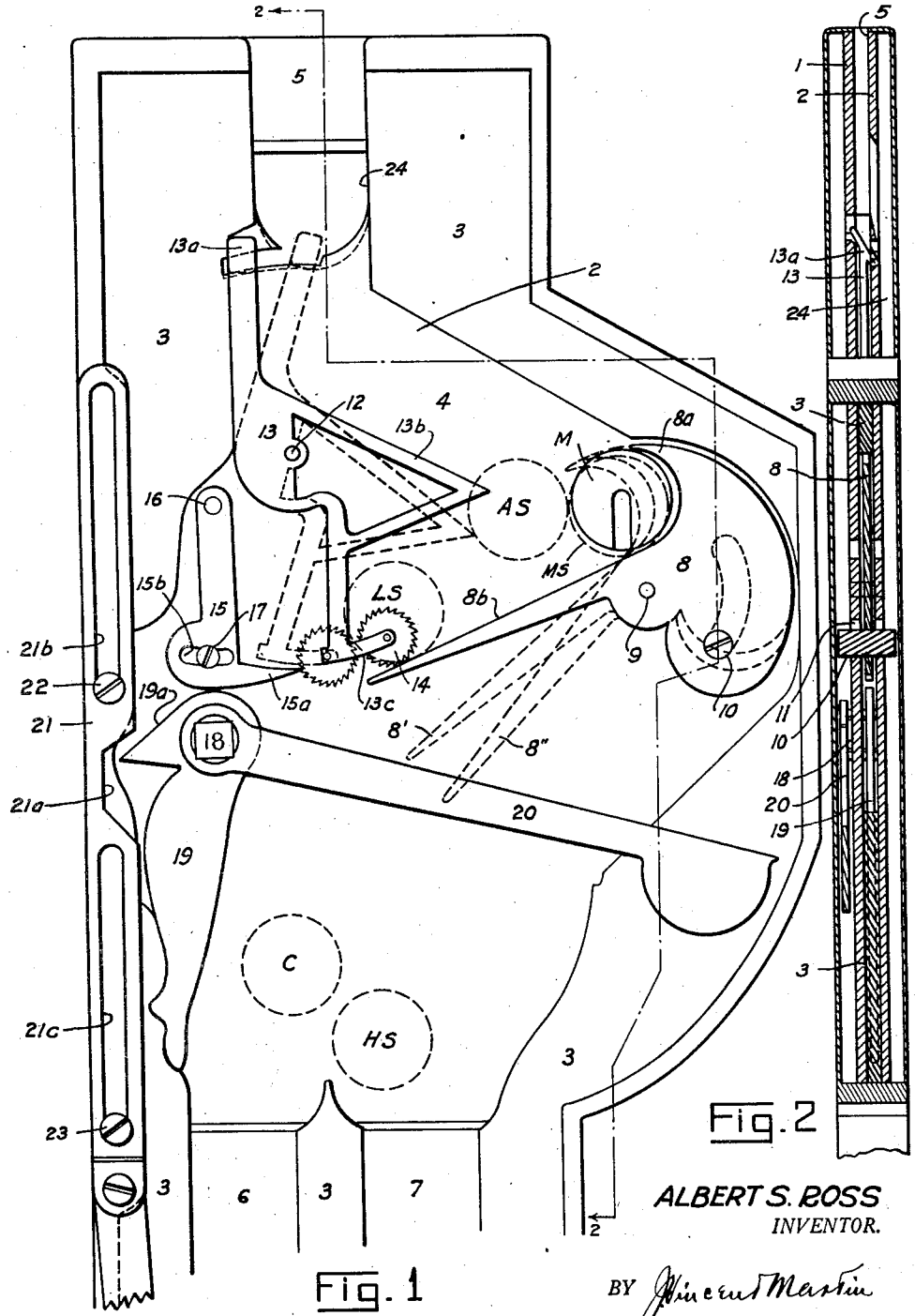
April 5, 1932. A. S. ROSS 1,852,725

SLUG EJECTOR

Filed Feb. 24, 1930 2 Sheets-Sheet 1



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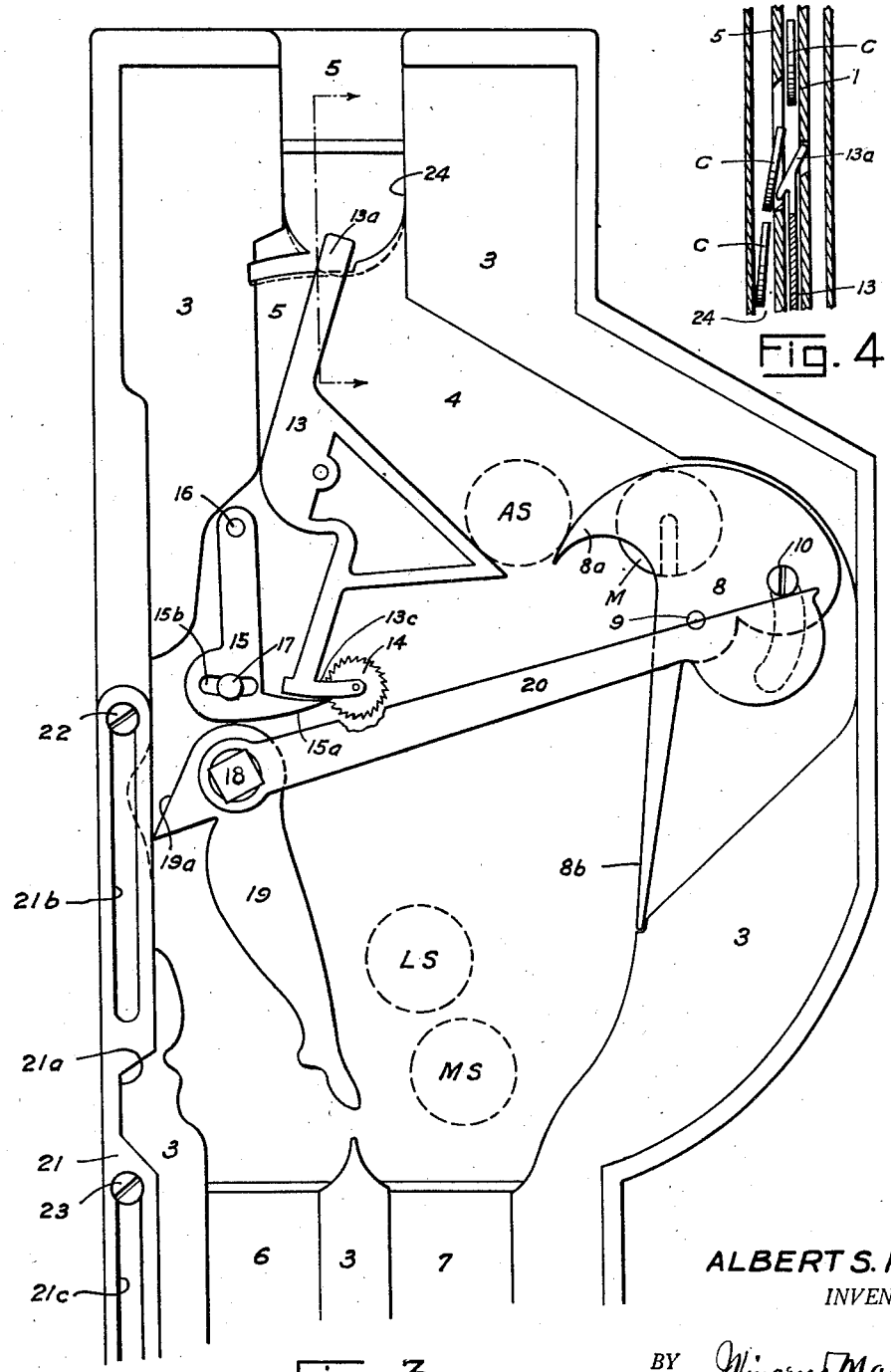

Fig. 3

Fig. 4

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UNITED STATES PATENT OFFICE

ALBERT S. ROSS, OF DALLAS, TEXAS, ASSIGNOR TO O. R. SEAGRAVES, OF HOUSTON, TEXAS

SLUG EJECTOR

Application filed February 24, 1930. Serial No. 430,506.

This invention relates to slug ejectors adapted for use in connection with coin actuated money changers, vending machines and other like apparatus and has for its general object the provision of certain new and useful improvements on the slug ejector covered by my pending application for Letters Patent of the United States filed on the 22d day of August, 1927, Serial No. 214,515; and also by my pending application for Letters Patent of the United States filed on the 20th day of August, 1928, Serial No. 300,645.

A specific object of the present invention is to provide a slug ejector having new and improved means to guide coins of a certain denomination to a predetermined destination; to eject every slug and coin which is heavier or lighter than a coin of that denomination, and all magnetic slugs; and to detain certain slugs and eject all coins and slugs deposited during such detention.

Other specific objects of the invention will hereinafter appear.

The preferred embodiment of the invention is illustrated by the accompanying drawings, of which Fig. 1 is a side elevation with one side wall of the casing and one of the partition plates removed, the movable parts being shown in their normal positions; Fig. 2, a section on the line 2—2 of Fig. 1; Fig. 3, a view similar to Fig. 1, the operative parts being shown in their actuated positions; and Fig. 4, a fragmentary detail view, partly in section, of the entrance blocking lever and associated parts.

The slug ejector may be housed in a suitable casing in which the parallel partition plates 1 and 2, shown clearly by Fig. 2, are mounted. The plates 1 and 2 are held in spaced relation by the guides 3, which form an entrance passageway 4 with which the deposit slot 5 communicates; a coin passageway 6 into which coins are directed and a slug passageway 7 into which slugs are directed.

The apparatus includes a selecting beam 8 pivotally mounted as indicated at 9 in the path of downwardly moving coins and slugs. The beam 8 is supported in the normal position shown by Fig. 1 by the pin 10 extending through the slot 11 in the partition plate 1. The beam has a curved finger 8*a* and a normally inclined upper edge 8*b* to form a track for downwardly moving coins and slugs.

Pivoted at 12 adjacent the deposit slot 5 is the entrance blocking lever 13. This lever has a laterally bevelled head 13*a* for a purpose which will hereinafter appear, and an inclined edge 13*b* to form a track for downwardly moving coins and slugs. Mounted on the horizontal arm 13*c* at the lower end of this lever is the roller 14 having peripheral teeth.

To limit the rotation of the blocking lever 13 and roller 14 the invention provides the stop member 15 having a tooth 15*a* to engage said roller. This stop member is pivoted at 16 so that it may be held in various positions by the set screw 17 fitting in the arcuate slot 15*b*.

Pivoted at 18 below the parts just referred to is the coin passageway gate 19. The pivot pin 18 extends through the partition plate 1, as shown by Fig. 2, and the beam actuating lever 20 is non-rotatably mounted on this pin on the outside of the partition plate 1. In Figs. 1 and 3, the partition plate 1 has been removed and the beam 20 remounted on the pin 18, for convenience in illustration. It will be understood that when the parts are assembled for operation, lever 20 will be disposed on the outside of the plate 1 and the other elements above referred to on the inside of said plate, as indicated by Fig. 2.

The gate 19 has a cam 19*a* normally extending into the slot 21*a* of the actuating bar 21. This bar is connected to a suitable handle, not shown, accessible from the exterior of the casing. It is guided in its reciprocatory movement by the pins 22 and 23 carried by the partition plate 1 and extending through slots 21*b* and 21*c*.

Coins of the proper denomination deposited in the ejector are directed to the coin passageway 6 which may lead to any desired destination, such as the coin-controlled mechanism of a vending machine, money changer, or the like.

Attention is now invited to Fig. 1 which illustrates the automatic operation of the

parts whereby a proper coin is directed to the coin passageway 6. When such a coin C is inserted in the deposit slot 5, it falls into the entrance passageway 4, rolls down and off the inclined edge 13*b* of the entrance blocking lever 13 and upon the concave finger 8*a* of the selecting beam 8. Rebounding from said finger, it then rolls down the inclined edge 8*b* of the selecting beam against the roller 14.

The size of the roller 14 and its disposition with respect to the beam 8 are such that the coin and roller come into contact at a point below the center of gravity of the coin. When, after such contact, the coin continues to roll in an anti-clockwise direction down the edge of the beam, carrying the roller with it, the roller rotates in a clockwise direction, so that practically no resistance is offered to the free rotation of the coin until the roller strikes the tooth 15*a* of the stop member 15. The stop member prevents all further movement of the roller by the coin. Robbed of its inertia and acted upon by gravity, the coin thereupon moves downwardly, swinging the beam 8 into the position indicated at 8′, and falling off the same into the coin passageway 6. The position 8′ of the beam is predetermined with respect to coin passageway 6.

The beam 8 is made movable by a proper coin into the position 8′ by placing the fulcrum 9 a certain distance from the center of gravity of the beam; and by placing the adjustable stop member 15 a certain distance from the fulcrum 9. It will be obvious that rotation of the beam 8 is dependent not only on the weight of the coin, but also upon the distance between the fulcrum 9 and the point on the edge 8*b* to which the coin is permitted to roll. This distance may be varied by adjusting the stop member 15.

The movement into the slug passageway 7 of a slug heavier than a coin of the proper denomination will now be described. See Fig. 1.

A slug HS appreciably heavier than a proper coin will fall upon and rock the beam 8 and then strike the roller 14 and rebound into the slug passageway 7. The position into which the heavy slug may move the beam is indicated at 8″. The exact position into which a certain heavy slug will move the beam will depend upon the weight of that slug. The beam may be rotated considerably more than indicated by the dotted lines 8″. The position 8″ is predetermined with respect to slug passageway 7.

Now a slug LS appreciably lighter than a coin of the proper denomination falls upon and rolls down the inclined edge 8*b* of the selecting beam (Fig. 1) and moves the roller 14 into engagement with the stop member 15. Of insufficient weight to rock the beam, the light slug is therefore arrested and detained by the beam and roller. The detention of the light slug and the release of the coin is effected by adjustment of the stop member 15.

It is very difficult to cause the light slug to fall into the coin passageway 6 by shaking the machine, because the point of contact between the roller 14 and the light slug is below the center of gravity of the light slug, so that when the ejector is shaken the light slug has a greater tendency to climb the roller than to depress the beam.

The light slug, it will be understood, moves the entrance blocking lever into the position indicated in dotted lines at 13′ so that the head 13*a* of the entrance blocking lever 13 is moved into the entrance passageway 4. All coins and slugs then inserted in the deposit slot 5 will be directed by the head 13*a* into the overflow passageway 24, (Figs. 1 and 4) which may be made to communicate with the slug passageway 7.

When an attempt is made to operate the machine with which the slug ejector is being used, by depressing the operating handle, not shown but hereinabove referred to, the actuating bar 21 is moved downwardly. When the bar 21 is moved downwardly, the gate 19 is first moved over the coin passageway, and then the beam 20 strikes the pin 10 and rocks the selecting beam 8. The position of the parts before the actuating bar 21 is moved is shown by Fig. 1, the position of the parts after the actuating bar has been moved downwardly is shown by Fig. 3. It will be apparent that the light slug is not released until the gate 19 is closed, so that the light slug cannot enter the coin passageway 6 and therefore must enter the slug passageway 7.

When the light slug is released, the lever 13 will be swung back by gravity to the normal position shown by Fig. 1 so that the entrance passageway 4 will automatically be opened.

Means are provided to automatically return the operating handle (not shown), to its normal position, when it is released by the operator, so that the bar 21 is moved to its normal position and the gate 19 and lever 20 are permitted to swing from the positions shown by Fig. 3 to the positions shown by Fig. 1.

Now if a slug MS containing iron is inserted, it will be detained by the magnet M. During the detention of the slug MS by the magnet, another slug AS may be inserted because the blocking lever 13 is not moved by the slug MS. The slug AS, however, will move the lever 13 into its dotted line position, and will be detained by the slug MS and the blocking lever, as shown by Fig. 1, so that all slugs and coins thereafter inserted will be directed by the head 13*a* into the overflow passageway 24.

Now if the operating handle, not shown,

is actuated, the parts will be moved from the positions shown by Fig. 1 to the positions shown by Fig. 3, whereby the slug MS is swept from the magnet M into the slug passageway 7, and the slug AS is forced upwardly on the edge 13*b* of the blocking lever 13 where it will temporarily be supported by the finger 8*a* of the selecting beam 8. When the parts are permitted to return to the normal positions illustrated by Fig. 1, the finger 8*a* releases the slug AS so that it falls upon the edge 8*b*. If the slug AS is heavier than the proper coin, it will rock the beam 8 into the dotted line position 8'' and fall from it into the slug passageway 7; if lighter, it will be detained by the beam 8 and the roller 14, and thereafter discharged through the slug passageway 7 by manual operation of the parts as hereinabove described; and if magnetic, it will not be detained by the magnet M because it will sweep over but one pole of the magnet. The poles of the magnet, it will be observed, are directed downwardly, so that its pull on the slug AS is insufficient to stop the same.

If a coin is inserted during the detention by the magnet of the slug MS, it will be detained by the slug MS and the blocking lever, and finally released and dropped into the coin passageway when the parts are manually operated to dispose of the slug MS.

The invention is not limited to the preferred embodiment shown. Various changes in construction may be made within the scope of the following claims.

I claim:

1. Coin apparatus having a deposit passageway, an entrance passageway, an overflow passageway, said passageways being defined by substantially parallel walls, an entrance blocking lever pivoted to rock in a plane substantially parallel with said walls and to be swung into a predetermined position by a slug in said entrance passageway to cause movement of deposited coins and slugs in a direction substantially at a right angle to said walls and into said overflow passageway.

2. Coin apparatus having a deposit passageway, an entrance passageway, an overflow passageway, said passageways being defined by substantially parallel walls, an entrance blocking lever pivoted to rock in a plane substantially parallel with said walls, and having an inclined head to be swung into a predetermined position by a slug in said entrance passageway to cause movement of deposited coins and slugs in a direction substantially at a right angle to said walls and into said over-flow passageway.

3. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, and a device disposed with respect to said beam to engage a light slug on said edge at a point below the center of gravity of said slug and limit the movement of said slug on said edge, said beam and device serving to hold said slug.

4. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, and a device mounted in a predetermined position with respect to said beam to engage a light slug on said edge at a point below the center of gravity of said slug, and yieldably resist movement of said slug on said edge in one direction, said beam and device serving to hold said slug.

5. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a device mounted in a predetermined position with respect to said beam to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist the movement of said coin on said edge in one direction, and means to cause said device to positively prevent movement of said coin in said direction.

6. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a device mounted in a predetermined position with respect to said beam to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist the movement of said coin on said edge in one direction, and means to cause said device to positively prevent movement of said coin in said direction, said means being adjustable with respect to said beam.

7. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, and a roller mounted in a predetermined position with respect to said beam to engage and yieldably resist movement of a light slug on said edge in one direction, said beam and roller serving to hold said slug.

8. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, and a roller mounted in a predetermined position with respect to said beam to engage a light slug on said edge at a point below the center of gravity of said slug, and yieldably resist movement of said slug on said edge in one direction, said beam and roller serving to hold said slug.

9. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a roller mounted in a predetermined position with respect to said beam to engage and yieldably resist movement of a coin on said edge in one direction, and a stop member to stop rotation of said roller and cause said roller to positively prevent movement of said coin in said direction.

10. A slug ejector having a pivoted coin

selecting beam, said beam having an edge forming a track for coins, a roller mounted in a predetermined position with respect to said beam to engage and yieldably resist movement of a coin on said edge in one direction, and a stop member to stop rotation of said roller and cause said roller to positively prevent movement of said coin in said direction, said member being adjustable with respect to said beam.

11. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a roller mounted in a predetermined position with respect to said beam to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist the movement of said coin on said edge in one direction, and a stop member to stop rotation of said roller and cause said roller to positively prevent movement of said coin in said direction.

12. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a roller mounted in a predetermined position with respect to said beam to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist the movement of said coin on said edge in one direction, and a stop member to stop rotation of said roller and cause said roller to positively prevent movement of said coin in said direction, said member being adjustable with respect to said beam.

13. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a roller having peripheral teeth and mounted in a predetermined position with respect to said beam to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist movement of said coin on said edge in one direction, and a stop member having a tooth to engage the teeth of said roller, stop rotation of said roller, and cause said roller to positively prevent movement of said coin in said direction.

14. A slug ejector having a pivoted coin selecting beam, said beam having an edge forming a track for coins, a roller having peripheral teeth and mounted in a predetermined position with respect to said beam to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist movement of said coin on said edge in one direction, and a stop member having a tooth to engage the teeth of said roller, stop rotation of said roller, and cause said roller to positively prevent movement of said coin in said direction, said member being adjustable with respect to said beam.

15. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, an entrance blocking lever, and a device carried by said lever to engage a light slug on said edge at a point below the center of gravity of said slug, and yieldably resist movement of said slug on said edge in one direction, said beam and device serving to hold said slug.

16. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, an entrance blocking lever, and a roller carried by said lever to engage and yieldably resist movement of a light slug on said edge in one direction, said beam and roller serving to hold said slug.

17. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins and slugs, an entrance blocking lever, and a roller carried by said lever to engage a light slug on said edge at a point below the center of gravity of said slug, and yieldably resist movement of said slug on said edge in one direction, said beam and roller serving to hold said slug.

18. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins, an entrance blocking lever, and a device carried by said lever to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist movement of said coin on said edge in one direction, and means to cause said device to positively prevent movement of said coin in said direction.

19. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins, an entrance blocking lever, and a device carried by said lever to engage a coin on said edge at a point below the center of gravity of said coin, and yieldably resist movement of said coin on said edge in one direction, and means to cause said device to positively prevent movement of said coin in said direction, said means being adjustable with respect to said beam.

20. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins, an entrance blocking lever, a roller carried by said lever to engage and yieldably resist movement of a coin on said edge in one direction, and a stop member to stop rotation of said roller and cause said roller to positively prevent movement of said coin in said direction.

21. A slug ejector having an entrance passageway, a pivoted coin selecting beam, said beam having an edge forming a track for coins, an entrance blocking lever, a roller carried by said lever to engage and yieldably resist movement of a coin on said edge in one direction, and a stop member to stop rotation of said roller and cause said roller to posi-

tively prevent movement of said coin in said direction, said member being adjustable with respect to said beam.

22. A slug ejector having an entrance passageway, a pivoted coin selecting beam below said entrance passageway, a coin passageway and a slug passageway below said beam, a pivoted entrance blocking lever, a roller carried by said lever adjacent said beam and forming with said beam lighter slug arresting means, and movable by an arrested light slug to cause said lever to move into said entrance passageway, and an actuating member to move said beam and thereby release arrested light slugs and direct the same into said slug passageway.

23. A slug ejector having an entrance passageway, a pivoted coin selecting beam below said entrance passageway, a coin passageway and a slug passageway below said beam, a pivoted entrance blocking lever, a roller carried by said lever adjacent said beam and forming with said beam lighter slug arresting means, and movable by an arrested light slug to cause said lever to move into said entrance passageway, a stop member to limit the movement of said roller by said slug, said member being adjustable with respect to said beam, and an actuating member to move said beam and thereby release arrested light slugs and direct the same into said slug passageway.

24. A slug ejector having an entrance passageway, a pivoted coin selecting beam below said passageway, a coin passageway and a slug passageway below said beam, said beam being rotatable by coins of a predetermined weight to direct said coins into said coin passageway and rotatable by heavier slugs to direct said slugs into said slug passageway, a pivoted lever, a roller carried by said lever adjacent said beam and serving with said beam to detain lighter slugs, and an actuating member to move said beam whereby lighter slugs detained by said beam and roller may be released and directed into said slug passageway.

25. A slug ejector having an entrance passageway, a pivoted coin selecting beam below said passageway, a coin passageway and a slug passageway below said beam, said beam being rotatable by coins of a predetermined weight to direct said coins into said coin passageway and rotatable by heavier slugs to direct said slugs into said slug passageway, a pivoted lever, a roller carried by said lever adjacent said beam and serving with said beam to detain lighter slugs, a stop member to limit the movement of said roller by said slug, said member being adjustable with respect to said beam, and an actuating member to move said beam whereby lighter slugs detained by said beam and roller may be released and directed into said slug passageway.

26. A slug ejector having an entrance passageway, a pivoted coin selecting beam below said passageway, a coin passageway and a slug passageway below said beam, said beam being rotatable by coins of a predetermined weight to direct said coins into said coin passageway, and rotatable by heavier slugs to direct said slugs into said slug passageway, an entrance blocking lever, a roller carried by said lever and forming with said beam arresting means for lighter slugs and movable by a lighter slug to cause said lever to enter said entrance passageway to block the same, and means to release arrested lighter slugs and direct the same into said slug passageway.

27. A slug ejector having an entrance passageway, a pivoted coin selecting beam below said passageway, a coin passageway and a slug passageway below said beam, said beam being rotatable by coins of a predetermined weight to direct said coins into said coin passageway, and rotatable by heavier slugs to direct said slugs into said slug pasageway, an entrance blocking lever, a roller carried by said lever and forming with said beam arresting means for lighter slugs and movable by a lighter slug to cause said lever to enter said entrance passageway to block the same, a stop member to limit the movement of said roller by said slug, said member being adjustable with respect to said beam, and means to release arrested lighter slugs and direct the same into said slug passageway.

28. A slug ejector having an entrance passageway, a coin selecting beam, an entrance blocking lever, and a roller carried by said lever adjacent said beam, said beam and roller being constructed and disposed to release a coin of a predetermined weight, and to retain a slug lighter than said coin, said roller being movable by said slug to cause said lever to enter said passageway and block the same.

29. A slug ejector having an entrance passageway, a coin selecting beam, an entrance blocking lever, a roller carried by said lever adjacent said beam, said beam and roller being constructed and disposed to release a coin of a predetermined weight, and to retain a slug lighter than said coin, said roller being movable by said slug to cause said lever to enter said passageway and block the same, and a stop member to limit the movement of said roller by said slug, said member being adjustable with respect to said beam.

30. A slug ejector having an entrance passageway, a coin selecting beam, a blocking lever, a roller carried by said lever adjacent said beam, said beam and roller being constructed and disposed to release a coin of a predetermined weight and retain a slug lighter than said coin, said roller being movable by said slug to cause said lever to enter said passageway and block the same, and means to cause said beam to release said slug.

31. A slug ejector having an entrance passageway, a coin selecting beam, a blocking

lever, a roller carried by said lever adjacent said beam, said beam and roller being constructed and disposed to release a coin of a predetermined weight and retain a slug lighter than said coin, said roller being movable by said slug to cause said lever to enter said passageway and block the same, a stop member to limit the movement by said roller of said slug, said member being adjustable with respect to said beam, and means to cause said beam to release said slug.

32. A slug ejector having an entrance passageway, a coin selecting beam, a magnet mounted to arrest magnetic slugs, means to cause said beam to sweep said magnet, and an entrance blocking lever mounted to be movable into said entrance passageway by a coin or slug inserted during the detention by said magnet of a magnetic slug.

33. A slug ejector having an entrance passageway, a coin selecting beam, a magnet mounted to arrest magnetic slugs, means to cause said beam to sweep said magnet, and an entrance blocking lever mounted to direct magnetic slugs to said magnet, and to be movable into said entrance passageway by a coin or slug inserted during the detention by said magnet of a magnetic slug.

34. A slug ejector having an entrance passageway, a magnet mounted to arrest magnetic slugs, the poles of said magnet being directed downwardly, a coin selecting beam pivoted below and adapted to sweep said magnet, and an entrance blocking lever mounted to be movable into said entrance passageway by an additional magnetic slug inserted during the detention by said magnet of a magnetic slug, and means to cause said beam to sweep said detained slug from said magnet and prevent detention by said magnet of said additional slug.

35. A slug ejector having an entrance passageway, a coin passageway, and a slug passageway, a pivoted coin selecting beam, and a coin passageway gate and a beam actuating lever rigidly connected together and rotatable about a common axis, so that when they are rotated together on said axis said gate first closes said entrance passageway and said lever then rocks said beam.

In testimony whereof, I hereunto affix my signature.

ALBERT S. ROSS.