H. J. BAUR.

FARE REGISTER.

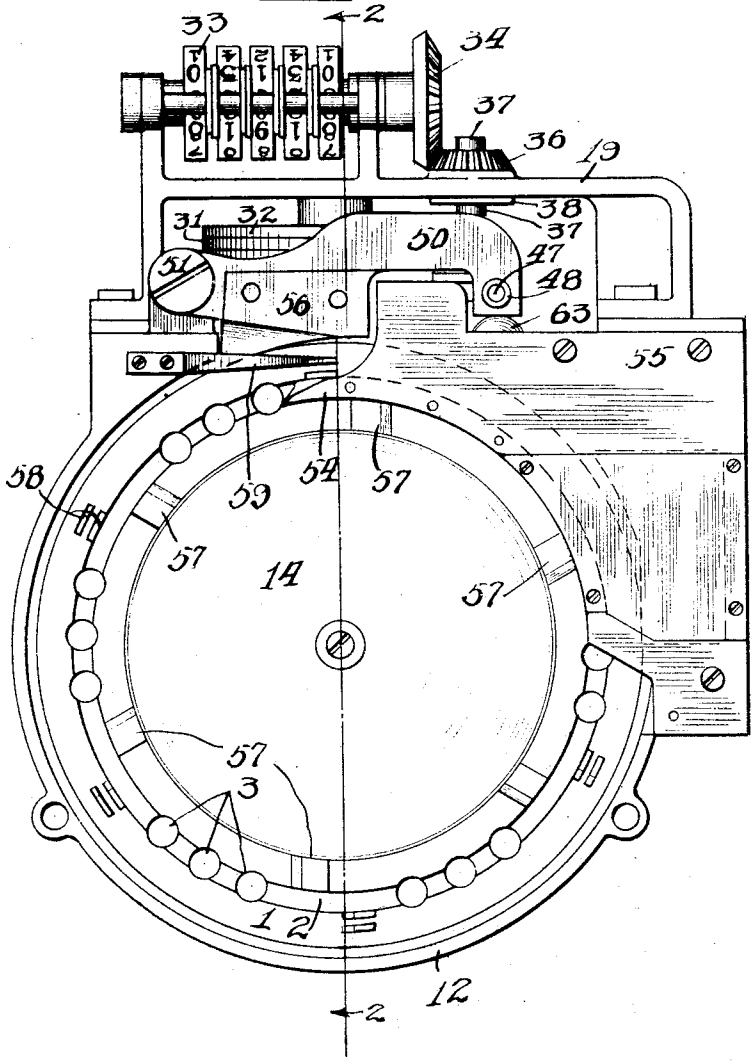
APPLICATION FILED FEB. 6, 1915.

1,268,669.

Patented June 4, 1918.

5 SHEETS—SHEET 1.

Fig. 1



Witnesses

J. W. Angell

Charles W. Gillespie

by

Inventor

Hugo J. Baur

Charles W. Gillespie

Atty.

H. J. BAUR.

FARE REGISTER.

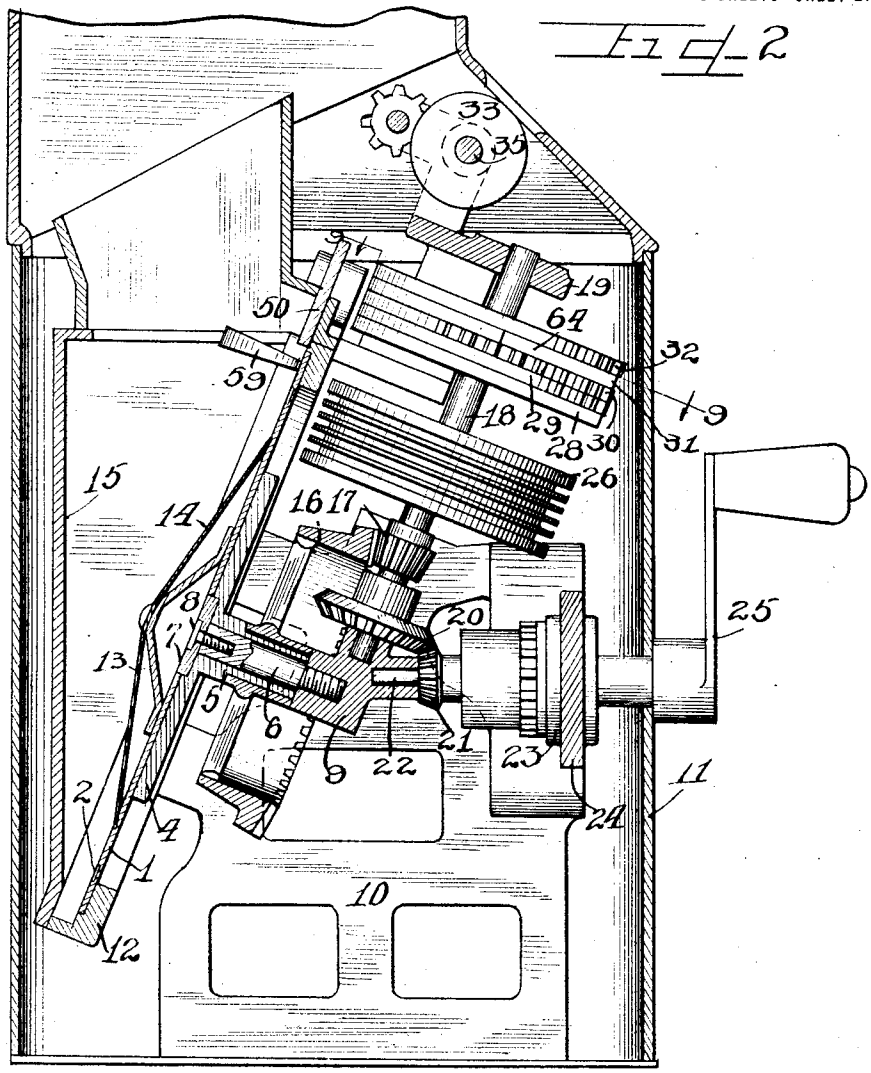
APPLICATION FILED FEB. 6, 1915.

1,268,669.

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5 SHEETS—SHEET 2.

Fig 2



Witnesses
J. W. Angell
Charles W. Fillebrown Jr.

by

Inventor
Hugo J Baur.
Charles W. Fillebrown
Atty.

H. J. BAUR.

FARE REGISTER.

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1,268,669.

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5 SHEETS—SHEET 3.

Fig. 6

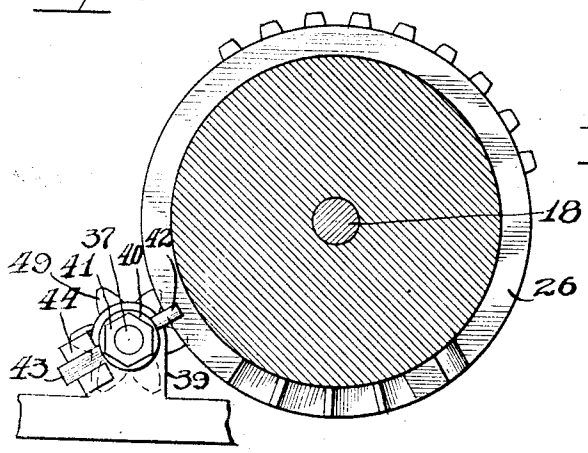


Fig. 12

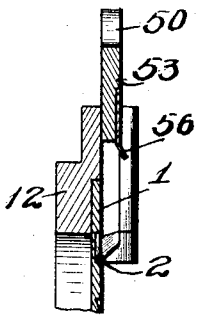


Fig. 3

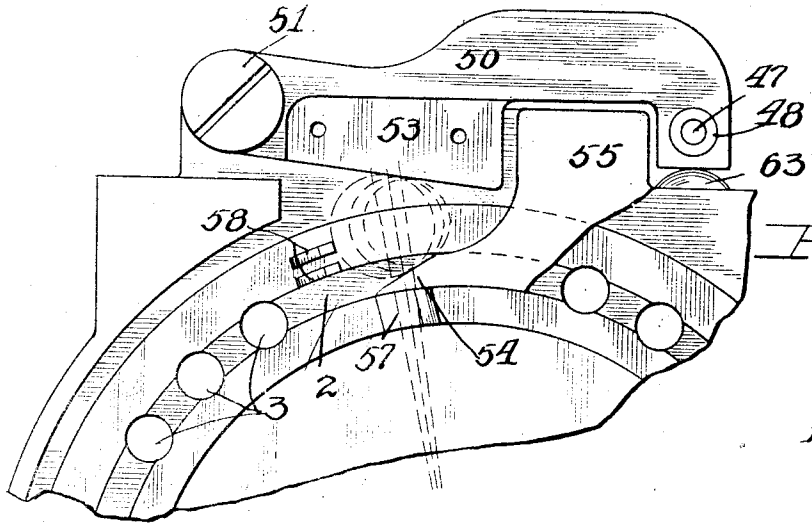
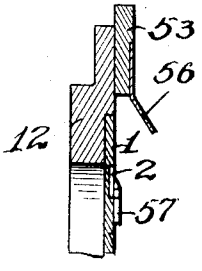


Fig. 13



Witnesses

J. W. Angell

Charles W. Ridge Jr. by

Inventor

Hugo J. Baur.

Charles W. Ridge Atty.

H. J. BAUR.

FARE REGISTER.

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5 SHEETS—SHEET 4.

Fig 4

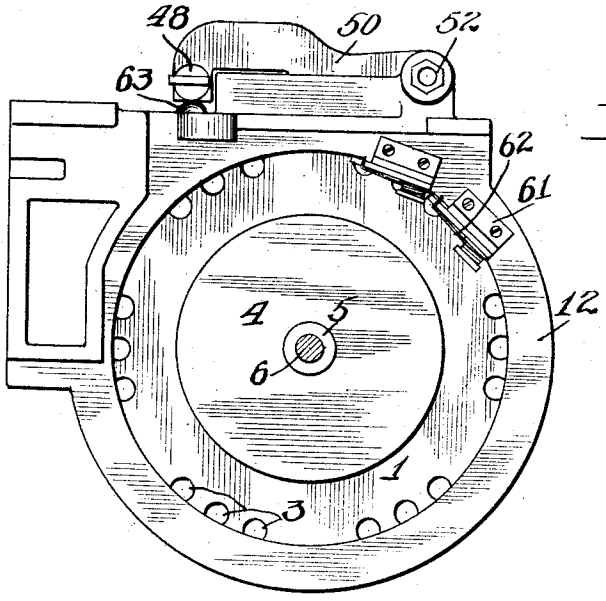


Fig 9

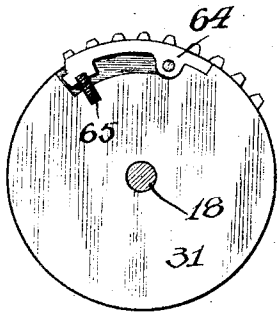


Fig 10

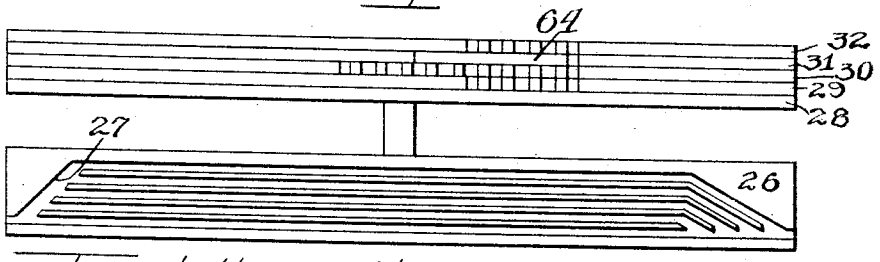
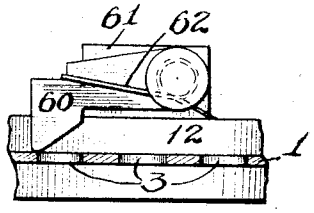


Fig 11



Witnesses

J. W. Angell

Charles W. Fills Jr. by

Inventor

Hugo J. Baur

Charles W. Fills

Atty.

H. J. BAUR.

FARE REGISTER.

APPLICATION FILED FEB. 6, 1915.

1,268,669.

Patented June 4, 1918.

5 SHEETS—SHEET 5.

Fig. 5

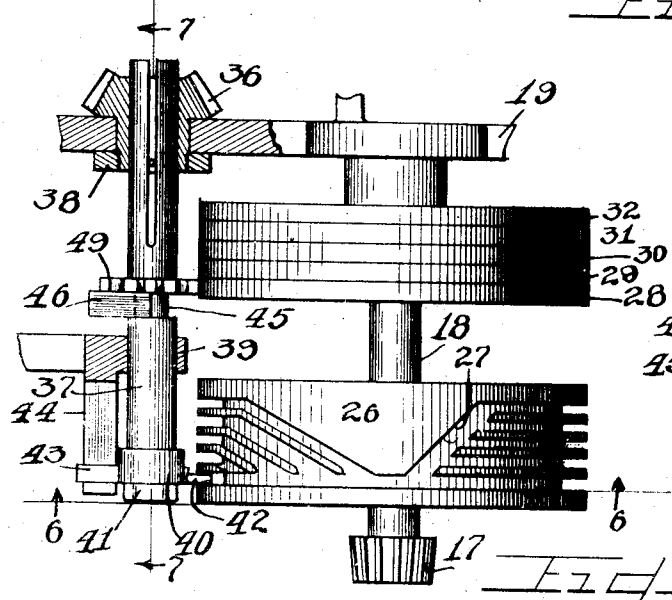


Fig. 7

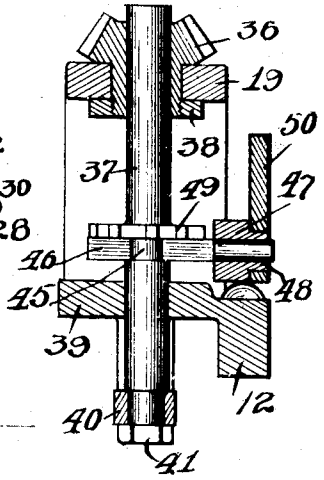
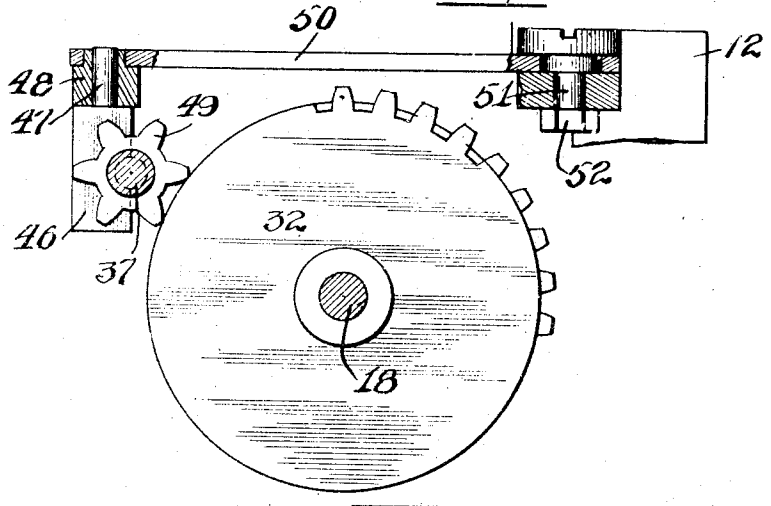


Fig. 8



Witnesses

J. M. Angell

Charles W. Fields

Inventor

Hugo J. Baur.

by Charles W. Fields

Atty

UNITED STATES PATENT OFFICE.

HUGO J. BAUR, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO WILLIAM P. BUTLER, OF BERWYN, ILLINOIS.

FARE-REGISTER.

1,268,669. Specification of Letters Patent. **Patented June 4, 1918.**

Application filed February 6, 1915. Serial No. 6,435.

To all whom it may concern:

Be it known that I, HUGO J. BAUR, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fare-Registers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to a device adapted to be used upon street cars or other conveyances for the collection of fares, acting when a coin is deposited therein to count the same, totalizing the amount upon a register mechanism placed in a visible position in the box. The device relates more particularly to the interior operating mechanisms of a fare box, that is, those elements which handle the coin received, carrying the same to a counting position and discharging the same into a collection receptacle, and, of course, such mechanisms are well adapted for insertion in various types of casings, and may be mounted in many different arrangements to accomplish the purpose.

The device hereinafter described is of the well known type shown in the patents issued to Jay M. Johnson, for "cash registering and counting mechanism for street cars and other purposes", issued May 12th, 1914, No. 1,096,171, and "coin counting and registering mechanism", issued May 12, 1914, No. 1,096,172, the arrangement and construction of the parts having been changed to some extent but still embodying the basic principles of this type of mechanism as disclosed in said patents above mentioned.

It is an object of this invention to construct a counting and registering mechanism for fare boxes provided with means preventing overtravel of the elements in any attempt to defraud the machine by abnormal operation thereof, the driving means for the register being held positively in train and out of train therewith at the proper intervals during operation of the mechanism.

It is an object, therefore, of this invention to construct a coin counting mechanism embracing means to selectively remove coins from a hopper and convey the same to a counting position and with a register adapted to be entrained with driving mechanism according to the denomination of coin and dependent upon the diameter thereof as the coin is conveyed past counting position.

It is also an object of this invention to construct a coin counting mechanism wherein means are shifted by a coin on a carrying element to entrain the register with a drive, and with mechanisms associated with said shifting means to positively maintain the same in a shifted position, preventing overtravel thereof by an abnormal operation of the machine in an attempt to defraud the same.

It is furthermore an important object of this invention to construct a coin counting mechanism for coins of various denominations wherein means are shifted by various coins at a time dependent upon the diameter of the coins carried to entrain mechanisms which shift driving means into engagement for a register and act to maintain said driving means in entrained relation during registration of the count upon the register and thereafter to positively disentrain said driving means and restore the parts to neutral position.

It is finally an object of this invention to construct a coin counting and registering mechanism operating automatically to entrain proper mechanisms at an interval of time to register a coin according to its diameter, the coin of greatest diameter serving to cause entrainment of the registering mechanisms at an earlier interval than coins of a smaller diameter to register the various coins according to their proper denomination.

The invention (in a preferred form) is illustrated in the drawings, and is more fully pointed out and defined in the appended claims.

In the drawings:

Figure 1 is a front face view of the coin counting and registering mechanism detached from its casing.

Fig. 2 is a central vertical section taken on line 2—2 of Fig. 1, with a part of the casing shown in section illustrating the mounting of the coin counting mechanism therein, and with parts shown in elevation.

Fig. 3 is an enlarged detail view of the upper portion of the coin carrying mechanisms and the shifting means operated thereby, with coins of various diameter shown in dotted lines.

Fig. 4 is a fragmentary rear elevation of the coin carrying and the coin actuated mechanism.

Fig. 5 is a fragmentary enlarged view of the register entraining and driving means with parts shown in section.

Fig. 6 is a detail section taken on line 6—6 of Fig. 5, with parts in elevation.

Fig. 7 is a detail section taken on line 7—7 of Fig. 5, with parts in elevation.

Fig. 8 is a fragmentary top plan view with parts in section, of the mechanism shown in Fig. 5.

Fig. 9 is a detail section on line 9—9 of Fig. 2, illustrating the construction of one of the elements constituting a part of the mutilated gear.

Fig. 10 is a diagrammatic view illustrating a development of the mutilated gear and cam entraining mechanism.

Fig 11 is a detail view illustrating one of the agitating elements mounted on the back of the coin carrying disk shown in Fig. 4.

Fig. 12 is a fragmentary section through the coin lever.

Fig. 13 is a similar section through another portion thereof.

As shown in the drawings:

Referring first to Figs. 1 and 2, the coin carrying element consists of a wheel or disk 1, having a groove 2, in the face theerof, and a plurality of groups of apertures 3, therethrough. Said disk is secured upon a circular plate 4, the hub 5, of which is apertured and is journaled upon a stud shaft 6, with a washer 7, engaged on the outer end of said stud shaft by means of a screw 8, and fitting into a registering recess of said plate 4, to hold the same engaged upon the stud shaft. Said stud shaft 6, is threaded into a cross brace member 9, which extends between end frame members 10, which support the mechanism at the sides disposed within a casing 11, forming the walls of the fare box. Rigidly secured upon said end frame members 10, only one of which is shown but which, of course, are similar in construction and similarly disposed within the casing 11, is a flanged recessed ring 12, mounted in inclined position on said frame members, and into the recess of which fits said coin carrying disk 2, as clearly shown in Fig. 2.

Secured over the face of the coin carrying disk 1, is a bracket member 13, and mounted thereover and extending to near the outer margin of said disk is a conical shield 14, which acts to prevent accidental retainment of coins upon the face of the disk at the center thereof, and deflects the coins as they are dropped into the hopper 15, fitting over and around the carrying disk and secured upon the ring 12. For the purpose of rotating said coin carrying disk 1, an annular bevel gear 16, is secured upon the hub 5, of the disk carrying plate, and meshes with a small bevel pinion 17, which is secured upon a vertically inclined shaft 18, journaled at its upper end in a cross brace member 19, which extends between the end frame members 10, and at its lower end in the cross brace member 9. Also secured upon the lower end of said shaft 18, is another bevel pinion 20, which is driven by a bevel pinion 21, secured upon a shaft 22, journaled at one end in said cross brace member 9, and at its other end in a ball bearing 23, mounted in a cross brace member 24, extending between said end frame members 10. A crank handle 25, is adapted to be inserted through an aperture in the walls of the casing 11, and engaged with the end of the small shaft 22, within the ball bearing member 23, to rotate said shaft. Also secured upon said shaft 18, is a cylindrical cam member 26, having a plurality of grooves in the surface thereof, each of which, as clearly shown in Figs. 5 and 10, has an entrance portion inclining downwardly toward the lower side of the cam element, and each groove terminates in an inclined passage, one wall of which forms an inclined abutment 27. Also mounted on said shaft 18, above said cam element 26, is a mutilated gear comprising built up circular plate sections 28, 29, 30, 31, and 32, respectively, all rigidly secured together upon said shaft 18, and each of said sections having different numbers of teeth thereon corresponding to different denominations of coin.

A register, denoted as a whole by the reference numeral 33, is mounted on said cross brace member 19, and mechanisms are provided for driving the same from said composite mutilated gear. For this purpose a bevel pinion 34, is secured upon the register shaft 35, and meshes at all times with a bevel pinion 36, feathered upon the upper end of a vertically slidable shaft 37. The hub of the bevel pinion 36, is journaled in the cross frame member 19, as clearly shown in Fig. 7, with a collar 38, threaded on said hub beneath said cross frame member to retain the pinion in position, said pinion 36, thus acting as a bearing for said vertically slidable shaft 37. The lower end of said shaft 37, is reduced in diameter, as clearly shown in Fig. 7, and secured thereon in a manner to permit said shaft to rotate therein is a collar 40, held retained upon said shaft by a nut 41. A pin 42, projects radially from said collar on one side thereof, in a position to engage normally in the lowermost groove of the cam element 26, but adapted when said shaft 37, is elevated, to move into any one of the entrance passages of the grooves and by engaging therein, riding upwardly thereon, thus elevating and holding said shaft 37, elevated at a predetermined point for a certain interval of time. To prevent rotation of said collar

40, on the shaft 37, a projection 43, is provided diametrically opposite said pin 42, and engages between vertical guide members 44, projecting downwardly from said bracket member 39, and formed integral therewith. Said shaft 37, is also reduced in diameter at the point designated by the reference numeral 45, and engaging therein is a fork member 46, provided with a shaft extension 47, on which is rotatably mounted a pivot head 48. A small pinion 49, is secured upon said shaft 37, directly above said fork member 46, and is normally prevented from rotation by contact of the teeth thereof with the lower peripheral surface 28, of the composite gear member, but is adapted to be elevated by said fork member 46, the shaft 37, moving therewith to mesh with one of the sets of teeth of the mutilated gear.

For the purpose of elevating said fork member 46, the shaft 37, and pinion 49, therewith, at the time a coin is moved into counting position by the carrying disk 1, said pivot member 47, is connected into the end of a long arm or coin lever 50, which is mounted upon a stud shaft 51, having a screw head, said stud shaft being secured into an extension of the ring frame 12, and held therein by a nut 52. Said lever 50, is provided with a cam shaped inclined extension 53, the lower edge of which is adapted to be contacted by the periphery of coins carried upwardly to counting position by the coin disk. The coin on the disk is caused to roll upwardly upon a fixed inclined tracking surface 54, which projects into the groove 2, of the disk and which forms a part of a plate 55, secured to the frame and extending over the upper right hand portion of the disk. A cover plate member, constructed of sheet metal or other suitable material, and denoted by the reference numeral 56, is adapted to be secured upon the cam extension 53, of the lever 50, projecting downwardly and outwardly therefrom, and forwardly to engage over the outer surface of coins carried upwardly into counting position by the disk to prevent the same tipping outwardly from the surface of the disk.

Means are provided on the marginal surface of said coin carrying disk, to engage the coins and elevate the same to counting position, and for this purpose a number of lugs 57, are formed on said disk projecting outwardly therefrom adjacent the groove 2, and for each lug are provided a pair of spaced portions 58, projecting outwardly from the surface of said disk and disposed radially beyond said groove 2. Said lugs and each pair of spaced portions coact with one another forming a pocket to receive a coin carried on the surface of the inclined disk. The apertures 3, hereinbefore referred to in said disk are disposed intermediate the coin pockets, so that in the event of a coin being improperly carried upon the disk, means may be projected through said apertures from behind the disk to strike off the coins so positioned. In order to insure the coins about to be counted remaining upon the carrying disk as the same are moved into counting position a spring element 59, is secured upon an extended portion of the ring member 12, and projects over the face of the disk, normally bearing thereupon at a point above said groove 2, so that when a coin is carried upwardly into counting position it passes beneath said spring element, which presses the coin firmly against the face of the disk as the same rolls upwardly upon the tracking member 54.

The coin agitating means which are provided for unseating improperly carried coins are mounted on the rear surface of the frame ring 12, as clearly shown in Fig. 4, and each consists of a pawl 60, pivoted on a bracket 61, which is secured upon the rear surface of the frame ring 12, and the pawl is normally impelled successively through the apertures 3, in the coin disk 1, by means of a spring 62.

A hard rubber resilient stop member 63, is secured in horizontal position upon an extension of the ring frame member 12, in a position to permit the outer end of the swinging coin lever 50, to strike thereon as the same is thrown down, due to the interaction of the grooved cam element 26, and pin 42, which is connected upon the shaft actuatable by said coin lever. The construction of the element 31, of the composite mutilated gear is peculiar in that only one tooth member is provided, and as clearly shown in Fig. 9, said tooth member consists of a long arc shaped bar 64, pivoted in a recess in said element 31, and one end thereof normally impelled outwardly by a spiral compression spring 65, as clearly shown in Fig. 9. The forward spring impelled end of said lever 64, normally projects outwardly from the periphery of the element 31, sufficiently to engage one of the teeth of the pinion 59, when the same is shifted into proper position for engagement therewith, but after said pinion has been rotated through a certain angle the following tooth thereon strikes the outer curved surface of said lever 64, causing the same to be depressed against the stress of the spring 65. As the gear element 31, continues its rotation said pinion assumes the position shown in Fig. 8, with respect to the periphery of the cam element, and the slight movement transmitted to said pinion 49. by the spring impelled tooth of the mutilated gear element 31, causes a rotation of the shaft 18, sufficient only to register or count a penny upon the register.

The operation is as follows:

When a coin is deposited into the machine it falls into the hopper 15, which consists of a receptacle one wall of which is formed by the inclined rotatable coin carrying wheel or disk 1, having spaced projections thereon adapted to pick up coins of various denominations one at a time and elevate the same to a counting position. As the coin is moved upwardly seated in the pocket formed by the projections 57 and 58, it passes beneath the resilient spring element 59, which presses the coin closely upon the disk, and the coin impelled forwardly by the projections 58, is caused to roll upwardly upon the inclined tracking element 54, which lies in the path of the coin and projects into the groove 2, on the face of the carrying element.

As the coin rolls upwardly upon said tracking element 54, thrust along by the projections 58, the upper periphery of the coin engages beneath the inclined cam edge of the member 53, which is a part of the coin lever 50, and thereby causes an elevation of said coin lever. It is evident by reference to Fig. 3, that coins of different diameters cause such elevation of the coin lever 50, to take place at different intervals of time with respect to the position of the coin carrying wheel.

Due to the engagement of a coin beneath said lever and consequent elevation thereof, the shaft 37, is also moved upwardly a corresponding amount due to the elevation of the pin 42, into engagement with one of the entrance openings of the grooves in the cam element 26. Immediately upon introduction of said pin 42, into one of the openings in the grooves of said cam element, the cam element acts to further elevate the shaft 37, into proper registering position, dependent upon which of said grooves of the cam element is engaged by said pin 42. This, of course, is determined by the interval of time at which the coin lever 50, is moved by coins of certain diameter. The pinion 49, moves upwardly with said shaft 37, and is thus moved into a position for engagement with one of the sets of teeth of the composite mutilated gear to register the coin properly.

Of course, as said pinion 49, is rotated by the mutilated gear, the movement is transmitted by said shaft 37, through the bevel pinions 36 and 34, to thus actuate the register. After the pinion 49, has been driven the proper amount to effect the registration of the coin, continued rotation of the cam element 26, finally releases the pin 42, from the particular groove with which it is engaged, and the inclined surface 27, at the rear of the various grooves of said cam element, thrusts said pin 42, and consequently said shaft 37, downwardly, thus moving the pinion 49, into a non-actuatable position. The teeth of the pinion 49, contact the periphery of the lowermost element 28, of the composite mutilated gear in a manner shown in Fig. 8, thus preventing accidental or fraudulent actuation of the register. Of course, when the crank 25, is turned the coin wheel or disk 1, is rotated, and also the cam element 26, and composite mutilated gear, due to the driving connection existing therebetween, but movement of the register only takes place when the coin of a certain denomination entrains the registering mechanism with the continuously moving driving means. In the event that more than one coin is elevated toward counting position upon the face of the disk all such coins which are not properly seated in the pocket formed by the projections 57 and 58, must necessarily project to some extent over the apertures 3, in said disk, and consequently just before said coins move into counting position the spring impelled pawls 60, mounted behind said disk, (as clearly shown in Fig. 4) snap through the respective apertures 3, striking the improperly carried coins from the disk. After a coin has been thrust up over the tracking element and counted, it rolls along a guideway (not shown) on the rear surface of the plate to a convenient point of discharge.

I am aware that various details of construction may be varied through a wide range, without departing from the principles of this invention. I therefore do not purpose limiting the patent granted otherwise than necessitated by the prior art.

I claim as my invention:

1. In a device of the class described the combination with an inclined coin carrying element, of a bevel driving pinion connected on the rear thereof, a crank, a bevel pinion driven thereby, a pair of connected bevel pinions one meshing with said latter bevel pinion and connected to said crank and the other with the bevel pinion mounted on said coin carrying element to drive the same, a mutilated gear and grooved cam element mounted co-axially with one another and with said latter pair of bevel pinions, a coin lever mounted over the face of the element, a register, and mechanism operated into engagement with said cam and by said cam moved into position to entrain said register and said mutilated gear to effect registration of a coin on said coin carrying element.

2. In a device of the class described a frame, a coin carrying wheel mounted in inclined position thereon, projections thereon for picking up and elevating coins to counting position, a lever mounted over the upper face portion of said wheel to contact the coins to be elevated thereby, a gear mounted co-axially with said coin carrying element at the rear thereof, a crank, a bevel pinion connected therewith, a vertically in-

clined shaft mounted parallel said coin carrying element at the rear thereof, a pair of bevel pinions thereon, one meshing with said gear on said coin carrying element and the other with said bevel pinion connected to said crank, a register, a mutilated gear and grooved cam element mounted on said shaft co-axially with said pair of bevel pinions, and entraining mechanism adapted to cause driving of the register by said mutilated gear when said mechanism is moved into engagement with the grooved cam element by movement of the lever on the coin element.

3. In a device of the class described the combination with an inclined coin carrying element, of a bevel driving pinion connected on the rear thereof, a crank, a bevel pinion driven thereby, a pair of connected bevel pinions, one meshing with said latter bevel pinion and connected to said crank and the other with the bevel pinion mounted on said coin carrying element to drive the same, a mutilated gear and grooved cam element mounted co-axially with one another and with said latter pair of bevel pinions, a slidably mounted shaft, a gear secured thereon and movable therewith adapted to engage said mutilated gear when said shaft is shifted, a coin lever mounted over the face of the coin carrying element, forked means connected therewith engaging beneath said shiftable gear to shift the same and the shaft therewith to move said gear into engagement with said mutilated gear, a register, a gear on said slidable shaft adapted to drive said register when said shaft and gear rigid thereon are shifted due to movement of the coin lever, and mechanism adapted to engage said cam to complete the shifting movement of said shaft and gear thereon and to maintain the same shifted and said register entrained until registration of the coin which elevated said coin lever is completed.

4. In a device of the class described, a coin carrying element, a register, a slide shaft connected with the register, a cam element having a plurality of cam grooves, a pin on said slide shaft normally engaged in one of said grooves to prevent actuation of the register, a lever contacted by the coins on said carrying element for adjusting the pin to engage in any of the other grooves in the cam element, mutilated gears and a pinion movable with said pin to engage one of the mutilated gears for driving the register.

5. In a device of the class described, a coin carrying element, a shaft, a plurality of mutilated gears and a cam element on said shaft, said cam element having a plurality of interrupted grooves and a continuous groove in the periphery thereof, a shaft parallel with said shaft, a pin thereon engaged in the continuous groove when the register is inactive, a pinion on the second named shaft adapted to mesh with any of the mutilated gears, a lever actuated by the coins to shift the pin out of the continuous groove into one of the interrupted grooves and the cam adapted to coact with the lever to effect the adjustment of the pinion.

6. In machines of the class described, the combination with a register, a coin carrying element, an annular gear rotatable therewith, a shaft, a gear on said shaft meshing with said annular gear, a grooved cam element and a mutilated gear on said shaft, a slidable shaft parallel with the aforesaid shaft, a member on said shaft at all times engaged with one of said grooves in the cam element, a gear on said slidable shaft adjustable with said member to mesh with said mutilated gear, and a beveled gear on said slide shaft adapted to actuate the register.

7. In a machine of the class described a combination with a coin carrying element, a register, a pair of parallel inclined shafts, a plurality of mutilated gears and a grooved cam element on one of said shafts, a member on the other shaft engaged at all times except when a coin is registered in one of the grooves in said cam element to prevent accidental actuation of the register, a gear on said shaft adapted to mesh with the mutilated gear, a lever actuated by the coin on said carrying element adapted to simultaneously adjust said member and said gear to engage the corresponding groove in the cam element and the proper mutilated gear for the proper actuation of the register.

8. In a device of the class described, the combination with the coin-carrying element, an annular gear rotatable therewith, a drive shaft, a shaft driven thereby, a gear on said driven shaft meshing with said annular gear, a cam element on said driven shaft, a composite mutilated gear on said driven shaft, a register, mechanism engaging said cam to prevent actuation of said register except when a coin is to be registered, and mechanism for entraining the mutilated gear with said register.

9. In a device of the class described, a coin carrying element, a deflector thereon, a drive shaft, a gear connected to said coin carrying element, a driven shaft, a pair of gears thereon one meshing with the drive shaft and the other with the annular gear, a lever actuated by peripheral contact of the coin, a shaft shifted by said lever, a gear on said shaft, a pin movable with said gear, a cam element provided with a plurality of grooves therein into any of which said pin is adapted to be shifted, and a gear having a plurality of mutilated sets of gears thereon any of which is adapted to be engaged by said pinion on said slid-

able shaft to actuate the register corresponding to the coin to be registered.

10. In a device of the class described, a register, a coin carrying element, a mechanism normally out of gear adapted to actuate the register, a lever shifted by the coin for adjusting the mechanism into gear, a cam element provided with a continuous groove and a plurality of interrupted grooves and a member engaged in the continuous groove to prevent accidental actuation of the register and shifted by each actuation of the lever to engage in one of the interrupted grooves to thereby hold the mechanism in mesh until the coin has been registered.

11. In a device of the class described, a register, a coin carrying element, a mechanism normally out of gear adapted to actuate the register, a lever shifted by the coin for adjusting the mechanism into gear, a cam element provided with a continuous groove and a plurality of interrupted grooves, a member engaged in the continuous groove to prevent accidental actuation of the register and shifted by each actuation of the lever to engage in one of the interrupted grooves to thereby hold the mechanism in mesh until the coin has been registered, said cam adapted to force the lever back to normal after the value of the coin is registered and to force the member back into the continuous groove.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

HUGO J. BAUR.

Witnesses:

CHARLES W. HILLS, Jr.,

FRANK K. HUDSON.

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