

March 27, 1928.

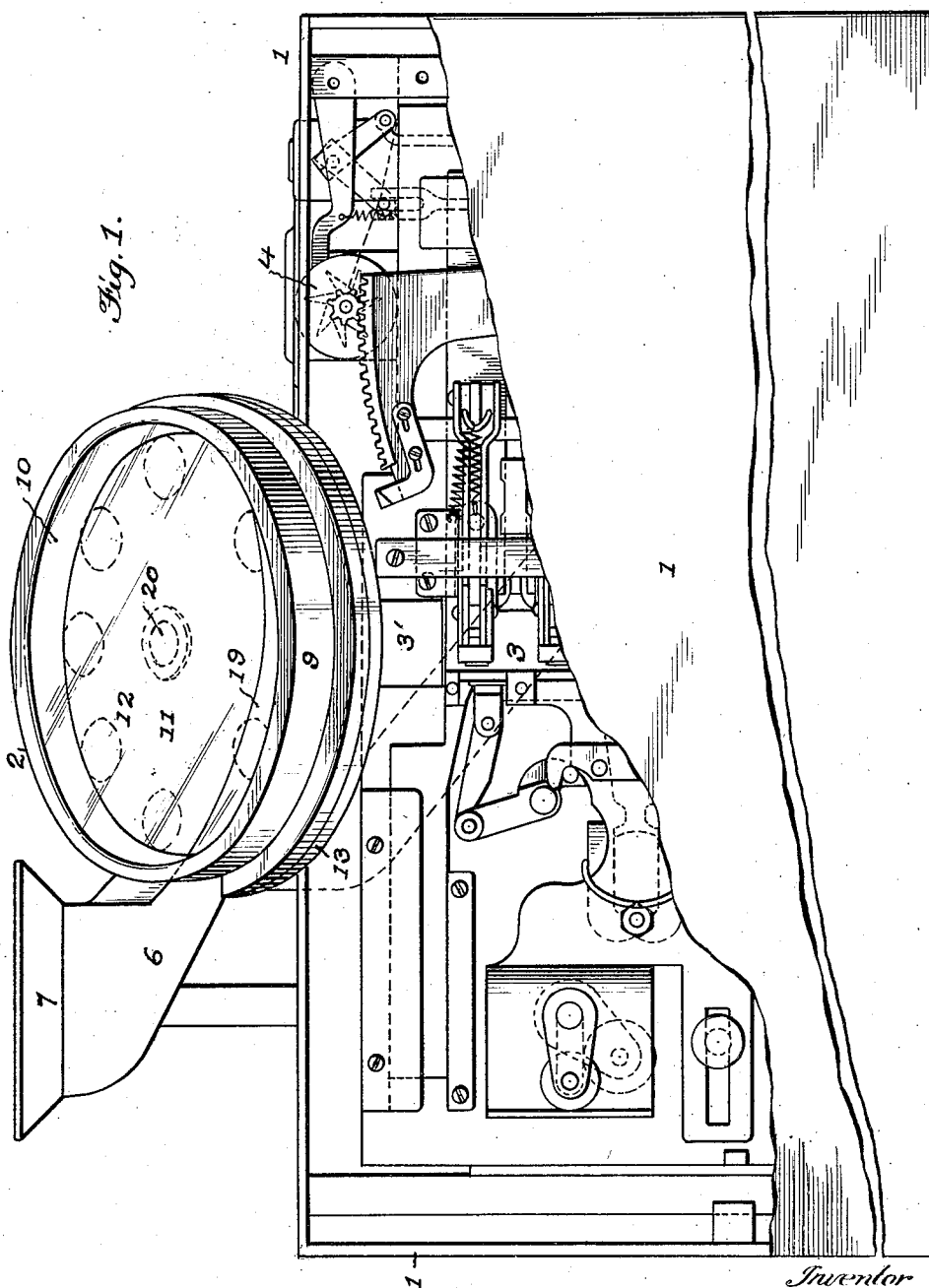
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F. G. MURRAY

COIN FEEDING MECHANISM

Filed Aug. 5, 1926

4 Sheets-Sheet 1



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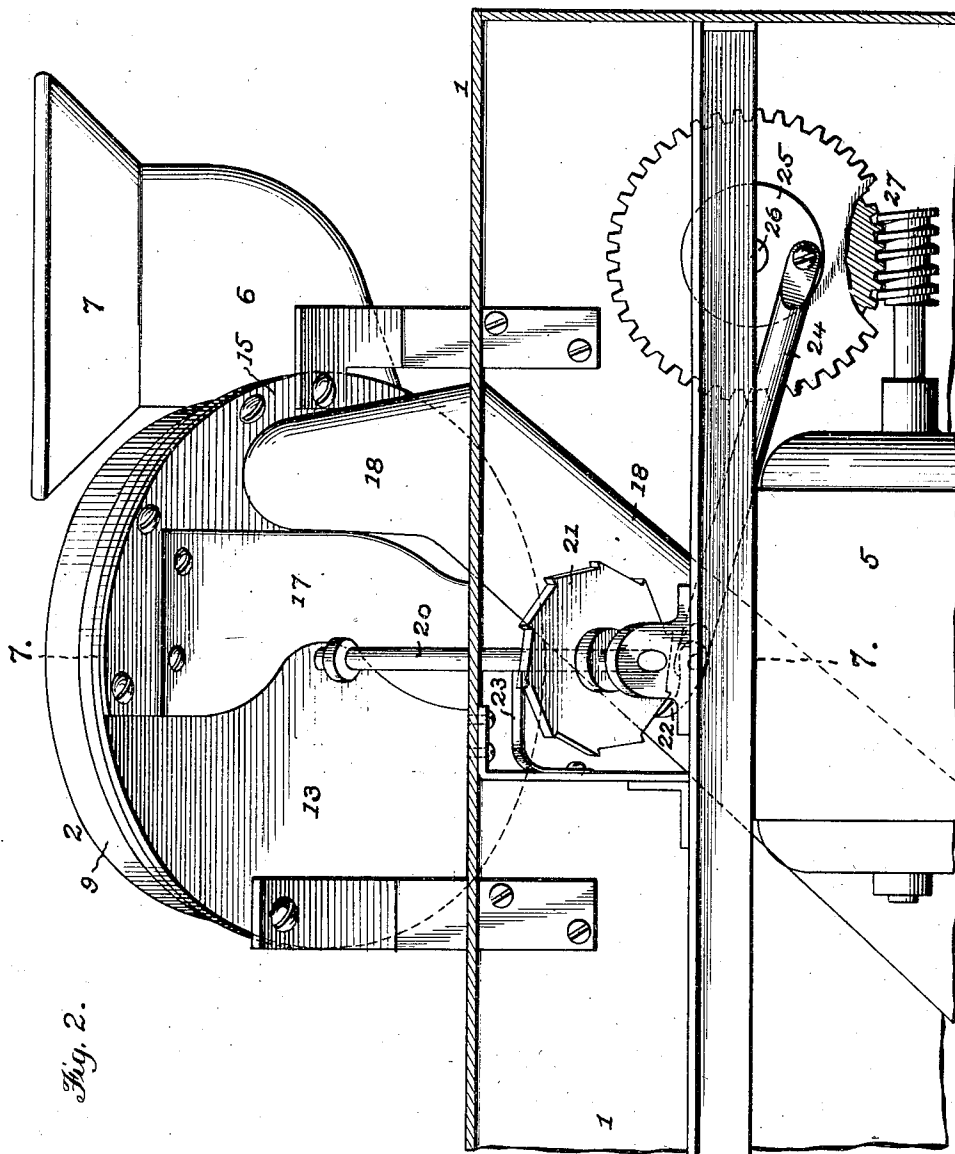
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COIN FEEDING MECHANISM

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4 Sheets-Sheet 2



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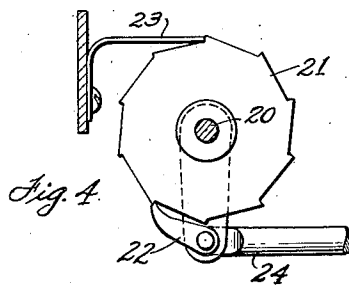
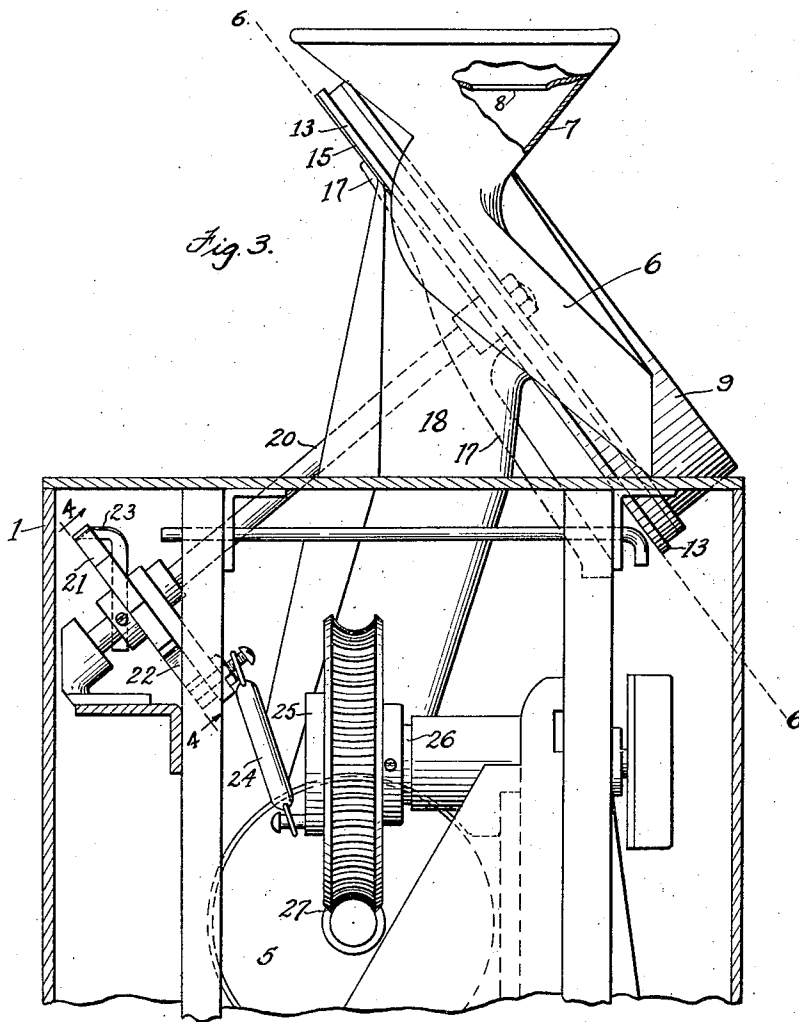
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4 Sheets-Sheet 3



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4 Sheets-Sheet 4

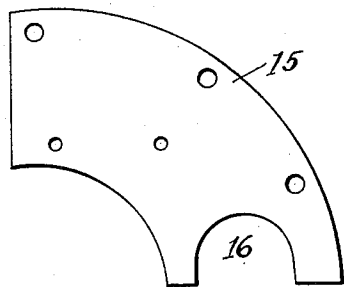


Fig. 8

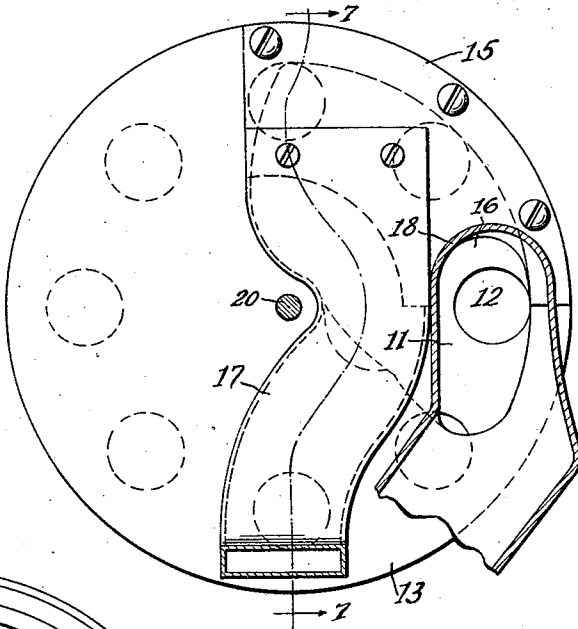


Fig. 6

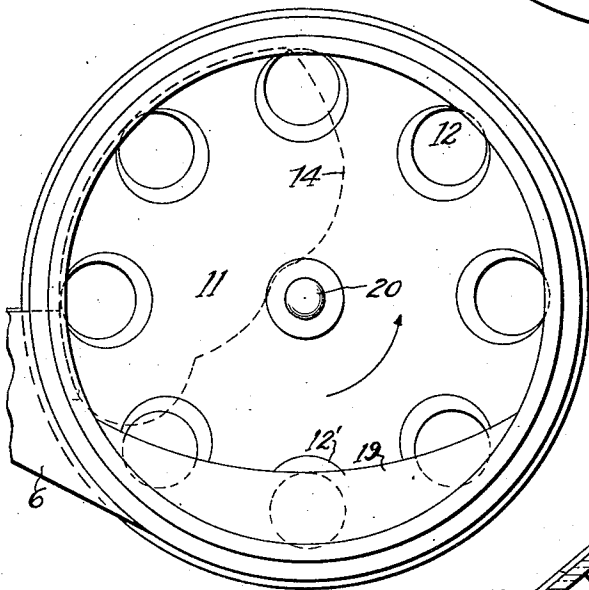


Fig. 5

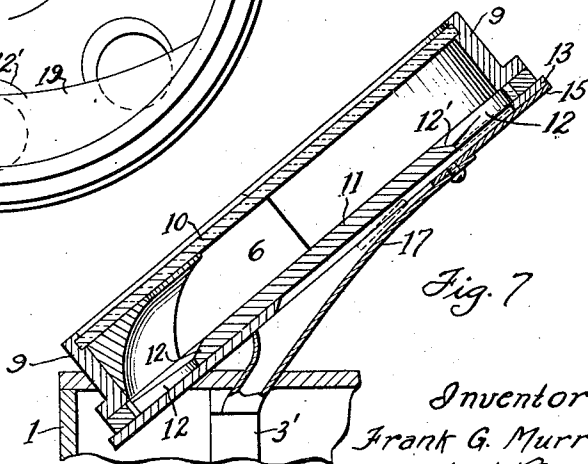


Fig. 7

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UNITED STATES PATENT OFFICE.

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COIN-FEEDING MECHANISM.

Application filed August 5, 1926. Serial No. 127,209.

This invention relates to a single feed mechanism for the successive delivery of coins and tokens to the assorting and registry mechanism of a fare box of the type shown and described in the Murray Patent No. 1,499,187, dated June 24, 1924, and the present improvement has for its object:

To provide a structural formation and combination of parts and elements of a coin feeding mechanism, in which the coins and tokens deposited by the passengers as fares, pass into a receiver, from which they are fed in a single and successive manner to an assorting mechanism operatively associated with a registry or recording mechanism enclosed against unauthorized manipulation or interference, with said coin feeding mechanism acting automatically to separate, reject and expel slugs, bent and defective coins or tokens to a point outside the apparatus, all as will herein-after more fully appear.

In the accompanying drawings:

Fig. 1, is a front elevation of the upper portion of a fare box having the present invention applied, the front wall of the fare box housing being removed to disclose the internal mechanism.

Fig. 2, is a rear elevation of the same, with a like removal of the rear wall of the housing.

Fig. 3, is an end elevation of the same, with a like removal of an end wall of the housing.

Fig. 4, is a detail elevation of the ratchet wheel and pawl of the intermittent feeding mechanism.

Fig. 5, is a detail top view of the holding shell or casing of the single delivery feeder mechanism.

Fig. 6, is a detail rear elevation of the same, with the discharge chute for rejected coins and tokens in section on line 6—6, Fig. 3.

Fig. 7, is a detail vertical section on line 7—7, Figs. 1 and 6.

Fig. 8, is an elevation of the gauge or depth plate, detached, and which constitutes the bottom web of the receiving recess and channel for the acceptable coins and tokens in the coin feeding operation.

Like reference numerals indicate like parts in the several views.

The present invention is intended more especially for use in connection with the assorting and registry type of fare boxes, in which a closed main housing 1, and a super-

imposed coin and token receiving hopper or casing 2, with which is operatively associated a delivery mechanism by which the deposited coins and tokens are taken from said casing 2, and delivered in a serial manner to an assorting mechanism 3, arranged in the interior of the main housing 1, along with the registry mechanism 4, and in some cases the electric motor 5, by which constant operation of the various mechanisms of the fare box is attained. In the construction shown in Fig. 1, the assorting mechanism 3 is of the reciprocating multiple slide type shown and described in the aforesaid Patent No. 1,499,187, and the associated registry mechanism is of the initial ratchet wheel and pawl operated type shown and described in said patent.

The novel and material portion of the present invention consists wholly in a delivery mechanism by which the coins and tokens are fed singly and in a separated condition from the aforesaid holding casing 2, to the receiving throat 3' of the aforesaid assorting mechanism of the fare box, and in the preferred construction shown in the drawings, the formation and combination of parts is as follows:—

The holding chamber of the hopper or casing 2 is of a cylindrical form and is arranged in an inclined position, usually 45°, to the normal horizontal position of the main housing 1 of the fare box. At one side and near its lower portion, said holding chamber has communication with an angular inclined chute 6, the upper end of which has the form of an open top funnel 7, adapted to receive the coins and tokens deposited by the passengers, the coins descending by gravity into said holding chamber.

Ordinarily the funnel 7, is provided with the usual orificed partition 8, the orifices in which are of a size to admit the passage of the smaller and acceptable sizes of coins and tokens the apparatus is designed to handle and prevent the entry of larger coins or other non-acceptable pieces.

The wall 9 of the chamber of the casing 2 is also preferably of a circular form, with its upper edge formed to receive a fixed transparent cover plate 10 of glass or the like to admit of a free visual inspection of the coins within the holding chamber by the conductor or other party in charge. At its lower edge the wall 9 is formed with an annular bearing recess in which the rim or

margin of a rotary feeder disc 11, now to be described, is held in position and guided in its turning movement.

The rotary feeder disc 11 above referred to has a flat upper face to constitute the bottom surface of the chamber of the holding hopper 2 to form a support for the main portion of the mass of coins and tokens which may be in said chamber. Near its margin said disc 11 is formed with a series of orifices 12 in concentric relation to the axis of rotation of the disc, with said orifices of a diameter slightly greater than the diameter of the largest coin or token the mechanism is intended to handle and so that in the normal rotation of the disc the orifices 12 thereof will each receive a single coin or token and carry the same up and around from a lower point in the containing chamber to the hereinafter described outlet chutes which open into the upper portion of said chamber.

Beneath the aforesaid feeder disc, the circular wall 9 of the holding hopper 2 carries a fixed bottom plate or head 13 upon which the feeder disc 11 bears in its turning movement with the plate 13 forming a closure for the lower ends of the orifices 12 of said feeder disc, except at the upper portion of the hopper, at which point said bottom plate 13 is cut away to form a shallow cavity or recess 14 into which the coins and tokens may pass in their serial upward travel towards the hereinafter described outlet or delivery chutes of the mechanism. In the present construction the thickness of the bottom plate or head 13 is slightly greater than the thickness of the largest acceptable coin or token the mechanism is designed to handle, and so that a spurious coin or token of a greater thickness than such largest acceptable coin or token will project above the top surface of the plate 13, for the purpose hereinafter stated.

Beneath the opening 14 of the bottom plate or head 13 and forming a closure for the bottom of said opening, a gauge plate 15 is secured to form the bottom wall of the above described shallow cavity or recess 14. Said gauge plate is preferably formed as a separate piece and of a sector shape as shown in Fig. 8, with one end formed with a segmental opening 16 to constitute the entry to, or mouth of the discharge chute for the non-acceptable coins, tokens and the like passing through the mechanism.

In the present improvement, a pair of outlet or delivery chutes 17 and 18 are fixedly attached at their upper ends and in side by side relation to the aforesaid gauge plate 15, with the mouth of the chute 17 in aligned relation with the uppermost orifice 12 of the feeder disc 11 and adapted to receive through the intermediate recess or cavity 14 aforesaid an acceptable coin or token from

said orifice and conduct the same down into the assorting mechanism of the fare box. The mouth of the companion chute 18 is in communication with the aforesaid segmental opening 16 of the gauge plate 15 and is adapted to receive and conduct away the imperfect coins, tokens, etc., which are of a thickness greater than the depth of the aforesaid shallow cavity 14 and which consequently can not wholly enter said cavity nor the complementary shallow depth of the entry mouth of the primary chute 17, which has communication with the lower part of the cavity as shown in Fig. 7. Accordingly the particular orifice 12 of the rotary feeder disc 11, will maintain carrying engagement with the spurious coin or token to carry the same to a separate point and into a secondary chute 17, which has communication with the cavity or recess 14, through its bottom wall or plate 15 aforesaid. In such construction the chute 17 is in advance of the chute 18, in the path of circular travel of the feeder disc 11, so that the chute 17 receives all the acceptable coins and tokens to conduct the same down into the open top of the vertical coin and token receiving channel 3' of an assorting mechanism 3, such as shown in the aforesaid Patent No. 1,499,187, while the companion chute 18 is located further along in the path of travel of the feeder disc 11, and receives all the imperfect coins, etc., that are rejected by the above described formation of the mouth or entry to the aforesaid chute 17; to conduct said imperfect coins, etc., to a suitable and accessible outside point.

The inclined position of the holding hopper while acting to maintain the mass of contained coins and tokens by gravity in the lower portion of the containing chamber, also acts to maintain by gravity each single coin or token in an individual orifice 12 of the feeder disc 11 in the heretofore described transfer of coins and tokens from the lower portion of the containing chamber to the upper and outlet portion thereof, and so that any coin or token not properly engaged by an orifice 12, after partial upward carriage will slip down by gravity into the lower portion of the containing chamber, and with a view to aid in such downward slippage of such coins or tokens, the margins of the series of orifices 12 of the feeder disc 11, have a chamfered formation 12' by means of which the holding edge of each orifice 12 is reduced to a thickness approximating the thickness of the smallest acceptable coin the apparatus is designed to handle, and so that a second smaller acceptable coin or token may not lodge upon the smaller coin or token in said orifice 12 and have holding engagement with the margin of said orifice and be carried around with the same. In consequence said second coin will slide

by gravity back into the lower portion of the containing chamber.

With a view to maintaining the mass of coins and tokens in the lower portion of the containing chamber in proper engagement relation with the orifices of the feeder disc 11, a filler piece 19 of a semi-lunar shape, triangular in cross-section is fixed in the lower portion of the containing chamber adjacent to the transparent front wall 10 of the same as shown, and acting to prevent any coins or tokens from lodging or sticking in lower forward portion of said containing chamber.

15 A step by step intermittent movement of the feeder disc 11, with each step equal in extent with the distance between the centers of the two adjacent orifices 12 of said disc, with a view to obtain a period of rest for each orifice 12, when said orifice is in communicating register with the chute 17 to attain a more effective and certain passage of the contained coin or token into said chute, is attained by means as follows:

25 A countershaft 20 journaled in the fare box housing 1 carries in addition to the feeder disc 11 a ratchet wheel 21 with which is associated an operating pawl 22 and a holding pawl 23, with the operating pawl 22 receiving reciprocation through a connecting rod 24 from a crank pin of a crank disc 25 on a constantly rotating shaft 26 having worm gear connection 27 with the armature shaft of the electric motor 5 of the fare box.

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

1. In a coin and token feeding mechanism of the type described, the combination of a stationary casing formed with a circular receiving chamber arranged in an inclined position and provided with an inlet for coins and tokens, a closure head for the underside of said chamber cut away near the upper end of said chamber to form a shallow recess, a revolvable feeder disc having bearing on said closure and constituting the bottom surface of the aforesaid chamber, the said feeder disc having a circular series of receiving orifices near its margin adapted to register with the aforesaid shallow recess in the closure head, a primary receiving chute connecting with said shallow recess and adapted to receive tokens only of a predetermined thickness or less, a secondary receiving chute connecting with said recess at a further point of travel of the feeder disk and adapted to receive tokens of a greater thickness than the aforesaid primary chute, and means for imparting rotation to said feeder disc.

2. In a coin and token feeding mechanism of the type described, the combination of a stationary inclined casing formed with a correspondingly inclined circular receiving chamber, an inlet chute attached to a side of

the casing and opening into said chamber, a closure head for the underside of said chamber having a segmental opening near the upper part of the casing, a gauge plate secured beneath the last mentioned opening to form in connection with the cut away portion of said closure head a shallow recess of a segmental form, a revolvable feeder disc constituting the bottom surface of the aforesaid chamber, the said feeder disc having a circular series of receiving orifices near its margin adapted to register with the aforesaid shallow recess of the closure head, a primary receiving chute connecting with said shallow recess, a secondary receiving chute connecting with said recess at a further point of travel of the feeder disk, and means for imparting rotation to said feeder disc.

3. In a coin and token feeding mechanism of the type described, the combination of a stationary inclined casing formed with a correspondingly inclined circular receiving chamber, an inlet chute attached to a side of the casing and opening into said chamber, a closure head for the underside of said chamber having a segmental opening near the upper part of the casing, a gauge plate secured beneath the closure head to form in connection with the cut away portion of said closure head a shallow recess of a segmental form, a revolvable feeder disc constituting the bottom surface of the aforesaid chamber, the said feeder disc having a circular series of receiving orifices near its margin adapted to register with the aforesaid shallow recess and opening in the closure head, the orifices in the feeder disc having a chamfered formation, a primary receiving chute connecting with said shallow recess, a secondary receiving chute connecting with said recess at a further point of travel of the feeder disk, and means for imparting rotation to said feeder disc.

4. In a coin and token feeding mechanism of the type described, the combination of a stationary inclined casing formed with a correspondingly inclined circular receiving chamber, an inlet chute attached to a side of the casing and opening into said chamber, a closure head for the underside of said chamber having a segmental opening near the upper part of the casing, a gauge plate secured beneath the closure head to form in connection with the cut away portion of said closure head a shallow recess of a segmental form, a revolvable feeder disc constituting the bottom surface of the aforesaid chamber, the said feeder disc having a circular series of receiving orifices near its margin adapted to register with the aforesaid shallow recess of the closure head, a primary receiving chute connecting with said shallow recess, a secondary receiving chute connecting with said recess at a fur-

ther point of travel of the feeder disk, a carrying shaft attached centrally to said feeder disc, a ratchet wheel on said shaft, an operating pawl associated with said ratchet wheel, and means for imparting reciprocating movement to said pawl.

5 5. In a coin and token feeding mechanism of the type described, the combination of a stationary inclined casing formed with a correspondingly inclined circular receiving chamber, an inlet chute attached to a side of the casing and opening into said chamber, a transparent closure plate at the upper side of said casing, a closure head at the underside of said casing cut away near the upper part of the casing, a gauge plate secured beneath the closure head to form in connection with the cut away portion of said closure head a shallow recess, a revolvable feeder disc constituting the bottom surface of the aforesaid chamber, said feeder disc having a circular series of receiving orifices near its margin adapted to register with the aforesaid shallow recess and opening in the closure head, the orifices in the feeder disc having a chamfered formation, a primary receiving chute connecting with said shallow recess, a secondary receiving chute connecting with said recess at a further point of travel of the feeder disk, and means for imparting rotation to said feeder disc.

6. In a coin and token feeding mechanism of the type described, the combination of a stationary inclined casing formed with a correspondingly inclined circular receiving chamber, an inlet chute attached to the side of the casing and opening into said chamber, a transparent closure plate at the upper side of said casing, a semi-lunar filler triangular in cross section fitting the lower end of the chamber adjacent to the transparent closure plate, a closure head at the underside of said casing cut away near the upper part of the casing, a gauge plate secured beneath the closure head to form in connection with the cut away portion of said closure head a shallow recess, a revolvable feeder disc constituting the bottom surface of the aforesaid chamber, said feeder disc having a circular series of receiving orifices near its margin adapted to register with the aforesaid shallow recess of the closure head, a primary receiving chute connecting with said shallow recess, a secondary receiving chute connecting with said recess at a further point of travel of the feeder disk, and means for imparting rotation to said feeder disc.

Signed at Chicago, Illinois, this 20th day of July, 1926.

FRANK G. MURRAY.