

Jan. 31, 1933.

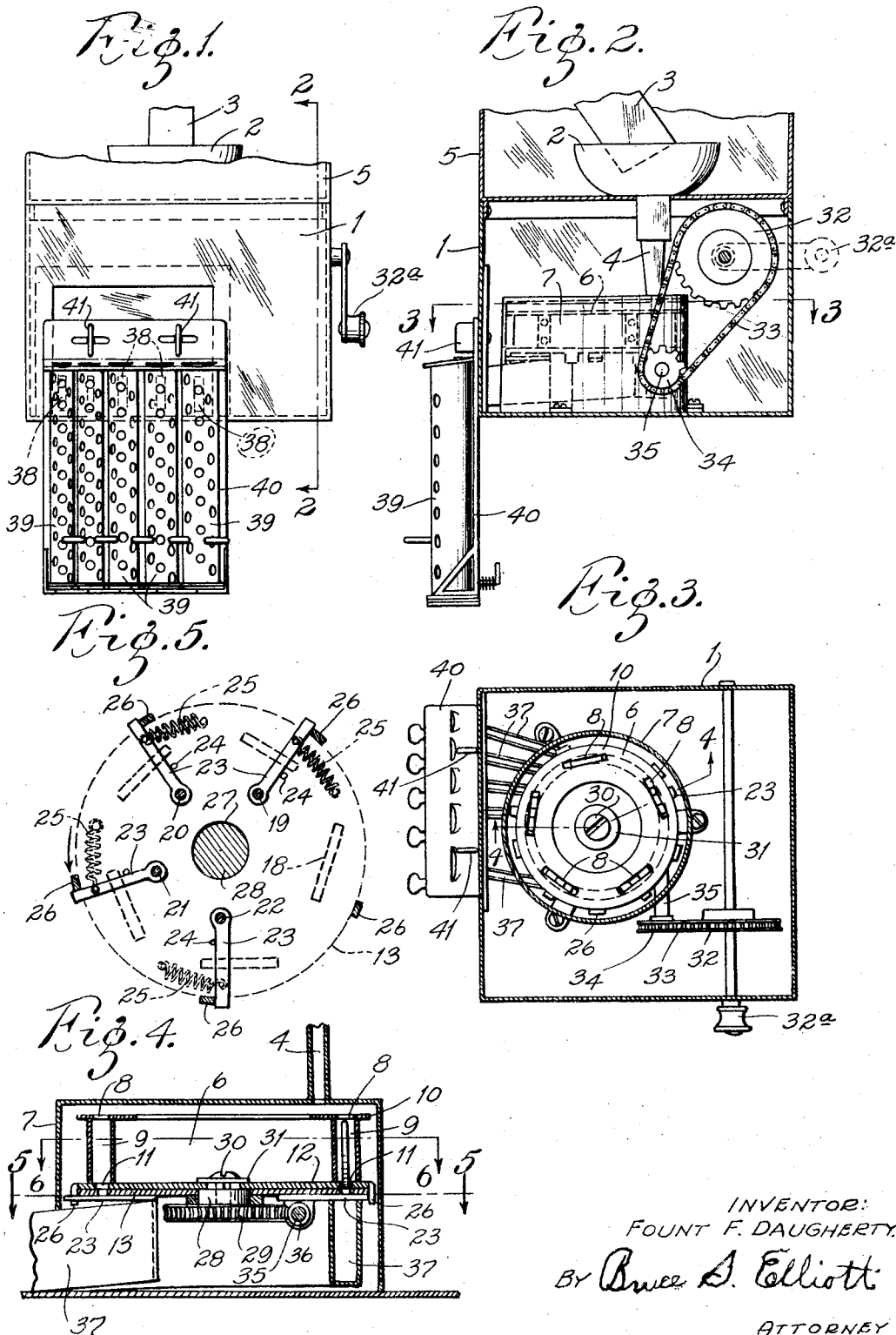
F. F. DAUGHERTY

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COIN SORTING MACHINE

Filed Feb. 26, 1930

2 Sheets-Sheet. 1



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2 Sheets-Sheet 2

Fig. 6.

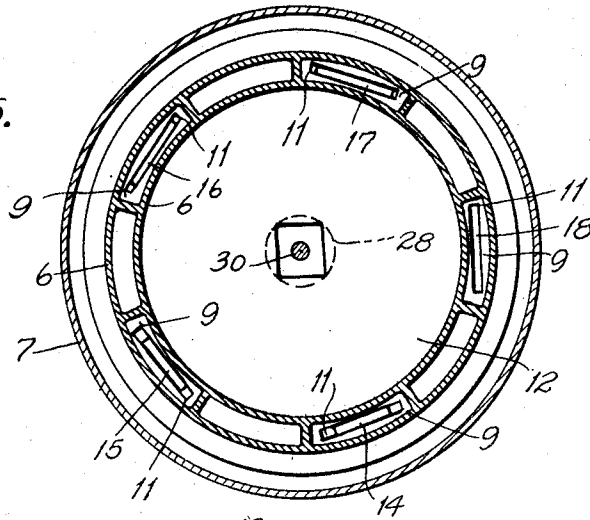


Fig. 7.

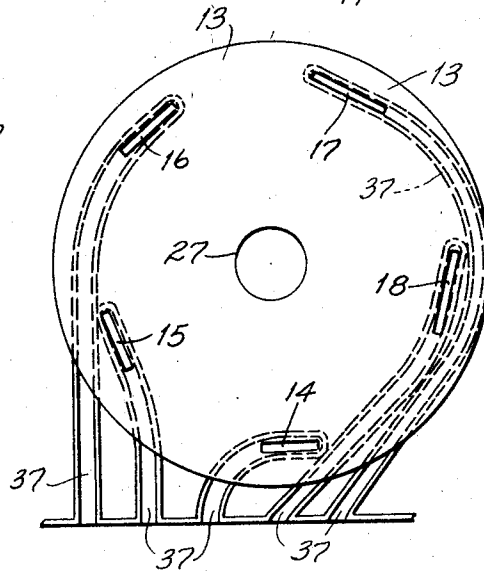
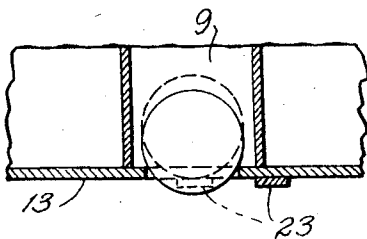


Fig. 8.



INVENTOR:
FOUNT F. DAUGHERTY.

BY *Bruce S. Elliott*
ATTORNEY.

UNITED STATES PATENT OFFICE

FOUNT F. DAUGHERTY, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-THIRD TO WILLIAM
H. SCHEER, OF ST. LOUIS, MISSOURI

COIN SORTING MACHINE

Application filed February 26, 1930. Serial No. 431,389.

The general object of this invention is to provide a novel machine for sorting coins and tokens of various sizes and denominations; and, while not restricted to such use, particularly applicable as an addition to a well-known type of fare-box extensively used in street cars in this country. In this fare-box the coins and tokens deposited are selectively registered by mechanism operated by a crank turned by the conductor, or by a small motor, after which they drop through a chute into a coin-trough located in the bottom and at one side of the fare-box, whence they are from time to time removed by the conductor who then inserts them one at a time in the appropriate tubes of a device called a "changer", which is either strapped to his body, or mounted on some part of the car within convenient reach. Each tube of the changer is provided with an ejecting device, and the coins, or tokens, are removed at will, one at a time, from the proper tubes by the conductor in making change for, or selling tokens to a passenger.

In the use of my invention as applied to the above, or a similar type of fare-box, after the coins leave the registering device of the fare-box they fall through a chute into my improved coin-sorting mechanism, which is operated from the same shaft which turns the coin registering mechanism above it. The coin-sorting mechanism includes a series of coin chutes, and as it is operated the coins of varying denominations fall into corresponding chutes, which lead them to openings in the rear sides of the tubes of the changer into which they fall by gravity. Thus the conductor does not have to do anything more than turn the crank of the fare-box, and the tubes of the changer will always be supplied with coins and the only handling of the coins by the conductor is when making change for a passenger. In the case of a one-man car, where the motorman also acts as the conductor, he may manipulate the crank of the fare-box and thus automatically sort the coins, or coins and tokens, if the latter be used, without taking his eyes off the road, which is a very important factor in preventing accidents.

The invention, as to its leading features, is characterized by a revolving drum mounted on a vertical axis and having a circular series of short chutes, or receptacles, each of which is of a size to receive a coin of the largest size the fare-box is adapted to handle. This drum constitutes a coin carrier and operates to carry the coins over and deposit them in slots in a circular plate, or selector, which slots correspond in size, respectively, to the sizes of the various coins or tokens, and through which slots the coins fall by gravity into the appropriate chutes leading to the tubes of the changer. Mounted on the circular plate in association with the bottoms of the slots therein, are a series of spring-controlled arms which, in the rotation of the coin carrier, are caused to be drawn beyond the slots and then released, so that in the event a coin or token should come to rest in a slot too small to permit of its passage there-through, the corresponding arm for that slot, when released, will be swept rapidly over the under side of the slot by the power of its spring and cause the deposited coin to be knocked upward into the receptacle of the drum which delivered the coin to the slot.

Ordinarily, without my improvement, a coin in one of these receptacles in the coin carrier passing over a slot in the plate too small to permit the coin to pass through, will simply be carried or rolled out of such slot, and any succeeding slot or slots too small to receive it, until it arrives in position over the slot of a size to permit it to pass through. It may chance, however, that under the above conditions a coin would lodge in a slot with sufficient firmness to stop the rotation of the drum, and to prevent this I provide for positively knocking out of each slot any coin resting therein too large to pass through the slot.

For the sake of brevity, I will refer in the following detailed description, and in the claims, to the sorting of coins only, it being understood that this term is intended to include tokens as well.

In the accompanying drawings—

Fig. 1 is a view in front elevation of the

lower part of a fare-box provided with my improved coin sorting machine;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a horizontal sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a section on the line 4—4 of Fig. 3, but including part of the construction sectioned out of Fig. 3, and omitting the changer shown at the left of Fig. 3, the view being on an enlarged scale;

Fig. 5 is a sectional plan view taken on the line 5—5 of Fig. 4;

Fig. 6 is a horizontal sectional view taken on the line 6—6 of Fig. 4, but on an enlarged scale;

Fig. 7 is a top plan view on an enlarged scale of a selector plate and associated coin chutes; and

Fig. 8 is an enlarged sectional detail view, showing a portion of the coin carrying drum and its associated selector plate.

Referring now to the drawings, the numeral 1 indicates a casing inclosing the coin sorting mechanism, on the top of which is a cup 2 for receiving the coins from a chute 3 leading from the fare-box. From the cup 2 the coins pass through a chute 4 into the sorting mechanism hereinafter described. As shown in Figs. 1 and 2, the casing 1 is secured to the bottom of the casing 5 of a fare-box.

Coins passing through the chute 4 fall upon the top of a circular drum or carrier 6, Figs. 3 and 4, inclosed in a casing 7, which carrier is provided at equal distances around its circumferential edge portion with slots 8, each of which is of a size to receive a coin of the largest size which will pass through the register of the fare-box above it. The coin carrier 6 has a series of short chutes, or receptacles, 9, Fig. 4, connecting the coin slots 8 in the top 10 of the carrier with similar slots 11 in the bottom 12 of the carrier. The coin carrier 6 is adapted to rotate on a circular plate 13, Figs. 4 and 5, which acts as the selector in sorting the coins. In the present instance this selector plate is provided with five coin slots, 14, 15, 16, 17 and 18, respectively, Figs. 5 and 7, arranged in circular series and which correspond in length with the width of the respective coins to be sorted, the slot 14 being of a size to receive the smallest coin to be sorted, in this case a dime, and the slot 18 being of a size to receive the largest coin to be sorted which, for example, would be a half dollar. The intermediate slots 15, 16 and 17 will then correspond in size to a penny, a nickel and a quarter, respectively. However, as will be understood, the slots may be varied in number and size according to the nature and different sizes of the coins to be sorted. A feature of the invention is in the provision of means for ejecting from any slot a coin too large to pass therethrough and which, if not

ejected, might act to jamb the machine. This mechanism will now be described.

Pivotaly mounted on the bottom of the selector plate 13, as indicated at 19, 20, 21 and 22, respectively, Fig. 5, are a series of radial arms 23, which extend outward slightly beyond the periphery of the selector plate and are movable under the coin slots 14, 15, 16 and 17, respectively. Each of these arms is normally held against a stop 24 by means of a coil spring 25. Projecting downward at intervals from the periphery of the bottom of the coin carrier 6 are a series of lugs 26 which are adapted to engage simultaneously and progressively the outer ends of the arms 23 and move them over and beyond the coin slots with which they are respectively associated against the resistance of the coil springs 25. When the arms so engaged have been brought to a position beyond the ends of the coin slots, the lugs 26 ride off of said arms, permitting the springs 25 to snap the arms 23 across the respective coin slots 14 to 17, for the purpose of knocking back from one or all of the slots any coin which is too large to pass through the same, as will be more clearly described later. The selector plate 13 is fixedly secured in position in the casing 7 and is provided with a central aperture 27, which affords a bearing for a hub 28, on the upper side of a worm gear 29, said hub being clamped to the bottom 12 of coin carrier 6 by means of a set-screw 30 and washer 31. The coin carrier 6 is adapted to be rotated by means of a sprocket 31, Fig. 2, which is turned by the crank 32. From the sprocket 31 a chain 33 passes to a small sprocket 34 on the outer end of a shaft 35 which is provided with a worm 36, Fig. 4, meshing with the worm wheel 29, which, as above explained, is non-rotatably secured to the bottom of coin carrier 6 by means of the set-screw 30.

Located under the selector plate 13 are a series of coin chutes 37, Figs. 3 and 7, the inlets to which are located directly under the respective slots 14 to 18 in the selector plate, and the outlet ends of which, as shown by Figs. 2 and 3, pass through the front wall of the casing 1, in line with openings 38, shown by dotted lines in Fig. 1, provided in the rear of the upper ends of the tubes 39 of the changer 40. This changer is preferably secured on the front wall of the casing 1 by slot and screw arrangement indicated at 41. The operation is as follows:

Coins dropping through the chute 3 from the fare-box into cup 2 pass through the chute 4 and fall into one or the other of the receptacles 9 of the coin carrier 6. It will be understood that the slot 8 of each receptacle 9 passes immediately under the lower end of chute 4 in the rotation of the coin carrier. As the coin carrier revolves the coin in the receptacle 9 under each slot 8 will be carried

over the slots 14 to 18 of the selector plate 13. At the same time the lugs 26 will engage the arms 23 and move them from under the slots 14 to 18, putting springs 25 under tension.

5 As the receptacle carrying a dime passes over slot 14 in the selector plate 13, the dime will readily fall through slot 14 and into its chute 37 whence it is conveyed to the appropriate tube 39 of the changer 40 for receiving dimes.
10 The same applies to coins of other sizes, which readily pass through the slots in the selector plate of a size to receive it. It will be understood of course, that the coins received by the carrier pass first over the smallest slot 14
15 and in order over the succeeding slots 15 to 18, so that it is impossible for a coin of one size to be delivered into a slot intended for a coin of a larger size. Some coins do not differ very greatly as to size, however, and it
20 might happen that a coin would fall into one of the coin slots of the selector plate too small to permit the coin to pass through and yet large enough to permit the coin to engage the end of the slot and stop the rotation of the
25 coin carrier. If, for example, a penny should fall into the slot 14 intended for a dime, it could not pass through said slot but it might lodge therein, and, as stated, prevent the coin carrier from moving it around to its proper
30 slot 15. To obviate this result, as soon as the receptacles 9 of the coin carrier start to pass beyond the corresponding slots 14 to 18 of the selector plate, the lugs 26 of the coin carrier pass off of the ends of the arms 23, per-
35 mitting springs 25 to move said arms swiftly under the said slots, with the result, in the case of the penny above referred to, that it would be knocked upward out of the dime slot 14 back into its receptacle 9 of the coin carrier, and the latter would carry it around un-
40 til it reached its own slot 15, through which it would fall. It will be obvious that no arm 23 is required for the largest slot 18, as only a half dollar will ever reach this slot, and of
45 course it will pass through the same at once.

As the receptacles 9 are slightly wider than a half dollar, and as a half dollar is approximately one-fourth of an inch greater in diameter than a quarter, and, of course, much
50 greater in width than a nickel, a penny or a dime; and further, as the arms 23 are released as soon as they start to move past the ends of the slots 14 to 18, it will be clear that an over-
55 size coin can be knocked upward into a receptacle by an arm before the rear end of the receptacle can engage the coin and jam the machine.

It will be observed that my improved coin sorting machine is complete in itself and
60 may therefore be used for sorting coins independent of a fare-box, or any other device for delivering coins thereto, and also without having the changer 40 attached thereto. For example, the machine could be
65 used in banks, commercial houses and other

places where a large number of coins have to be sorted, the operator simply placing the coins by hand into the cup 2 and turning the crank 32. The sorted coins passing out of
70 the various chutes 37 could then drop into suitable containers provided for the purpose, or be otherwise maintained in separated relation.

While I have illustrated in the accompanying drawings the best form of my invention
75 now known to me, it should be understood that the invention is not to be limited to the precise details of construction illustrated, but that various changes in the form, construction and arrangement of parts could be made
80 without departing from the spirit of my invention.

I claim:

1. In a coin sorting machine, in combination with a selector plate having a circular
85 series of slots therein graduated in size to correspond to the various sizes of the coins to be sorted, a coin carrier rotatably mounted above said plate and provided with means
90 movable over said slots for delivering coins thereto, and means for ejecting from any slot a coin delivered thereto of a size too large to pass through such slot.

2. In a coin sorting machine, in combination with a selector plate having a circular
95 series of slots therein graduated in size to correspond to the various sizes of the coins to be sorted, a coin carrier rotatably mounted above said plate and provided with a circular series of open-end coin receptacles mov-
100 able over said slots for delivering coins thereto, an ejecting device associated with each slot, and means for simultaneously actuating all of said ejecting devices while the re-
105 ceptacles of the carrier are in register with said slots to knock back into any receptacle from any slot a coin delivered thereto from such receptacle of a size too large to pass
110 through such slot.

3. In a coin sorting machine in combination with a selector plate having a circular
110 series of slots therein graduated in size to correspond to the various sizes of the coins to be sorted, and progressing in size from the
115 smallest to the largest slot, a coin carrier rotatably mounted above said plate and provided with means movable over said slots for delivering coins thereto, and automatic
120 means for ejecting from any slot a coin delivered thereto of a size too large to pass through such slot.

4. In a coin sorting machine, in combination with a selector plate having a circular
125 series of slots therein graduated in size to correspond to the various sizes of the coins to be sorted, and progressing in size from the smallest to the largest slot, a coin carrier rotatably mounted above said plate and provided with means movable over said slots
130 for delivering coins thereto, and means actu-

ated by said carrier for ejecting from any slot a coin delivered thereto of a size too large to pass through such slot.

5. In a coin sorting machine, in combination with a selector plate having a circular series of slots therein graduated in size to correspond to the various sizes of the coins to be sorted, and progressing in size from the smallest to the largest slot, a coin carrier 10 rotatably mounted above said plate and provided with means movable over said slots for delivering coins thereto, and spring-actuated means associated with each slot and adapted to be actuated by said carrier for ejecting 15 from any slot a coin delivered thereto of a size too large to pass through such slot.

6. In a coin sorting machine, in combination with a selector plate having a circular series of slots therein graduated in size to 20 correspond to the various sizes of the coins to be sorted, a coin carrier rotatably mounted above said plate and provided with means movable over said slots for delivering coins therein, and spring-controlled means associated 25 with each slot and adapted to be simultaneously actuated by said carrier for ejecting from any slot a coin delivered thereto of a size too large to pass through such slot.

7. In a coin sorting machine, in combination with a selector plate having a circular series of slots therein graduated in size to 30 correspond to the various sizes of the coins to be sorted, a coin carrier rotatably mounted above said plate and provided with means movable over said slots for delivering coins 35 thereto, a spring-controlled member associated with each slot, and means on said carrier for simultaneously actuating all of said members while said receptacles are in register 40 with said slots, for ejecting from any slot a coin delivered thereto of a size too large to pass through such slot.

8. In a coin sorting machine, in combination with a selector plate having a circular 45 series of slots therein graduated in size to correspond to the various sizes of the coins to be sorted, a chute leading from each of said slots, a coin carrier rotatably mounted above said plate and provided with means 50 movable over said slots for delivering coins thereto, and means for ejecting from any slot a coin delivered thereto of a size too large to pass through such slot.

9. In a coin sorting machine, in combination with a selector plate having a circular series of slots therein graduated in size 55 to correspond to the various sizes of the coins to be sorted and progressing in size from the smallest to the largest slot, a circular series of coin receptacles movable over said 60 slots for delivering coins thereto, each of said receptacles being of a size to receive the largest coin to be sorted, said receptacles being adapted to pass from a coin receiving 65 point over said slots in order from the small-

est to the largest slot, and automatic means operating while the receptacles are in register with said slots to knock back from any slot into its registering receptacle a coin delivered thereto by such receptacle of a size too 70 large to pass through such slot.

10. In a coin sorting machine, in combination with a selector plate having a circular series of slots therein graduated in size to correspond to the various sizes of the coins 75 to be sorted, and progressing in size from the smallest to the largest slot, a circular series of open-end coin receptacles spaced to correspond in position with the slots in the selector plate and movable over said slots for 80 delivering coins thereto, and a plurality of automatic means, one of which is associated with each slot, operating simultaneously while said receptacles are in register with 85 said slots to knock back from any slot into its registering receptacle a coin delivered thereto by such receptacle of a size too large to pass through such slot.

In testimony whereof, I have hereunto set my hand.

FOUNT F. DAUGHERTY.

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