No. 793,562. PATENTED JUNE 27, 1905.

W. W. BROGA.

COIN SEPARATING MACHINE.

APPLICATION FILED APR. 27, 1904. RENEWED NOV. 29, 1904.

2 SHEETS—SHEET 1.

Fig. 2.

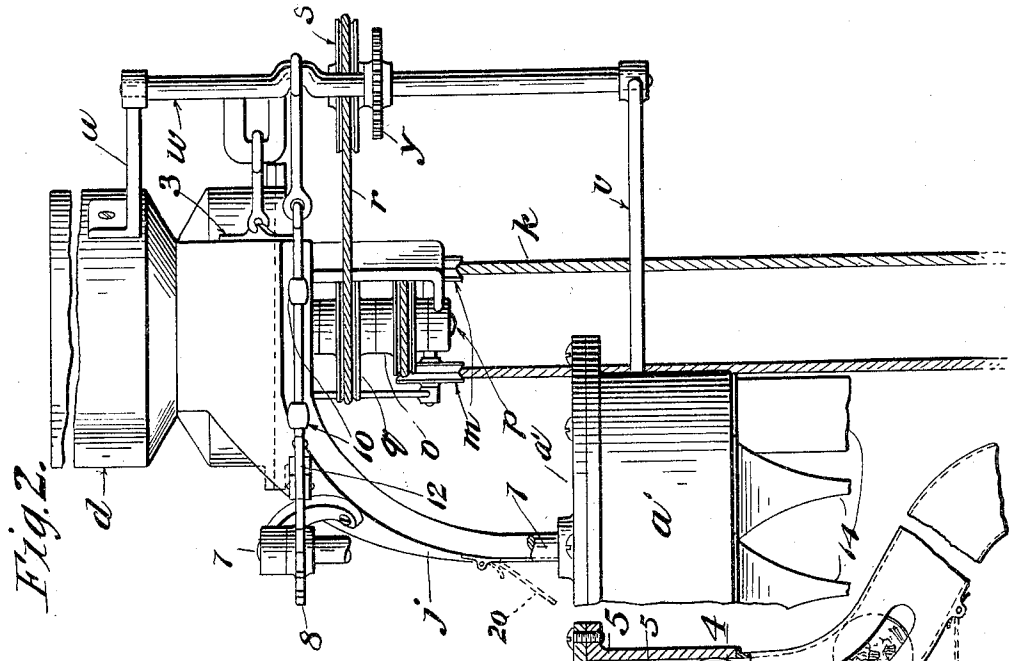
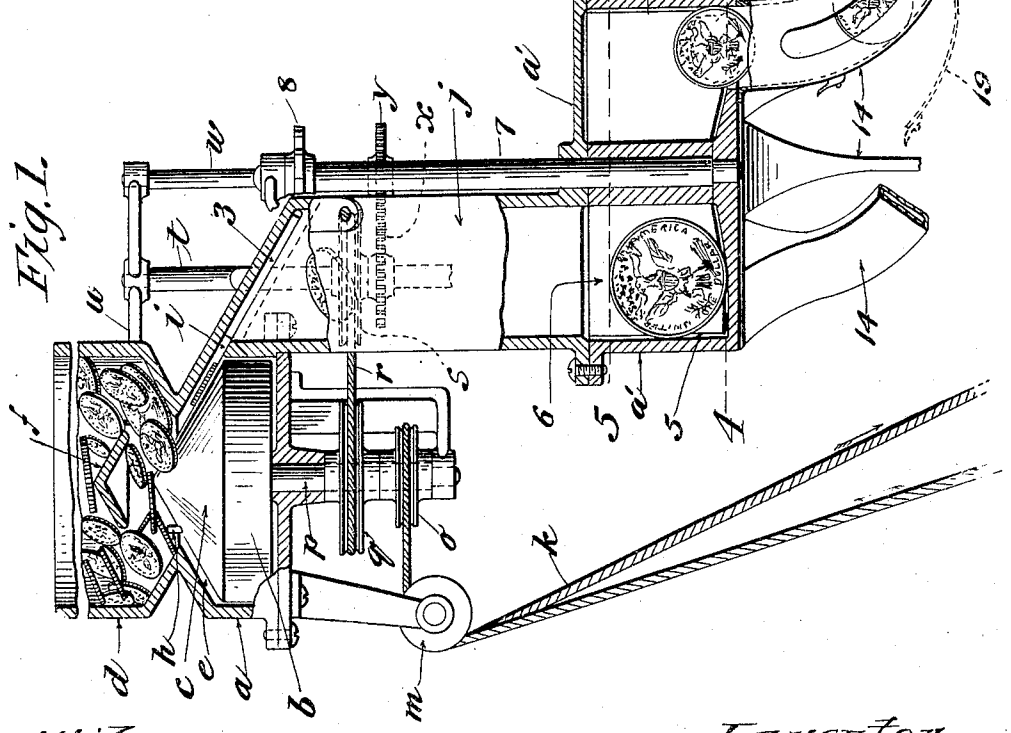


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 5.

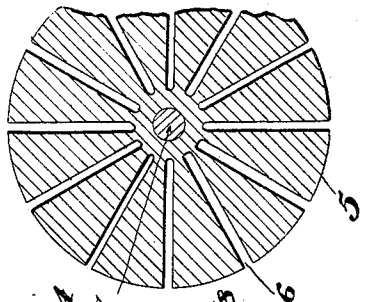


Fig. 4.

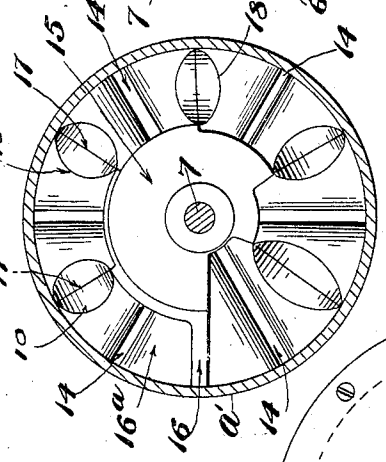
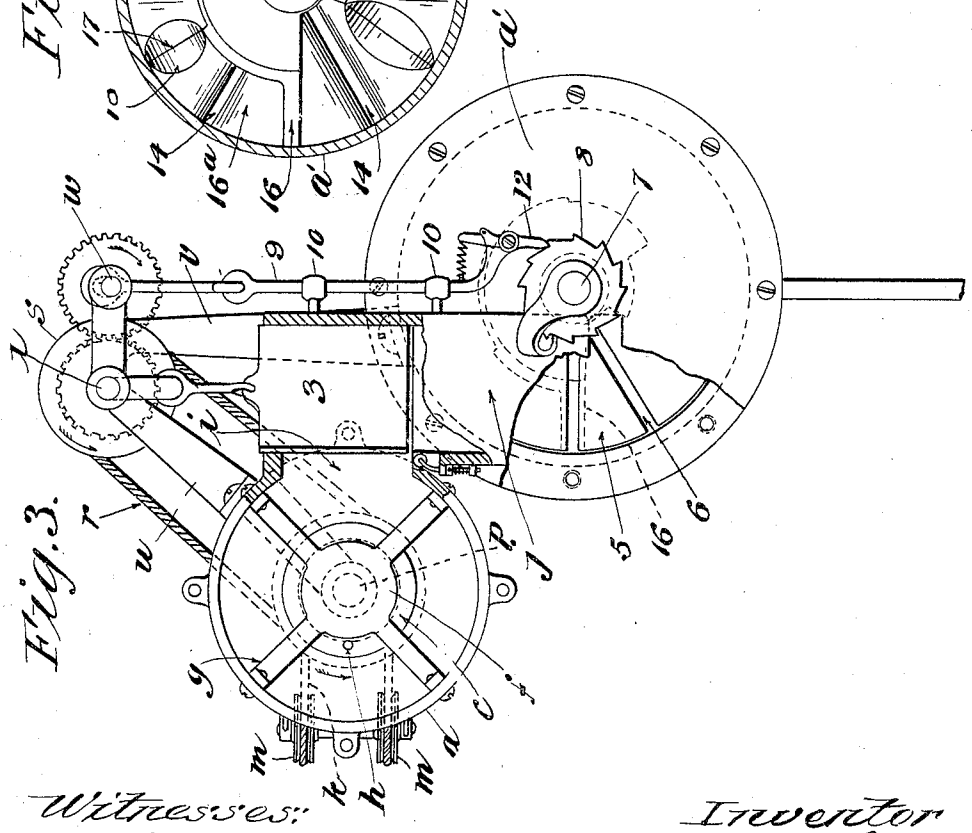


Fig. 3.



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No. 793,562. Patented June 27, 1905.

UNITED STATES PATENT OFFICE.

WILLIAM W. BROGA, OF SPRINGFIELD, MASSACHUSETTS.

COIN-SEPARATING MACHINE.

SPECIFICATION forming part of Letters Patent No. 793,562, dated June 27, 1905.

Application filed April 27, 1904. Renewed November 29, 1904. Serial No. 234,752.

To all whom it may concern:

Be it known that I, WILLIAM W. BROGA, a citizen of the United States of America, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Coin-Separating Machines, of which the following is a specification.

This invention relates to mechanism for separating mixed coins, each according to its kind, the object of the invention being to provide a mechanism of this character adapted especially for use in association with a machine for counting and packaging the separated coins, the separating mechanism being provided with a chute or some analogous conveying means for depositing each kind of coin in a separate place; and the invention consists in the construction described in the following specification and pointed out in the claims, the accompanying drawings clearly illustrating the construction and various novel features of the invention, in which—

Figure 1 is a vertical sectional view of mechanism, showing the preferred embodiment of the invention. Fig. 2 is an elevation of the mechanism shown in Fig. 1 as seen from the right-hand side of the latter. Fig. 3 is a plan view, partly in section, of Fig. 1. Fig. 4 is a transverse sectional view on line 4 4, Fig. 1. Fig. 5 is a similar section on line 5 5, Fig. 1, this view showing only the wheel whereby the coins are distributed to the various chutes or conveyers.

Referring to the drawings, *a* indicates a cylindrical casing in which is located a short cylinder *b*, having a cone-shaped top *c*, the casing *a* being carried in to overlap more or less of this cone-shaped top *c*, as shown in Figs. 1 and 2. The upper part of the casing is then continued upwardly, constituting a cylindrical hopper *d*. The top of the cylinder and its inclosing casing is so arranged as to leave an annular space between them, (indicated by *e*,) which space is wide enough to permit the thickest coin to slide freely into it from the hopper.

Supported in the hopper and some distance above the apex of the cylinder *b* is a conical disk *f*, (shown in Figs. 1 and 3,) rigidly supported by means of arms *g* extending therefrom to the wall of the hopper. This disk serves to take the weight of the mass of coins directly off the upper end of the cylinder *b*, causing the coin to slide outwardly at that point against the wall of the hopper and from thence down the inclined side of the bottom of the latter toward the cone-shaped top *c* of the cylinder *b*, whereby these coins are disposed in substantial parallelism with one side of said cone-shaped top *c*.

At some point on the cone-shaped top *c* between its apex and the opening through the bottom of the hopper *d* is a vertically-disposed pin *h*, projecting a short distance above the surface of the cone, which as the latter rotates will engage the coins and carry them around until the edge thereof slides into the space *e*, whereupon they will fall against the cylindrical portion of the casing *a* and moving with the cylinder be eventually brought to the mouth of the inclined chute *i*, which is located at the upper end of the curved downwardly-inclined chute *j*, to be referred to farther on.

The cylinder *b* may be rotated in any suitable manner, as by means of a belt *k*, running from some suitable driving-pulley (not shown) over the sheaves *m* and from thence around a pulley *o*, secured on the shaft *p*, on the upper end of which the cylinder *b* is secured. The shaft *p* is rotatably supported in any suitable manner in the bottom of the casing *a*. There is also secured to this shaft *p* a second pulley *q*, and from this a belt *r* runs to a pulley *s*, supported on a crank-shaft *t*, which is parallel with the shaft *p* and properly supported on the machine—as, for example, by means of the bracket-arms *u* and *v*, in which also a crank-shaft *w*, parallel with the shafts *p* and *t*, is supported. On the crank-shaft *t* is a pinion *x* and on the shaft *w* is another pinion *y* in mesh therewith, whereby this last-named shaft may be rotated with the crank-shaft *t*.

Referring again to the inclined chute *i*, there is located therein a slide 3, which is connected with the crank of the shaft *t*, as shown in Figs. 2 and 3, and this slide has a constant reciprocatory movement across the inclined chute *i*, whereby when a coin sliding down the chute

drops in front of it in its retracted position it will when the forward movement of the slide takes place be pushed over into the chute *j*, which communicates with or is a continuation of the chute *i*. All of the coins, regardless of their denomination, are thus sent through this last-named chute, the lower end of which, as shown in Fig. 1, enters the casing *a'* of the distributing-wheel 5 one side of the center of the latter, said chute being disposed radially of said wheel. This wheel (shown in section in Fig. 1 and in plan view in Fig. 5) is located below and a little one side of the casing *a* and is provided with radially-disposed slots 6 of uniform width and depth, the wheel being thick enough and the slots being deep enough radially to receive therein the coin of the largest denomination to which the machine is adapted. This wheel 5 is secured on the end of a shaft 7, parallel with the crank-shaft *w*, and having on its upper end a ratchet-wheel 8, whereby it and the wheel 5 may have imparted thereto a step-by-step rotary movement by means of a connecting-rod 9 extending to and connected with the crank on the shaft *w*, sliding in suitable bearings 10 on the machine. On the end of the connecting-rod is a pawl 12, spring-held in engagement with the teeth of the ratchet-wheel 8. The teeth of the ratchet-wheel correspond to the position of the slots 6 in the wheel 5, the parts being so disposed that one of the slots in said wheel will be located under the end of the chute *j* when the slide 3 moves forward to push a coin into said chute. The bottom of the cylindrical casing *a'*, in which the wheel is located, is slightly conical, the under side of the wheel being made to fit it. Thus when a coin drops into one of the slots 6 in said wheel it will when it reaches the bottom roll toward and bear against the wall of the casing. A view of the inside of this casing *a'* is shown in Fig. 4, which view shows also the flaring end of the distributing-chutes 14. It will be seen by an examination of this figure that the bottom consists of a center piece 15, the general configuration of which in plan is helical, and from the point of its greater diameter a bridge-piece 16 extends therefrom to the inner wall of the casing. It will be noted that the disposition of the periphery of the center piece 15 relative to the inner wall of the casing is such that a circular opening is left in the bottom of the casing, the width of which, measured from the inner wall of the latter, progressively increases step by step, whereby a coin of the smallest diameter will fall through the first part of said opening—that is, that portion thereof next to the bridge 16. Farther on the diameter is abruptly increased to permit the coin of the next larger size to pass through it, and so on around the inner circumference of the casing. It is to be noted, however, that whenever the wheel 5 is at rest and one of the slots 6 therein is in position to receive a coin this slot will be disposed directly over the bridge 16, and the next movement of the wheel 5 will carry this coin away from the bridge 16, the coin being supported between the inner wall of the casing and the edge of the center piece 15, provided it is a coin whose diameter is greater than the distance between the inner wall of the casing and the edge of the center piece 15 contiguous to the bridge 16, the space referred to being lettered 16^a. Whatever the coin may be it will be carried step by step around the casing *a'* until it reaches that point at which the diameter of the center piece 15 has been sufficiently reduced to permit it to pass through, whereupon it will fall into that one of the chutes 14. These chutes, as shown particularly in Figs. 1 and 2, have their upper ends flared, so that they will embrace all of that part of the annular space through which the coins drop which is located opposite each one of the steps in the edge of the center piece, the meeting lines of these flaring ends being indicated by 17 on Fig. 4. Where the edges of these chutes come together and form a sort of radial ridge at the bottom of the casing *a'*, a segmental cut 18 is made through the ridge, half of it lying in the edge of one chute and half in the other. This is necessary, for the reason that the lower edge of the coins bearing against the inner edge of the casing and on the edge of the center piece 15 would otherwise strike on the edges of these chutes; but with the latter cut away, as shown in Fig. 4, a coin—say of the largest diameter—can move from the bridge 16 all the way around to the last chute just in the rear of the bridge without touching the upper ends of the chutes.

It is desirable that the chutes 14 should be provided at some point thereon with a door—such as is shown, for instance, in dotted lines in Fig. 1 and indicated by 19—and likewise the chute *j* should be provided with a door—as, for example, like that shown in Fig. 2 in dotted lines and indicated by 20—whereby access may be had to the interior of the chutes, if necessary.

From the foregoing description it is seen that by means of this invention promiscuously-mixed coins may be deposited in the hopper *d* and one by one dropped into one of the slots 6 of the wheel 5 and by the latter each coin carried to its particular chute, whereby it may be conveyed to a suitable counting mechanism or packaging mechanism or to some mechanism combining both of these characteristics, or the chutes may lead simply to separate tills in which the coins may be loosely deposited.

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

1. A coin-separating mechanism consisting of a movable member having radially-disposed recesses for receiving coins, means to feed mixed coins into said recesses, there being disposed beneath said member a progressively-

widening opening on the border of which the coins rest, and over which said member moves the coins during the operation of the machine, together with conveyer devices associated with the different parts of said opening through which coins of different diameters may fall, to convey the coins of different sizes to separate places.

2. A coin-receiving wheel having radially-disposed slots therein, a casing in which the wheel revolves, and means to introduce coins into the slots in the wheel, there being an opening beneath the wheel having a progressively-increasing width, over which opening the coins are moved and through which they may fall, together with conveyer devices associated with the different parts of said opening through which coins may fall, to convey the coins to different places.

3. In a machine of the character described, a chute or analogous conveyer, and a slide reciprocally movable therein; a wheel having radially-disposed coin-receiving recesses, and a casing in which the wheel rotates, the latter being disposed at the delivery end of said chute; means to rotate the wheel to locate one of the recesses therein in registration with the chute, coincidently with the movement of the slide, whereby for each movement of the latter a different recess in said wheel will be located under the chute; together with means associated with said wheel whereby coins of different sizes may be conveyed to different places.

4. In a machine of the character described, a coin-separating device consisting of a wheel having radial slots therein extending through the wheel, an inclosing casing for the latter, means to support the coins in said slots consisting of a flat, helically-shaped center piece non-rotatably supported beneath the wheel, the greatest diameter of said center piece being less than the diameter of said casing whereby an annular opening of progressively-increasing width is provided, of which the wall of the casing and the edge of said center piece constitute the two side boundaries, together with means to feed coins into said radial slots, and means to rotate the wheel to move the coins over said opening.

5. In a machine of the class described, a vertical hopper having a contracted lower end, a cylinder having a cone-shaped upper end extending into the opening in the bottom of the hopper, a casing for the cylinder, there being a space between the conical upper end of the latter and its casing to receive a coin; an inclined chute extending from the outer edge of the cone-shaped top of said cylinder, in line therewith, and a second chute extending from the outer end of said first-named chute downwardly, at an angle thereto; a slide movable transversely back and forth across the first-named chute in line with said second chute, whereby a coin falling in front of the slide will be pushed into the second chute, and means located at the delivery end of the latter to separate the coins each according to its kind.

6. A wheel rotatable on a vertical axis, a cylindrical casing therefor, said wheel having radial slots therein to receive coins edgewise, and means to rotate the wheel step by step; a plurality of chutes extending from the bottom of the casing, the bottom of the casing having therein an annular opening the width of which progressively increases between each chute; another chute to deliver coins through the upper side of the casing, said last-named chute registering with one of the radial slots in the wheel when the latter is at rest; a hopper to receive mixed coins, with the lower end of which the upper end of the last-named chute communicates, and means to effect the entrance of the coins into the end of the chute entering the hopper.

7. A circular casing, a flat helically-shaped center piece of less diameter than the casing, and an arm extending from the point of the greatest diameter of said center piece to the wall of the casing, whereby an annular opening of progressively-increasing width is provided at the bottom of the casing, said center piece being at right angles to the axis of the casing and its border constituting a support for the coins; a wheel in said casing having radial slots therein extending through the wheel; a chute with its delivery end located above the wheel, radial to the latter, and in the same vertical plane as said arm; means to rotate said wheel step by step to locate one of the radial slots therein in the plane of said chute and said arm, and means to feed a coin into the chute when one of said slots is in this position.

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