

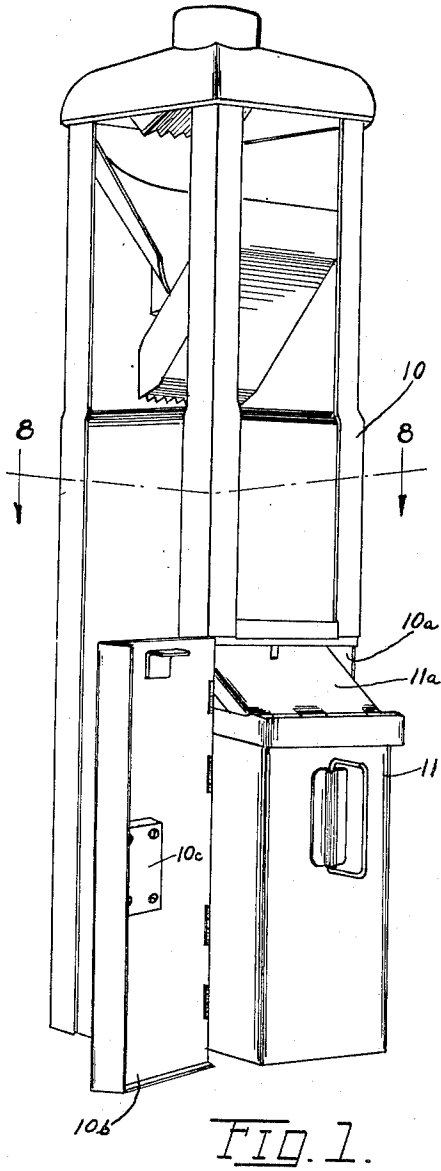
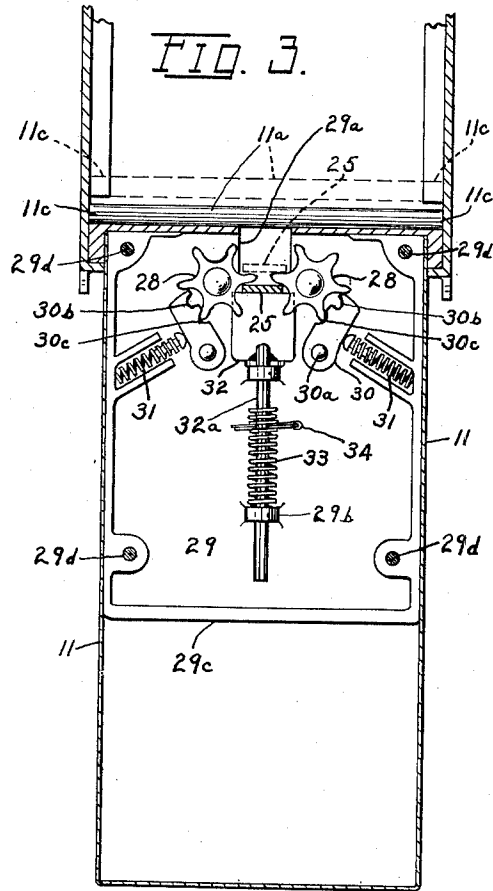
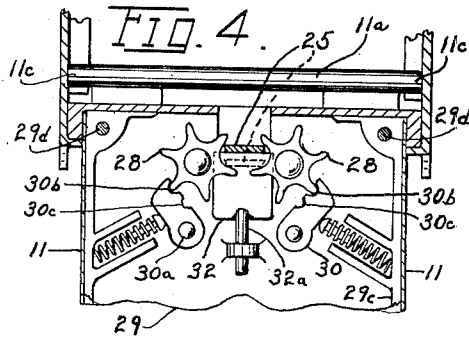
Feb. 20, 1951

A. MAIN
LATCH CONSTRUCTION

2,542,876

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3 Sheets-Sheet 1



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3 Sheets-Sheet 2

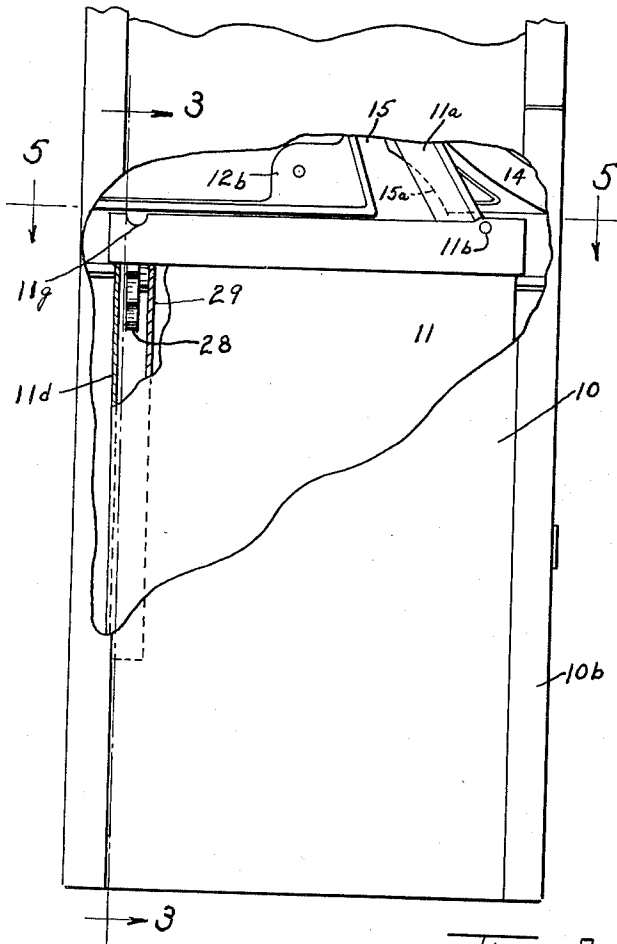


FIG. 2.

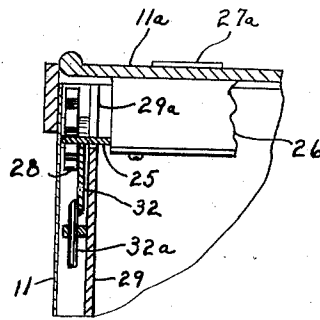


FIG. 6.

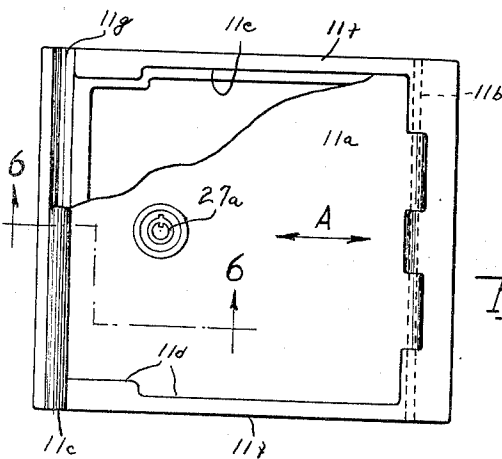


FIG. 5.

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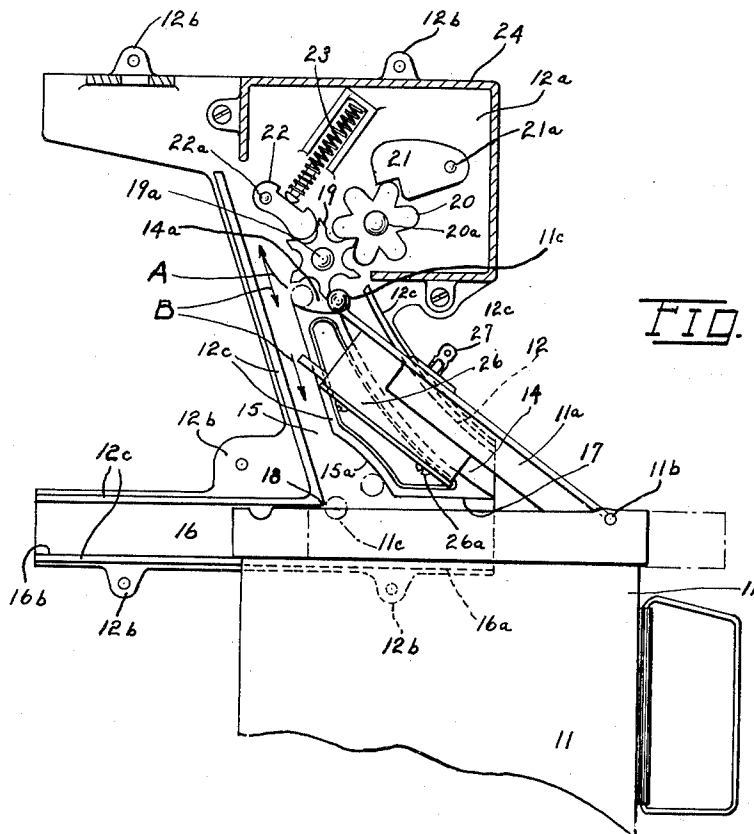


FIG. 7.

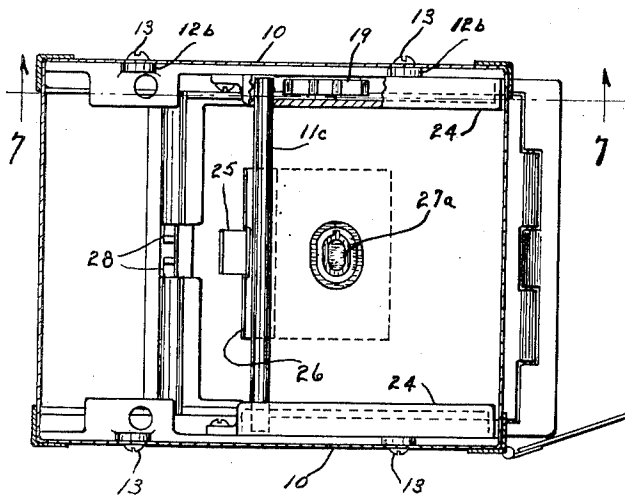


FIG. 8.

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UNITED STATES PATENT OFFICE

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LATCH CONSTRUCTION

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2 Claims. (Cl. 292—341.17)

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This invention relates to improvements in fare boxes or coin boxes and more particularly to the money-box or drawer and cooperating means on the cabinet housing the same for insuring that all coins or fares deposited in the cabinet are received into the drawer and that the drawer is locked before it is removed from the cabinet.

An object of the present invention is to provide positive means for closing the fare box cover by the mere act of withdrawing the box from the cabinet.

Another novel feature of my present invention is the provision of a two-positioned keeper for the lock of the fare box cover whereby the lock bolt is compelled to pass the first position of the keeper before the box and cover thereof are in position to be withdrawn from the cabinet.

Other objects and advantages of the present invention will be more fully described in the accompanying drawings and specification, and the essential features thereof will be summarized in the appended claims.

In the drawings,

Fig. 1 is a perspective view of my improved fare box partially inserted in a cabinet or housing for the same;

Fig. 2 is a side elevational view of the device of Fig. 1 somewhat enlarged and with the fare box completely inserted in the cabinet; certain of the parts being broken away to more clearly show the structure;

Fig. 3 is a fragmental sectional view taken along the line 3—3 of Fig. 2;

Fig. 4 is a view similar to a portion of Fig. 3 showing another position of the parts;

Fig. 5 is a top plan view of the fare box taken in substantially the position of line 5—5 of Fig. 2 but with the lid of the box closed and partially broken away to illustrate the construction;

Fig. 6 is a fragmental sectional view taken along the line 6—6 of Fig. 5;

Fig. 7 is a fragmental sectional view taken along the line 7—7 of Fig. 8 but with box 11 somewhat more removed from the cabinet; while

Fig. 8 is a sectional view taken along the line 8—8 of Fig. 1.

My invention is shown in combination with a fare-depositing cabinet or housing 10 such as used in many public transportation systems and other places where tokens, coins, tickets, or the like are deposited, but it will be understood that many of the features of my invention may be utilized in connection with the boxes for the deposit of coins, tokens, or tickets, whatever the shape of the box or drawer and whatever the

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type of cabinet or housing in which the same is inserted.

In the device shown in Fig. 1, the upper portion of the cabinet 10 is arranged for the deposit of coins or tokens which drop through a series of baffles for deposit in the fare box or drawer 11 which is inserted in and completely surrounded by the lower walls of the cabinet 10. One side wall is provided with the opening 10a through which the box is inserted after which the opening is closed by means of the hinged cabinet door 10b. This door is then locked by means of the lock 10c indicated. One of the features of my invention is an arrangement which insures that the top door 11a of the fare box will be started along a predetermined path of travel before the cabinet door 10b can be closed, the arrangement including means which insures that the cover 11a will first be fully opened so that all coins or tokens dropped into the cabinet 10 will be received within the box 11; and thereafter the box 11 can only be withdrawn by causing the top 11a to continue along a predetermined path which insures that the top cover 11a is firmly locked in closed position before the box 11 is again withdrawn from the cabinet 10.

The means by which I carry out the above-described purpose is most clearly shown in Fig. 7 taken in combination with the other views of the drawings. The cover 11a is fastened to the top of box 11 by means of the hinge pin 11b. The cover thus has a horizontal hinge connection whereby the oscillation of the cover takes place in a vertical plane about the pivot 11b. Near the free edge of the cover 11a are a pair of laterally extending lugs 11c which project outside of the side edges 11d of the cover. It will be noted that these side edges enter into complementary shoulders 11e on the top side walls of the box as best seen in Fig. 5. Preferably, the top face of the cover 11a lies substantially flush with the tops 11f of the side walls when the cover is closed. Notches 11g are provided in the side walls of the box to accommodate the lower portion of the generally cylindrical lugs 11c when the box cover is closed. Guideways are provided secured to the inner walls of the cabinet 10 to receive and guide the lugs 11c along the desired path of travel. While I have shown two lugs 11c oppositely disposed and a guideway for each of them, it should be understood that one lug and one control guideway therefor might be used, but I prefer to use two as shown.

One of these guideways 12 is clearly shown in

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Fig. 7. It comprises a base plate 12a having ears 12b at various points, through which fastening means 13 may be passed to secure the guideways to the walls of the cabinet 10. Upstanding from the base plate 12a are ribs 12c which define three troughlike guideways. The guideway 14 I have called a cover-opening guide, and this is inclined inwardly and upwardly from the opening 10a and preferably slightly concave upwardly as shown in Fig. 7. The top portion of the guideway 14 extends generally horizontally rearwardly at the portion 14a where the lugs 11c pass by a ratchet-retaining device to be later described. The second guideway indicated at 15 I have called a cover-closing guideway, and this extends downwardly and forwardly with respect to the opening 10a as clearly seen in Fig. 7. The lower portion of this guideway on the forward wall is given a special shape as shown at 15a for a purpose later described. The third guideway 16 extends generally horizontally from front to rear and has a portion 16a extending forwardly from the guideway 15 and a portion 16b extending rearwardly therefrom. When the box 11 is inserted into the cabinet through the opening 10a in vertical position, as shown in Fig. 1, the operator holds the cover 11a slightly open so that the lugs 11c enter the guideways 14. Then as the box 11 is inserted into the cabinet moving in a generally horizontal direction, the lugs 11c travel upwardly and rearwardly along the guideway 14 and along the portion 14a around the ratchet device (which can move in a clockwise direction only as seen in Fig. 7), the lugs 11c moving to the dot-dash position of Fig. 7 and then following the arrow A until the box 11 is wholly within the cabinet 10 so that the door 10b can be closed. When the box 11 is withdrawn, the lugs 11c cannot return down the guideway 14 because of the one-way ratchet device, and, therefore, the lugs 11c follow the arrows B forwardly and downwardly along the guideway 15 until the cover is forced closed by the pressure of the rib 12c along the guideway portion 15a, after which the lugs may be moved horizontally outwardly along the guideway 16a.

In Fig. 7, I have indicated a dot-dash circle near corner 13 showing the position of a lug 11c after cover 11a is closed and the box 11 is inserted into the cabinet 10 without attempting to open the cover 11a. In this closed position, the lug will pass the rib 17, but when it reaches the corner 18, the portion 16b of the guideway is too narrow to permit the lug 11c to pass. At this time, the box 11 still projects out the front of the cabinet 10, and this insures that the box 11 cannot be fully inserted in the cabinet 10 with the door 11a closed.

The dog mechanism which prevents the withdrawal of the lugs 11c in the opposite direction along guideway 14 from their normal entering path is best seen in Fig. 7. While a single ratchet device might be used at this point, I prefer the double ratchet arrangement shown. The ratchet wheel 19 is pivotally mounted to the base plate 12a by means of the pivot 19a. The ratchet wheel 20 is in like manner pivoted about the pin 20a. A gravity actuated holding dog 21 pivoted on the base plate at 21a permits counterclockwise rotation of the wheel 20 but prevents clockwise rotation thereof. The dog 22 pivotally mounted on the base plate at 22a and spring pressed downwardly and toward the left by spring 23 permits clockwise movement of

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wheel 19 but prevents counterclockwise movement thereof. The double ratchet mechanism is protected against tampering by a cover member 24 which is secured to base plate 21 and has side walls and a top cover parallel to the base plate (as seen in Fig. 8) which sufficiently incloses the double ratchet mechanism so as to prevent tampering. This double ratchet wheel arrangement prevents the insertion of a tool for the manipulation of the holding dog so that movement of the ratchet wheel in an undesirable direction may take place. It is practically impossible for an operator to manipulate both of the dogs 21 and 22 so that undesirable movement of ratchet wheels 19 and 20 may occur. When the lug 11c has reached the dot-dash position shown in Fig. 7 near arrow A, the rear edge of box 11 is at the position indicated in full in Fig. 8. Therefore, at this time the box 11 still extends outside the cabinet 10 so that the door 10b cannot be closed. It will thus be seen that the lug 11c has passed the ratchet wheel 19 to a position where the holding dog 22 prevents the withdrawal of the lug 11c and the box cover back down the guideway 14 for removal of the box 11. It is, therefore, necessary in order to close the cabinet door 10b that the box 11 should be inserted so far into the cabinet that the lugs 11c have passed the holding device so that the only possible way of removing the box 11 is to continue along the path previously described into the guideway 15 which, as stated before, compels the closing and locking of the cover 11a before the box 11 is removed from the cabinet. It results from this construction that when the box 11 is fully positioned inside the cabinet 10, the foolproof operation of the cover 11a is insured. No coins or fares can be collected in the box 11 subject to pilfering by the operator. All of these coins or fares will be safely locked in the box 11 before it is again removed from the cabinet.

Novel locking means is provided for holding the cover 11a in closed position on the box. The lock bolt 25 is carried in a housing 26 which is secured by cap screws 26a to the inside face of the cover 11a. These fastening members do not extend through the outside wall of the cover, and, therefore, the mechanism in housing 26 cannot be tampered with. The key 27 for controlling the lock bolt 25 is inserted into the housing 26 through the opening 27a.

Novel keeper mechanism is provided for lock bolt 25. This keeper mechanism is wholly within the box 11 so that it cannot be tampered with. As best seen in Figs. 3, 4, and 6, a pair of star wheels 28 are provided, each rotatably mounted on a base plate 29. Two-position dog means is provided for each of these star wheels which may take various forms, but as shown clearly in Figs. 3 and 4, each wheel is provided with a dog 30 pivotally mounted on the base plate 29 at 30a. Each dog has two notches 30b and 30c adapted to engage one of the projections of the associated star wheel. A spring 31 urges the dog into engagement with the star wheel. As the lock bolt 25 moves downwardly from the broken line position of Fig. 3 to the broken line position of Fig. 4, it carries the star wheel projections from the position of Fig. 3 where the notches 30c are holding to the position of Fig. 4 where the notches 30b are holding. After the lock bolt 25 reaches the broken line position of Fig. 4, the spring pressed follower member 32 (whose purpose will be later described) moves the bolt upwardly slightly to

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the full line position of Fig. 4. In this position the cover 11a is not fully closed, but the lock bolt is so held by the projections of the star wheels, as shown in Fig. 4, that it is impossible to open the cover 11a. When the cover 11a is moved still further downwardly to the full line position of Fig. 3, the star wheels are again in position where they are held by the notches 30c, and the lock bolt 25 is in the full line position of Fig. 3 firmly held between the two star wheels which will not permit the opening of the cover 11a. As viewed in Fig. 3, the holding dogs prevent clockwise movement of the right-hand star wheel 28 and prevent counterclockwise movement of the left-hand star wheel 28. The entire double star wheel keeper mechanism is housed against access thereto by means of side flanges 29c which extend around three sides of the base plate so as to hold the base plate spaced from the wall 11d of the box 11 and parallel thereto as best seen in Fig. 2. This supports the star wheel mechanism and associated parts for free movement between plate 29 and the box wall 11d. Means is provided passing through the openings 29d to secure the plate 29 to the wall 11d. Thus, as mentioned above, the entire keeper mechanism is inside of the box 11 and completely protected from the coins or tokens.

The purpose of the almost-closed lock position described in the preceding paragraph is to provide a safety feature whereby even the slightest approach of the box cover to a closed position results in locking the cover. During the use of applicant's device there may be a wearing of the parts as they go through the cycle described in connection with Fig. 7 and it may happen that through poor workmanship or wearing of the parts or tampering with the apparatus, it will be desirable to lock the box cover even though it should not be completely closed. It should be understood that the bolt 25 must be withdrawn by a key inserted in the lock at 27a in order to open the box cover. In other words, the star wheels 28 shown in Figs. 3 and 4 always move in one direction only.

The purpose of the follower member 32 will now be described. It will be noted in Figs. 3 and 4 that there is a slotted opening 29a in the base plate 29 to permit the entrance of the lock bolt 25 between the star wheels 28. Coins or fares might enter into the star wheel mechanism through this slotted opening. Therefore, the follower member 32 is provided having a sliding fit against the base plate 29 and inside of the housing which otherwise completely incloses the star wheel mechanism. This follower is provided with a rigidly connected stem 32a which is urged upwardly by means of the spring 33 which is held in compression between abutment 29b on the base plate and the cotter pin 34 which passes through the stem 32a. Thus the follower member 32 always has its flat upper edge in tight engagement against the lower face of lock bolt 25, and prevents the entrance of coins or fares into the star wheel mechanism.

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It results from the various constructions above described and the positioning and tensioning of the parts that foolproof depositing and accounting for coins, fares, or the like is insured by the use of my improved box. A visual inspection of the cabinet 10 will tell whether the collection box 11 has been fully inserted therein or not. If the collection box is fully inserted within the cabinet, those in charge are assured that the cover of the collection box is in open position so that all coins or fares deposited will fall within the box 11, and this box cannot be again withdrawn without the cover thereof being first completely locked, and no parts of the locking mechanism of the collection box are in position to be tampered with.

What I claim is:

1. Means for locking a box having a hinged cover, said locking means comprising a lock bolt carried by said cover on the inside surface of the latter and projectable toward a free edge of said cover, a pair of star wheels rotatable in planes at right angles to the general path of bolt movement, said star wheels being rotatably mounted on said box on opposite sides of the path of movement of said bolt, dog means for permitting rotation of said wheels to pass said lock bolt downwardly and for preventing the opposite rotation of said wheels, said wheels presenting a pair of points toward said bolt spaced to permit entrance of said bolt between them, and said wheels presenting a pair of points, next in series to said first named pair, toward said bolt and spaced to prevent passage of said bolt between them, whereby said bolt may enter between the more widely spaced wheel points and engage the more closely spaced points to rotate said wheels until said bolt lies below a pair of closely spaced points where said dog means acts to retain said bolt.
2. The combination of claim 1 wherein said dog means engages said star wheels to hold the latter in two positions, there being coacting points on said wheels extending toward each other in each of said two positions, said points spaced apart less than the width of said bolt.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,070,580	Breithaupt	Aug. 19, 1913
1,105,620	Cook	Aug. 4, 1914
1,105,621	Cook	Aug. 4, 1914
1,293,695	Burrows	Feb. 11, 1919
1,459,701	Willis	June 19, 1923
1,504,992	Stewart	Aug. 12, 1924
1,628,508	McElligott	May 10, 1927
1,891,224	Edwards	Dec. 20, 1932
1,934,105	Totty	Nov. 7, 1933