

Nov. 26, 1935.

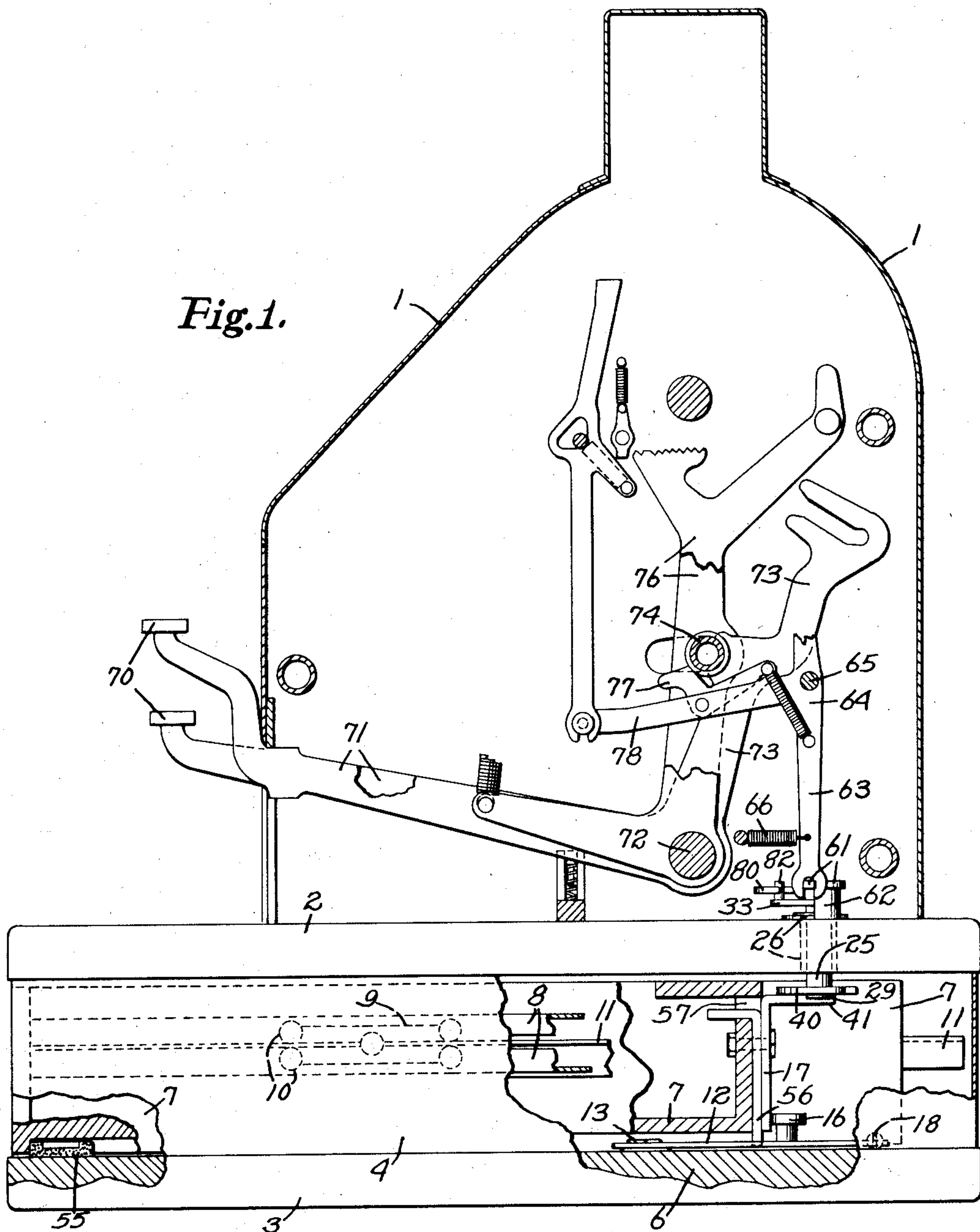
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2,022,385

LATCH

Filed Sept. 15, 1933

3 Sheets-Sheet 1



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3 Sheets-Sheet 2

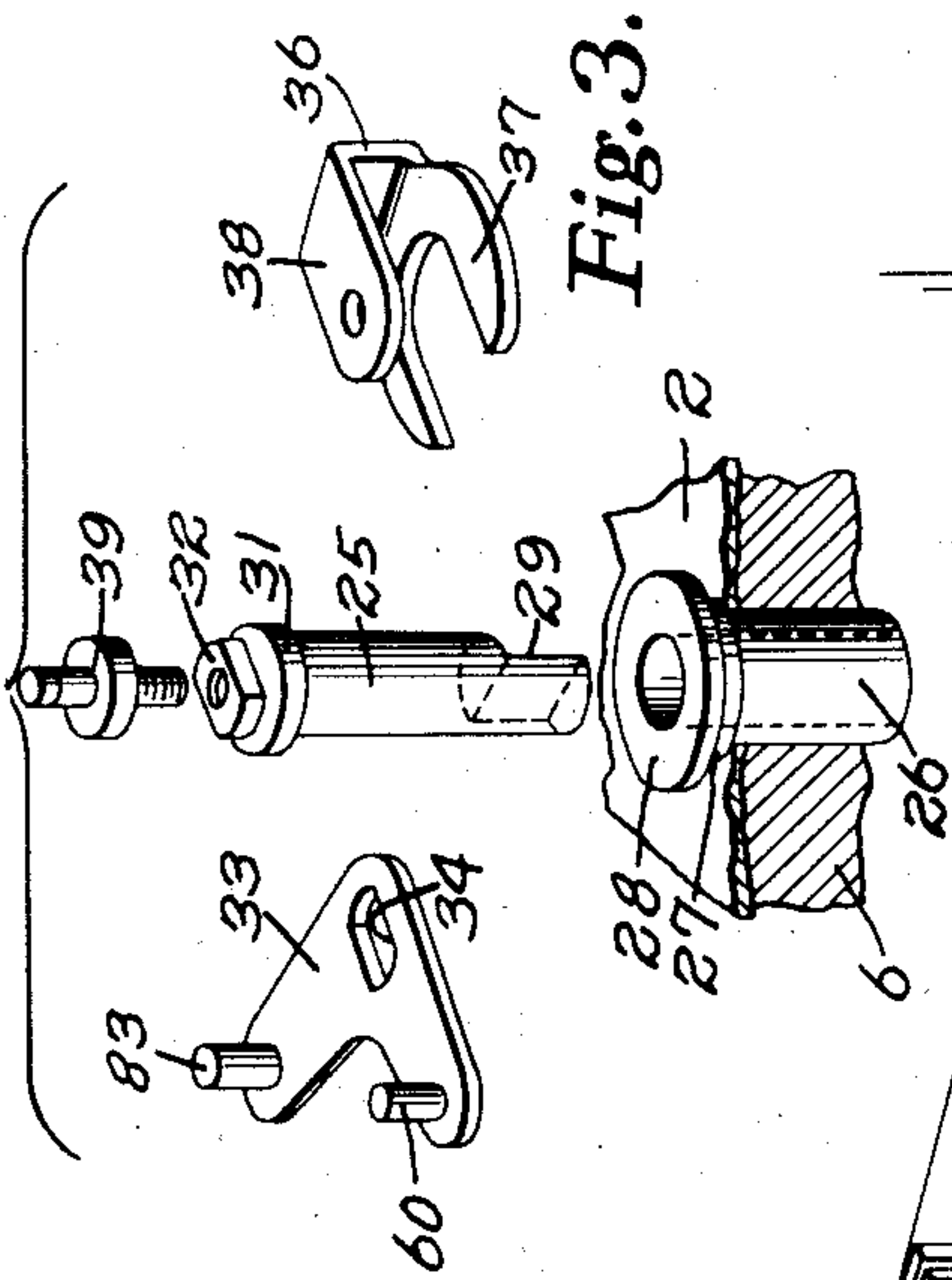


Fig. 3.

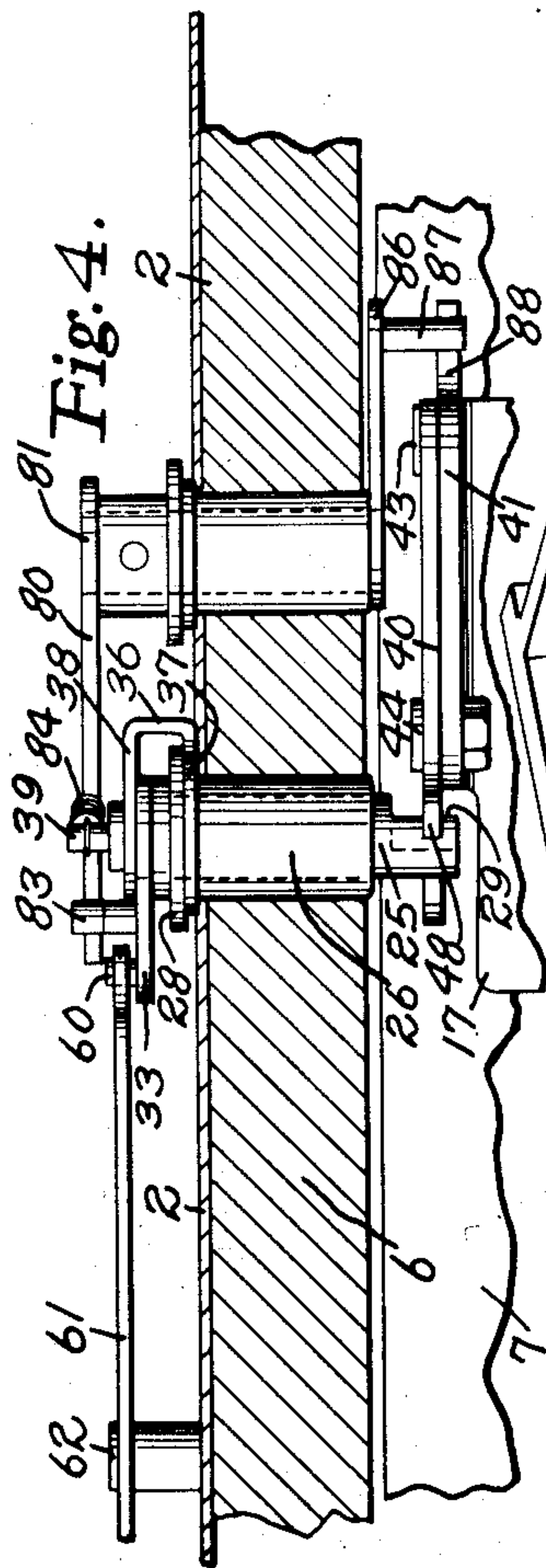


Fig. 4.

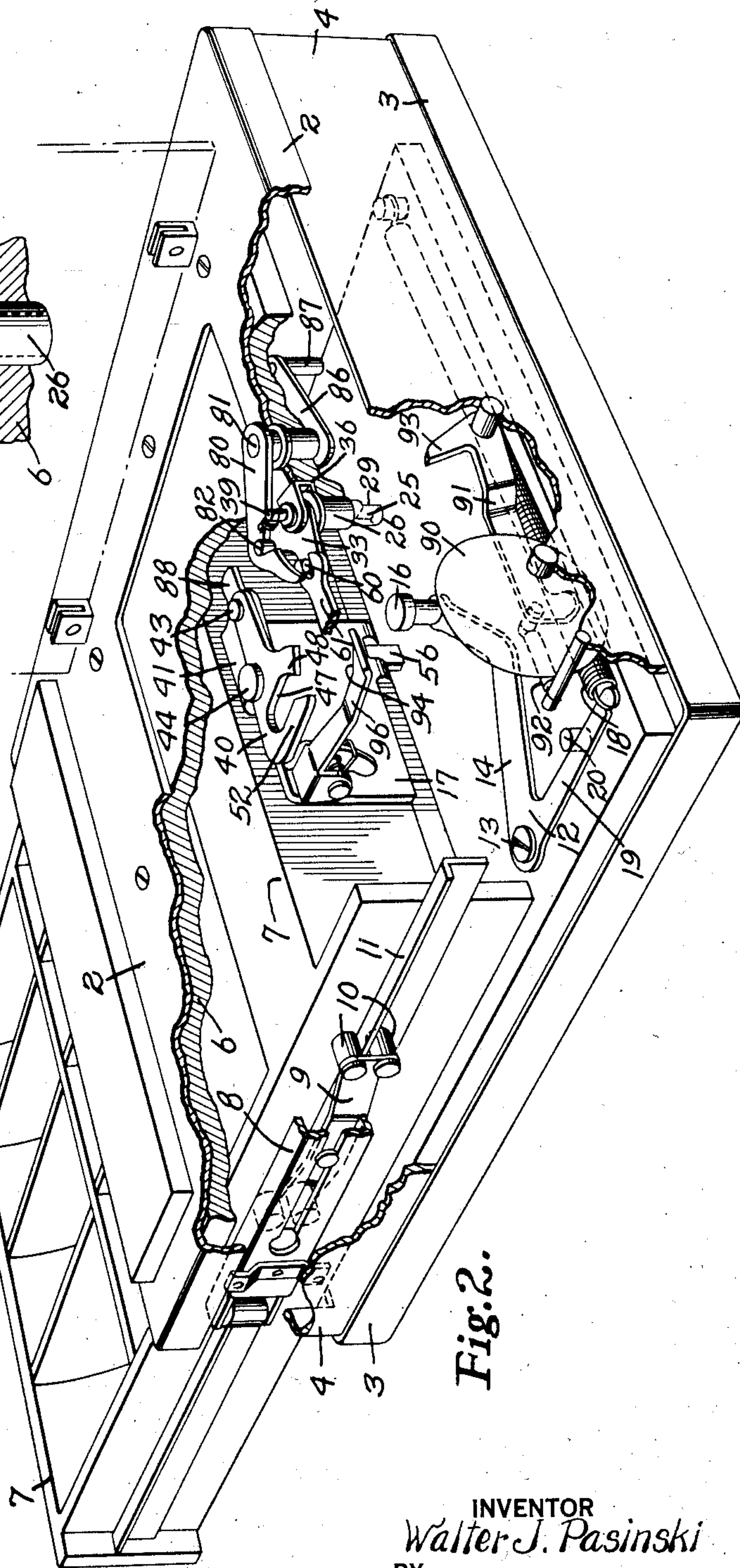


Fig. 2.

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LATCH

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Application September 15, 1933, Serial No. 689,664

6 Claims. (Cl. 235—22)

This invention relates to cash drawers adapted to be used in cash machines and more particularly to opening and latching mechanisms therefor.

The usual type of cash drawer lock employs a
5 bodily movable latching member having a hooked nose spring-pressed over a strike or latch plate. This construction which embodies what may be termed a bodily movement of the latching member not only permits of no adjustment whereby
10 the front of the cash drawer may be adjusted relatively to the cash drawer housing, but offers considerable frictional resistance to movement of the latch member relatively to its latch bar or strike and therefore decreases the sensitivity of
15 the latch and increases the effort necessary to release the latch to permit opening of the cash drawer.

It is the general object of this invention to provide improved cash drawer opening and latching mechanisms.

It is a more particular object of this invention to provide an improved cash drawer latch which overcomes the foregoing difficulties.

It is a further object of this invention to provide a latch which is self-centering.

Other objects and their resultant advantages will be apparent from the following description given in connection with the drawings in which:—

Figure 1 is a right side sectional elevation of
30 a cash register and a cash drawer embodying the latch of this invention with the right side of the casing and other parts of the mechanism removed but showing the main controls of the cash register in normal position.

Fig. 2 is a perspective view of the cash drawer housing, cash drawer and associated latching mechanism, taken from the rear, parts of the housing being cut away and parts of the mechanism being omitted to better illustrate other portions.

Fig. 3 is a spread perspective of the cash drawer latching shaft and mounting elements looking from the rear.

Fig. 4 is a sectional elevation taken from the rear and illustrating the cash drawer latch and drawer in closed position.

Fig. 5 is a partial plan view of the cash drawer and latch illustrating the drawer in closed position from the rear of the machine.

Fig. 6 is a similar view to Fig. 5 illustrating the cash drawer and latch in open position; and

Fig. 7 is a diagrammatic plan detail illustrating the latching shaft and strike or keeper in position assumed when the cash drawer is being

closed by the operator, and at the moment the strike engages the half round shaft.

For purposes of illustration, the cash drawer is shown as being applied to a cash register, in which case it is disposed below the cash register mechanism (Fig. 1) which latter mechanism is enclosed in a sectional casing 1 not described or claimed in this application but which constitutes the subject matter of my co-pending application, Serial No. 689,662, filed September 15, 1933.

Drawer housing

The cash drawer is enclosed within a cash drawer housing disposed beneath the cash register mechanism housing. The drawer housing 15 comprises generally an upper flanged plate 2, a lower flanged plate 3 and a U-shaped wall member 4 secured to the upper and lower plates. The upper and lower plates may, and preferably are, lined with sound-deadening plates 6. The cash drawer housing constitutes no part of this invention and is therefore not described in detail. For further details of this construction reference is made to my co-pending application, Serial No. 689,663, filed September 15, 1933 and to my heretofore mentioned copending application, Serial No. 689,662.

Drawer mounting

The cash drawer 7 may be made of wood or any other material and is usually partitioned off to provide suitable compartments for the various denominations of currency. The drawer is mounted for sliding movement into and out of the cash drawer housing by means of U-shaped tracks 8 (Figs. 1 and 2) secured to each side wall of the cash drawer housing, which tracks guide and retain roller carriages 9 carrying rollers 10 and cooperate with L-shaped tracks 11 secured to each side of the drawer. The drawer mounting means is described only briefly in that it constitutes no part of this invention, being made the subject matter of my co-pending application, Serial No. 689,663, filed September 15, 1933 to which reference is made for further details thereof.

Drawer opening means

It is desirable that the drawer always open with a uniform speed that is not materially affected by the weight of the contents of the drawer and without the objectionable "kick out" usually present in cash drawers.

For this purpose, a crank 12 is pivoted at 13 to the lower housing plate. One arm of the crank is provided with an upstanding lug 16 which en-

gages a plate 17 secured to the rear of the drawer. The other arm of the crank 12 is attached to one end of a relatively long tension spring 18 extending substantially entirely across the lower plate and having its other end secured by a pin to the lower plate at the opposite side thereof. The spring tends to rotate crank 12 counterclockwise to normally open the drawer. The movement of the crank is limited, however, by a pin 20 engaging the arm of the crank to which the spring is applied to limit the effect of the crank upon the drawer to a portion of its opening movement only, after which the drawer is free to travel by momentum or under manual control of the operator.

The foregoing opening means provides a substantially uniform and easy opening effort on the drawer which eliminates sudden "kick out" and the added effort necessary to return the drawer to closed position against short compression springs, particularly as it approaches closed position.

Latch mechanism

In order to reduce the effort necessary to operate the latch and reduce the resistance offered by the heretofore used, bodily movable hooked latch members which have a bodily sliding movement with respect to the keepers or strikes, I have provided a rotary latching member or shaft which does not move bodily but merely rotates upon its own axis. The latching member is restricted from bodily movement and is arranged to have a relatively small surface engagement with its latching plate or strike, all of which contributes toward reducing the frictional resistance that the latch offers to being released.

For this purpose a vertical locking post or shaft 25 is supported at the rear of the upper housing member 2 and its associated lining 5 by means of a bushing 26 pressed into a suitable opening provided in the upper casing and lining. Adjacent its upper end the bushing is provided with a shoulder 27 which limits the downward movement of the bushing through the casing 2 and at its upper end above shoulder 27 with a larger flange 28, the purpose of which will later appear. The lower end of the shaft 25 is cut away to provide a half round portion 29 which projects below the top of the drawer housing and engages the latch keeper or strike as will be later explained. Adjacent its upper end shaft 25 is provided with a flange or shoulder 31 which limits the downward movement of the shaft in the bushing and at the extreme upper end is flattened upon two sides to provide a flat sided end portion 32 adapted to receive a plate 33 having a similarly shaped aperture 34 (Fig. 3).

Latch post 25 is retained within bushing 26 by means of a yoke, the lower arm 37 of which is bifurcated and fits the shoulder 27 of sleeve 26. The upper arm 38 overlies the top of shaft 25 and is provided with an aperture through which a screw 39 passes to retain yoke 36 and plate 33 upon the upper end of shaft 25 and thereby retains shaft 25 within bushing 26, the lower end 37 of yoke 36 lying below the enlarged flange 28 of sleeve 26 which prevents upward movement of the yoke 36, shaft 25 and plate 33.

The half round end 29 of shaft 25 cooperates with a latch plate or strike 40 attached to the rear end of the drawer by a plate 17. Plate 17 is secured to the rear end of the drawer and is provided with a rearwardly extending shelf or flange 41 to which is pivotally and adjustably secured

the latch plate or strike 40 by means of a pivot 43 and an adjusting bolt 44. Bolt 44 extends through a circular hole in strike 40 and an arcuate slot 45 in shelf 41 to permit lateral adjustment of strike 40 whereby the front edge of the drawer may be adjusted relatively to the front wall of the drawer housing.

The free end of the strike 40 is formed with a slot 47 of sufficient width to receive the full diameter portion of locking post 25. The entrance to slot 47 is restricted by an abutment 48 which extends towards the outer end leg 49 of the latch plate sufficiently close thereto to prevent passage of the full diameter portion of the locking post 25 into and out of the slot as shown in Fig. 5, but to permit passage therethrough of the half round portion as shown in Fig. 6 when properly presented. In other words the latch plate and locking post are so proportioned and disposed that when the half round lower end of post 25 lies within slot 47 with the circular portion against abutment 48 the drawer is latched in closed position and when the shaft is rotated to present the flat surface to the abutment it is free to enter or to pass out of the slot 47.

The abutment 48 is provided with an inclined cam edge 51 which engages the flat surface of the shaft and cams or rotates the shaft clockwise as illustrated in Fig. 7 when the drawer is closed manually until projection 48 is cleared and the locking shaft is restored counterclockwise to latch the drawer in closed position. The end leg 49 of the strike is also provided with an inclined or cam edge 52 which serves to center and guide the shaft 25 into the slot should the strike be out of alignment with the locking post due to the drawer being forced to one side when being closed. It will be understood that for latching purposes only the end portion 49 with its inclined or cam edge 52 can be omitted entirely.

It follows from the foregoing that when the drawer is closed and the lower half circular portion 29 of locking post 25 is turned so that the semi-circular portion thereof engages lug 48 as shown in Fig. 5, the drawer is prevented from moving forwardly. When it is desired to open the drawer, post 25 is rotated slightly clockwise until the front surface of the circular portion is aligned straight to the front. This releases the hold of post 25 on the latch plate and the semi-circular portion can then pass through the restricted opening, that is, pass abutment 48 and permit crank 4 and spring 18 to move the drawer to open position.

Inward movement of the drawer is limited and cushioned by a rubber bumper 55 which engages a depending ledge of the front of the drawer (Figure 1). The outward movement of the drawer is limited by a slide 56 (Figs. 1 and 2) which engages bumper 55 at the extreme outer limit of the outward movement of the drawer. In order to remove the drawer completely, the slide may be raised by engaging the upper end which is bent inwardly and extends through the rear wall of the drawer as at 57.

Latch operating means

Any suitable means may be provided for rotating the locking shaft to latch and release the cash drawer. In the present instance the latch is operated from the cash register mechanism. For this purpose one arm of plate 23 is provided with a stud 60 which is engaged by the forked end of a lever 61 pivoted at 62 to the upper plate 2 of the cash drawer mounting. The other end

of lever 62 is engaged by the lower forked end of the lower vertical arm 63 of a three-armed crank lever 64 of the cash register mechanism pivoted at 65 to one of the frame members of the cash register. The lever 63 is normally urged clockwise by a spring 66 which also tends to rotate lever 61 clockwise and thereby rotate locking shaft 25 counterclockwise to urge the half-round portion thereof into locking position as shown in Figs. 4 and 5, after said half round portion has passed into the slot 47.

In the present application of this invention it is intended that the cash drawer be opened each time an amount is registered in the cash register. Accordingly, lever 64 is actuated at each depression and release of a cash register key 70.

Referring to Fig. 1 it will be seen that the cash register keys 70 are attached to key levers 71 pivoted upon a shaft 72 and having upwardly extending arms 73 which engage a shaft 74, carried by a pair of full stroke levers 76. Shaft 74 engages a passby pawl 77 pivoted to a horizontal forwardly extending arm 78 of the three-armed crank lever 64.

Upon depression of any key 70 and forward movement of shaft 74 passby pawl 77 moves about its pivot without moving arm 78 of the three-armed crank lever. Upon return movement of a key 70 and the corresponding key lever 71, shaft 74 engages the forward end of passby pawl 77 which cannot rock clockwise about its pivot and therefore moves arm 78 downwardly, thus rotating the crank lever 63 and accordingly lever 61 and locking shaft 25. This movement of shaft 25 presents the flat face of the half round portion 29 thereof to the abutment 48 and permits the shaft to slide out of slot 47 permitting the cash drawer to open under action of the spring 18 and bell crank lever 12.

Latch detent

In some cases it is desirable to retain the latching shaft in open position rather than permit it to be returned by spring 66 to locking position immediately after the drawer is opened. For this purpose, there is provided a detent 80 secured to a stud 81 journaled in the top plate of the cash drawer housing. The detent is provided with a notch 82 adapted to receive a pin 83 projecting upwardly from a second arm of plate 33. The detent is normally rotated counterclockwise about its pivot by a spring 84 from which it follows that when shaft 25 is rotated clockwise by the cash register key mechanism or any other means to open position, pin 83 will be received in notch 82 and the shaft will be retained in open position.

An arm 86 is secured to the lower end of stud 81 for releasing the detent upon closing of the cash drawer. Arm 86 carries a downwardly projecting pin 87 which projects into the path of a finger 88 projecting laterally from shelf 41 of plate 17. As the drawer is closed therefore finger 88 engages pin 87, rocks detent 80 clockwise, thus releasing pin 83 from the notch 82.

Bell mechanism

A bell mechanism is also provided which strikes each time the cash drawer is opened. This mechanism comprises a bell 90, which is struck by an arm 91 pivoted to the cash drawer housing and normally held in horizontal position by a spring 92. This striking arm is provided with an upstanding finger 93 at its outer end which is engaged by the inclined side cam edge 94 of an arm

96 pivoted to a bracket on end plate 17. Upon opening movement of the drawer the clockwise movement of the arm 91 will tension the spring 92 so that when the cam edge 94 passes beyond the finger 93 the bell will be struck a percussive blow by a hammer on the end of arm 91. Upon closing movement of the drawer the upturned end of arm 96 slides over finger 93 thus raising the pivoted arm over the finger 93 so that the latter is not moved by arm 96.

From the foregoing description it will be apparent that there has been provided a latching mechanism for a cash drawer which offers a minimum resistance to release of the cash drawer, although the cash drawer is normally spring-pressed against the latch. The latch is readily and very easily operated and when used on a drawer in connection with a cash register mechanism offers substantially no resistance to operation and substantially no additional load upon the cash register operation. This ease of operation is obtained in part at least by the use of the rotary latching member which does not move bodily and which must merely be rotated to a slight arc of revolution. Furthermore the latch plate or strike is adjustable so that the front edge of the drawer may be brought flush with the front edge of the housing. Other novel features will be apparent to those skilled in the art to whom it will also be apparent that minor changes may be made in the details of construction without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A cash drawer assembly comprising a housing, and a drawer slidably mounted therein, means for urging said drawer to open position, and a latch for securing said drawer in closed position, said latch comprising a member having a reduced portion, a strike provided with a slot having a reduced entrance and adapted to permit passage of said member therethrough when turned in one position, and to prevent passage of said member therethrough at other positions of said member, and means for moving said member to different positions.

2. A drawer assembly comprising a housing, a drawer therein mounted for sliding movement into and out of said housing, means for urging said drawer to open position, and a latch for securing said drawer in closed position, said latch comprising a rotary shaft having one end reduced in diameter, a strike having a slot with a constricted portion positioned relatively to said shaft to permit passage of the reduced portion of said shaft when in one position but not when in other positions, and means for moving said shaft.

3. A cash drawer assembly comprising a housing, and a cash drawer slidably mounted therein, means for opening said cash drawer, a latch for securing said cash drawer in closed position, said latch comprising a rotary shaft having a reduced portion, a strike arranged to engage said shaft and to permit passage thereby when the reduced portion is presented thereto in one position, and to prevent passage thereby when in other positions, means for rotating said shaft to selectively vary the position of its reduced portion relatively to said strike, a detent for retaining said shaft when turned to permit passage of said strike, and means controlled by said cash drawer for releasing said detent.

4. A cash drawer assembly comprising a housing, a cash drawer slidably mounted therein,

means for normally urging said drawer to open position, a latch for securing said drawer in closed position, said latch comprising a rotary shaft having one end thereof formed with a half round portion, a strike secured to said drawer and having a slot therein, the entrance of which is restricted but wide enough to permit passage of the half diameter of said shaft when in one position and to prevent passage of said shaft therethrough, when in another position, said shaft being in the path of movement of said strike, and means for rotating said shaft to vary the position of said half round portion relatively to the entrance of said groove in said strike.

15 5. A cash drawer assembly comprising a housing, a cash drawer slidably mounted therein, means for normally urging said drawer to open position, a latch for securing said drawer in closed position, said latch comprising a rotary
20 shaft having one end thereof formed with a half-round portion, a strike secured to said drawer

and having a slot therein having a constricted portion, the entering edges of said slot being inclined to serve as a means for guiding the shaft into said slot, and means for rotating said shaft to cause it to engage or disengage said strike. 5

6. A cash drawer assembly comprising a housing, a cash drawer slidably mounted therein, means for urging said drawer to open position, and a latch for securing said drawer in closed position, said latch comprising a cylindrical member rotatable about its own axis, a strike having a projecting abutment thereon positioned to engage said rotary member, and means for rotating said member to selectively cause it to engage or disengage said strike, said abutment having a cam surface arranged to engage and rotate said member when said member and strike are moved toward each other without first rotating said member to open position. 10 15 20

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