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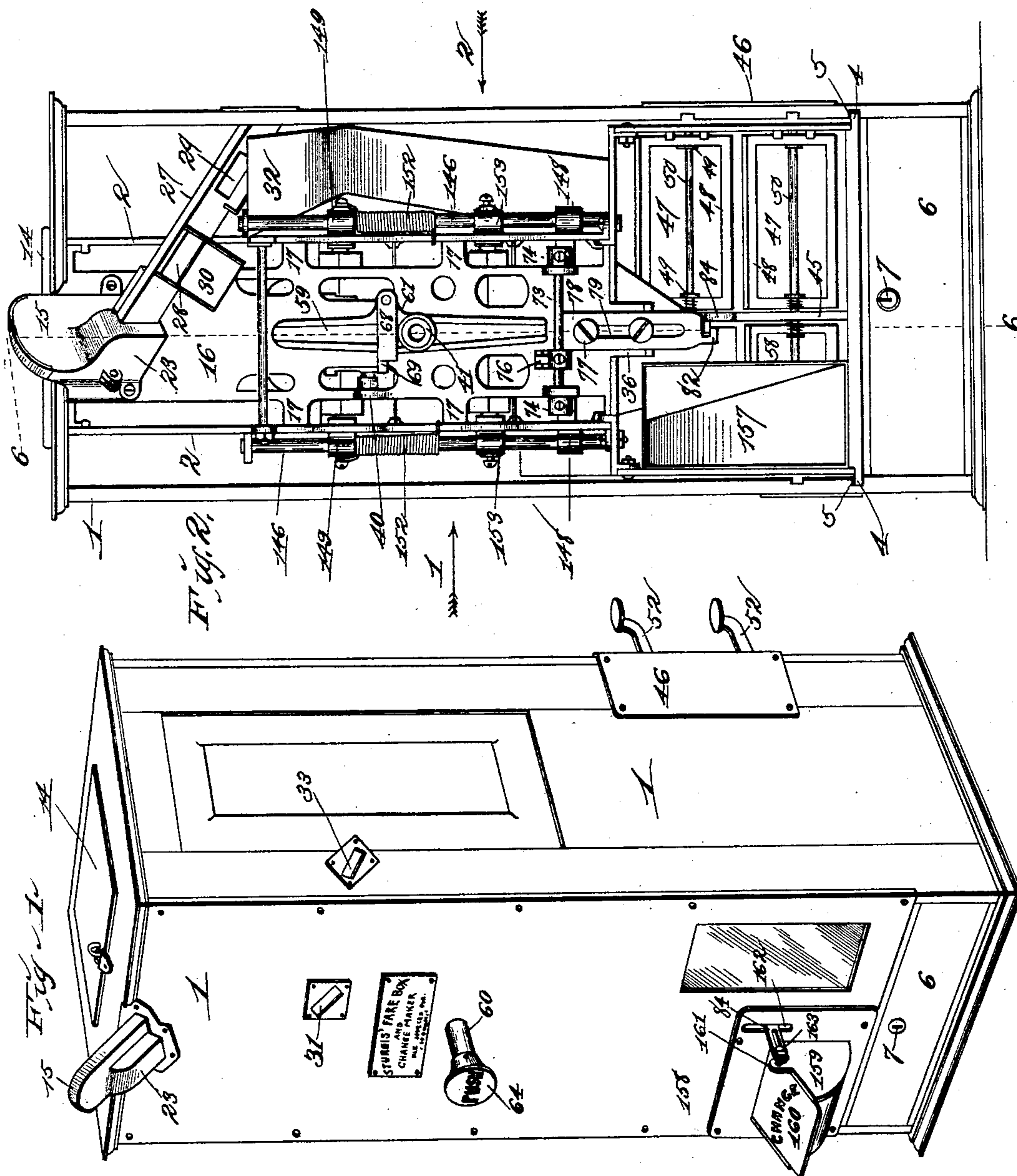
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H. M. STURGIS.

FARE RECEIVER AND AUTOMATIC CHANGE MAKER.

No. 541,299.

Patented June 18, 1895.



Attest
M. R. Smith
J. M. H. A.

Inventor:
Herbert M. Sturgis:
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Attys.

(No Model.)

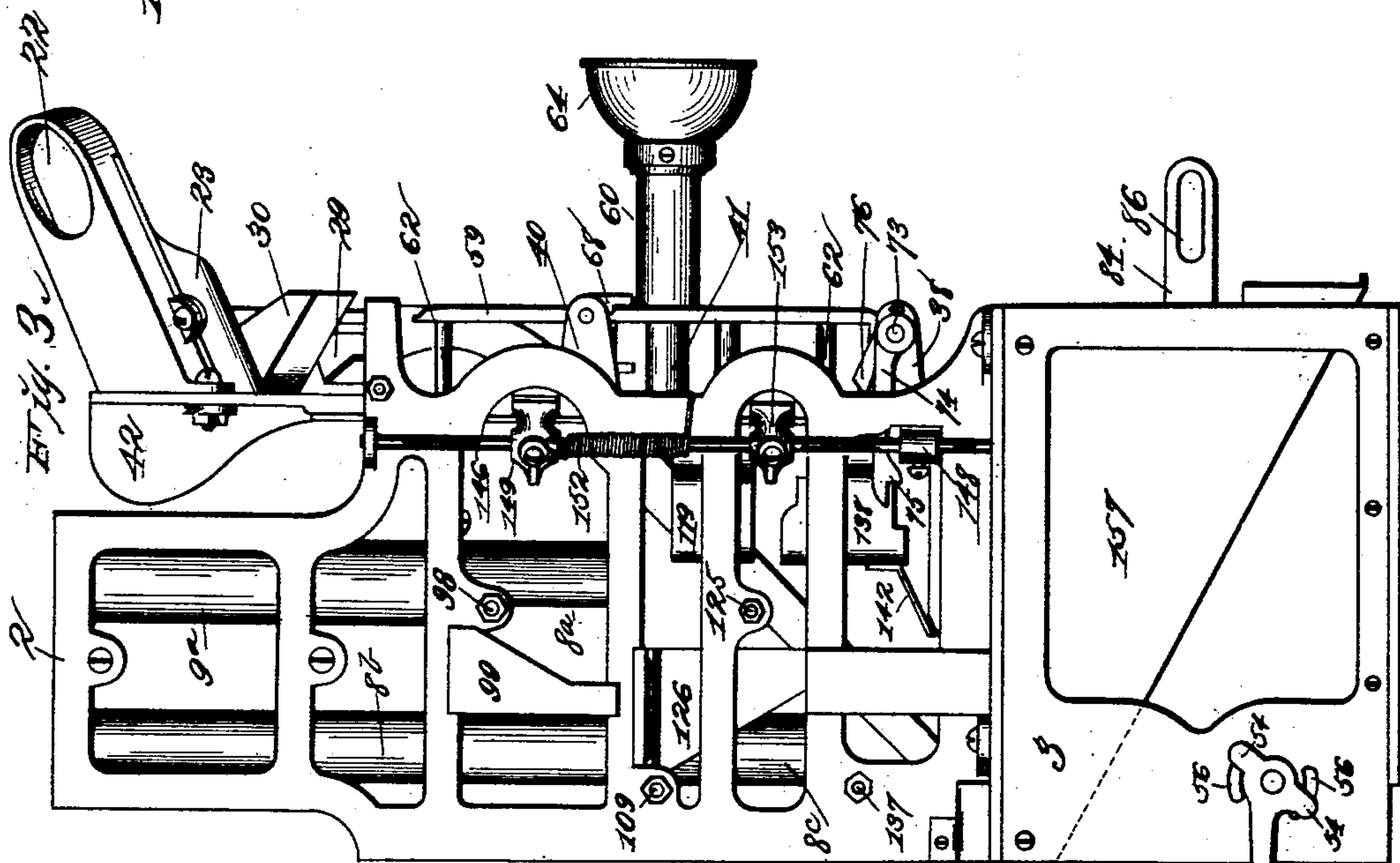
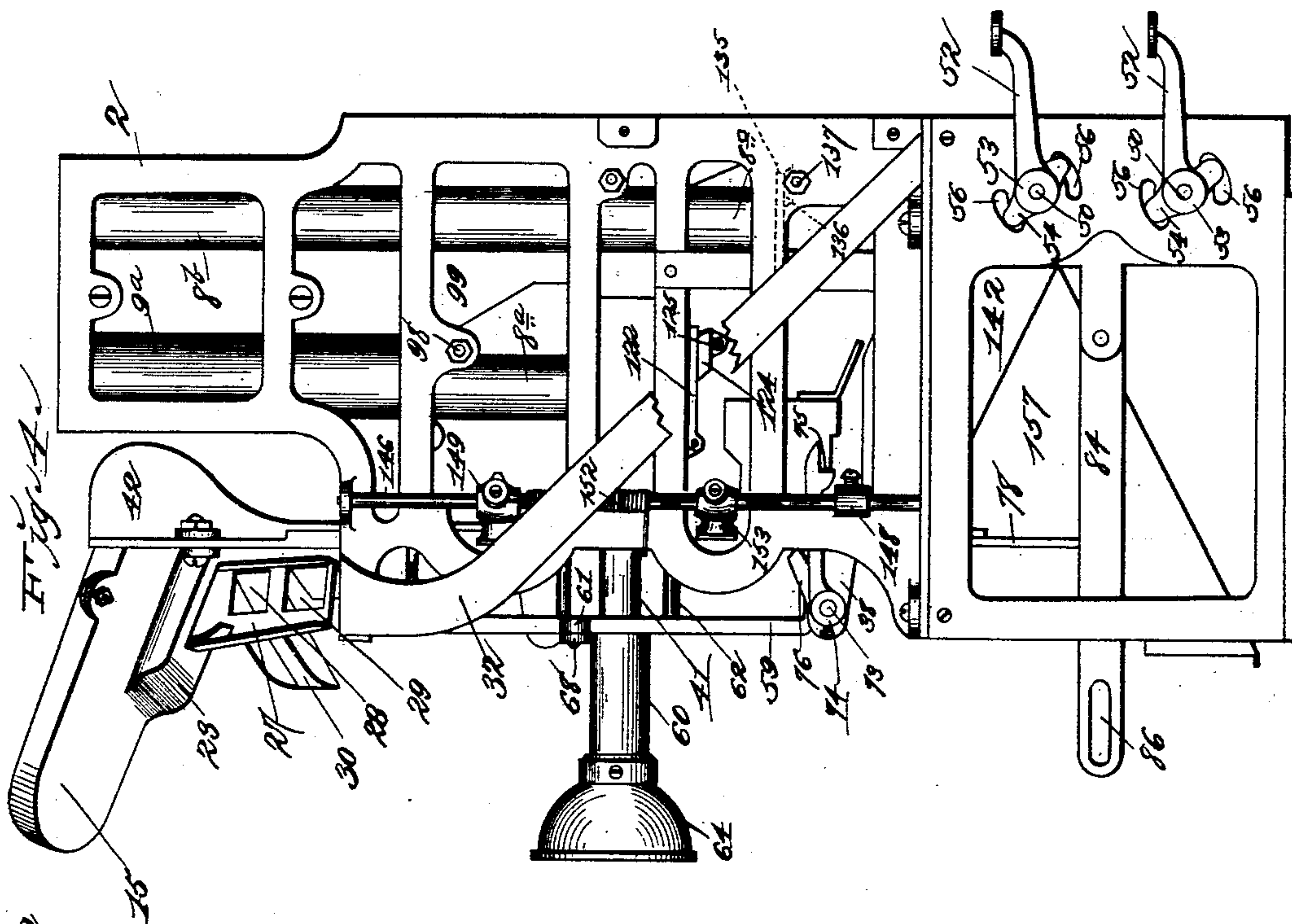
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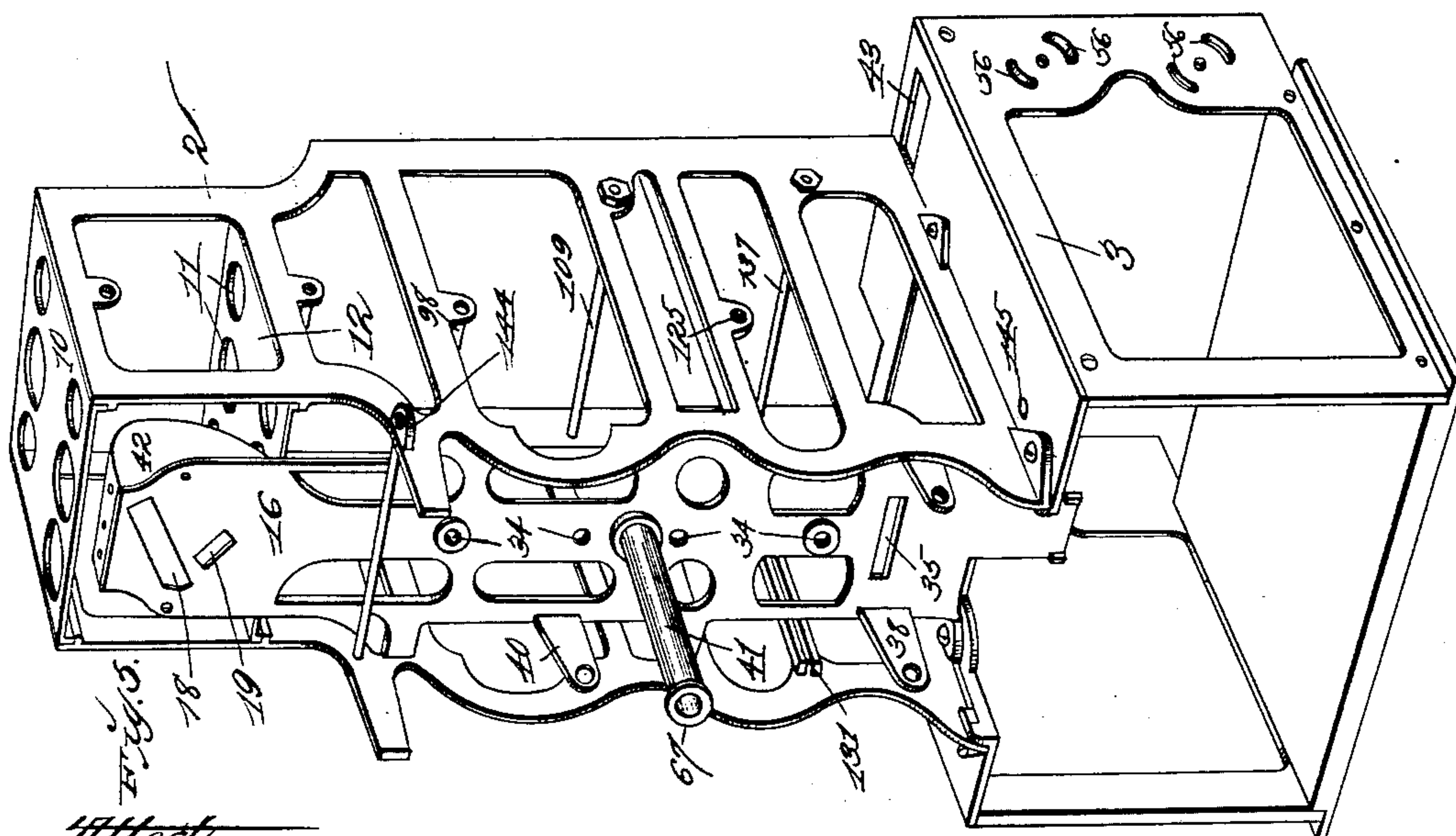
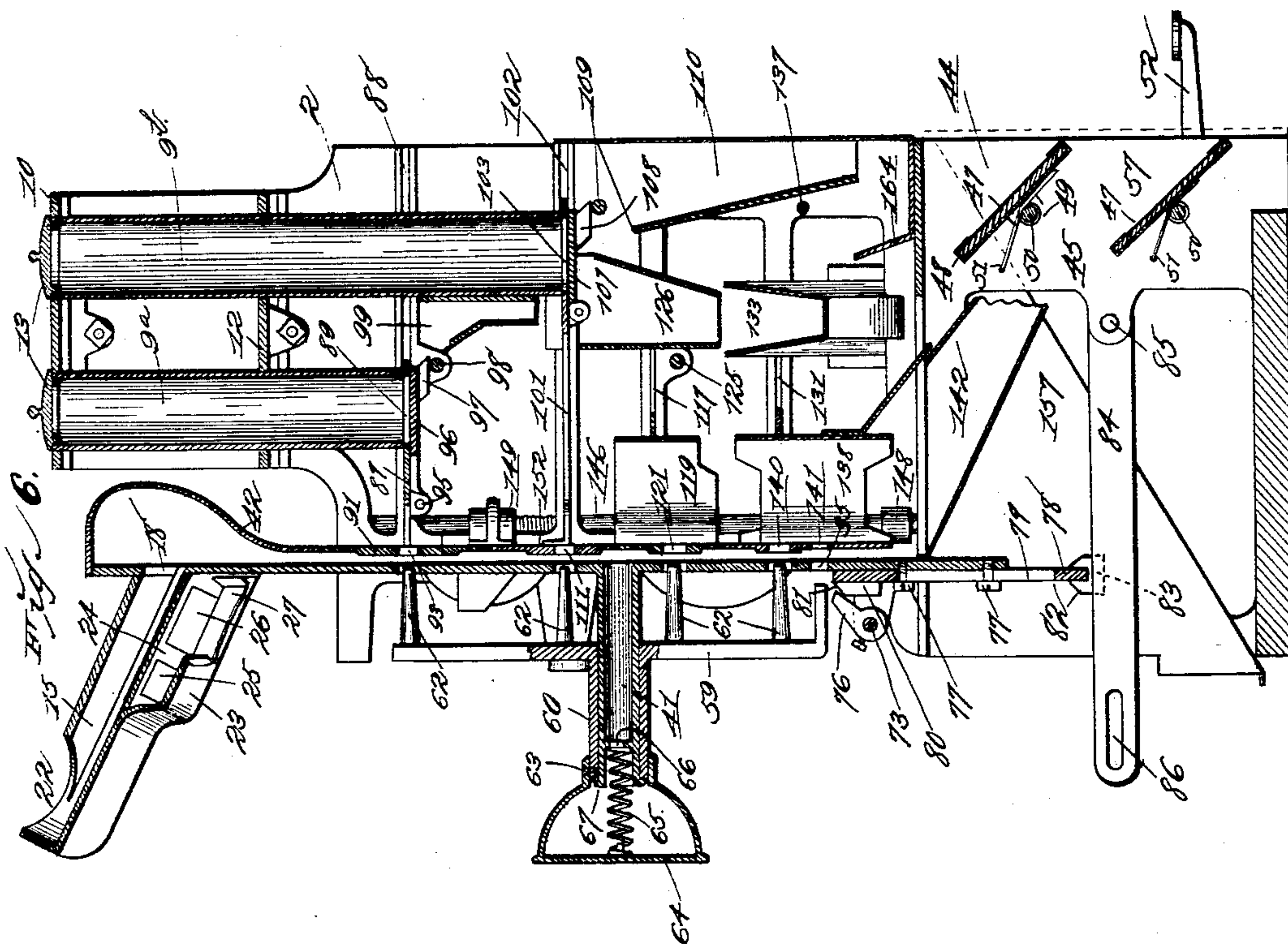
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FARE RECEIVER AND AUTOMATIC CHANGE MAKER.

No. 541,299.

Patented June 18, 1895.



Attest
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(No Model.)

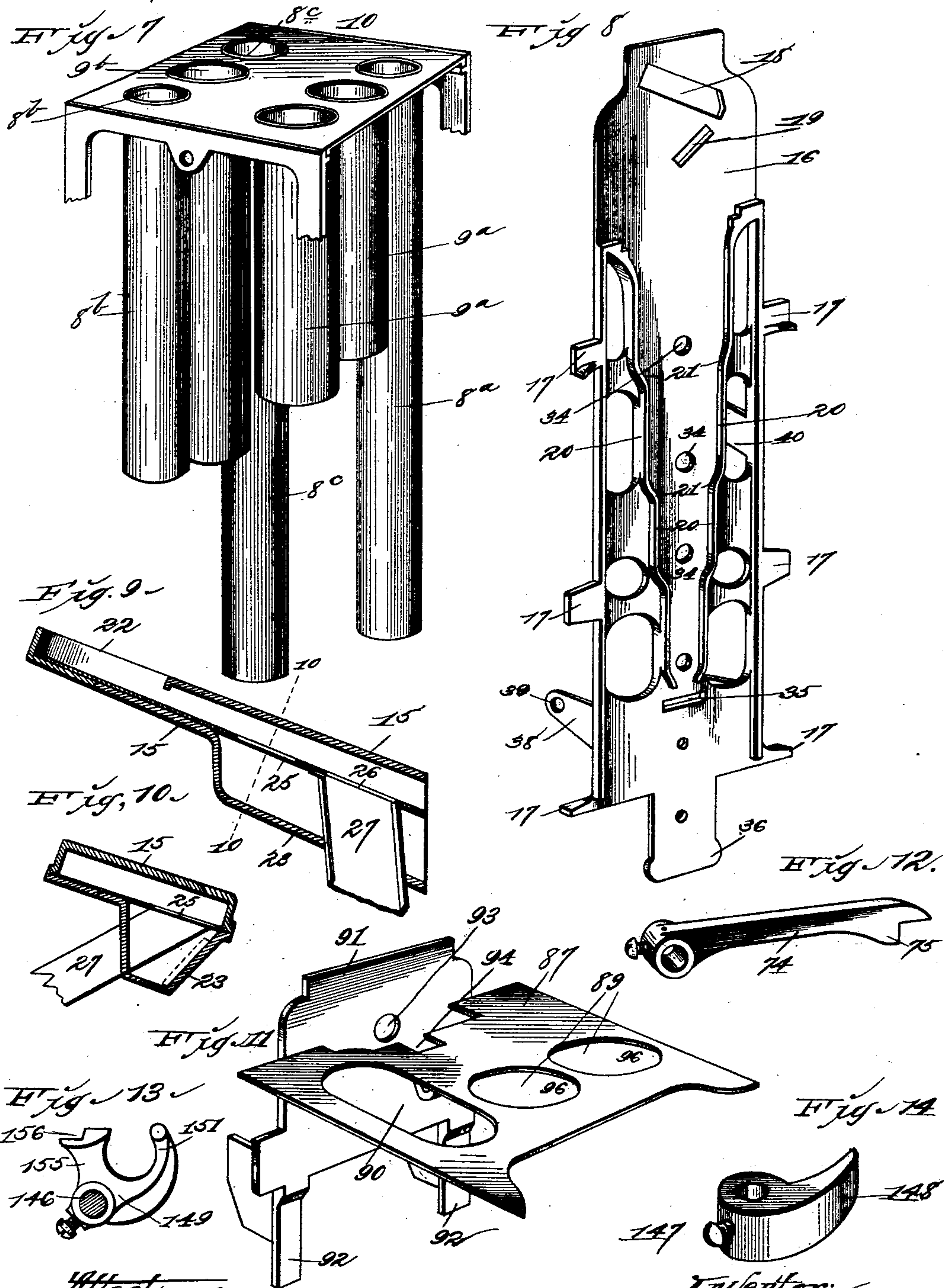
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H. M. STURGIS.

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No. 541,299.

Patented June 18, 1895.



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(No Model.)

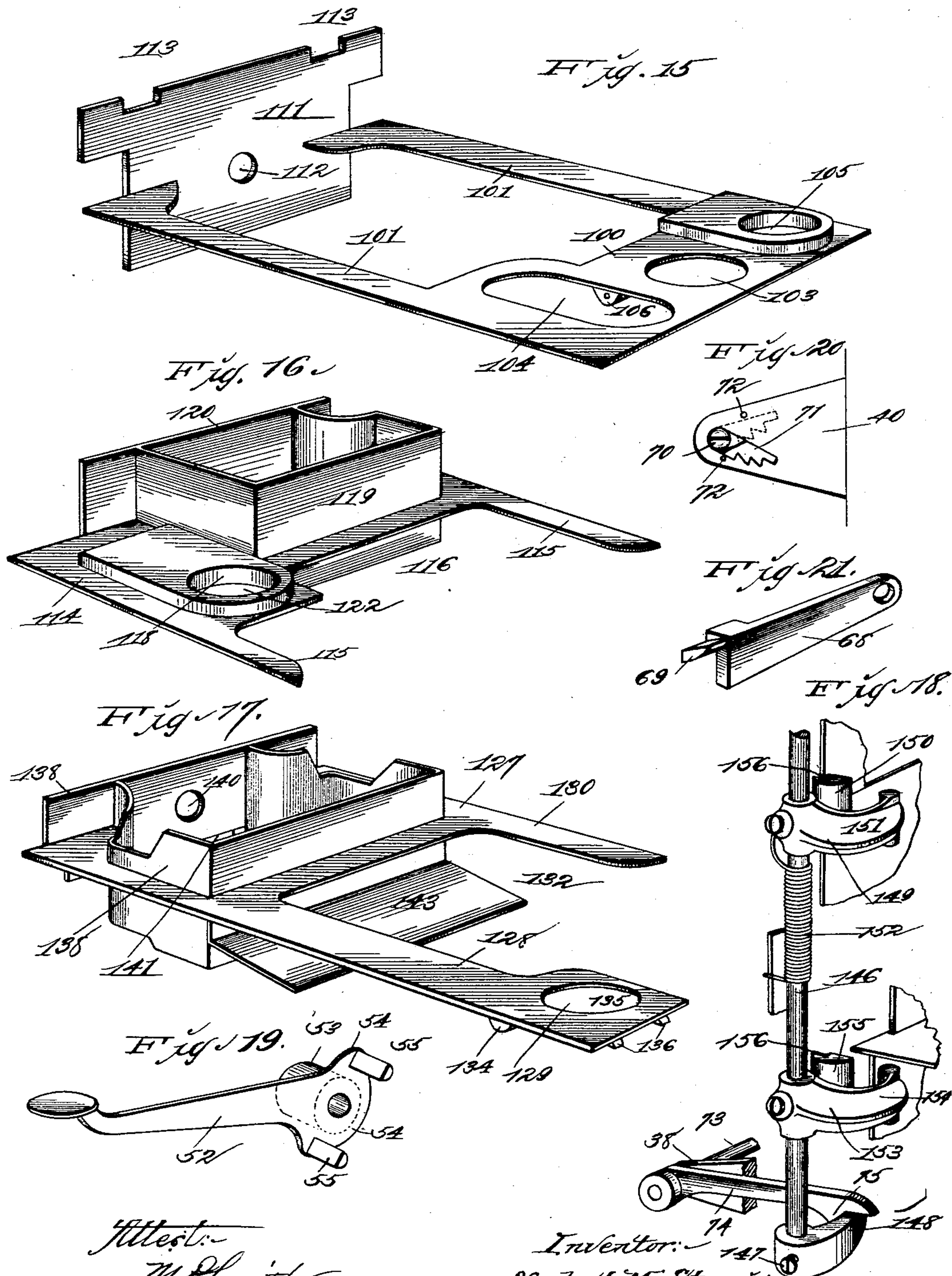
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No. 541,299.

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UNITED STATES PATENT OFFICE.

HERBERT MARSHALL STURGIS, OF ST. LOUIS, MISSOURI, ASSIGNOR OF TWO-THIRDS TO WILLIAM B. TAYLOR AND JAMES H. SMITH, OF DALLAS, TEXAS.

FARE-RECEIVER AND AUTOMATIC CHANGE-MAKER.

SPECIFICATION forming part of Letters Patent No. 541,299, dated June 18, 1895.

Application filed November 12, 1894. Serial No. 528,568. (No model.)

To all whom it may concern:

Be it known that I, HERBERT MARSHALL STURGIS, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Fare-Boxes and Change-Makers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a fare box and change maker, and consists in the novel construction, combination and arrangement of parts, hereinafter described and claimed.

The object of my invention is to provide an improved machine of the class above described which will automatically deliver the correct change to a passenger or other person, who deposits in the machine a coin of greater value than is the regulation fare.

Referring to the drawings, Figure 1 is a perspective view of a machine embodying my invention. Fig. 2 is a front elevation of the machine, the front plate or casing thereof being removed in order to more clearly show the interior mechanism of said machine. Fig. 3 is a side elevation of the machine, the same being removed from the casing and said view being taken as looking in the direction of the arrow 1 in Fig. 2. Fig. 4 is a side elevation of the machine, the same being removed from the outer casing, said view being taken as looking in the direction of the arrow 2 in Fig. 2. Fig. 5 is a view in perspective of the frame of my machine, the same being stripped of its contiguous mechanism. Fig. 6 is a vertical sectional view taken approximately on the indicated line 6 6 of Fig. 2 and looking in the direction of the arrow 2 in Fig. 2. Fig. 7 is a view in perspective of a portion of the frame and showing the coin-tubes as carried thereby. Fig. 8 is a view in perspective of the inner side of the coin-assorting plate. Fig. 9 is a longitudinal section of the coin-chute into which all of the coins are first placed and before they pass into the machine. Fig. 10 is a cross-sectional view on the line 10 10 of Fig. 9. Fig. 11 is a view in perspective of one of the coin-delivery slides of which I make use in carrying out my invention. Fig. 12 is a detail view in perspective of a latch used in connection with the locking mechanism I employ in carrying out my

invention. Fig. 13 is a top plan view of a spring-actuated locking-dog used in connection with the locking mechanism. Fig. 14 is a view in perspective of the arm against which the latch shown in Fig. 12 engages. Figs. 15, 16, and 17 are views in perspective of the different coin-delivery slides of which I make use in carrying out my invention. Fig. 18 is a view in perspective of one of a pair of vertical rock-shafts I employ in my invention, the same having mounted thereon locking-dogs such as shown in Fig. 13. Fig. 19 is a perspective view of one of the handles used for tipping the inclined bottoms of the sight-pockets into which the coins pass before being deposited in the money-drawer or other receptacle. Fig. 20 is a side elevation of a locking-dog used for locking the horizontally-moving operating-handle at various points along its path of travel. Fig. 21 is a view in perspective of a latch having a double cam-face at one end that alternately engages with the top and bottom sides of the dog shown in Fig. 20.

1 indicates the outer casing of the machine, which is preferably constructed of wood, rectangular in form to inclose on all sides the mechanism contained therein. The frame of which I make use is removably located within the outer casing 1, is constructed of metal and supports the main operative parts independent of the outer casing, (Fig. 5.) the lower portion 3 of the frame 2 is somewhat wider than the upper portion, and is provided with flanges 4 on its lower outer edges that are adapted to slide in recesses 5 formed in the inner sides of the casing 1. Thus the entire frame work, together with mechanism hereinafter described, is properly positioned within the casing 1.

Occupying the entire floor space beneath the frame and within the casing is a receptacle 6 that may be properly termed the cash drawer. Said cash drawer is provided with a suitable lock 7.

I will now proceed to describe the mechanism for assorting and holding the coins placed in the machine and for delivering to a passenger the requisite change. This mechanism is adapted to receive from a passenger and assort coins of all values from five cents up to one dollar. It is here shown as arranged to

deliver change in coins of the denominations of five cents and twenty-five cents only, the number of coins delivered as change being automatically increased or decreased and selected in accordance with the amount of change to which the passenger is entitled. This function is controlled entirely by the diameter of the coin placed in the machine by a passenger. All coins which are placed in the machine by a passenger, if good coins, are automatically directed into the money drawer 6 and are not used by the machine for making change, the required coins for making change being automatically taken from a series of coin-tubes which are to be supplied with coins by an authorized person in charge of the vehicle in which the machine is located.

I make use of three five-cent coin tubes 8 and three twenty-five cent coin tubes 9, all of said tubes being rigidly fixed to the top-plate 10 of the frame 2 and extending downwardly through apertures 11 formed in the plate 12, said plate 12 being fixed to the frame 2 at a suitable distance below the plate 10. These five and twenty-five cent tubes 8 and 9 are arranged in rows, the first row comprising two short twenty-five cent tubes 9^a and one five-cent tube 8^a, which is somewhat longer than the twenty-five cent tubes 9^a. The second row is composed of one twenty-five cent tube 9^b between two five-cent tubes 8^b and 8^c, the tube 8^c being of greater length than any one of the other tubes, (Fig. 7.)

Removable covers 13 are adapted to be placed on the upper ends of all of the coin-tubes, the same to be removed by an authorized person when it is desired to place coins in said tubes for making change. Access to the upper ends of the coin tubes and to these caps or covers 13 is made by way of a suitable locked door 14, the same being located in the top of the outer casing 1. Horizontally positioned beneath these coin tubes and adapted to slide laterally are coin-slides that detach one or more coins from the bottom ends of the tubes in making change. These slides will be more fully hereinafter described.

15 indicates a coin inlet or chute that projects through an opening on the front side of the casing 1, and into which all coins are to be deposited by passengers. This coin inlet or chute 15 is rigidly screwed or bolted to the front face of the coin-assorting plate now to be described. This coin-assorting plate, clearly shown in Fig. 8 and indicated by the numeral 16, is rectangular in form and rigidly fixed in the forward portion of the upper part of the frame 2, laterally extending lugs 17 being formed on the edges thereof to more effectually hold said plate in its proper position. Arranged at an angle to the vertical plane of the plate 16 and near the upper end thereof is a rectangular aperture 18, and immediately below said aperture and oppositely inclined thereto is a smaller rectangular opening or aperture 19. On the inner side of this assorting-plate 16 are formed vertical flanges 20 which

are so graduated as to form spaces differing in size according to the size of the various coins, the largest space being at a point near the upper end of the plate, said spaces decreasing in size successively to the lower end of the plate.

Oppositely arranged shoulders or projections 21 formed on the vertical flanges 20 are so spaced as to arrest the downward movement of the various sized coins, the ten cent piece passing to the lowermost space and the dollar coin stopping in the uppermost space. It may be here mentioned that the five-cent pieces do not pass between the flanges 20 on this coin-assorting plate 16, they having been deflected into a coin chute before they reach said plate.

Referring now to the coin inlet or chute 15 (Figs. 2, 4, 6, 9 and 10), said inlet or chute comprises a rectangular casing having in the top of the upper side a circular aperture 22 of such a size as to admit coins of all dimensions. This inlet or chute is rigidly bolted to the upper end and to the outside of the coin-assorting plate 16 and in such a manner as that the main opening at the end of said chute registers with the aperture 18 previously mentioned in said coin-assorting plate. An auxiliary chute or inlet 23 is formed integral with the under side of the inlet 15, the partition 24 between the two inlets or chutes being provided with two rectangular openings 25 and 26, the rectangular opening 25 being of a size sufficient to just admit the passage of a ten-cent piece. The rectangular opening 26 is of a size sufficient to admit the passage of a five-cent piece, or all bad coins or metallic disks, &c., of a size approximating that of a five-cent piece. The mouth of the auxiliary inlet or chute 23 registers with the rectangular aperture 19 formed in the coin-assorting plate 16 immediately below the aperture 18. It may be here stated that the ten-cent coins are the only coins that pass through the rectangular aperture 25 and through the aperture 19 in the coin-assorting plate 16.

A chute 27 is provided with rectangular openings 28 and 29. This chute 27 is firmly fixed to and projects downwardly at right angles from the auxiliary chute 23. The rectangular opening 28 is of a size slightly smaller than is a five-cent piece, said rectangular opening 28 being provided with a chute 30 that leads to an opening 31 in the casing 1. The rectangular opening 29 is of a size that will just admit the passage of a five-cent piece, and is directly over the open upper end of a chute 32 hereinafter more fully described, (Figs. 2 and 4.) The outer lower end of the chute 27 communicates with an aperture 33 formed in the outer casing 1. Thus it may be plainly seen how a coin or disk of a diameter slightly less than the ordinary five-cent piece will pass through the rectangular opening 28 and be discharged by the chute 30 through the aperture 31 in the casing 1. A coin or disk of a diameter slightly larger than

the ordinary five-cent piece will pass over the rectangular aperture 29 and be discharged through the aperture 33 in the casing 1. A good five-cent piece on being deposited in the circular aperture in the upper end of the inlet or chute 15 will pass downwardly through said chute, through the aperture 26, along the chute 27, over the aperture 28, and then through the aperture 29 into the chute 32. Twenty-five cent, fifty cent and one dollar coins being of a much greater diameter than is the width of the apertures 25 and 26 will pass over said apertures and be discharged through the rectangular opening into the various sized spaces between the flanges 20 on the rear side of the coin-assorting plate 16.

Formed in the coin-assorting plate 16 in the centers of the coin spaces between the flanges 20 are circular apertures 34, and horizontally arranged in said plate 16 immediately below the terminus of the flanges 20 is a slot or aperture 35. Depending from the center of the plate 16 is an extension 36. Formed integral with the front side of the plate 16 and extending at right angles thereto in a plane with the horizontal slot 35 are a pair of ears 38 provided in their outer ends with circular apertures 39. A single ear 40 is formed integral with one side of the plate 16 at approximately a central point.

Formed integral with the front side of the plate 16 and extending forward therefrom is a hollow cylindrical arm 41. Formed on or fixed to the upper rear side of the plate 16 is a semi-circular hood 42, against which the larger coins strike after having passed through the aperture 18 and are thereby caused to enter the various spaces between the flanges 20 on the rear side of the plate 16 edgewise. The open upper ended chute 32 into which the five-cent pieces drop extends downwardly and rearwardly and passes through an aperture 43 formed in the top plate of the lower portion 3 of the frame 2.

A sight pocket 44 is formed immediately below this aperture 43, the sides of said sight pocket comprising one side of the lower portion 3 of the frame, and the partition 45 that is vertically arranged between the upper and lower portions of the frame work, and at the rear side of the lower frame work. The front of the sight pocket consists of a section of transparent material placed in the rear side of the outer casing 1 and held in position thereon by a plate 46 fixed to the outer casing 1. An inclined tilting bottom for the sight pocket is constructed of a section of transparent material 47, the same being held in a suitable rectangular frame work 48, said frame work being provided with ears 49 by means of which the plate and frame work are pivoted upon a shaft 50, the ends of which find bearings in the side wall and center partition forming the sides of said sight pocket. A coil-spring 51 is, at one end, fixed to the center partition 45, is then wound upon the shaft 50, and its free end engages against the

lower end of the transparent plate 47. The tendency of this spring 51 is to normally hold the lower edge of the transparent plate 47 in engagement with the transparent plate fixed in the rear side of the casing 1, (Fig. 6.) A lever 52 for tilting the bottom of this sight pocket is constructed with a head 53 that is adapted to be mounted directly upon the end of the shaft 50. Integral projections 54, diametrically opposite each other, are formed on the head 53 and extending inwardly from these projections 54 are flat faced lugs 55 that are adapted to engage directly against the under side of the tilting bottom or transparent plate 47. The arm 52 is on the outside of the lower portion 3 of the frame 2, and in order that the flat faced lugs 55 may contact with the plate 47, oppositely arranged concentric slots 56 are formed in the side of the lower portion 3 of the frame 2. The sight pocket 57 is arranged directly beneath the sight pocket 44, and is in every way similar and provided with the same operating parts as is the one just described.

A third sight pocket 58, identical with the others, is located on the opposite side of the center partition 45 and in alignment with the sight pocket 57, it being provided with a transparent front in the casing 1 and with an operating handle identical with the operating handle 52.

I will now proceed to describe the bar and pins carried thereby that are used to displace the coins that lodge in the various spaces between the flanges 20 on the rear side of the coin-assorting plate 16. This mechanism consists of a bar 59, the same being provided near its vertical center with a tubular sleeve 60 that is adapted to slide upon the tubular arm 41 that projects from the coin-assorting plate 16. Immediately above this tubular sleeve 60 and on one side of the bar 59 is a projection 61, the purpose of which will be presently shown.

The lower end of the vertically arranged bar 59 is bent rearwardly at right angles to the main body thereof, and is adapted at times to pass through the horizontally arranged aperture 35 near the lower end of the coin-assorting plate 16. Formed integral with the inner side of the vertically arranged bar 59 is a series of pins 62 which slightly taper toward their ends, said ends normally lying just within the apertures 34 in the coin-assorting plate 16, and through which apertures said pins are adapted to pass.

Mounted upon the outer end of the cylindrical sleeve 60 and held thereto by means of a screw 63 is a handle 64. A coil-spring 65 is interposed between the inner surface of this handle 64, and a projection 66 is formed on the inside of the tubular arm 41. A flange 67 formed on the outer end of the tubular arm 41 prevents the sleeve 60 and handle 64 from leaving said tubular arm 41. The coil-spring 65 being an expansive spring, the tendency thereof is to hold the bar 59, sleeve 60 and

handle 64 in the position as shown in Fig. 6. Pivoted to the lug 61 extending from the side of the vertical bar 59 is an arm 68, the same being provided on its end with an inclined
5 lug 69, the upper and lower sides of which form an acute angle, the apex of which is in alignment with the upper edge of the arm 68.

Pivoted to the ear 40 by means of a pin or screw 70 is a toothed gravity pawl or dog 71,
10 the vertical movement of which is restricted by pins 72. This toothed pawl or dog 71 being directly in the path of travel of the lug 69, when the arm 68 carrying said lug is moved rearwardly with the bar 59 and handle 64, the
15 upper surface of the lug 69 will cause the toothed pawl 71 to assume a horizontal position, and as said lug 69 is carried farther rearwardly, the teeth on the under side of the pawl or dog 71 will consecutively engage the
20 point or upper edge of the lug 69. When said lug 69 has been carried rearwardly to its limit of movement, the pawl 71 will reassume its normal position, and then the lug in its return movement is free to ride over the plain
25 top surface of said pawl 71.

Mounted in the bearings 39 in the ends of the ears 38 is a shaft 73, the same having rigidly mounted on its ends and just outside the
30 ears 38, locking-arms 74, the same being provided on their under sides near their outer ends with shoulders 75. Rigidly mounted upon the shaft 73 to one side of the lower end of the vertically arranged bar 59 is a pawl or
35 detent 76. Adapted to slide vertically upon the face of the lower end of the plate 16 and held thereto by screws or bolts 77 is a plate 78 provided with a centrally arranged vertical slot 79 through which said screws 77 pass. Formed integral with one side of and the up-
40 per end of this plate 78 is a lug 80 having an inclined upper face 81 against which the upper end of the pawl or detent 76 normally engages.

Formed on or fixed to the lower end of the
45 plate 78 is a hook 82. This hook 82 is adapted to engage beneath the flange 83 formed integral with a horizontally positioned bar 84, the rear end of which is pivoted at 85 to the central partition 45. The forward end of this
50 bar 84 projects through the casing 1 and is provided in its forward end with a horizontal slot 86.

I will now proceed to describe the various slides used for detaching from the various
55 coin-tubes the necessary change and depositing the same in the various chutes, from whence said change finds passage through various other chutes into the change receptacle located on the outside of the casing 1 and
60 hereinafter described.

The topmost, or what I term the dollar slide, consists of a rectangular plate 87 mounted to slide in transverse bearings 88 formed on or fixed to the sides of the upper
65 portion of the frame 2. This slide 87 operates directly beneath the two twenty-five cent coin tubes 9^a, and formed in said slide are

circular apertures 89 that are of a size sufficient to admit a twenty-five cent piece. To one side of the apertures 89 is a slot 90,
70 through which the five-cent tube 8^a passes. The slot 90 is made of sufficient length to allow the free movement of this slide.

Formed integral with or fixed to the rear edge of the slide 87 is a vertical plate 91, the
75 same being provided with downwardly pending arms 92, the same being offset and in a different plane from the main body of the plate 91. An aperture 93 in the vertical plate 91 and a cutaway portion 94 in the slide 87
80 permits forward movement of the topmost pin 62, when a coin other than a dollar is passed into the machine. The plate 91 is in direct alignment with the lower edge of the hood 42 and also lies parallel with the coin
85 assorting plate 16. To lugs 95 formed integral on the under side of the plate 87 is pivoted a drop-plate 96 that normally closes the circular apertures 89. Formed integral with the under side of this plate 96 are lugs 97
90 that are adapted to ride directly upon a transverse rod 98 that passes from one side of the frame to the other immediately beneath the twenty-five cent tubes 9^a. Directly in the rear of this transversely positioned rod 98
95 and extending downwardly from the same is a small chute 99, the same having a flaring upper end.

The fifty cent slide 100 comprises a rectangular plate provided with arms 101, said slide
100 being located directly beneath the five-cent coin tube 8^b and the twenty-five cent tube 9^b. Said slide is adapted to operate in bearings 102 formed integral with the inner faces of the side walls of the upright portion of the
105 frame 2. Located in the slide 100 and normally coinciding with the twenty-five cent coin tube 9^b is a circular aperture 103 that is of sufficient size to admit a twenty-five cent piece. Adjacent this circular aperture 103 is
110 a slot 104, through which the five-cent coin tube 8^c passes. On the other side of the aperture 103, the slide 100 is made of a thickness four times as great as is the main portion of the plate, thereby allowing the loca-
115 tion of four five-cent pieces in the aperture 105 that is formed in said thickened portion of the plate. Pivoted in lugs 106 formed on the under side of the plate 100 is a drop-plate 107 that normally closes the apertures 103
120 and 105. Formed on or fixed to the forward under side of the drop-plate 107 are lugs 108 that ride directly upon a rod 109 that extends from one side of the frame 2 to the other. A chute 110 has its upper open end directly be-
125 neath the shaft 109, and is adapted to receive the coins cut off or out of the tubes 9^b and 8^b.

Fixed to the front ends of the arms 101 is a rectangular plate 111 in the center of which is a circular aperture 112, through which the
130 second pin 62 from the top passes. Formed in the upper edge of the plate 111 are rectangular notches 113, in which notches are located the shoulders formed at the juncture of

the downwardly pending arms 92 and the vertically arranged plate 91. When the plates 91 and 111 are arranged in vertical alignment and parallel with the coin assorting plate 16, the arms 92 will engage on the front side of the plate 111. Thus it will be seen that the fifty-cent slide 100 can move laterally in its bearings 102 independent of the one dollar slide 87, but when the dollar slide 87 is moved laterally in its bearings 88, the fifty-cent slide 100 must necessarily move, as the arms 92 bear directly upon the front face of the plate 111.

The twenty-five cent slide 114 is provided with extending arms 115, thus leaving a cut-away portion or space 116 between said arms. This twenty-five cent slide 114 operates directly beneath the five-cent coin-tube 8^a and is adapted to move laterally in the bearings 117 formed on or fixed to the upright portion of the frame 2. That part of the slide 114 that is directly beneath the end of the tube 8^a is made of a thickness equal to that of four five-cent pieces, and in said thickened portion is formed a circular aperture 118 of a diameter equal to that of a five-cent piece. A passage through the plate 114 comprises the three vertical sides 119, said sides being formed integral with the vertical front plate 120, in which is located an aperture 121, through which the next to the lowest pin 62 is adapted to pass at various times. The circular aperture 118 is closed by a drop-plate 122 that is pivoted to lugs 123 projecting downwardly from the under side of the plate 114. To the under side of this drop-plate are fixed lugs 124 that normally rest upon and ride over a transversely positioned rod 125 that extends from one side of the upright portion of the frame 2 to the other. By forming the passage through the plate 114 and constructing the same with the sides 119, a vertical chute or guide-way is formed for the fifty-cent and one dollar pieces as they drop from above. The cutaway portion or space 116 is left for the purpose of allowing the slide 114 free movement and to pass to its limit of movement without abutting against a chute 126 that is placed directly in front of the slide 114, but to one side of that portion that contains the aperture 118.

The ten-cent slide 127 comprises a rectangular plate provided on one side with an extension 128, in the outer end of which is formed a circular aperture 129 of a size corresponding to that of a five-cent piece. On the other side of the slide is formed an arm 130. The slide 127 is located in a plane immediately below the five-cent coin-tube 8^c and moves laterally beneath the same, the extension 128 and arm 130 sliding in bearings 131 formed integral with the inner faces of the sides of the upright portion of the frame 2. A cut-away portion or space 132 is left between the projection 128 and the arm 130 so as to allow the slide to move freely in a rearward direction and not engage against a chute 133, and is located directly beneath the chute 126.

Pivoted to lugs 134 formed integral with the under side of the extension 128 is a drop-plate 135 that is adapted to close the circular aperture 129. Formed on the under side of the drop-plate 135 are lugs 136 that normally rest and are adapted to ride upon a transversely positioned rod 137 that extends from one side of the machine to the other. Formed in the plate 127 is a passage surrounded by the sides 138, thus forming a vertical guide-way or chute for the coins that drop from above. The rear plate 139 is provided with an aperture 140 through which the lowermost one of the pins 62 is adapted to pass, and immediately below this aperture 140 is a rectangular aperture 141, through which the inwardly bent lower end of the vertical bar 59 is adapted to pass. A chute 142 is arranged directly beneath the passage through the sliding five-cent plate 127 and passing downwardly and rearwardly discharges into the sight pocket 58. A plate 143 is formed on or fixed to the front lower edge of the front side 138, and is adapted to partially cover the open upper end of this chute 142.

Mounted in bearings 144 formed integral with the sides of the upper portion of the frame 2, and passing through bearings 145 in the top plate of the lower portion of the frame 2 are vertical shafts 146. Positioned upon each of these shafts and near the lower ends thereof, by means of set-screws 147, are curved arms 148, against which the shoulder 75 on the latching-arms 74 are adapted to engage. Mounted upon the shafts 146 near their upper ends are locking dogs 149, comprising integral arms 150 and 151, the end of the arm 151 being adapted to normally engage against the meeting edges of the vertical plates 91 and 111 of the fifty-cent and one dollar slides. Fixed to the set-screws that hold the dogs 149 upon the shafts 146 are the upper ends of coil-springs 152, the bodies of which are coiled around the vertical shafts 146, their lower ends being rigidly secured to the upper portion of the frame 2. Thus the vertical shafts 146 are made spring-actuated, and the tendency of these springs 152 is to hold the ends of the arms 151 of the dogs 149 against the vertical plates of the slides when said slides are in their normal positions. Mounted upon the vertical shafts 146 just above the arms 148 are locking-dogs 153 that are identical with the dogs 149, the outer ends of the arms 154 of said dogs bearing directly upon the vertical plates of the twenty-five and ten-cent slides when said slides are in their normal positions. The arms 150 and 155 of the dogs 149 and 143 are provided in their faces with vertical shoulders 156.

When the fifty-cent and one dollar slides are moved horizontally, the edges of the same will engage the ends of the arms 151 of the dogs 149, and the same being mounted upon the vertical shafts 146 will necessarily partially rotate said vertical shafts. This partial rotation of the shafts 146 necessarily im-

parts the same movement to the dogs 153 that are rigidly mounted upon the lower ends of said shafts. The ends of the arms 154 of the dogs 153 leave the meeting edges of the twenty-five cent and ten-cent slides, and with the continued movement the shoulders 156 of the arms 155 are brought to a point directly in front of said meeting edges of the twenty-five cent and ten-cent slides; this position being occupied by the shoulders 156 when the dollar and fifty-cent slides have been moved to their limit horizontally, and the shoulders 75 of the locking arms 74 engage the curved arms 148 to lock the vertical shafts 146 from reverse movement.

When the dog 151 is partially rotated by the horizontal movement of the ten-cent and twenty-five cent slides against the end of the arm 154 of said dog, the dog 149 will be likewise rotated and the shoulder 156 of the arm 150 of said dog 149 brought directly against the meeting edges of the fifty-cent and dollar slides, and locks the same against any horizontal movement.

In Fig. 18 the ten-cent and twenty-five cent slides are shown at their forward limit of movement, and the fifty-cent and dollar slides locked against any forward movement, by the shoulder 156 on the face of the arm 150 of the dog 149. When the locking arm 74 is raised the action of the coil-spring 152 rotates the shaft 146 in the reverse direction from the one just described, and the ends of the arms 151 or 154 that have been partially rotated will engage the slides and return them to their normal positions.

In the left-hand side of the lower portion 3 of the frame 2 is a large chute 157, the mouth of which communicates with an opening in the casing 1, said opening being incased by a plate 158 upon which a change receptacle 159 is formed. The cover 160 for this change receptacle is provided with an upwardly extending lug 161. The slotted end of the bar 84 previously mentioned passes through a vertical slot 162 in the plate 158 and is connected to the upwardly extending lug 161 by means of a screw or pin 163 passing through the slot 86 in the end of said bar. The chute 133 communicates near the rear side of the machine with the chute 157. A chute 164 connects the vertical chute 110 with the rear end of the chute 157.

The operation is as follows: Should a five-cent piece be deposited through the circular aperture 22 in the inlet or chute 15, the same will, by reason of the inclination of said chute, pass downwardly through the upper passage in said chute, drop through the aperture 26 which is of a size sufficient to admit said five-cent piece, from thence passes down the chute 29 over the aperture 28, which is slightly smaller than the five-cent piece, and drops through the rectangular aperture 29 into the open upper end of the chute 32. By this chute it is directed into the sight-pocket 44 where it may be plainly seen by the person in charge

of the car. By a downward movement of the outer end of the handle 52, the five-cent piece will pass into the sight-pocket 57 and by a downward movement of the handle 52 of the second sight-pocket, the coin is dropped and deposited in the coin receptacle or cash-drawer 6. A ten-cent piece on being placed in the chute 15 will pass downwardly through the same, drop through the opening 25 which is of a size sufficient to admit said ten-cent piece, then pass through the lower portion 23 of the chute 15, through the aperture 19 in the coin-assorting plate 16, and from thence drop to the lowermost space formed between the flanges 20 on the rear side of said plate. Here it is engaged and held directly opposite the lowermost aperture 34 by reason of the inwardly projecting shoulders 21 of said flanges 20. The passenger is of course entitled to change to the amount of five-cents. In order to procure said change, said passenger must push the handle 64 inwardly. By so doing the following operation takes place: The lowermost pin 62 on being carried rearwardly contacts with the ten-cent piece that is directly opposite the lowermost aperture 34 of the plate 16, through which said pin passes and impinges said ten-cent piece directly against the front side of the vertically arranged plate 139 that is formed integral with the slide 127. As the tube 8° contains five-cent pieces, and the aperture 129 in the arm 128 capable of holding one five-cent piece is directly beneath the lower end of said tube, one five-cent piece will be carried in said aperture 129 and on the drop-plate 135 as the rearward movement of the slide 127 is continued. As the push handle 64, bar 59 and slide 127 reach the limit of their rearward movement, the lugs 136 on the under side of the plate 135 leave the horizontally arranged rod 137, and the drop-plate carrying the five-cent piece is tilted and said five-cent piece drops into the chute 164, and from thence passes through the chute 157 into the change receptacle 159. As the slide 127 is being moved rearwardly, the edges of the vertical plate 139 thereof necessarily engage the ends of the arms 154 of the locking-dogs 153, and said dogs being rigidly mounted upon the spring-actuated vertical shaft 146, said dogs and shaft will be moved approximately one quarter of a revolution. The curved arms 148 being rigidly fixed to the lower ends of the vertical shafts 146 must necessarily turn with said shafts. As the locking-arms 74 are by gravity bearing directly against the arms 148, as soon as said arms 148 have passed the shoulders 75 of the locking-arms 74, said shoulders will engage the outer ends of the arms 148, thus locking or holding the vertical shafts 146, together with the locking-dogs 149 and 153, in their abnormal positions. The arms 150 and 155 are now so positioned as that the shoulders 156 on said arms will rigidly lock the unmoved slides against any movement whatever. The locking-arms 74

which are rigidly mounted upon the horizontal shaft 73 being at their limit of downward movement. the dog 76 rigidly mounted upon the shaft 73 is brought into direct engagement with the inclined face 81 of the lug 80 that is formed integral with the upper end of the slotted bar 73. As soon as the pressure is removed from the handle 64, the coil-spring 65 therein having been compressed in the hereinbefore described operation, will expand and carry the handle 64, sleeve 60, vertically arranged bar 59 and pins 62 to their normal positions, or as that shown in Fig. 6. By reason of the triangular lug 69 on the end of the pivoted arm 68 that is carried by the vertically arranged bar 59, engaging with the teeth of the dog 71 during the rearward movement of the handle 64 and bar 59, it will be seen that said handle 64 and bar 59 must necessarily be moved to their rearward limit of movement before the spring 65 can return them to their normal positions. As soon as the lowermost pin 62 starts on its return movement, the ten-cent piece that has heretofore been impinged between the end of said pin and the front face of the vertically arranged plate 139 of the slide 127 will fall into the chute 142 and by said chute be passed into the sight-pocket 58. Said sight-pocket 58 being provided with a glazed front, the person in charge of the car may plainly see said ten-cent piece.

A passenger in order to procure his change, or the five-cent piece that is in the receptacle 159, must necessarily raise the cover 160 of said receptacle. This being done, the forward end of the bar 84 is raised as it is attached to said cover by means of the pin or screw 163. The bar 84 being moved slightly upward, the lug 83 on said bar will engage with the lower end of the slotted vertical bar 78, raise the same a slight distance, and cause the inclined face 81 of the lug 80 to engage with the point of the dog 76, which being rigidly mounted upon the shaft 73, slightly rotates said shaft. The locking-arms 74 being rigidly mounted upon the ends of this shaft 73, will be raised sufficiently far to allow the shoulders 75 thereon to release the arms 148. The resiliency of the springs 152 on the vertical shafts 146 will necessarily cause said shafts and the locking-dogs 149 and 153 to re-assume their normal positions, and also carry the slide 127 to its normal position. The various parts are now in position for another operation.

As the action and operation of the handle 64, bar 59, pins 62, slides, vertical shafts 146, locking-dogs 149 and 153, horizontal shaft 73 and contiguous mechanism, bar 84 and cover 160 of the change receptacle are the same whenever change is detached by the twenty-five-cent, fifty cent and one dollar slides, it will not be necessary to describe such operation in the succeeding descriptions of the manner in which change is detached by the

twenty-five cent, fifty cent and one dollar slides.

When a twenty-five cent piece is passed into the machine through the coin inlet or chute 15, the same passes through the aperture 18 in the upper end of the coin assorting plate 16 and from thence drops into the next lowermost space formed between the flanges 20, where it rests upon the shoulders 21 formed in said flanges. With the rearward movement of the bar 59 the next to the lowermost pin 62 will impinge against such twenty-five cent piece and move in a rearward direction the slide 114, which operates directly beneath the five-cent coin-tube 8^a. The aperture 118 is adapted to hold four five-cent pieces. Consequently when said slide is moved rearwardly that number of five-cent pieces will be detached from the lower end of the tube 8^a, and as the lugs 124 on the under side of the drop-plate 122 pass over the transversely positioned rod 125, said drop-plate will tilt and deliver the four five-cent pieces into the upper end of the chute 133. By this chute it will be directed into the chute 157 and from thence into the change receptacle 159. The various other operations, as hereinbefore stated, are coincident with this movement.

When a fifty-cent piece is deposited in the coin inlet or chute 15, said fifty-cent piece passes through the aperture 18 in the upper end of the coin-assorting-plate 16 and from thence drops in the next to the highest space formed by the flanges 20 on the rear side of the coin-assorting plate 16. Here it rests against the shoulders 21 formed in said flanges until the next to the highest pin 62 detaches said coin from its resting place. The fifty-cent piece impinges directly against the rear side of the vertically arranged plate 111 of the slide 100, said slide 100 operating directly beneath the five-cent coin tube 8^b and the twenty-five cent coin tube 9^b. The aperture 103 in this slide 100 is of a size sufficient to hold one twenty-five cent piece, while the aperture 105 is adapted to hold four five-cent pieces. As said slide is moved rearwardly, one twenty-five cent piece and four five-cent pieces will be detached from the lower ends of the tubes 8^b and 9^b and the same carried rearwardly on the drop-plate 107. When the lugs 108 on the under side of said drop-plate 107 have passed the transversely arranged rod 109 the coins, the total value of which is forty-five cents and the correct change to be given the passenger who placed the fifty-cent piece in the machine, is dropped through the vertical chute 110 into the chute 164 and by said chute carried into the chute 157 and from thence into the change receptacle 159 on the exterior of the casing 1. As hereinbefore stated, the coil-spring 65 causes the handle 64 and bar 59 to re-assume their normal positions, and when the passenger raises the cover 160 of the change receptacle 159, this movement causes the repositioning of the various

locking devices, the fifty-cent slide and contiguous mechanism.

When a dollar coin is placed in the coin inlet or receptacle 15, said coin passes through the aperture 18 in the upper end of the coin-assorting plate 16 and from thence drops to the upper one of the spaces formed between the flanges 20 on the rear side of the coin-assorting plate and rests directly against the shoulders 21 formed in said flanges 20. As the upper one of the pins 62 contacts with the coin, it detaches the same from its lodging place and impinges it against the rear side of the slide 87. The vertically arranged plate 91 of this slide 87 being provided with the downwardly pending arms 92 that engage against the front side of the vertically arranged plate 111 of the fifty-cent slide 100, both the slides 87 and 100 will be moved rearwardly. The slide 87 operates directly beneath the twenty-five cent coin-tube 9^a and the apertures 89 in said slide 87 are each adapted to hold one twenty-five cent piece. Consequently when said slides 87 and 100 are moved rearwardly, each of the apertures 89 will contain a twenty-five cent piece, the aperture 103 and the slide 100 will contain one twenty-five cent piece and the aperture 105 and the slide 100 will contain four five-cent pieces, making a total of ninety-five cents, the correct change to be delivered to the depositor of the one dollar coin. As the slide 87 moves rearwardly, the drop-plate 96 beneath the apertures 89 will, when the lugs 97 on the under side of said plate 96 pass the transversely arranged rod 98, tilt and allow the two twenty-five cent pieces carried in the apertures 89 to drop through the chute 99, from thence through the chute 126 into the chute 133 which carries said coins into the chute 157, and from thence into the change receptacle 159 on the exterior of the casing 1. As the fifty-cent slide 100 moves rearwardly at the same time as does the one dollar slide 87, the coins detached from said dollar slide will have an unobstructed passage from the chute 99 into the chute 126. The coins detached by the fifty-cent slide will pass through the chute 110 into the chute 164, from thence through the chute 157 into the receptacle 159 on the exterior of the casing 1. The movement of the slides 100 and 87 being simultaneous, the change consisting of three twenty-five cent pieces and four five-cent pieces will be simultaneously deposited in the change receptacle. As the next to the lowest pin 62 withdraws from engagement with the twenty-five cent piece, said twenty-five cent piece will drop through the passage formed in the slide 127 and into the chute 142, and by said chute pass into the sight-pocket 58. When the pin impinging against the fifty-cent piece withdraws, said fifty-cent piece drops through the passage surrounded by the sides 119 formed in the slide 114, through the passage in the slide 127 and into the chute 143 and by this chute passes into the sight-pocket 58. The dollar

coin drops through the passages formed in the slides 114 and 127 and is carried by the chute 142 into the sight-pocket 58. The person in charge of the car can at any time press downwardly upon the handle 52 operating the tilting bottom of said sight-pocket 58 and allow the coin or coins in said sight-pocket to drop into the receptacle or cash drawer 6. By providing the lower end of the bar 59 with an inwardly projecting portion, it will be plainly seen that the cover of the change receptacle can in no instance be raised unless the handle 64 and bar 59 are in their normal positions, and by providing the arm 68 carrying the V-shaped lug 69 that engages the teeth of the dog 71, it will be seen that the handle 64 has to be moved to the limit of its rearward movement before said handle and contiguous parts can return to their normal positions.

When spurious coins or disks approximating the size of a five-cent piece are inserted in the coin inlet 15, they will pass out of the chute 30, or out of the end of the chute 27, through the apertures 31 and 33 in the casing 1. Should spurious coins or disks approximating the size of twenty-five cent, fifty-cent and one dollar coins be passed into the machine, the person in charge of the vehicle would immediately discover their presence through the glazed fronts of the sight-pockets.

I do not limit myself to the exact arrangement of the coin-tubes and other minor details herein shown, as it is obvious that the same may be increased or decreased in number and changed within the limit of mechanical skill without departing from the scope of my invention.

I will also state that the principle of my invention may be extended for any denomination of coins, in which case the number of mechanical parts will necessarily have to be extended, and also the mechanical construction varied, which may be done without departing from the true principle and spirit of my invention.

What I claim is—

1. In a fare box and change maker, the combination of coin cut-off and delivery slides arranged in horizontal planes one above the other, the same being actuated by the inserted coin, single chutes leading from each of the said slides to a universal chute and coin containing tubes arranged vertically above the before-mentioned slides.

2. A fare box and change maker having an operating handle, and change delivery slides so arranged that the coin deposited in the fare box is impinged against the slides to form a connection between the operating handle and said slides.

3. A fare box and change maker having an upright coin-assorting plate, the same being provided on one side with a pair of flanges between which are formed spaces differing in size according to the size of the various coins.

4. In a fare box and change maker, the com-

combination of an upright coin-assorting plate having on one side thereof parallel flanges between which are graduated spaces differing in size according to the size of the various coins, a series of laterally moving change slides arranged one above the other adjacent the graduated spaces of the coin-assorting plate, and pins passing through apertures in said plate to move the slides by impinging the inserted coin against the rear faces thereof.

5. A fare box and change maker having a vertically arranged coin-assorting plate, on one side of which are parallel flanges between which are formed spaces differing in size according to the size of the various coins, a series of change making slides arranged vertically one above the other adjacent said coin-assorting plate, and a bar provided with a series of pins that are adapted to pass through apertures in the coin-assorting plate and impinge the inserted coin against one of the change making slides.

6. A fare-box and change maker, having a vertically arranged coin-assorting plate, a coin-inlet or chute fixed to the top of said coin-assorting plate, horizontally moving change making slides arranged vertically one above the other, and a bar having an operating handle and integral pins for displacing the coins from their lodging places on the rear side of the coin-assorting plate.

7. In a fare box and change maker, a vertically arranged coin-assorting plate provided with parallel flanges on its rear side, shoulders formed in said flanges to form lodging places for the various sized coins, a coin-inlet or chute arranged at the top of said coin-assorting plate, said plate being provided with apertures at the points where the coins lodge, pins formed integral with the horizontally sliding bar, an operating handle for said bar, and change making slides arranged one above the other immediately in front of the coin-assorting plate.

8. A fare box and change maker having a series of vertically arranged tubes for holding coins of various denominations for making change, slides adapted to move horizontally immediately beneath said coin containing tubes, a coin-assorting plate arranged adjacent the forward ends of the change making slides, said coin-assorting plate being provided with parallel flanges on one side, said parallel flanges having shoulders formed thereon against which the inserted coins lodge, a bar provided with an operating handle and having integral pins that pass through apertures in the coin-assorting plate, and chutes, one of which forms a passage for the inserted coin into a receptacle inside of the fare box, the other chutes so arranged as to carry the coins cut off for change into a suitable receptacle on the exterior of the fare box.

9. A fare-box and change maker, having an inlet coin chute, an auxiliary chute formed integral with the under side of the first men-

tioned chute, a branch chute leading from the auxiliary chute, and a second branch chute leading from the first mentioned branch chute.

10. In a fare box and change maker, the combination of an upright coin-assorting plate constructed with a series of apertures and an integral laterally projecting arm, horizontally moving change making slides arranged vertically one above the other and adjacent the coin-assorting plate, a vertically arranged bar mounted to slide upon said arm, fingers formed integral with said bar and adapted to pass through the apertures of the coin-assorting plate and dislodge the coins from their resting places upon the rear sides thereof, a spring-actuated handle for said vertically arranged bar, an arm pivoted transversely to said bar and constructed on its free end with a V-shaped lug and a toothed dog with which the lug of the arm is adapted to engage.

11. In a fare-box and change maker, the combination of transversely positioned tie-rods, change making slides operating horizontally and above said tie-rods, drop-plates pivoted to the under sides of said slides, and lugs formed integral with the under sides of the drop-plates.

12. A fare box and change maker having a series of change making slides moving laterally in bearings formed integral with the sides of the frame work, the outer ends of which are constructed with circular apertures, and drop plates hinged to the under sides of the slides so as to normally close said apertures.

13. A fare box and change maker having a series of laterally moving change making slides, the same being provided with circular apertures of a size sufficient to admit a certain number of coins, and drop-plates pivoted to the under sides of said change making slides, said drop-plates having integral lugs on their under sides that are adapted to ride for a short distance on transversely positioned rods, the ends of which are fixed in the frame-work of the fare box.

14. In a fare box and change maker, the combination of a series of vertically arranged coin-tubes, laterally moving slides positioned immediately beneath said tubes and having circular apertures therein that register with the interior diameters of the tubes, drop-plates pivoted to the under sides of the change making slides, lugs formed integral with the under sides of the drop-plates, transversely positioned rods on which the lugs of the drop-plates rest while the change slides are in normal position, and chutes so arranged as to receive the coins constituting the change that are discharged by the drop-plates and carry said coins into a receptacle on the exterior of the fare box.

15. A fare box and change maker having laterally moving change making slides, vertically arranged shafts on the sides of the frame of the machine, locking-dogs for the laterally moving slides, arms rigidly mounted

upon the lower ends of the shafts, and gravity locking-arms for engaging against the herein-before mentioned arms to hold the shafts and locking-dogs when in an abnormal position.

5 16. A fare box and change maker having laterally moving change making slides, and mechanism for locking said slides when any one of them is moved laterally, said locking mechanism being released by suitably ar-
10 ranged mechanism connected to the cover of the change receptacle on the exterior of the box.

17. In a fare box and change maker, a releasing mechanism connected to the cover of
15 the change receptacle on the exterior of the box, comprising a hinged bar, a vertically moving slotted bar, a lug formed integral with the upper end of said slotted bar, and a dog fixed to a horizontally positioned shaft, upon
20 which shaft locking-arms are rigidly fixed, the movement of said slotted bar being possible only when the operating handle and bar carrying the displacing pins are in their normal positions.

25 18. In a fare-box and change maker, the combination of the slide 87 provided with a series of circular apertures, a vertically ar-

ranged plate formed on or fixed to said slide, arms depending from said vertical plate, and
30 a slide 100 located in a horizontal plane directly beneath the slide 87, the same being constructed with an aperture adapted to hold a single coin, together with the adjacent ap-
35 erture adapted to hold a plurality of coins, said slide adapted to move independently of the first mentioned slide.

19. In a fare-box and change maker, the combination of a vertically arranged coin-assorting plate, a hollow arm formed integral
40 with and projecting from said coin-assorting plate, a sleeve mounted to slide upon said hollow arm, a vertically arranged bar formed integral with said sleeve, integral pins ex-
45 tending from said bar and adapted to pass through apertures in the coin-assorting plate, an operating handle fixed rigidly to the outer end of the sleeve, and a coil-spring interposed between said handle and the hollow arm.

In testimony whereof I affix my signature in presence of two witnesses.

HERBERT MARSHALL STURGIS.

Witnesses:

E. E. LONGAN,

JNO. C. HIGDON.