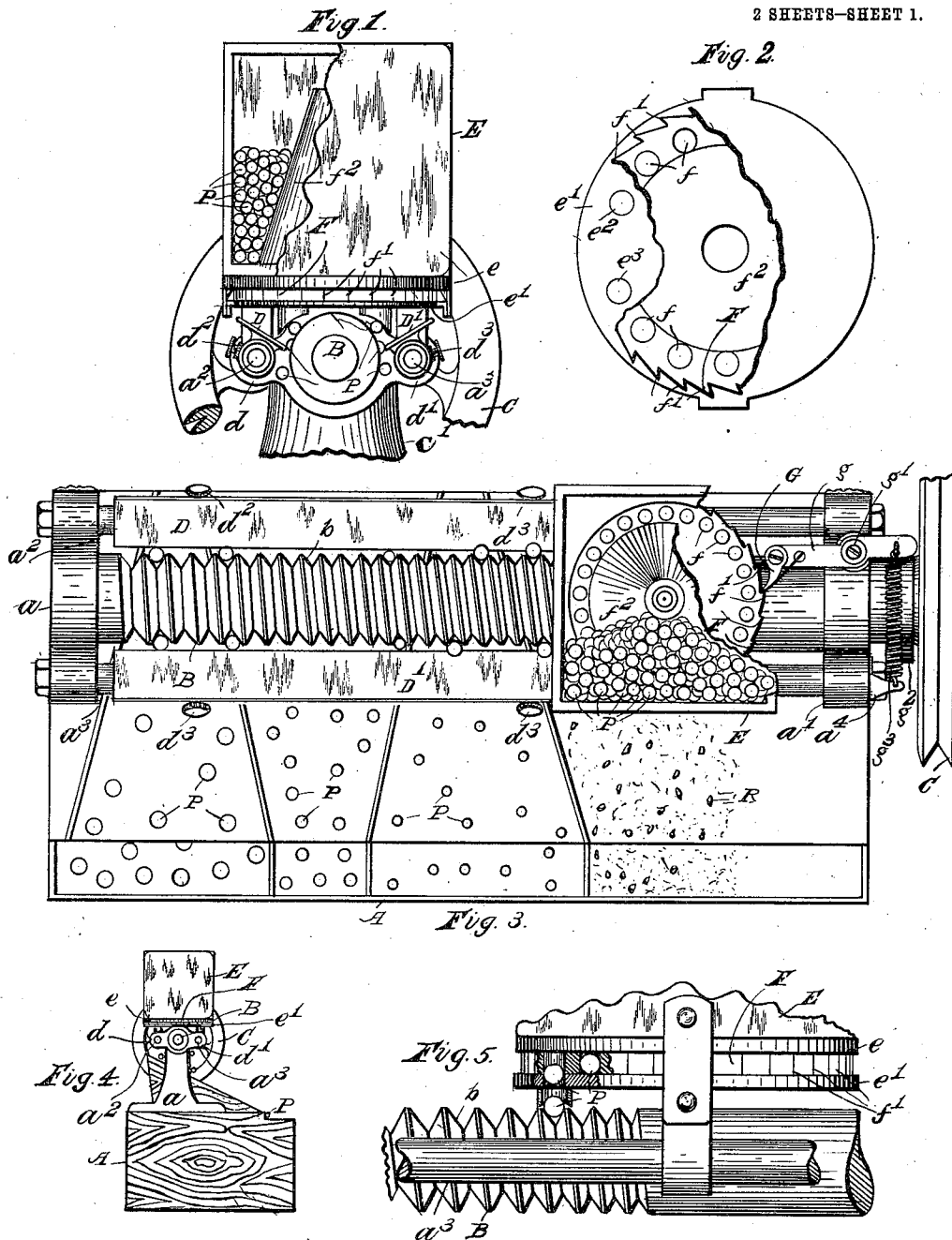


J. J. BRINE.
ASSORTING AND SIZING MACHINE.
APPLICATION FILED JAN. 24, 1908.

1,022,655.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

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Grace Browley.

INVENTOR.

John J. Brine,
BY Albert M. Moore,
His ATTORNEY.

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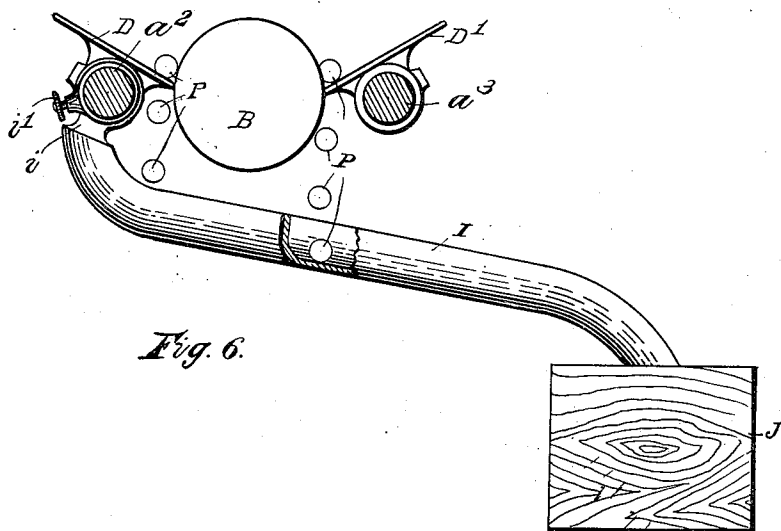


Fig. 6.

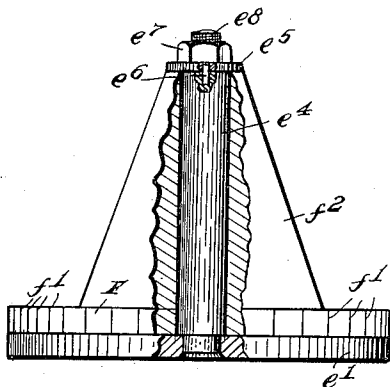


Fig. 7.

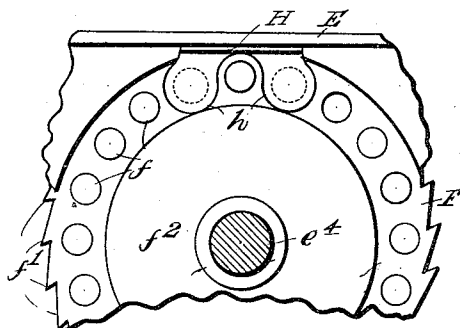


Fig. 8.

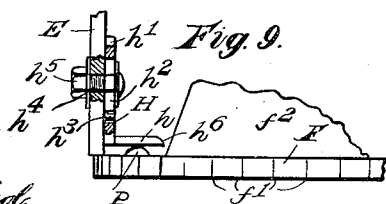


Fig. 9.

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UNITED STATES PATENT OFFICE.

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ASSORTING AND SIZING MACHINE.

1,022,655.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed January 24, 1908. Serial No. 412,527.

To all whom it may concern:

Be it known that I, JOHN J. BRINE, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Assorting and Sizing Machines, of which the following is a specification.

This invention relates to assorting and sizing machines and is capable of assorting with great accuracy spherical bodies and of distributing them into separate receptacles according to their size. Such a machine may also be used to distribute with sufficient accuracy for many purposes, bodies which are only approximately spherical or even approximately cubical or of quite irregular forms.

One of the most important uses of this machine is in grading according to size, pills. Such pills frequently contain small quantities of poison, and are usually prescribed in doses of one or more by number and in many cases an overdose would be followed by dangerous or fatal results. It is therefore necessary that the pills should not only be of uniform composition, but of uniform size throughout the same box or package. If the pills are all of uniform size in the same package, this size being known, the number of pills for a dose may readily be proportioned to the size of the pills, that is the larger the pills, the fewer should be taken at one time. The package containing pills is frequently marked with the number of grains of the active ingredient in a single pill.

In the accompanying drawings, on two sheets, Figure 1 is an elevation of the discharging end of the machine, a part of the reservoir or hopper being removed to show the construction; Fig. 2, a plan of the bottom of the hopper and of a part of the ratchet; Fig. 3, a plan of the machine with a part of the hopper broken away; Fig. 4, is an end elevation of the frame, the hopper and the inclined bottom of the receiving compartment; Fig. 5, a front side elevation of a part of the hopper and ratchet, part of the frame and a part of the screw, the ratchet and the hopper bottom being partly in section to show how the articles to be sorted are delivered to the screw; Fig. 6, a side elevation of a delivering trough and receptacle, an end elevation of the screw and a cross-section of the tie-rods; Fig. 7, a side

elevation of the base of the reservoir, the ratchet and cone partly in section to show the connection between said parts; Fig. 8, a plan of a part of the ratchet, part of the reservoir and the wiper or cover; Fig. 9, a front elevation of part of the ratchet and cone, part of the reservoir and the wiper and cover and its supporting means.

The frame of the machine comprises a base A which supports two stands a a^1 connected by parallel rods a^2 a^3 . In the stands a a^1 is journaled a screw B which is rotated without advancing as by means of a belt (not shown) or other connections between a suitable motor and a pulley C fast on said screw B, the rotation of the screw being in the direction to carry articles placed in the grooves of the screw away from the pulley C.

The screw B is represented as of uniform pitch but of constantly increasing depth of thread b from the pulley toward the other end of said screw. The thread is preferably V-shaped, the sides of the thread making an angle of sixty degrees with each other so that the sides of the groove if prolonged and the adjacent side guide D D^1 form an equilateral triangle, the sides of which are tangent to a circle at three equidistant points.

Side-guides D D^1 are supported on the tie-rods a^2 a^3 by means of ears d d^1 which extend from said guides and set-screws d^2 d^3 which turn in said ears and thrust against said rods radially thereto, as indicated in Figs. 1 and 3, so that by loosening said set-screws, the inclination of said guides may be varied and the distance of the adjacent straight edges of said guides from the screw may be adjusted to regulate the discharging points on the screw by enlarging or diminishing the triangular openings between said screw and said guides.

The hopper E may be of any shape in horizontal cross-section, but is represented as rectangular for the most part but as provided with a cylindrical lower portion e which forms the bottom of said hopper. The bottom plate e^1 , is provided with two discharge-holes e^2 e^3 at a distance apart about equal to the diameter of the screw, so that pills or balls P will fall through said holes on opposite sides of the axis of the screw, nearly on the spaces between the side-guides and said screw. Upon the plate e^1 the ratchet-plate F concentric therewith

turns on a vertical stud e^4 secured to the center of said plate e^1 . The ratchet is provided with a circular row of holes f near its lower edge, said row being concentric with said ratchet and said holes being arranged at such equal angular intervals that when one of the holes f is over one of the holes e^2 e^3 in said plate e^1 another of the holes f is over the other of said holes e^2 e^3 . The teeth f^1 of the ratchet-plate equal in number the holes f and are engaged singly by a pawl G pivoted on a pawl-lever g , fulcrumed at g^1 and the stand a^1 and moved in its operative direction by a cam or projection g^2 on the shaft of the screw B and restored to position by a spring g^3 stretched between said lever and a projection a^4 on said stand a^1 , and said teeth are so arranged as to bring two new holes f over the holes e^2 e^3 at each revolution of the screw.

A frustum of a cone f^2 is integral with or rigidly secured to the ratchet concentrically therewith and causes the pills or other bodies P to be agitated sufficiently and to move outward against the walls of the hopper above the holes f in the ratchet. The cone and ratchet are prevented from being turned too far by their momentum at a single stroke of the pawl lever g by a frictional brake consisting of a washer e^5 which rests on the shoulder near the upper end of the stud e^4 and is prevented from turning therefrom as by a pin e^6 which enters said stud and said washer, and a nut e^7 which turns on the screw-threaded upper end e^8 of said stud to force said washer down upon said stud as shown in Fig. 7, with a pressure which may be varied by the turning of said nut.

A wiper H , Figs. 8 and 9 is secured directly above the holes e^2 e^3 and above the ratchet F , said wiper being a horizontal plate h provided with a vertical shank h^1 having a vertical slot h^2 which receives a guide stud h^3 projecting from the side of the hopper and through which passes a bolt h^4 carrying a nut h^5 which being loosened allows the wiper to be adjusted vertically in such a manner as to permit but one ball or pill in a hole of the ratchet to pass freely under said wiper and subsequently to fall through the corresponding hole e^2 or e^3 in the plate E . The edges of the wiper are beveled or rounded on top at h^6 to cause the balls or pills on the upper surface of the ratchet to ride over said wiper and the wiper is cut away in the middle to allow a pill or ball to enter that hole f in the ratchet which has just before been emptied into the hole a^2 , so that, two pills or balls will be discharged simultaneously one through the hole a^2 and one through the hole a^3 .

Where the greatest possible accuracy is required, it may be secured by arranging an inclined trough I wide enough at the top

to admit a single ball or pill and arranged below the screw at right angles to the axis thereof, said trough discharging into any suitable receptacle as J in Fig. 6. The upper end of the trough is provided with a stirrup i which surrounds one of the tie-rods a^2 a^3 and is prevented from lateral movement on said rod by a set-screw i which turns in said stirrup against said tie-rod. Any refuse, dust or small particles will be dropped as soon as they fall upon the screw instead of being carried along by the screw. Such matters, indicated by the letter R are dropped into a separate compartment. When the machine is used for sizing and assorting pills and the small particles indicated at R are simply the cuttings or trimmings of the pills, they may be reground and formed into pills. The articles large enough to be saved are dropped into different compartments, as indicated in Fig. 3 at different distances from the hopper according to their size.

I claim as my invention:—

1. The combination of a screw, means for rotating the same, a hopper arranged above said screw and having a bottom provided with a discharge-hole on each side of the axis of said screw, a plate having a plurality of holes, means for moving said plate to bring two of said last-named holes to register with the discharge-holes in said bottom once in each revolution of said screw.

2. The combination of a screw, means for rotating the same, a hopper arranged above said screws and having a bottom provided with a discharge-hole on each side of the axis of said screw, a plate having a plurality of holes arranged at equal intervals in a circle concentric with said plate and means for rotating said plate to bring two of the holes therein to register with the discharge-holes in said bottom once in each revolution of said screw.

3. The combination of a screw, means for rotating the same, a hopper arranged above said screw and having a bottom provided with a discharge-hole on each side of the axis of said screw, a plate having a plurality of holes arranged at equal intervals in a circle concentric with said plate and means for rotating said plate to bring two of the holes therein to register with the discharge-holes in said bottom once in each revolution of said screw, and means for directing the contents of said hopper over said circle of holes.

4. The combination of a screw, means for rotating the same, a hopper arranged above said screw and having a bottom provided with a discharge-hole on each side of the axis of said screw, a ratchet having a plurality of holes arranged at equal intervals in a circle concentric with said ratchet, a pawl-lever, a pawl carried thereby and en-

gaging the teeth of said ratchet, and a cam fast on the shaft of said screw to move positively said pawl-lever and a spring to give a return movement to said pawl-lever.

5 5. The combination of a screw, means for rotating the same, a hopper arranged above said screw and having a bottom provided with a discharge-hole on each side of the axis of said screw, a plate having a plu-
10 rality of holes, means for moving said plate to bring two of said last-named holes to register with the discharge-holes in said

bottom once in each revolution of said screw, and a cover or wiper arranged above said discharge-holes and above said plate 15 to prevent more than one of the bodies contained in said hopper to pass through a discharge-hole at a time.

In witness whereof, I have affixed my signature in presence of two witnesses.

JOHN J. BRINE.

Witnesses:

ALBERT M. MOORE,
GRACE CROWLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."