of any suitable material in any preferred form and with either one or both of its ends open until the operation of packing has been complete; but if either of its ends must be closed it should be the lower one, so as to allow the open end to be fed over the packing-tube 7^b.

When my invention is applied to the production of electric batteries, the filling medium consists of finely-divided carbon or such other material suited for that purpose made into a mastic, viscous, or sticky composition, and under the same conditions the core should be a solid bar of carbon or an equivalent material, and said core should preferably be of uniform length and size.

The operation of my device is as follows: The finely-divided carbon or like material for batteries is made into a pasty or mastic compound and is preferably elevated by means of the bucket conveyers 30 into the hopper 29, from whence it is fed by the enlarged screw conveyer 21 under pressure into the casing 11, in which the vertical packing-auger 7^a is rotated. By this means the viscous mastic material is forced into intimate contact with the packing-auger 7^a and into the casing 7^b, in which the auger 7^a revolves. The hopper 29 being vertical, the material contained therein settles by gravity in and around the convolutions of the conveyer 21 and is forced with some pressure into the casing 11. Before the packing material is placed in the can 40 one of the cores 20 is fed through the tube 16 into the packing-auger 7^a at the time when the perforation 35 of one of the links of the chain 34 registers with the tapered perforation 18, made through the table 31, whereby the core 20 is allowed to drop by gravity into the can 40 at that time surrounding the lower end of the packing-auger 7^a. When the can 40 has been filled, the yielding table 3^a has been depressed, the pivoted lever 8^a, operating the rod 8^b, moves the clutch-operating lever 9^a to disengage the clutch of the driving-pulley 10^a, and thereby stop the machine. At this time the rod 36 is moved by the extended end of the lever 9^a until the ratchet-pawl 38 engages the central perforation 35 of the next succeeding link of the chain ready to move a carbon core over the perforation or opening 18, when the clutch 10 is again caused to engage the clutch-pulley. When the can 40 has been filled and removed and an empty can placed upon the

table 3ª to be filled, the machine is started again by raising lever 8ª, by the operation of which the clutch-lever 9ª is moved to engage the clutch for the pulley 10ª, when the rod 36 will be moved a sufficient distance to bring the next succeeding link of the chain 34 into a position in which its central perforation will register with the conical perforation 18, and the carbon core 20 contained therein will drop through the tube 16 into the packing-auger 7ª. The core 20 will thus be directed and held in a central position within the can 40, and the finely-divided mastic carbon material will be easily packed at a uniform density between the surfaces of the said can and the surface of the core. Each time the machine is stopped and started one link of the chain 34 will be moved so that the carbon contained therein will be dropped in the manner described into the can to be filled.

The carbon cores 20 are to be placed in the links of the chain by an attendant, when they will be automatically brought into position and dropped at the proper time into the can to be filled in the manner heretofore described.

I have found from experience that a finely-divided mastic mass will not be fed into the can 40 when such mass is contained in a hopper immediately over the vertical packing-auger 7ª, and that it is necessary to feed the material with some pressure into the packing-tube surrounding the auger 7ª.

While I have shown a chain for containing the cores to be fed into the cans to be filled, it is evident that other forms of magazines may be used in lieu of the chain, and other forms of conveyers for feeding the material into the casing surrounding the packing-auger may be employed within the spirit and intent of my invention.

The cores may in form be of any desirable cross-section, cylindrical, square, oblong, fluted, or otherwise, and the perforations through the links in the chain should approximately conform with the shape of the cores.

While I have herein described the screw conveyer as larger than the filling-auger to produce a pressure in the latter, it is apparent that this result might be attained in other ways, as by making the conveyer-screw of sharper pitch than the auger, the chief desideratim being to give the conveyer a greater feeding capacity than the auger in order that a pressure may be constantly maintained in the latter.

Having described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the class described, the combination with a revoluble packing-auger, a casing closed around the axis of the auger at its receiving end, and a driven conveyer communicating with the receiving end of said casing.

2. In an apparatus of the class described, the combination with a revoluble packing-auger, a casing surrounding said auger, closed around the auger at its receiving end, and a conveyer having a larger feeding capacity than the packing-auger, communicating with the receiving end of said casing.

3. In an apparatus of the class described, the combination with a hollow revoluble packing-auger, a hollow driving-shaft for revolving said auger, a casing surrounding said auger, closed around said auger at its receiving end, a conveyer having a larger feeding capacity than the packing-auger, communicating with the receiving end of said casing, and a means for feeding cores through the hollow driving-shaft into the said hollow packing-auger.

4. In an apparatus of the class described, the combination of a hollow packing-auger, a hollow driving-shaft for revolving said auger, a magazine for containing a series of cores to be fed into said auger, and a means shifted by movement of the shell or casing to be filled, for operating said magazine to feed said cores into said auger.

5. In an apparatus of the character described, the combination with a hollow, revoluble packing-auger, means for revolving the same, and a casing surrounding said auger, of a magazine adapted to hold a series of cores to be fed to the auger, and means for automatically feeding the cores from said magazine to the hollow feeding-auger.

6. In an apparatus of the character described, the combination with a hollow, revoluble packing-auger, and means for revolving the same, of a magazine adapted to hold a series of cores in position to be fed to the auger, and means for moving the magazine to feed the cores to the hollow packing-auger.

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

VINCENT G. APPLE.

In presence of—
L. M. ARNOLD,
B. P. WOLF.