W. N. DOVENER.

CHANGE COUNTER.

APPLICATION FILED MAY 11, 1917.

1,317,358.

Patented Sept. 30, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

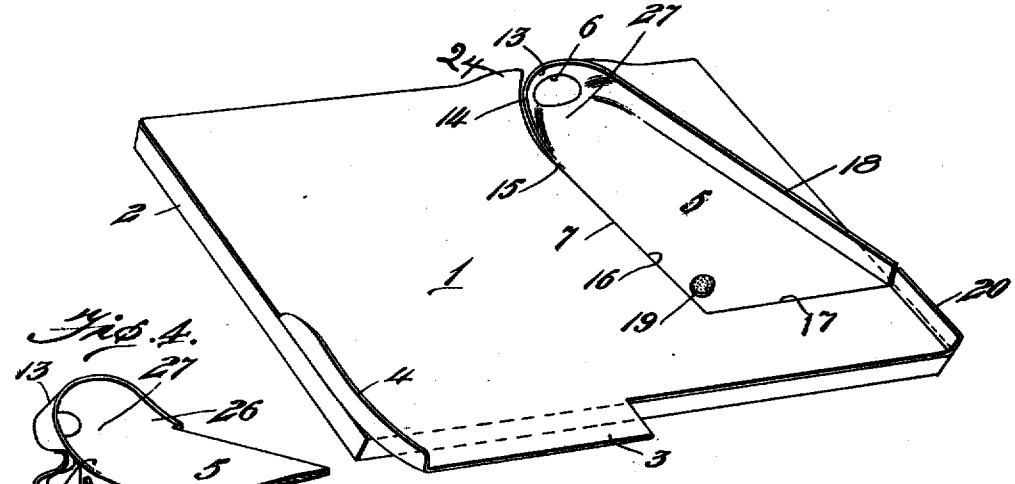


Fig. 4.

Fig. 2.

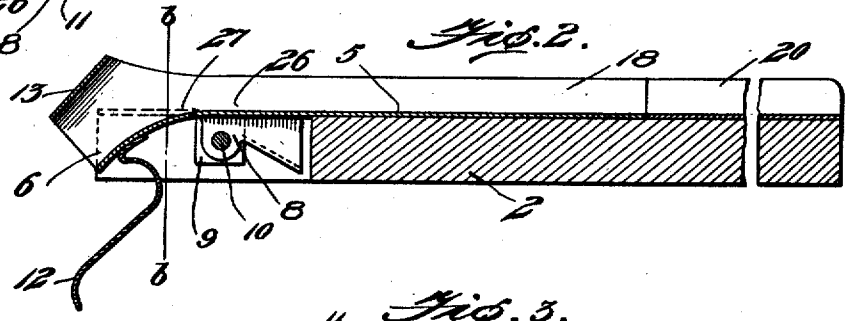


Fig. 3.

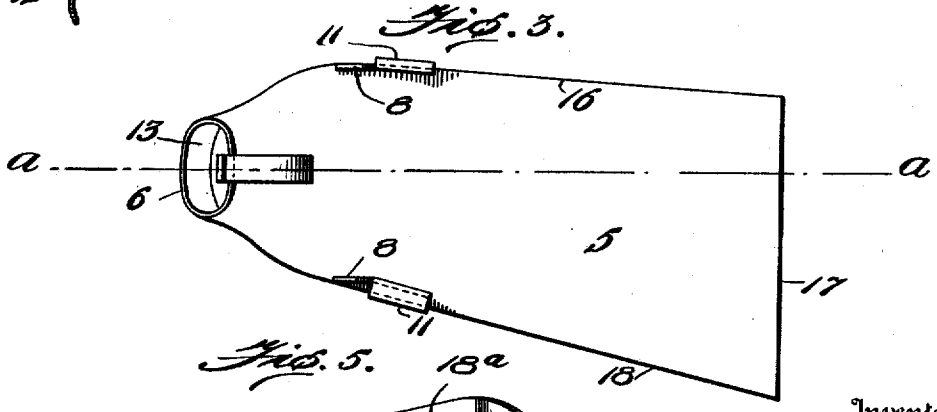
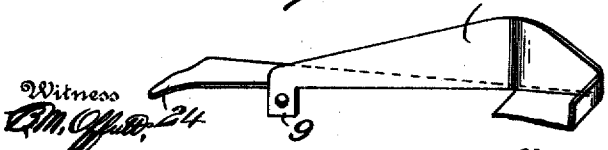


Fig. 5.



Witness

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2 SHEETS—SHEET 2.

Fig. 8.

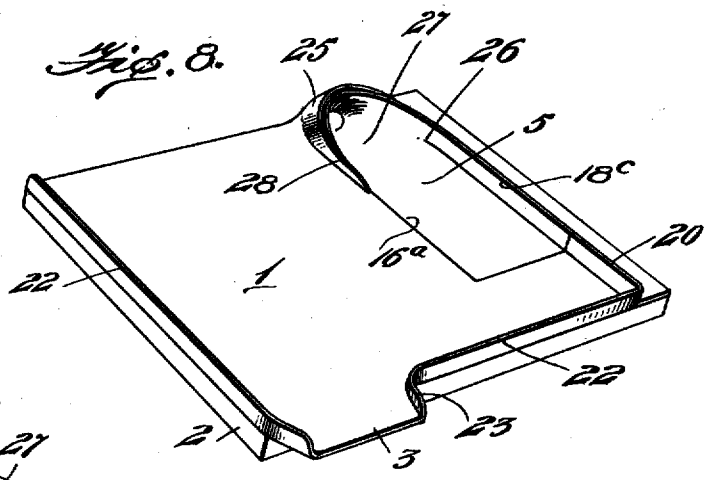
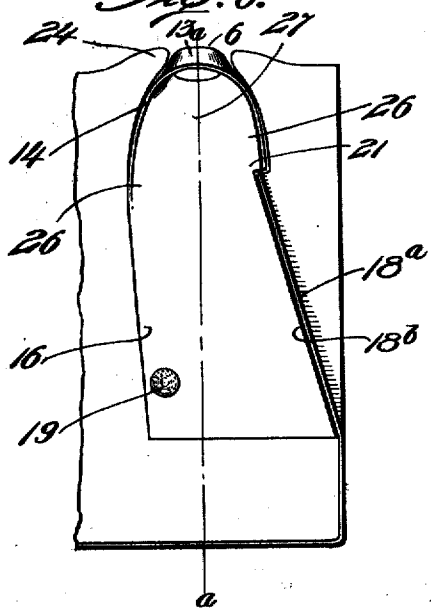


Fig. 6.



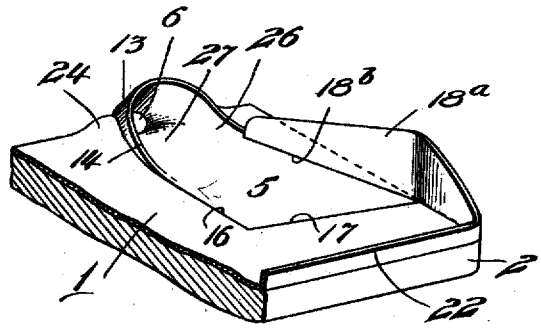


Fig. 7.

Fig. 9.

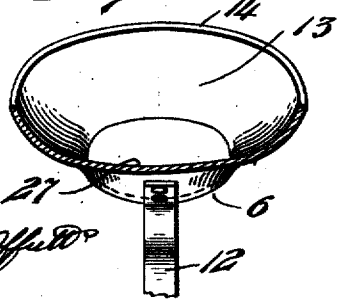
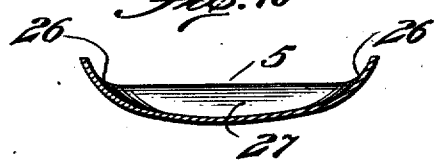


Fig. 10.



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CHANGE-COUNTER.

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To all whom it may concern:

Be it known that I, WILLIAM N. DOVENER, a citizen of the United States, residing at 5327 Conduit road, District of Columbia, have invented certain new and useful Improvements in Change-Counters, of which the following is a specification.

The word "counter" is used in the sense of a table or board upon which money is counted; and the invention is especially designed to facilitate the handling of money (when change is to be made) by either or both of the parties to the transaction—a customer and a cashier, for example. For the sake of brevity and convenient identification the persons concerned in the use of the invention will be described as a customer and a cashier.

The invention provides simple and improved devices to facilitate the handling of money and the making of change by the cashier, and the delivery of change to the customer. Described in general terms, the invention comprises the following principal features: A plate or surface, usually metallic, forming the body of the device, which is usually placed upon a thicker base such as the wooden top of the cashier's desk or counter. This plate may or may not be provided at certain of its margins with upstanding flanges to prevent escape of coins. At one side, usually the cashier's side, the money plate or surface is preferably provided with a thin extension to facilitate the sweeping of coins from the plate into the cashier's hand with little chance of any of the coins falling to the floor. At one part of the plate is preferably provided a movable or tilting tray arranged to deliver change to the customer. This tray is preferably provided with a spout to direct the coins into the customer's hand, and a handle adjacent to the spout; and the tray, or the plate adjacent to the tray is preferably provided with upstanding guides or flanges to direct coins properly onto the tray when they are quickly swept toward it by the cashier. The tray is also preferably shaped and arranged in relation to the plate so that when the tray is tilted the coins are directed toward the spout or delivery part of the tray in a new and improved manner.

The characteristics and advantages of the invention will be further explained so far as is necessary to enable persons skilled in the art to understand the invention, in connection with a detailed description of the accompanying drawings, which show certain exemplifying embodiments of the invention. After considering these embodiments it will be evident that the invention may be embodied in different forms and I do not limit myself to details except as claimed hereinafter.

Figure 1 is a perspective view of one form of the invention.

Fig. 2 is a vertical section of the same in the plane of the longitudinal axis of the tray.

Fig. 3 is a bottom plan view of the tray removed from the plate.

Fig. 4 is a perspective detail of a part of a tray of modified construction.

Fig. 5 is a perspective detail of a guide flange to coöperate with the tray of Fig. 4.

Fig. 6 is a top plan of the tray and plate of Figs. 4 and 5.

Fig. 7 is a perspective detail of a part of the plate, the tray and guide flanges adjacent to the tray.

Fig. 8 is a perspective view of another modified form of the invention.

Fig. 9 is a vertical transverse section through a change tray on the line *b*—*b*, Fig. 2, looking toward the spout.

Fig. 10 is a section taken at the same line Fig. 2, but looking away from the spout.

Figs. 1, 2 and 3 show one form of the invention in which the plate 1 constituting the body of the device is laid upon a thicker support 2, which may be a board or slab of wood of the dimensions shown, or may be considered to be a part of any suitable cashier's table or counter upon which the plate 1 may be located. Usually the cashier will stand at the near side of the device as shown in Fig. 1 and the customer at the far side, and any suitable screen or grill may be located at a suitable point to protect the cashier's money, as is usual, without interfering with the operation of the invention. At one part of the side of the plate, adjacent to the cashier, is provided an extension 3, which is thin in a vertical direction and may conveniently be an integral extension of the plate 1. This extension protrudes beyond

the thicker base 2, and by placing one hand beneath the extension 3 the cashier may, with the other hand, rapidly sweep the coins from the tray over the extension, and these coins, will because of the thinness of the extension, immediately come into contact with the adjacent hand without any perceptible drop of the coins, and the coins will, therefore, be substantially immediately checked and retained by the hand of the cashier without any considerable chance of falling to the floor.

In some cases, an upstanding flange 4 may be provided at one side of the extension 3 and this flange may extend more or less forwardly across one edge or surface of the plate 1. Evidently in sweeping coins toward the extension 3 the flange 4 will prevent them flying off the plate toward the left and will also serve as a guide in the sweeping of the coins into the hand adjacent to the extension.

The tray 5 is conveniently located on the plate 1, usually near one end of the plate, and arranged so that its spout or delivery portion 6 is conveniently placed to discharge coins into the hands of the customer. The plate 1 is usually cut away to form an opening 7 to accommodate the tray. Near its delivery end the tray at its bottom is provided with downwardly turned ears 8 fitting within lugs or ears 9 provided on the plate 1. The rod 10 seated in plate ears 9 and passing through ears 8 of the tray provides a tilting pivot for the tray. The ears 8 may also be extended rearwardly and outwardly turned to provide stops 11 to engage the adjacent edges of the plate opening 7 and limit the tilting movement of the tray. Evidently other specific forms of pivot and stop device may be substituted for those described.

At the delivery end the tray terminates in a spout 6, which may or may not be completely inclosed at the top. The sides of the tray approaching the spout converge, and at the commencement of this converging part the flat bottom of the tray is rounded up to meet the side walls of the beginning of the spout as at 26, and this curvature of the tray bottom and side walls may be increased farther on toward the spout so that the bottom of the tray at about the point 27 becomes concave and this concavity merges with the curvature of the spout. This curvature of the convergent walls, tray bottom and spout prevents to a notable degree the jamming of coins as they approach the discharge point and cause the coins to issue freely and rapidly from the discharge end of the tray when it is tilted.

Beneath the spout 6 is a handle or operating device 12 which may be depressed by the back of the hand of the customer, whereupon the palm of the same hand falls naturally into position below the spout as the tray is tilted, and coins placed upon the tray will slide through the spout into the hand without any appreciable chance of dropping. The spout is preferably provided with an upper and outward wall 13 to deflect and properly guide downward any coins that may shoot forward rapidly when the tray is tilted. The upper edge of the spout is defined by the upper margin 14 of the adjacent wall 13 of the spout, and in a preferred construction this margin 14 as it proceeds back toward the tray at the side nearest to the cashier is curved down to meet the normal surface of the tray at 15, near the spout and well away from the cashier. This leaves the long clear side 16 of the tray and the rear edge 17 of the tray flush with plate 1 and open to receive coins which are pushed toward the tray by the cashier. The natural movement of the cashier's hand in placing coins upon the tray is a quick forward and lateral sweep, and it is, therefore, very important to provide, as is done in Fig. 1, an extensive "opening" so to speak, or free space between the plate and the tray in the direction from which the coins will naturally come to enable the coins to be placed upon the tray in the most ripid and easy manner. At the side of the tray farthest from the cashier, is provided a guide flange 18. This may be located either on the plate 1 or on the tray. In Figs. 1 to 3 the flange 18 is attached to the tray. At its outward end the flange 18 may, as shown in these figures, merge into the outer wall 13 of the spout. The flange 18 serves as a stop for coins when they are pushed toward the tray to prevent them from going beyond it, and the flange also serves as a guide when the tray is tilted to direct the coins to the spout. In connection with the guide flange 18 and the open sides 16 and 17 of the tray, the preferred shape and arrangement of the tray with relation to the plate 1 shown in Figs. 1 to 3 is important. The edge 16 of the tray is not arranged at right angles to the front and rear edges of the counter but is inclined so that at the point nearest to the cashier the edge 16 of the tray is farther away from him than it is where it approaches the spout. The edge of the tray defined by the guide flange 18 is still further inclined in the same manner. This is more easily understood by reference to Fig. 3 and Fig. 6 in which the same general tray outline is embodied. In these figures the line *a*—*a* defines the main longitudinal axis of the tray or the plane in which the tray tilts, and on reference to this line it will be seen that the edge 16 of the tray nearest to the cashier is inclined to the median line so that the edge 16 diverges from the median line as it approaches the spout, while the edge 18 is inclined to the median line prefer-

ably at a still greater angle, converging, however, toward the median line as it approaches the spout. This provides an increased area toward the rear end of the tray to more easily receive and retain coins propelled toward it, and it also provides means by which any coins that are placed upon the tray are sure to be delivered through the spout in spite of the fact that in the preferred construction no guide flange is placed adjacent to the edge 16 of the tray. Evidently, any coin, such as the coin 19 (Figs. 1 and 6), if placed anywhere near the margin 16 of the tray, will, when the tray is tilted, by the influence of gravity slide substantially parallel to the line *a—a*, and, therefore, will not escape from the left margin of the tray in spite of the fact that no guide flange is there provided. Thus, a left hand guide flange for the tray is dispensed with, giving the cashier the greatest possible facility for placing coins upon the tray, and at the same time the proper movement of the coins toward the spout when the tray is tilted is provided for.

The angular arrangement of flange 18 is also important because when this flange is so arranged any coins which are swept toward the flange 18 in the normal directions in which they are moved by the cashier, with sufficient force to rebound from the flange, will rebound away from the spout instead of toward it. This reduces the possibility of coins rebounding from the guide flange and out of the spout before the tray is tilted to intentionally discharge the coin.

Figs. 1 and 2 show that the plate 1 may be provided with a guard flange 20 forming substantially a continuation of the flange 18 carried by the tray.

Figs. 4 to 7 inclusive show a modification in which guide flange 18^a for the right hand side of the tray is secured to the plate 1. The right hand edge 18^b of the tray is located so close to the flange that there is very little clearance and there is, therefore, no possibility of coins falling between the plate and flange. The flange is also made high enough so that when the rear part of the tray is in its uppermost position in tilting, the flange will still project above it sufficiently to form a guide for the coins. The margin of the spout 6 in this construction is discontinued at the point where a shoulder 21 is formed in the tray to accommodate the forward end of flange 18^a, so that in this construction the flange 18^a and the commencement of the lateral margin of the spout are substantially in line, and in operative effect continuous.

In Fig. 8 guide flanges 22 extend along the left side and the cashier's side of the plate 1 and may even be extended along the sides of the extension 3 as at 23, leaving however the front of the extension open for delivery of coins to the cashier's hand. In Fig. 8 also the construction of the tray is modified. The margins 16^a and 18^c of the tray are substantially parallel and also substantially at right angles to the front and rear edges of the counter. While this arrangement does not give such a wide area of tray and such certain delivery of coin from the tray when tilted as the other structure described, it still has notable advantages over previous constructions.

In Figs. 1 to 7 inclusive, the part of the plate 1 adjacent to spout 6 is formed with two slight projections 24 partially embracing the spout when the tray is in normal position. In Fig. 8, however, the plate adjacent to the spout is formed into a hood-like guard 25 completely surrounding the spout when the tray is in normal position. This guard prevents the hand or other part of the body of a customer from striking the spout of the tray when the tray is in normal position, and thus accidentally tilting it.

In some cases, as shown in Fig. 8, for example, the left hand margin 28 of the hood may be extended along the left hand side of the tray near the spout and this upstanding margin prevents coins from being pushed upon the tray too near to the spout, and takes the place of any guard flange on the tray for the same purpose.

An important feature of the invention when embodied in a preferred form as here shown is that the major part of the tray surface is flat, and flush with the surface of the counter or with the surface of the plate 1. This enables the cashier not only to easily place coins upon the tray but to remove them with equal facility if he desires to do so for any reason. To properly guide coins to the delivery end of the tray I provide suitable guide flanges or the like, and shape and arrange the tray suitably in relation to the counter. Thus I am enabled to make the surface of the tray flat and flush with the counter, as above stated.

It will be evident that the change trays can be duplicated so that one will be at each side of the cashier and in that case the tray at his left would be substantially a reversal of the one shown, that is the guide flange would be at the left side of the tray and the open side at the right. Or, in some cases where it would be desirable to have the change tray at the cashier's left, the device might be so arranged without any tray at the right. Words in this specification therefore which denote relative positions, such as "right" and "left," are used in the descriptive sense only and not as limitations.

I claim:—

1. In a change counter the combination with a relatively thick base, of a plate fixed thereon, the plate being provided with a

portion free from the base, said portion having a flat upper surface in the same plane as the top of the counter, and being relatively thin to facilitate the sweeping of coins from the plate into the hand of the user held below the edge of said relatively thin portion.

2. In devices of the class described, the combination with a counter of a change tray connected in tilting relation thereto, and a guide flange at one side of the tray to limit the movement of coins swept upon the tray from the counter and to guide the coins when the tray is tilted, the tray at the side opposite the guide flange being open to receive coins along a substantial part of its length, the edge of the tray at said open side being arranged at an angle to the tilting axis of the tray, so that coins will be retained upon the tray when tilted without the provision of guiding means at that side of the tray.

3. In devices of the class described, the combination with a counter, of a change tray connected in tilting relation thereto and having its upper surface flat and flush with the upper surface of the counter, and a guide flange at the side of the tray remote from the user to limit the movement of coins delivered upon the tray from the counter and to guide the coins when the tray is tilted, the tray at the side opposite the guide flange being open to facilitate moving coins to and from the tray, across the edge adjacent to the user, the said open side of the tray being arranged at an angle to the tilting axis of the tray, so that coins will be ratained upon the tray when tilted without the provision of guiding means at that side of the tray.

4. In a change-counter, the combination of a base, a plate thereon, a change tray pivoted on the plate and having a part flush with the plate, and a guide-flange at the side of the tray remote from the user, the side of the tray adjacent to the user being open for a substantial part of its length to receive coins swept toward the tray from the plate, the open side of the tray being arranged at such an angle that coins slide by gravity toward the discharge point of the tray when the tray is tilted.

5. Same as claim 4, with the addition that the side of the tray adjacent to the guide flange is arranged at such an angle that coins rebounding from the flange will tend to move away from the discharge end of the tray.

6. In a change counter, the combination of a base, a plate thereon, a change tray pivoted on the plate and having a part flush with the plate, and a guide flange at the side of the tray remote from the user, the side of the tray adjacent to the user being open for a substantial part of its length to receive coins swept toward the tray from the plate, the side of the tray adjacent to the guide flange being arranged at such an angle that coins rebounding from the flange will tend to move away from the discharge end of the tray.

7. In a device of the class described, the combination of a counter, a change tray pivoted thereon and having a projecting discharge member, and a hood located on the counter and serving to protect the discharge member of the tray when the tray is in normal position, a part of the hood being continued at one side of the tray to prevent coins being pushed onto the tray adjacent to the discharge end.

8. In a device of the class described, the combination of a counter, a change tray pivoted thereon, a guide flange at the side of the tray remote from the user, guide means at the near side of the tray near the delivery end, the guide flange and guide means converging toward the delivery end of the tray, the rearward portion of the tray being flat and flush with the top of the counter, and the surface of the tray near the delivery end being concave, the described arrangement of flange, guiding means and concave surface serving to prevent jamming of the coins as they slide toward the delivery end of the tray.

9. In a device of the class described, the combination of a counter, a change tray pivoted in relation thereto, the rearward surface of the tray being substantially flat and flush with the counter, the other end of the tray being formed into a delivery spout, an upstanding guide flange at the side of the tray remote from the normal position of the user, said flange being arranged at such an angle that coins striking it tend to rebound away from the delivery end, the side of the tray near the user being open for a substantial part of its length, the edge of the tray at that side being arranged at an angle to the tilting axis, so that coins placed on the tray adjacent to said edge tend to move inward from the edge when sliding toward the spout, and means to prevent coins being pushed upon the tray at a point adjacent to the spout.

10. The same as claim 9, with the addition that convergent guides are placed at opposite sides of the tray adjacent to the spout, and the surface of the tray approaching the spout is concave, to prevent jamming of coins.

11. In a change counter, the combination of a counter, a change tray connected in tiltable relation with the counter, a guide-flange along one side of the tray, and a flange carried by the counter and constituting substantially a continuation of the first-named flange when the tray is in normal position.

12. In change-handling apparatus, the

combination with a counter of a tray pivoted in relation thereto, the tray being open along a substantial part of one side to receive coins, and a guard flange at the opposite side of the tray to limit movement of coins toward that side, the flange being arranged at an angle diverging considerably rearwardly from the longitudinal axis of the tray, to affect the direction of rebound of coins from said flange to cause coins rebounding therefrom to move away from the delivery end of the tray.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."