

April 16, 1935.

A. J. JOHNSTON

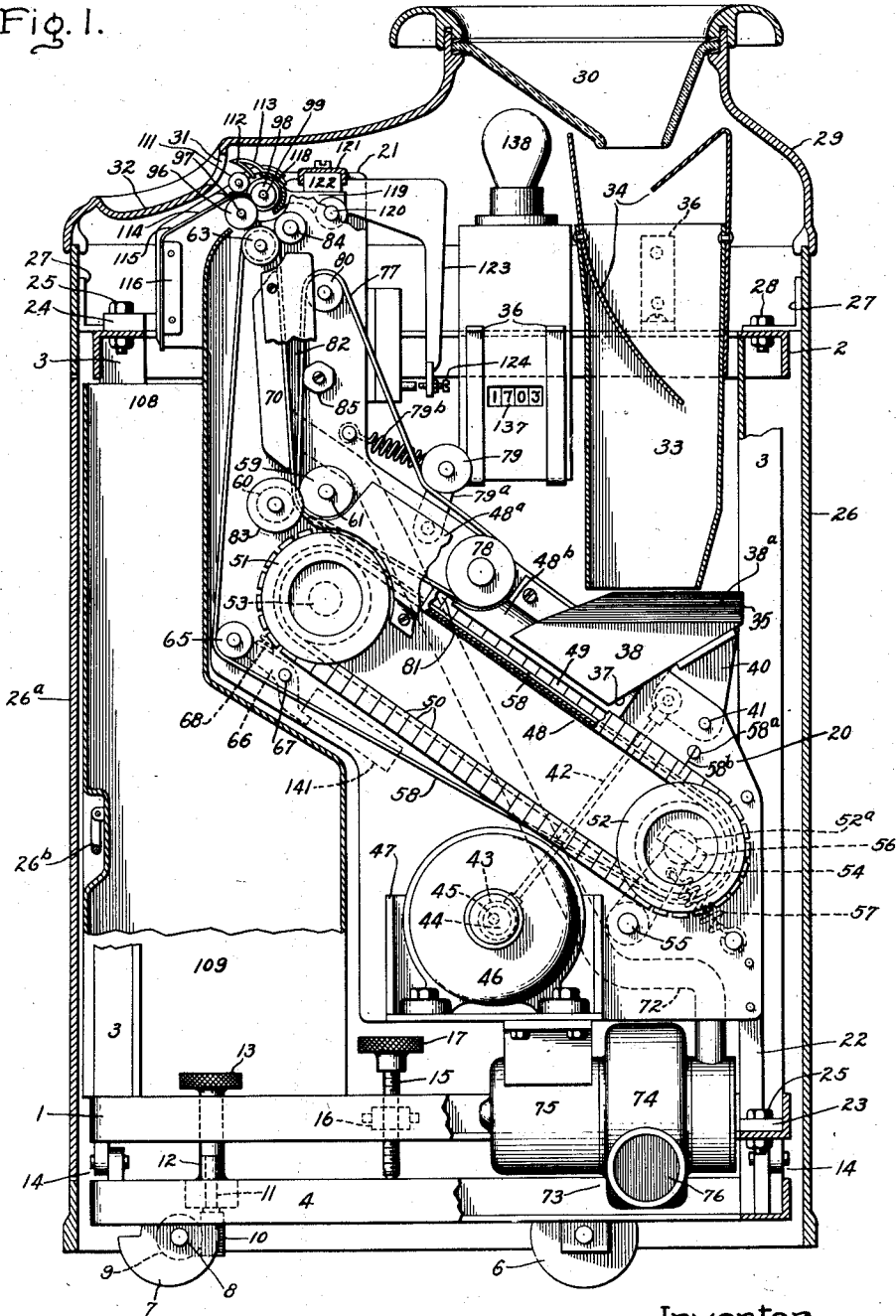
1,998,320

AUTOMATIC TICKET STRIPPER

Filed Dec. 21, 1932

4 Sheets-Sheet 1

Fig. 1.



Inventor
Arthur J. Johnston,
by *Charles E. Tuller*
His Attorney

April 16, 1935.

A. J. JOHNSTON

1,998,320

AUTOMATIC TICKET STRIPPER

Filed Dec. 21, 1932

4 Sheets-Sheet 3

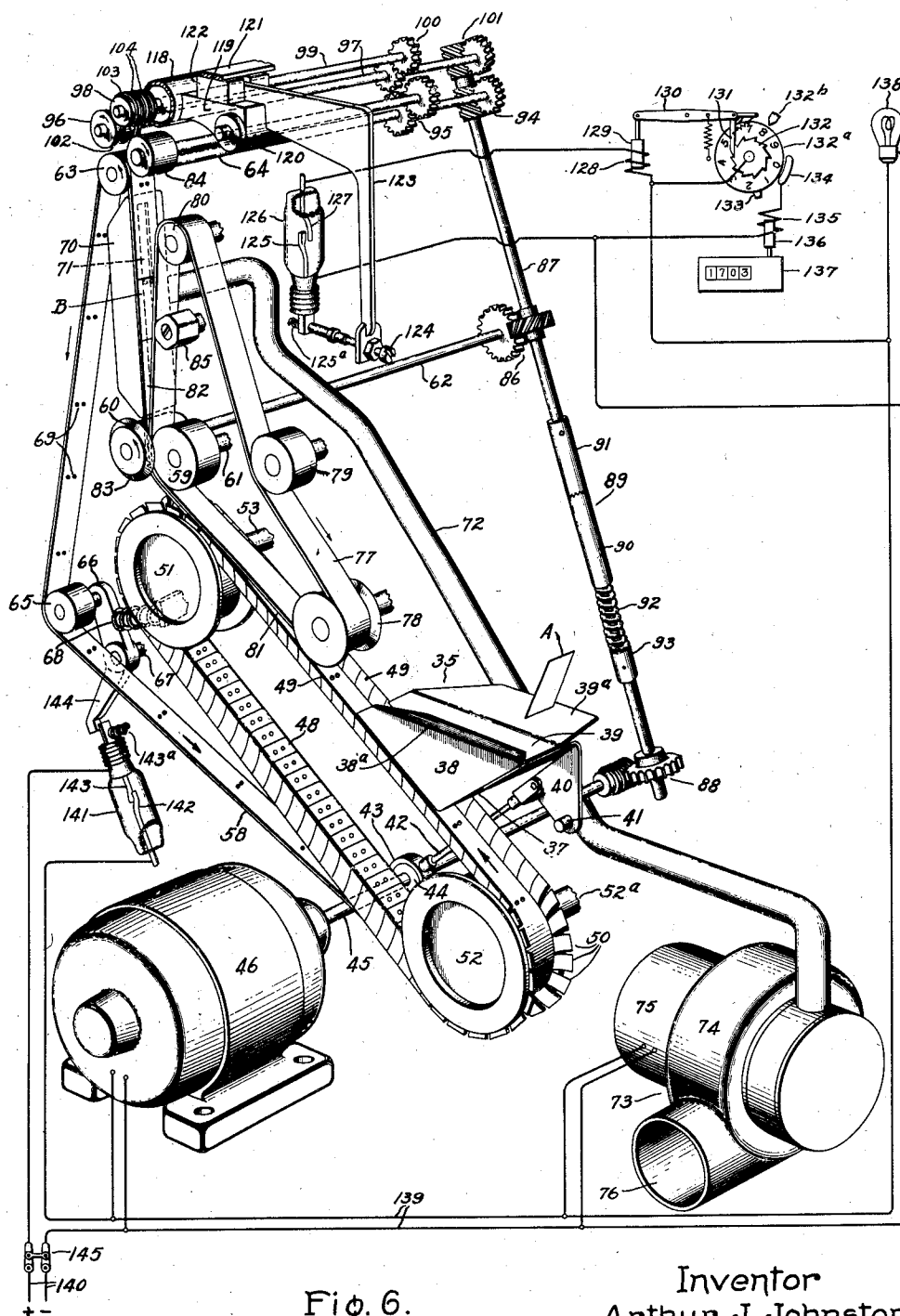


Fig. 6.

Inventor
Arthur J. Johnston,
by *Charles T. Ullan*
His Attorney.

April 16, 1935.

A. J. JOHNSTON

1,998,320

AUTOMATIC TICKET STRIPPER

Filed Dec. 21, 1932

4 Sheets-Sheet 4

Fig. 8.

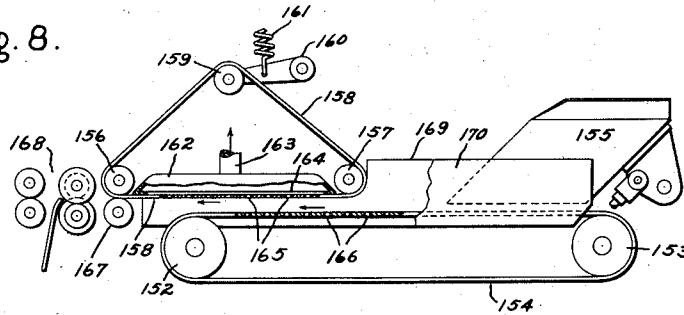


Fig. 9.

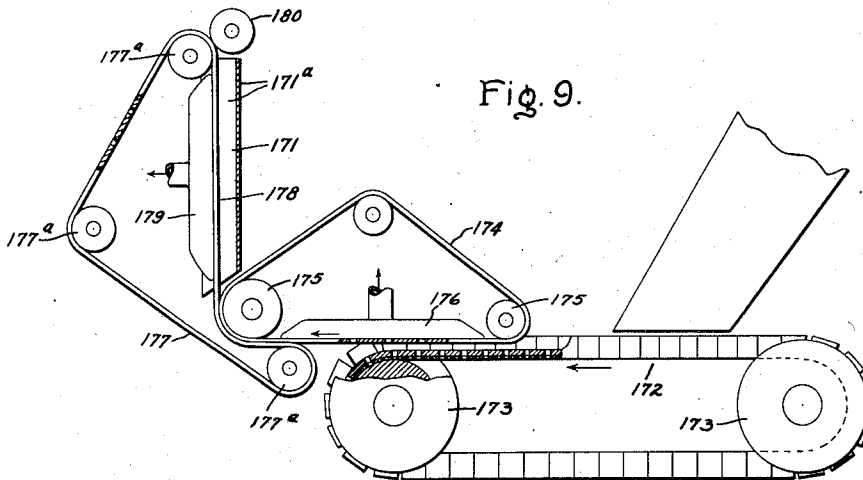


Fig. 10.

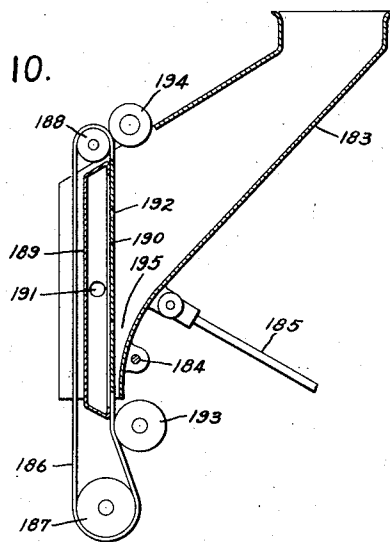
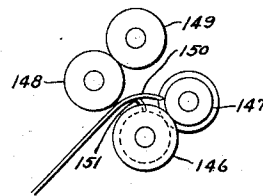


Fig. 7.



UNITED STATES PATENT OFFICE

1,998,320

AUTOMATIC TICKET STRIPPER

Arthur J. Johnston, Alden, Pa., assignor to General Electric Company, a corporation of New York

Application December 21, 1932, Serial No. 648,181

32 Claims. (Cl. 232—8)

The present invention relates to ticket canceling machines. The primary object of the invention is to provide an improved ticket canceling machine, well adapted for use in theatres, wherein each ticket dropped into the machine will be cancelled, and a portion of the ticket issued to the patron as a receipt, and wherein the tickets will be counted on a registering mechanism.

For a consideration of what I believe to be novel and my invention, attention is directed to the accompanying description and the claims appended thereto.

In the drawings, Fig. 1 is a side view, partly in section, of a ticket canceling machine embodying the invention; Fig. 2 is a perspective view taken from the front of the machine showing the framework and operating mechanism supported thereby; Fig. 3 is a detail perspective view of the ticket canceling rollers and delivering mechanism; Fig. 4 is a perspective view of a conveyor belt; Fig. 5 is a detail sectional view; Fig. 6 is a diagrammatic perspective view of the operating mechanism; Fig. 7 is an end view of a modified form of ticket canceling and delivering mechanism; and Figs. 8, 9 and 10 are views of modifications of certain parts of the ticket canceling machine shown in Figs. 1 to 6.

The machine generally comprises a hopper into which the tickets are dropped, conveying means for conveying the tickets, one at a time, to the canceling rolls, canceling rolls which cut each ticket into a plurality of pieces, means whereby one of the pieces is issued to the patron as a receipt, the other piece or pieces being retained in the machine, and means for counting the tickets as they pass through the machine.

The mechanism of the machine is supported by a rectangular framework built up from angle irons. It comprises a rectangular bottom frame 1 comprising four angle irons joined together at the corners by suitable means, such as by welding, rectangular top frame 2 comprising four angle irons suitably joined together at the corners, and four upright angle irons 3 located between the corners of frames 1 and 2 and supporting them in spaced relation to each other. The framework is supported on a rectangular base frame 4 comprising four angle irons joined together at the corners. Since the machine may be located often on floors which are sloping, means are provided whereby it may be adjusted to level it. To this end, base frame 4 is supported at two corners, in the present instance the two front corners, on rollers 6 and at the other two corners on cams 7 which may be turned to tilt the ma-

chine in one plane. Cams 7 are carried by a shaft 8 journaled in frame 4 and on which is a worm wheel 9 with which meshes a worm 10 carried by a shaft 11 which is pivoted in a bearing block 12 fixed to base frame 4. On the end of the shaft 11 is a knurled button 13 for turning the shaft. Bottom frame 1 is supported on base frame 4 on one side by two spaced hinges 14 and on the other side by a threaded rod 15 adjustably mounted in an ear 16 on bottom frame 1. On the upper end of rod 15 is a knurled button 17 for turning the rod. By adjusting cams 7, the machine as a whole may be leveled in a plane through the machine from front to back. By adjusting rod 15, the framework which carries the mechanism can be adjusted in a transverse plane.

The mechanism of the machine is built as a unitary structure adapted to be attached to or detached from the framework as a unit. It comprises two side plates 20 and 21 fastened together in spaced relation to each other and suitably supported on the framework. In the present instance, plates 20 and 21 are supported at the lower front corners by a post 22 having a foot 23 at its lower end which rests on bottom frame 1 and at the upper rear corner by a lug 24 which rests on top frame 2. Foot 23 and lug 24 may be attached to the bottom and top frames by suitable bolts 25.

The framework is covered by a rectangular housing 26 which fits over it and is supported on top frame 2 by brackets 27 fastened thereto by bolts 28. The upper open end of housing 26 is closed by a top 29 having a hopper or receiver 30 into which tickets are dropped by a depositor and a delivery slot 31 through which a portion of each ticket is delivered into a tray 32, whence the portion may be taken by the depositor or ticket holder. Directly beneath the hopper 30 is a chute 33 having baffles 34 which direct the tickets to a vibrating trough 35 from which the tickets are fed to the canceling mechanism. Chute 33 is supported on top frame 2 by suitable brackets 36.

Vibrating trough 35 has a downwardly inclined bottom wall 37 and side walls 38 and 39 which at their outer edges are provided with outwardly flared wings 38^a and 39^a located directly under chute 33. The trough is supported by a bracket 40 pivoted to side plates 21 and 22 as is indicated at 41. Pivotaly connected to bracket 40 is one end of a shaker rod 42, the other end of which is provided with a strap 43 which surrounds an eccentric 44 fixed on a shaft 45. Shaft 45 is driven by an electric motor 46 supported on a bracket 47

attached to side plates 20 and 21. When motor 46 is running, trough 35 is vibrated through the intermediary of eccentric 44 and rod 42. At its bottom, trough 35 is of a width slightly greater than the width of the tickets the machine is intended to handle. The sloping side wings 33^a and 39^a coupled with the vibration of the trough serve to cause tickets which drop from chute 33 on to trough 35 to be turned so as to extend longitudinally of the trough and to drop off the trough on to a conveyor located directly beneath the trough. In Fig. 6, A indicates a ticket dropping into the trough.

The conveyor comprises an endless belt 48 having a bottom wall of a width equal substantially to the width of the tickets to be carried and sloping side walls 49. It may be constructed as shown more particularly in Fig. 5 wherein the bottom wall is shown as comprising a strip of flexible material, such as leather, for example, to the under side of which are riveted a plurality of relatively thin metal cross strips 53 which at their ends are bent upwardly to form side walls 49. This arrangement permits the belt to bend readily. The endless belt is arranged to run on two spaced rollers 51 and 52 supported adjacent to the outer side of plate 20. Roller 51 is rotatably mounted on a stationary shaft 53 supported by plates 20 and 21, the roller being provided preferably with ball bearings. Roller 52 is rotatably mounted on a shaft 52^a which is fixed on the upper end of an arm 54 located between plates 21 and 22 and pivotally mounted on a stationary shaft 55 fixed to the plates. Shaft 52^a passes through an elongated slot 56 in plate 21. Attached to arm 54 is a spring 57 which serves to maintain tension on the endless belt 48. One edge of endless belt 48 runs adjacent to side plates 20. Adjacent to the other edge is a shield 43^a (see Fig. 5) which is attached to side plate 20 and extends along the outer edge of the belt throughout substantially its length. On the inside of shield 43^a and on side plate 20 are guard strips 40^b behind which the edges of side walls 49 are located.

Extending around roller 52 is a second endless belt 58 of suitable flexible material such as leather. It extends along the upper side of endless belt 48 to a point beyond roller 51 where it passes upwardly between two rollers 59 and 60. Roller 59 is an idler and is rotatably mounted on a shaft 61 fixed to and projecting from plates 20 and 21. Roller 60 is fixed on a driven shaft 62 suitably pivoted in bearings in plates 20 and 21. From between rollers 59 and 60, belt 58 passes upwardly over a roller 63 fixed on a driven shaft 64, thence downwardly over a tension roller 65 and along the under side of endless belt 48 to roller 52. Endless belt 58 passes around roller 52 on the outside of and in engagement with endless belt 48 and serves as a driving means for belt 48. Tension roller 65 is rotatably mounted on the free end of an arm 66 which at its central portion is carried by a shaft 67 pivoted in walls 20 and 21. A spring 68 serves to force roller 65 against endless belt 58 to keep it tight.

Endless belt 58 is provided with a series of holes 69 spaced apart a distance slightly greater than the length of the ticket which the machine is intended to cancel. A pin 55^a fastened in walls 20 and 21 and carrying a curtain of flexible metal strips, a brush or the like is provided ahead of the vibrating trough 35 as regards the direction of travel of the belt 53 to stop tickets from sliding in downward direction along the belt in case several tickets are thrown onto the belt

simultaneously. The curtain thus represents a stop for tickets sliding down the belt 53. On the other hand, this flexible curtain or brush permits the passage of heavier objects, such as marbles or the like, thrown into the hopper. These objects may be discharged through an opening in the bottom of the outer casing.

Located behind endless belt 58 between rollers 60 and 63 is a sealed casing 70 having an elongated opening 71 directly beneath belt 58. Sealed casing 70 is connected by a conduit 72 to the suction inlet of a vacuum creating device 73. In the present instance, the vacuum creating device is shown as being a centrifugal blower 74 driven by an electric motor 75 and having a discharge opening 76. When the suction device is running, it serves to create a vacuum in sealed casing 70.

Adjacent endless belt 53 is another endless belt 77 which runs over rollers 78, 79 and 80 and between rollers 59 and 60. Rollers 78 and 80 are rotatably mounted on shafts fixed directly in plates 20 and 21. Roller 79 is an idler which serves to keep belt 57 tight. It is carried on the free end of an arm 79^a pivoted at its other end in plates 20 and 21 and held against the belt by a spring 79^b. Roller 78 is located slightly above endless belt 58 so that the two belts 53 and 77 where directly over each other are located at an angle to each other, the belts coming into engagement where they pass between rollers 59 and 60. Rollers 63 and 60 are located so that after belts 58 and 77 pass between rollers 59 and 60, they diverge. This provides a V-shaped space 81 between the belts in advance of rollers 59 and 60 and a V-shaped space 82 between the belts beyond the rollers 59 and 60, as regards the direction of travel of the belts. Space 82 forms a separating chamber as explained hereinafter. On the end of shaft 62 adjacent to roller 60 is mounted a circular trimming knife 83 which serves to trim off the edges of any tickets being conveyed between the two belts which project beyond the edges of the belts.

The tickets discharged from trough 37 on to belt 53 are carried along by the belt (the tickets being straightened by the sloping side walls 49) through V-shaped space 81 and between rollers 59 and 60 into the V-shaped space 82. From this space, the tickets are picked up, one by one, due to the suction in chamber 70 acting on the tickets through holes 69, and are carried upward and discharged between roller 63 and an adjacent roller 84 to a stripping and canceling mechanism. In Fig. 6, B indicates a ticket being carried upward by belt 58 to rollers 63 and 84. Engaging belt 77 is a hexagonally shaped roller 85 which, in turning, causes the portion of the belt 77 passing over it to be vibrated. The purpose of this is to prevent tickets from sticking to belt 77 and being carried upward by it over the roller 80. Shaft 32 on which roller 60 and cutting knife 83 are mounted is rotated by gearing 86 which connects it to a shaft 87 which in turn is connected by a gearing 88 to shaft 45. A suitable spring pressed clutch 89 is arranged in shaft 87 and is adapted to slip in case for any reason the mechanism tends to stall the motor. In the present instance, the slip clutch is provided by making shaft 87 in two parts which are connected together by sleeves 90 and 91 having serrated ends which engage each other, sleeve 91 being fixed to one part of shaft 87 and sleeve 90 being slidably mounted on the other part and pressed

into engagement with sleeve 91 by a spring 92 arranged between sleeve 90 and a collar 93 fixed on shaft 87. Shaft 87 drives also shaft 64 and the shaft on which roller 84 is mounted through gearing 94 and 95.

The stripping and canceling mechanism for tickets comprises a roller 96 mounted on a shaft 97 and a roller 98 mounted on a shaft 99, the two shafts being geared together by gears 100 and driven from shaft 87 by gearing 101. Rollers 96 and 98 are of a width substantially equal to that of the tickets to be canceled. Roller 96 is provided with end portions 102 which contact with end portions 103 on roller 98. Between end portions 103, roller 98 is provided with spaced ribs 104. Between end portions 102, roller 96 is provided with rings of spaced projections 105 in line with the spaces between ribs 104. The inner edges of portions 102 and the edges of the adjacent ribs 104 form cutting edges or shares. With this arrangement, when a ticket passes between the rollers, it is cut into three pieces, a central piece and two edge pieces. In Fig. 3 a ticket is shown as having passed between rollers 96 and 98 and as having been cut into a central piece 106 and two side pieces 107. Means are provided to deliver the central piece 106 of the ticket through opening 31 into tray 32 and to direct the two edge pieces 107 down a chute 108 into a receptacle 109. Chute 108 and receptacle 109 are formed as an integral structure. For directing central piece 106 to opening 31, there is provided a curved deflecting plate 110 directly above the central portion of roller 96 which serves to catch the forward edge of the central portion of a ticket being carried through between rollers 96 and 98 and deflect such central portion upward between roller 96 and an adjacent guide roller 111 which engages and is driven by roller 98. Above guide roller 111 is a curved deflecting plate 112 which directs the central ticket portion, as it is discharged from between rollers 98 and 111, through opening 31 into tray 32. Deflecting plate 112 is carried by a strip 113. For directing the two edge pieces 107 of a ticket into chute 108 there is provided adjacent to surfaces 103 on roller 98 two curved deflecting fingers 114 which serve to catch the forward ends of the edge pieces as they issue from between rollers 96 and 98 and direct such edge pieces downward into the chute. Deflectors 110 and 114 may be formed as part of a single strip of metal 115 suitably supported on plate 20 and 21 as is indicated at 116 in Fig. 1. When a ticket passes between rollers 96 and 98, projections 105, which fit between ribs 104 serve to produce struck-out parts or projections 117 in the central portion 106 of a ticket, thus more or less mutilating it.

Chute 108 and receptacle 109 are suitably supported on the framework comprising bottom and top frames 1 and 2, and casing 26 is provided with a hinged door 26^a to give access to the receptacle. On the side of the receptacle is a recess in which is mounted a suitable handle 26^b for pulling the receptacle and chute as a unit out through door 26^a.

For counting the tickets, I utilize the movement of rollers 96 and 98 relatively to each other which takes place when a ticket passes between them. Roller 96 has its shaft 97 mounted in a bearing fixed in plates 20 and 21 so that such shaft has only rotary motion. Roller 98 has its shaft 99 mounted in a circular bearing housing 113 carried by an arm 119, suitable ball bearings 75 being located between the housing and the shaft.

The other end of arm 119 is carried by a shaft 120 pivotally mounted in walls 20 and 21. Between the upper surface of arm 119 and a cross piece 121 fixed to plates 20 and 21 is a yielding pad 122, such as a rubber pad, which serves as a spring to press roller 98 yieldingly into engagement with roller 96. Connected to arm 119 is a switch actuating arm 123, the free end of which is provided with an adjustable pin 124 adapted to engage the movable contact 125 of a suitable electric switch 126, such as a vacuum switch. Movable contact 125 is maintained normally in open position by a spring 125^a. With this arrangement, each time a ticket passes between rollers 96 and 98, switch arm 123 is actuated and moves contact 125 into engagement with the fixed contact 127 of the switch. The contacts of switch 126 are connected to the winding 128 of an electro-magnet, the plunger 129 of which is connected to one end of a lever 130. The other end of lever 130 carries a spring pressed pawl 131 which engages a ratchet wheel 132. Ratchet wheel 132 has ten teeth and during each revolution a contact arm 133 carried by it engages a contact 134 thereby closing a circuit on the winding 135 of an electro magnet, the plunger 136 of which is connected to the actuating arm of a suitable register 137. Each time ten tickets pass between rollers 96 and 98, the register is moved one notch, thus counting the tickets in groups of ten. This arrangement for counting the tickets in groups of ten is utilized because of the difficulty in counting the tickets individually due to the rapidity with which successive tickets may pass between the rollers. It is to be understood, however, that if desired, the tickets may be counted in groups of ten, individually, or otherwise. If desired a suitable dial 132^a may be connected directly to ratchet wheel 132 for indicating units, 132^b being an indicating pointer.

Since guide roller 111 and deflecting plate 112 cooperate directly with roller 98 it is desirable that they move with it. Accordingly these parts are arranged to be carried by bearing housing 118. To this end the strip 113 is suitably fixed to housing 118 and the shaft of roller 111 is mounted in bearings carried by housing 118.

Adjacent to hopper 30 is an electric light 138 for illuminating it, the hopper being made preferably of transparent material such as glass. This arrangement enables an attendant to see readily the tickets dropped into the hopper. Electric lamp 138, the solenoid windings 128 and 135, and the two motors 46 and 75 are all connected by circuit wires 139 to a suitable source of electrical energy 140. In connection with this circuit, I provide means whereby in case the belt 58 breaks, the circuit is opened, thus stopping motors 46 and 74, extinguishing lamp 138 and disconnecting solenoids 128 and 135 from the circuit. For this purpose, there is provided in one of the circuit wires 139 in advance of the several electrical devices a switch 141, which may be of the vacuum type, having a fixed contact 142 and a movable contact 143. Contact 143 is biased to a position in contact with contact 142 by a spring 143^a. Adjacent to the outer end of contact 143 is an arm 144 connected to the arm 66 which supports roller 65. As long as belt 58 is in operative condition, roller 65 is held in a position such that arm 144 is held from engagement with contact 143. In case belt 58 breaks, spring 63 will effect a turning movement of arm 66, moving arm 144 into engagement with contact 143 and thus causing it to move away

from contact 142 to open the circuit. In circuit 140 is a suitable control switch 145. From a broad viewpoint, the line 140—139, the motor 46, and the blower 75 form a power agency for operating the means for receiving, conveying and canceling tickets, whereas the switch 141, together with the adjacent elements, represents in substance a means under the control of the belt, or responsive to the operation of the conveying and canceling means for rendering the power agency inoperative in case the conveying and canceling means fails.

The operation is as follows:

Normally circuit 139 is closed so that motors 46 and 75 are operating. Motor 46 drives the mechanism through the gearing illustrated and the blower driven by motor 75 maintains a slight vacuum in sealed chamber 70. Belt 58 runs in the direction indicated by the arrow in Fig. 6 and in passing around pulley 52 serves to drive belt 48 in the same direction. Belt 77 runs in the direction indicated by the arrow in Fig. 6. Rollers 63, 84, 96 and 98 run in the directions indicated by the arrows.

In case of a theatre, the machine is located at the entrance to the theatre, hopper 30 being toward the outside and tray 32 being toward the inside of the theatre so that a patron entering the theatre walks past the machine from the hopper side to the tray side. In walking past the machine, a patron drops his ticket into the hopper 30 at which time it can be viewed by the attendant. The ticket drops from hopper 30 down chute 33 on to trough 35. In striking the flared wings 36^a and 36^b of trough 35, the ticket tends to be turned longitudinally of the trough. Wings 36^a and 36^b coupled with the vibration of the trough, serve to turn the ticket, in case it requires turning, and to cause it to fall lengthwise on to sloping bottom 37 of the vibrating trough. From bottom 37, the ticket drops on to the endless conveyor belt 53 and is carried along by it through the V-shaped space 81 and between rollers 59 and 60 into the V-shaped space 82. The side walls 49 of traveling belt 48 serve to hold the tickets straight on belt 53 and to turn any tickets which might find their way from trough 35 to the belt in an angular position relatively to the belt. In case an edge of a ticket projects over the outer edge of belts 58 and 77 in passing between rollers 59 and 60, a thing which might occur if a ticket were bent angularly on itself before being dropped into the hopper, the projecting edge will be trimmed off by the circular rotating knife 83. From the V-shaped space 82, the ticket is picked up by belt 59 due to the suction in chamber 70 acting through the openings 69 in the belt and is carried upward by the belt into the rollers 63 and 84. From the rollers 63 and 84, the ticket is fed to the stripping and canceling rollers 96 and 98 and is cut into a plurality of pieces as described above, the one piece 103 being discharged through opening 31 into tray 32, and the other piece or pieces 107 being discharged downward into receptacle 109. The patron picks up the piece of ticket from tray 32 which piece serves as his receipt for admission to the theatre. As the ticket passes between rollers 96 and 98, the registering mechanism is actuated by circuit closer 136, the ratchet wheel 132 being moved one notch.

In case several tickets are dropped into the hopper 30 at the same time, all drop down on to vibrating trough 35 and from there are deposited on the traveling belt 48. They may be carried

along with the traveling belt either one at a time or overlapping each other as happens to occur, and are carried through V-shaped space 81 between rollers 59 and 60 to the V-shaped space 82. V-shaped space 82 is of a size to accommodate a number of tickets standing vertically on one end. From this space, the tickets are picked up one at a time by the vacuum in chamber 70 and carried through the canceling mechanism. This arrangement thus serves to feed the tickets through the canceling mechanism one at a time irrespective of whether the tickets are dropped into the hopper one at a time. With this arrangement, therefore, each ticket is canceled and counted as it passes through the machine. Space 82 serves as a separating chamber. It is adapted to hold a number of tickets at a time, the tickets being then picked up one at a time and carried to the canceling mechanism.

In Fig. 7, I have shown a modified construction wherein the central portion of the ticket, after passing through the canceling rollers 146 and 147, corresponding to the canceling rollers 96 and 98 of Figs. 1 to 6, is directed between two suitable rollers 148 and 149, which rollers may be formed of rubber and which serve to discharge the central portion of the ticket through opening 31 into tray 32, rollers 148 and 149 being located directly adjacent to opening 31. At 150 is a deflecting finger corresponding to deflecting fingers 114 in Fig. 3, and at 151 is a deflecting plate corresponding to plate 110 in Fig. 3. Otherwise the structure may be the same substantially as that shown in Figs. 1 to 6.

In Figure 8 is illustrated a modified construction for conveying tickets from the hopper to the canceling mechanism. In this arrangement 152 and 153 are rollers corresponding to rollers 51 and 52 of Figure 1, and 154 is an endless belt corresponding to endless belt 48. In this modification the shaft of one of the rollers 152 or 153 is direct-driven from the motor. Located directly above belt 154 is a vibrating trough 155 corresponding to the vibrating trough 35 of Figure 1. It may be vibrated in a manner similar to trough 35. Directly adjacent to the left hand end of belt 154 and spaced slightly above it are two rollers 156 and 157 on which is arranged an endless belt 158, the belt passing over an idler roller 159 carried by an arm 160. Connected to arm 160 is a spring 161 which serves to hold idler 159 against belt 158 to keep it tight. With this arrangement, there is provided between rollers 156 and 157 a length of the belt 158 which is substantially parallel to the upper portion of belt 154. Located directly above the portion of belt 153 which is located between rollers 156 and 157 is a sealed casing 162 having a pipe 163 connected to a suitable vacuum producing means such as that shown at 73 in Figure 1. In sealed casing 162 is a longitudinally extending slot 164 over which belt 158 runs and which corresponds to the slot 71 in sealed casing 73 of Figs. 1 and 6. In belt 158 are spaced openings 165 and in belt 154 are spaced openings 166. Adjacent to roller 156 is an idler roller 167. Beyond rollers 156 and 167 is the canceling and delivering mechanism 168. This mechanism may be similar to that shown in Fig. 1 or it may be similar to the modified construction shown in Fig. 7. It is indicated generally by the reference numeral 168 and further description of it is believed to be unnecessary, it operating after the manner of the constructions shown in Figs. 1 and 6. One of the rollers 156

or 167 is direct-driven from the motor which drives the mechanism and the arrangement is such that belt 158 is driven at a speed higher than that of belt 154. For example, belt 158 may be driven at a speed of the order of five times greater than that of belt 154. Extending along the sides of belts 154 and 158 are guide plates 169 and 170, the lower end of trough 155 being located between these plates. Guide plates 169 and 170 extend up to the rollers 156 and 167. With this arrangement, the tickets are delivered from vibrating trough 155 on to belt 154 and are aligned and carried up under the portion of belt 158 located between rollers 156 and 167. The parallel portions of the belts 154 and 158 and the adjacent elements form a separating chamber for the tickets. As the tickets pass beneath this portion of belt 158, the suction in sealed casing 162 picks the tickets up one at a time and belt 158, against which they are held by the suction, carries the tickets to rollers 156 and 167 between which they pass and from which they are delivered to the canceling mechanism. The openings 166 in belt 154 serve to admit air to the under side of the tickets so they may be readily lifted from the belt 154. On opposite sides of belts 154 and 158 are guide plates 169 and 170 which are arranged angularly relatively to each other, being farther apart at their right hand ends than at their left hand ends. The purpose of these guide plates is to assist in straightening tickets on belts 154 and 158. As the tickets simply lie on belt 154 they are easily turned, and after being picked up by belt 158 they may still be easily turned to straighten them, as the amount of suction required to hold the tickets against belt 158 is not great. Since belt 158 travels at a speed higher than belt 154, the tickets will be picked up one at a time by belt 158 even though the tickets overlap one another. Any foreign articles, such as metal pieces for example, will not be picked up by belt 158 because of the small suction but will be carried along over roller 152 and dropped to a suitable receptacle. Thus the arrangement serves to separate foreign objects from the tickets.

In Fig. 9 is illustrated a modification of the invention similar to that shown in Fig. 8 except that there is provided for the tickets a separating chamber 171 formed by walls 171^a, corresponding to separating chamber 82 of Fig. 1. In this modification the tickets are delivered from the vibrating trough to an endless belt 172 similar to belt 48 of Fig. 1, which runs on rollers 173. Belt 172 delivers the ticket to a belt 174 which runs on rollers 175, the arrangement of belt 174 being similar to that of belt 158 in Fig. 8, there being provided directly above the horizontal portion of the belt a sealed chamber 176 having a slot over which the belt runs and in which is maintained a slight vacuum. Adjacent to belt 174 is an endless belt 177 which runs over rollers 177^a, the rollers being arranged to provide a vertically extending belt portion 178 behind which is located a sealed suction chamber 179 similar to sealed chamber 176. Belts 172, 174 and 177 are provided with spaced openings, as shown in Fig. 9, for the purposes described in connection with the other modifications. The adjacent portions of belts 172 and 174 define a separating chamber. With this arrangement, the tickets carried along by belt 172 are picked therefrom by suction and are carried by belt 174 around roller 175 into the separating space 171.

From here the tickets are picked up one at a time by belt 177 due to the suction in sealed chamber 179 and are carried vertically upward to be discharged between roller 177^a and an adjacent idling roller 180 to the canceling mechanism which mechanism may be the same as that shown in either Fig. 1 or Fig. 6. With this arrangement foreign material such as metallic objects which find their way to belt 172 are carried along and dropped over roller 173, this being effected because the suction in sealed casing 176 is insufficient to lift an object heavier than a ticket.

In Fig. 10 is shown a further modification of the invention wherein a travelling belt corresponding to the travelling belt 48 of Fig. 1 is omitted, the tickets being discharged from the hopper directly to a separating chamber similar to chamber 82 of Fig. 1 or 171 of Fig. 9. In this arrangement the tickets are delivered to a hopper 183 pivotally mounted at 184 and arranged to be vibrated by a vibratory rod 185. For this purpose, an arrangement similar to that utilized for vibrating trough 35 in Figs. 1 to 6 may be utilized. The lower end of hopper 183 has an opening which is substantially vertical and extending across the opening is an endless belt 186 which runs over rollers 187 and 188, one of which is a driven roller. Located behind the portion of belt 186 which extends across the opening of hopper 183 is a sealed casing 189 having a longitudinally extending slot 190 directly behind belt 186. It is connected by a pipe 191 to a suitable means for maintaining a slight vacuum in the casing. In belt 186 are spaced openings 192 which are in line with slot 190. At 193 and 194 are idler rollers. With this arrangement, it will be seen that the lower wall of hopper 183 and the adjacent portion of belt 186 form a separating chamber 195 to which tickets are delivered by the hopper 183. From separating chamber 195 the tickets are picked up one at a time by the suction in chamber 189 after the manner already described, and are discharged from between rollers 188 and 194 to the canceling and delivering mechanism which may be similar to that disclosed in Figs. 1 to 6 or that disclosed in Fig. 8. With this arrangement, there is a reverse action insofar as the movements of the tickets are concerned. That is to say, the tickets are moving downward in the separating chamber 195 and are being moved upward by the belt 186 from the separating chamber. This arrangement has the advantage that it assists in separating the tickets and insuring that they are picked up one at a time by belt 186.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a ticket canceling machine, the combination of a hopper into which the tickets to be canceled are dropped, a tray accessible from the outside of the machine for receiving a portion of a canceled ticket and delivering it to the depositor, canceling mechanism, means for conveying tickets from the hopper to the canceling mechanism, and means for conveying a portion of a canceled ticket from the canceling mechanism to the tray.

2. In a ticket canceling machine, the combination of a hopper into which the tickets to be canceled are dropped, a tray accessible from the outside of the machine for delivering a portion of each canceled ticket to the depositor, canceling mechanism, means including an endless belt

for conveying tickets from the hopper to the canceling mechanism, and means for conveying a portion of a canceled ticket from the canceling mechanism to the tray.

5 3. In a ticket canceling machine, the combination of a hopper into which the tickets to be canceled are dropped, a tray accessible from the outside of the machine for delivering at least a portion of each canceled ticket to the depositor, canceling mechanism, means including a suction creating device for conveying tickets from the hopper to the canceling mechanism, and means for conveying at least a portion of a canceled ticket from the canceling mechanism to the tray.

10 4. In a ticket canceling machine, the combination of a canceling mechanism, means forming a chamber for receiving tickets, and means for conveying tickets to be canceled one at a time from the chamber to the canceling mechanism.

15 5. In a ticket canceling machine, the combination of a canceling mechanism, means forming a chamber for receiving tickets, and means including a suction creating device for conveying tickets to be canceled one at a time from the chamber to the canceling mechanism.

20 6. In a ticket canceling machine, the combination of a canceling mechanism which divides a ticket to be canceled into a plurality of parts, a tray accessible from the outside of the machine for delivering at least a portion of each canceled ticket to the depositor, a receptacle, means for conveying tickets to be canceled to the canceling mechanism, and means for directing parts of a canceled ticket to said tray and receptacle.

25 7. In a ticket canceling machine, the combination of a canceling mechanism, a chamber, a traveling belt for conveying tickets to the chamber, a traveling belt for conveying tickets individually from the chamber to the canceling mechanism, and means for depositing tickets flatwise on the first named belt.

30 8. In a ticket canceling machine, the combination of a canceling mechanism, a chamber, a traveling belt for conveying tickets to the chamber, a traveling belt for conveying tickets individually from the chamber to the canceling mechanism, and a vibrating trough for depositing tickets on the first named belt.

35 9. In a ticket canceling machine, the combination of a canceling mechanism comprising rollers between which tickets to be canceled are passed and means for feeding tickets to the canceling mechanism comprising an endless belt having openings therein spaced in direction of travel of the belt at distances longer than the length of a ticket, a vacuum casing having a slot over which the belt passes, and means for conveying tickets to the portion of the belt adjacent to said casing.

40 10. In a ticket canceling machine, the combination of a sealed casing having an elongated slot therein, means for maintaining a vacuum in the casing, a traveling belt which extends along the casing over said slot, said belt being provided with spaced openings, means for feeding tickets to the belt, and canceling mechanism located beyond the casing to which tickets are conveyed by said belt, the openings being spaced so that one ticket at a time is conveyed to the canceling mechanism.

45 11. In a ticket canceling machine, the combination of a sealed casing having an elongated slot therein, means for maintaining a vacuum in the casing, a traveling belt which extends

along the casing in front of said slot, said belt being provided with spaced openings, means forming a separating chamber in front of the portion of said belt which is in front of said slot, means including said belt for depositing tickets in said separating chamber, and canceling means to which the belt conveys tickets from the separating chamber.

5 12. In a ticket canceling machine, the combination of a sealed casing having an elongated slot therein, means for maintaining a vacuum in the casing, a traveling belt which extends along the casing in front of said slot, said belt being provided with spaced openings, means forming a separating chamber in front of the portion of said belt which is in front of said slot, a hopper, a traveling belt for conveying tickets from the hopper to said separating chamber, and canceling means to which the belt conveys tickets from the separating chamber.

10 13. In a ticket canceling machine, the combination of a canceling means, means for feeding tickets to be canceled to the canceling means one at a time, a registering mechanism, and means actuated by movement of the canceling means for actuating the registering mechanism.

15 14. In a ticket canceling machine, the combination of canceling rolls between which tickets to be canceled pass, one of said rolls being pivotally mounted whereby it is moved away from the other roll by the passage of a ticket between the rolls, means for feeding tickets to the rolls one at a time, a registering mechanism, and means actuated by the relative movement of said rolls when a ticket passes between them for operating the registering mechanism.

20 15. In a ticket canceling machine, the combination of a hopper, a traveling belt, means for transferring tickets from the hopper to the belt and depositing them on the belt lengthwise thereof, canceling mechanism, means for transferring tickets from the traveling belt to the canceling mechanism, and means whereby, after a ticket is canceled, a portion is deposited outside the machine and a portion is retained in the machine.

25 16. In a ticket canceling machine, the combination of a casing having an admission opening for the reception of tickets and a discharge opening, a traveling belt, a vibrating trough for transferring tickets from the admission opening to the belt, canceling mechanism, means for transferring tickets from the traveling belt to the canceling mechanism, and means for delivering at least a portion of a ticket from the canceling mechanism through said discharge opening.

30 17. In a ticket canceling machine, the combination of a casing having an admission opening for the reception of tickets and a discharge opening, canceling mechanism, means for receiving tickets from the admission opening and delivering them individually to the canceling mechanism, means for delivering at least a portion of a canceled ticket through said discharge opening, and a tray adjacent the discharge opening and accessible from the outside of the machine.

35 18. In a ticket canceling machine, the combination of a casing having a hopper into which tickets are dropped and a tray accessible from the outside of the machine, ticket canceling means in the casing, an endless belt, means for depositing tickets lengthwise on the belt, means for picking tickets from the belt and transferring them to the canceling means, and means for

delivering at least a portion of a canceled ticket from the canceling means to said tray.

19. In a ticket canceling machine, the combination of a hopper for receiving tickets from a depositor, canceling mechanism, means for conveying the tickets from the hopper to the canceling mechanism, means for driving the canceling mechanism and the conveying means, and means responsive to an abnormal condition of the conveying means for automatically rendering the driving means inoperative.

20. In a ticket canceling machine, the combination of means for receiving, conveying and individually canceling tickets, a power agency for operating said means, and other means responsive to an abnormal condition of the first named means for rendering the power agency inoperative.

21. In a ticket canceling machine, the combination of a hopper for receiving tickets to be canceled, canceling mechanism, an endless belt having an inclined portion below the level of the canceling mechanism for receiving tickets from the hopper and conveying them to the canceling mechanism, and a curtain of flexible strips hanging down onto the belt ahead of the ticket receiving belt portion as regards the direction of belt movement, said curtain stopping tickets from sliding down the belt and permitting the passage of heavier objects thrown into the hopper.

22. In a ticket canceling machine, the combination of a hopper for receiving tickets to be canceled, an endless belt for receiving and conveying the tickets, canceling mechanism, another endless belt and a suction creating device for picking up individual tickets from the first named belt and carrying them to the canceling mechanism, and a tray accessible from the outside of the machine for receiving at least a portion of each canceled ticket.

23. In a ticket canceling machine, the combination of a receiving means for tickets to be canceled, a horizontally arranged, perforated endless belt for receiving tickets from the receiving means, canceling mechanism, another perforated endless belt having a horizontal portion above the first named belt and defining a chamber with the latter, suction creating means for causing the tickets being picked up individually by the horizontal portion and carried to the canceling mechanism, and discharge means for the canceled tickets.

24. In a ticket canceling machine, the combination of a canceling mechanism, a chamber, traveling belt means for conveying tickets to the chamber, and means including traveling belt means for conveying tickets individually from the chamber to the canceling mechanism.

25. In a ticket canceling machine, the combination of a canceling mechanism, a chamber, traveling belt means for conveying tickets to the chamber, means including traveling belt means for conveying tickets individually from the chamber to the canceling mechanism, and means for depositing tickets flatwise and aligned on the first mentioned belt means.

26. In a ticket canceling machine, the combination of a canceling mechanism, a chamber, traveling belt means for conveying tickets to the chamber, means including traveling belt means for conveying tickets individually from the chamber to the canceling mechanism, means for de-

positing tickets flatwise and aligned on the first mentioned belt means, and means for cutting off overhanging edges of the tickets on the first mentioned belt means.

27. In a ticket canceling machine, the combination of a canceling mechanism, a trough for receiving tickets to be canceled, means for vibrating the trough, a perforated endless traveling belt having a steeply inclined portion adjacent an opening of the trough, and means for creating a suction in the direction from the interior of the trough through the belt perforations to cause individual tickets to be carried upward by said belt portion to the canceling mechanism.

28. In a ticket canceling machine, the combination of a canceling mechanism, means forming a chamber for receiving tickets, and means including a suction creating device for conveying tickets to be canceled one at a time from the separating chamber to the canceling mechanism, the canceling mechanism comprising cutting means for cutting each ticket into a plurality of parallel strips.

29. In a ticket canceling machine, the combination of a hopper for receiving tickets to be canceled, a tray accessible from the outside of the machine for delivering a portion of each canceled ticket to the depositor, canceling mechanism, means forming a separating chamber, means for conveying tickets from the hopper to the chamber and from the chamber to the canceling mechanism, the canceling mechanism comprising cutting means for cutting each ticket in at least three parallel strips and providing one of the strips with indentations, and means for delivering one of the strips to the tray.

30. In a ticket canceling machine, the combination of a receiver for tickets to be canceled, ticket conveying and canceling means for receiving tickets from the receiver and cutting out a central portion from each ticket, a tray accessible from the outside of the machine, and a casing locked into the machine, said canceling mechanism including a device causing the central ticket portions being delivered into the exposed tray and the other ticket portions into the casing.

31. In a ticket canceling machine, the combination of a canceling mechanism, traveling belt means for feeding the tickets to be canceled to the mechanism, a power agency for operating the belt means, means for automatically rendering the power agency inoperative when the belt breaks, and a registering mechanism connected to the canceling mechanism for counting the canceled tickets.

32. In a ticket canceling machine, the combination of a hopper for receiving tickets to be canceled, a traveling belt, a motor for driving the belt, a vibrating trough between the hopper and the belt, a canceling mechanism, means including the belt for feeding the tickets to be canceled one at a time to the canceling mechanism, a tray accessible from the outside of the machine, a casing enclosed in the machine, means for directing a certain portion of each ticket into the tray and another portion into the casing, means under the control of the belt rendering the motor inoperative in response to an abnormal condition of the belt, and a register connected to the canceling mechanism for counting the tickets.

ARTHUR J. JOHNSTON.

CERTIFICATE OF CORRECTION.

Patent No. 1,998,320.

April 16, 1935.

ARTHUR J. JOHNSTON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 20, for "shares" read shears; and line 53, for "plate" read plates; page 4, first column, line 42, for "58" read 48; and second column, lines 31 and 32, for "Fig. 3" read Fig. 4; and page 5, first column, line 11, for "thickets" read tickets; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of June, A. D. 1935.

Leslie Frazer

Acting Commissioner of Patents.

(Seal)

CERTIFICATE OF CORRECTION.

Patent No. 1,998,320.

April 16, 1935.

ARTHUR J. JOHNSTON.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, first column, line 20, for "shares" read shears; and line 53, for "plate" read plates; page 4, first column, line 42, for "58" read 48; and second column, lines 31 and 32, for "Fig. 3" read Fig. 4; and page 5, first column, line 11, for "thickets" read tickets; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of June, A. D. 1935.

Leslie Frazer

Acting Commissioner of Patents.

(Seal)