No. 678,399 Patented July 16, 1901.

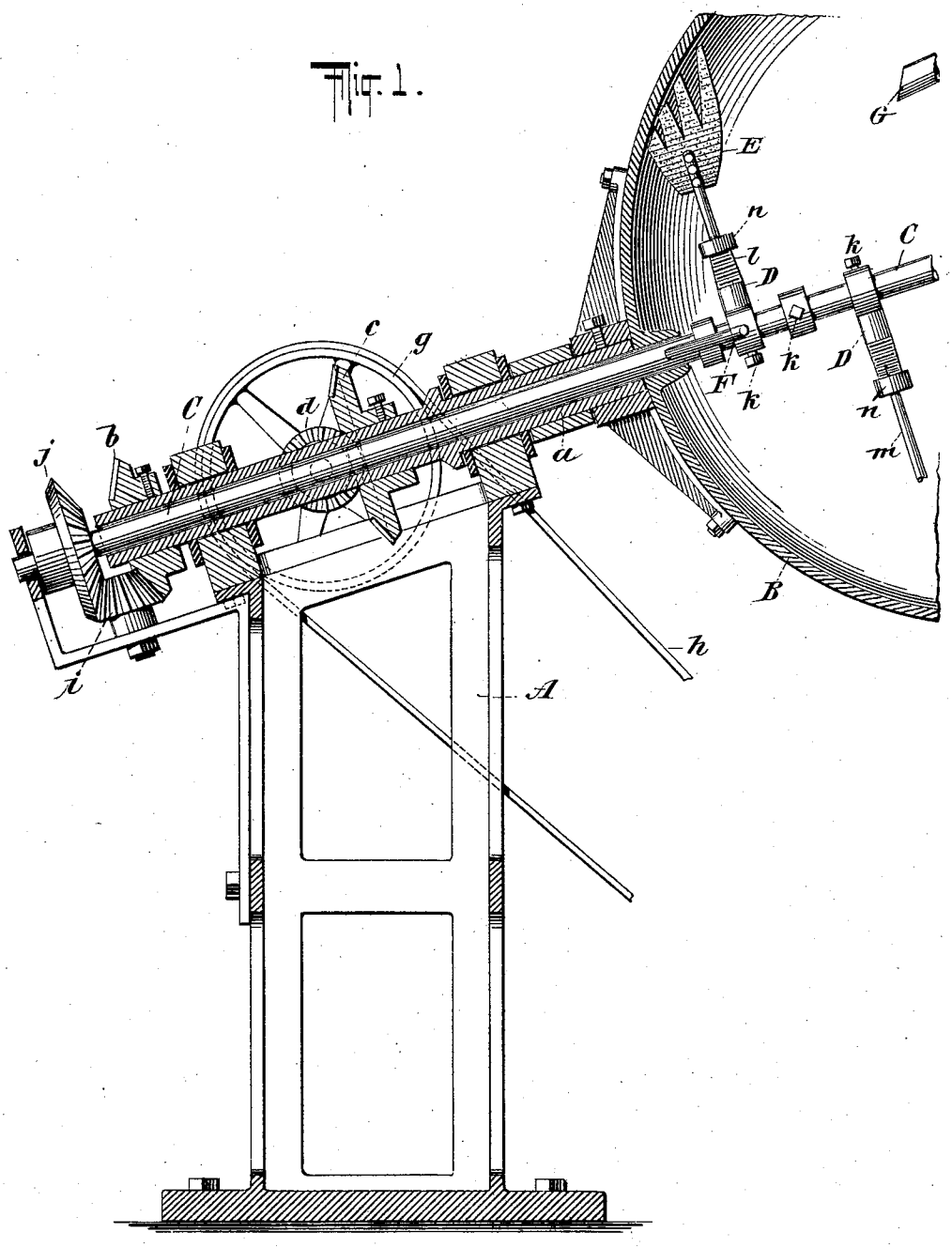
B. F. HAYS.

MACHINE FOR COATING TABLETS.

(No Model.) (Application filed Oct. 1, 1900.)

3 Sheets—Sheet 1.

Fig. 1.

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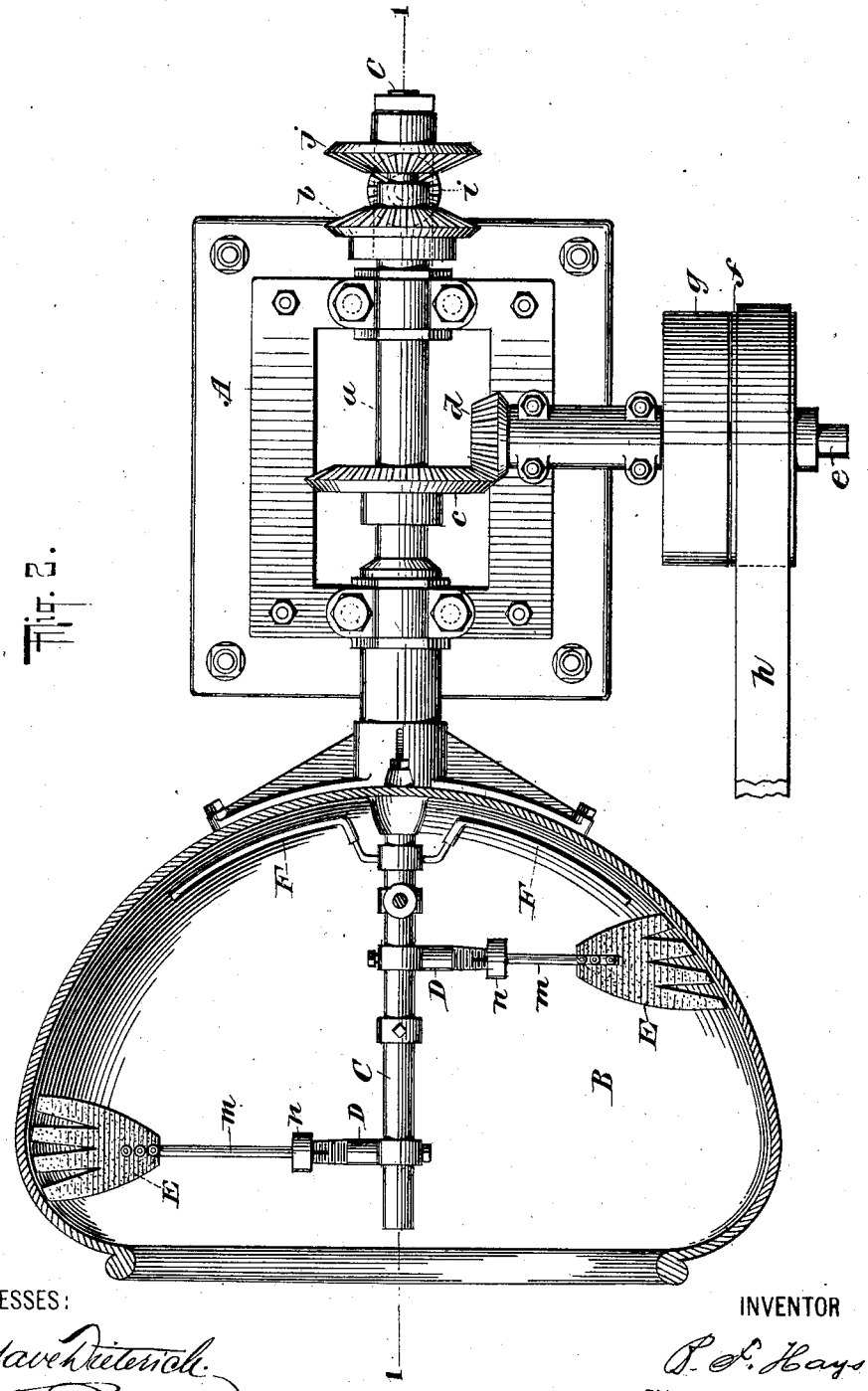


Fig. 2.

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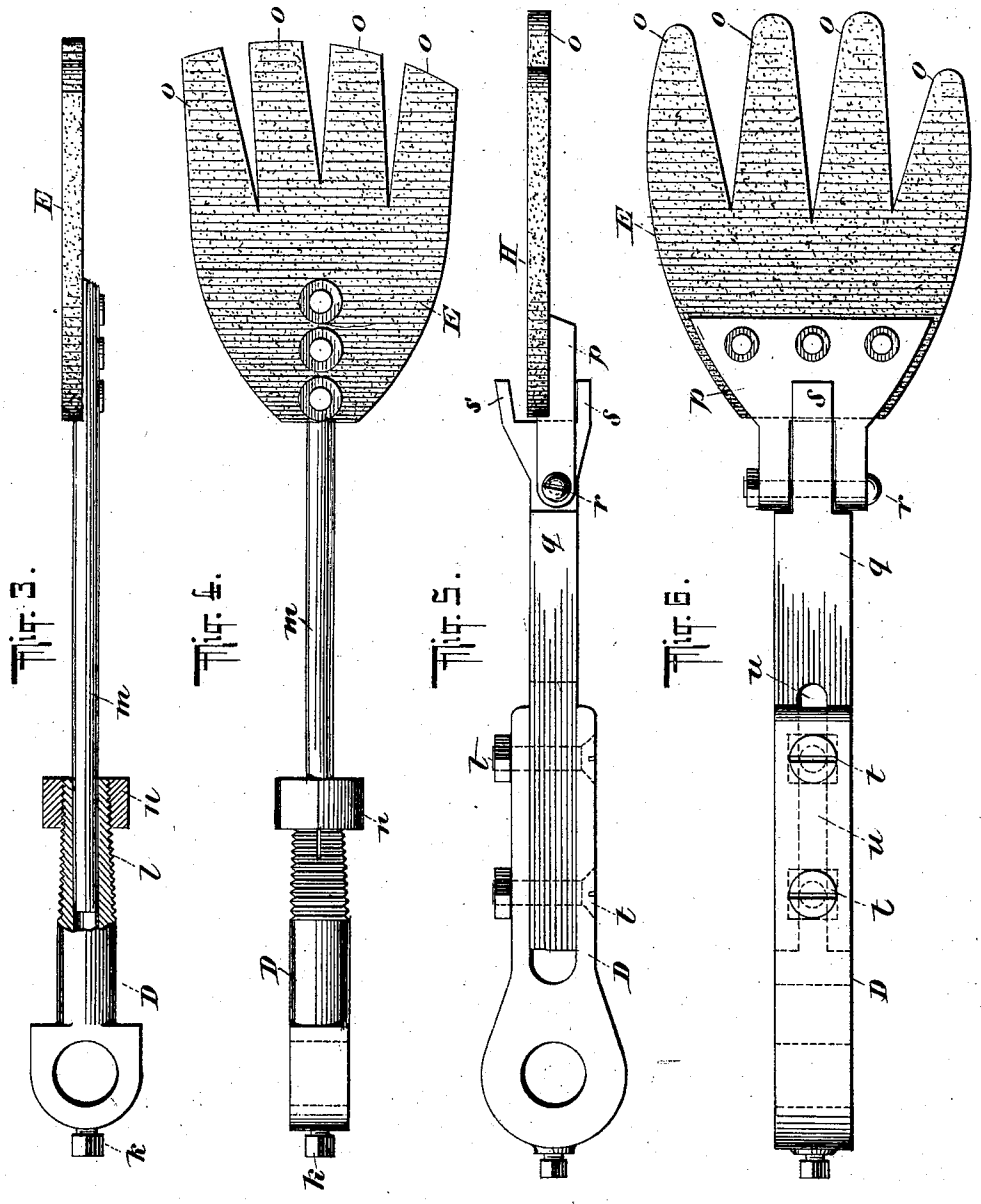


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# UNITED STATES PATENT OFFICE.

BENJAMIN F. HAYS, OF NEW YORK, N. Y., ASSIGNOR TO HORATIO W. FRASER, OF SAME PLACE.

## MACHINE FOR COATING TABLETS.

SPECIFICATION forming part of Letters Patent No. 678,399, dated July 16, 1901.

Application filed October 1, 1900. Serial No. 31,600. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN FRANKLIN HAYS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Coating Tablets, of which the following is a specification.

Heretofore in the manufacture of tablets such as those employed for medicinal purposes it has been found to be impracticable to coat them by mechanical means for the reason that the compressed pulverulent material of which the tablets are formed would be injured by the compression or abrading action of rigid elements employed to agitate them. For this reason the tablets were agitated by hand, and when it is understood that during a considerable period of the coating process it is necessary to keep the tablets constantly agitated to prevent them from adhering to one another it will be appreciated that the method heretofore employed for coating tablets was a slow, expensive, and tiresome one.

The object of my invention is to overcome the difficulties heretofore encountered in coating tablets and to provide a simple and efficient apparatus with the aid of which tablets can be quickly, economically, and efficiently coated without liability of injuring the tablets.

To these ends my invention consists in the novel arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, wherein like reference characters indicate corresponding parts in the various views, Figure 1 is a vertical sectional view, with parts broken away, of one form of device embodying my invention. Fig. 2 is a plan view, partly in section, of the same. Fig. 3 is a detail edge view of one of the stirring-arms, showing the stirring-blade connected thereto and with parts broken away. Fig. 4 is a similar view of the same, taken at right angles to the position indicated in Fig. 3. Figs. 5 and 6 are edge and plan views, respectively, of a modified form of stirring arm and blade.

A indicates the framing of the machine, in suitable bearings in which is contained a hollow shaft *a*, which is connected to a tablet-containing hopper B. This hopper is preferably open-mouthed and curvilinear in form, as shown in Fig. 2 of the drawings, and is maintained in an inclined position, as indicated in Fig. 1. The shaft *a* has bevel-gears *b* and *c* connected thereto. The bevel-gear *c* coöperates with a bevel-pinion *d*, connected to a driving-shaft *e*. The driving-shaft *e* may be provided with suitable means for rotating it. In the present instance a fixed and loose pulley *f g*, respectively, are provided and with which a driving-belt *h* may be operatively connected. The bevel-gear *b* meshes with an idler *i*, that engages a bevel-gear *j*, that is fixed to a shaft C, which extends through the hollow hopper-shaft *a* and projects into the interior of the hopper B. To the shaft C are adjustably secured stirrer-arms D, that are adapted to be adjusted in the direction of the length of the shaft *c* by means of set-screws *k* or other suitable adjusting means. Stirrer-blades E are adapted to be adjustably connected to the stirrer-arms, and in the present instance the adjusting means consists of a split hollow section *l*, into which a rigid supporting-arm *m* on the stirrer-blade is adapted to fit. This hollow split section *l* of the stirrer-arm is screw-threaded on its exterior and is tapering in form and adapted to receive a nut *n*. (See Fig. 3.) By this means the rigid supporting-arm *m* may be adjusted in an axial direction or may be turned on its axis and secured in the adjusted position by the nut *n*, so that the proper relative position of the stirrer-blades E with relation to the walls of the hopper may be readily attained. The stirrer-blades E are made of resilient material—such as leather, rubber, or the like—and are preferably slitted, so as to provide independent stirrer-fingers *o* in order to give greater elasticity to the stirrer-blades at the outer extremity thereof to avoid liability of injuring the tablets in the operation of the machine.

Upon reference to Fig. 2 of the drawings it will be observed that the outer end of each blade conforms substantially to the contour of the hopper at that portion thereof with which the blade coöperates. Secured to the shaft C near the bottom of the hopper B are sweeping or wiper fingers F, which conform

substantially to the shape of the hopper at the places where the fingers contact therewith. The purpose of these wiper-fingers F is to prevent the tablets from adhering to the bottom of the hopper.

It will be understood that in operation motion is transmitted to the driving-shaft *e* through the belt and pulley *h* and *f*, respectively, to the pinion *d*. Motion is thus communicated to the hollow shaft *a*, and thence to the hopper B. The hollow hopper-shaft *a* rotating in one direction will transmit movement in an opposite direction to the gear *j* through the intermediate idler *i*, thus causing the stirrer-shaft C to be rotated in an opposite direction from that in which the hopper is rotated. During the operation of the device in the manner described an air-blast is conveyed to the interior of the hopper through a suitable pipe, as indicated at G, in order to dry the tablets while they are agitated in the hopper.

In Figs. 5 and 6 of the drawings I have illustrated a modified form of stirrer arm and blade in which the blade H is substantially the same as that hereinbefore described. This blade H is connected to a plate *p*, which is pivoted to the rigid arm *q*, as indicated at *r*. Suitable means are provided to limit the oscillation of the blade H with relation to its supporting-arm *q*. In the present instance I have illustrated lugs *s* for this purpose. The rigid support *q* may be adjusted in the direction of its length upon the stirrer-arm by means of the bolt-and-slot connections *t u*, respectively.

In operation it will be found that the resilient stirrer-blades E H will readily give if undue pressure is exerted upon the tablets in the operation of the machine. The construction represented in Figs. 5 and 6 of the drawings affords greater resiliency in view of the fact that the stirrer-blade is pivoted to move freely on its support as well as being made of resilient material. The adjustable means shown and described for securing the stirrer-blade in position permits any desired adjustment of the blades with relation to one another and to the walls of the hopper.

It will be seen that by my invention a simple and efficient mechanism is provided wherein the tablets can be agitated during the coating operation without liability of injuring them and that the tablets can be quickly and efficiently coated with the aid of the apparatus herein shown and described.

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

1. In a machine for coating tablets and the like, the combination of an open tablet-containing hopper and a stirring device rotating therein, means for rotating said stirring device, said stirring device comprising resilient stirring-blades which are adapted to contact with and agitate the tablets.

2. In a machine for coating tablets and the like, the combination of an open rotating tablet-containing hopper, means for rotating said hopper, a stirring device rotating in said hopper, means for rotating said stirring device, said stirring device comprising resilient stirring-blades which are adapted to contact with and agitate the tablets.

3. In a machine for coating tablets and the like, the combination of an open tablet-containing hopper, a stirring device rotating therein, means for rotating said stirring device, said stirring device comprising resilient blades which are adapted to contact with and agitate the tablets and means for conveying an air-blast to the interior of said hopper.

4. In a machine for coating tablets and the like, the combination of a tablet-containing hopper, a stirring device rotating therein, said stirring device comprising a plurality of stirring-blades each of which has a plurality of resilient fingers.

5. In a machine for coating tablets and the like, the combination of a rotating curvilinear tablet-containing hopper, means for rotating said hopper, a stirring device rotating in the hopper, said stirring device comprising a plurality of adjustable stirring-blades each of which has a plurality of resilient fingers that are adapted to contact with the walls of the hopper and means for rotating said stirring device.

6. In a machine for coating tablets and the like, the combination of an open tablet-containing hopper and a stirring device rotating therein, said stirring device comprising a plurality of resilient stirring-blades each of which is pivoted to a rotating support so as to vibrate independently thereof.

7. In a machine for coating tablets and the like, the combination of a rotating curvilinear tablet-containing hopper, a hollow hopper-shaft and means connected thereto for rotating said hopper, a stirrer-shaft extending through said hollow shaft and into the hopper, means for rotating said stirrer-shaft, stirrer-arms contained within said hopper and adjustably secured to the stirrer-shaft and resilient blades secured to the stirrer-arms.

8. In a machine for coating tablets and the like, the combination of a rotating curvilinear tablet-containing hopper, a hollow hopper-shaft and means connected thereto for rotating said hopper in one direction, a stirrer-shaft extending through said hollow shaft and into said hopper, means for rotating the stirrer-shaft in an opposite direction from that in which the hollow shaft is rotated, stirrer-arms contained within the hopper and adjustably secured to the stirrer-shaft and resilient blades adjustably and removably secured to the stirrer-arms.

9. In a machine for coating tablets and the like, the combination of a rotating curvilinear tablet-containing hopper, means for conveying an air-blast thereto, a hollow hopper-shaft and means connected thereto for rotat-

ing said hopper, a stirrer-shaft extending through said hollow shaft and into said hopper, means for rotating said stirrer-shaft, stirrer-arms contained within the hopper and adjustably secured to the stirrer-shaft and resilient blades secured to the stirrer-arms, each of said blades comprising a plurality of resilient fingers that are adapted to contact with and agitate the tablets.

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