

- [54] **RECEPTACLE CARRIER FOR AN  
AUTOMATIC CONVEYING SYSTEM**
- [76] Inventor: **Robert L. Cahn**, 257 Grand Central  
Ave., Amityville, N.Y. 11701
- [22] Filed: **Feb. 28, 1972**
- [21] Appl. No.: **229,735**
- [52] U.S. Cl. .... **198/131, 198/179**  
[51] Int. Cl. .... **B65g 17/00**  
[58] Field of Search 198/179, 210, 131; 24/230 AK,  
24/230 AL, 230 AM, 230 AN

3,655,031	4/1972	Cahn.....	198/138
3,077,973	2/1963	Sieburg.....	198/179
1,059,381	4/1913	Moffet.....	198/179
3,082,856	3/1963	Larsen.....	198/210
3,094,349	6/1963	Schwalm.....	198/179

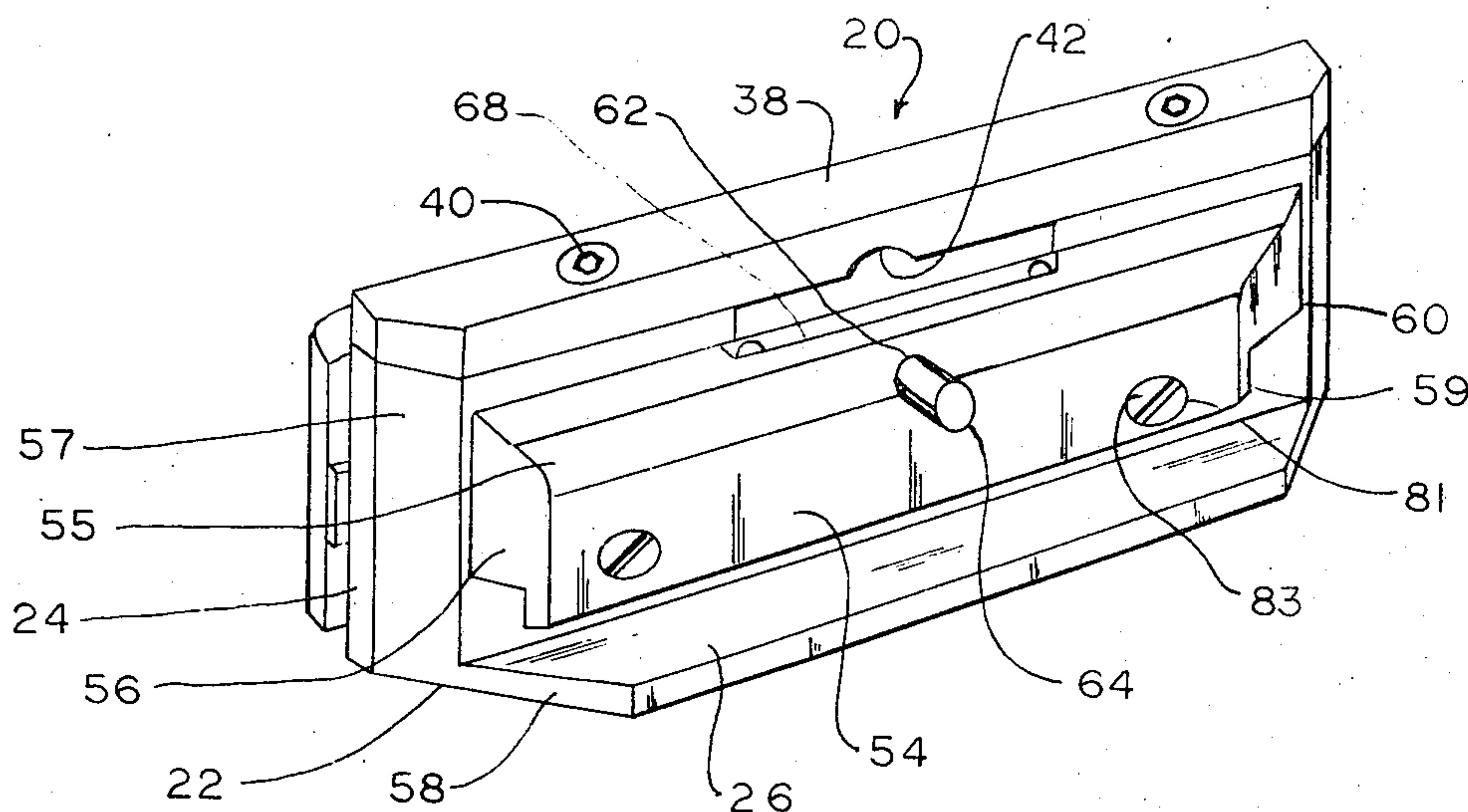
*Primary Examiner*—Richard E. Aegerter  
*Assistant Examiner*—Joseph E. Valenza

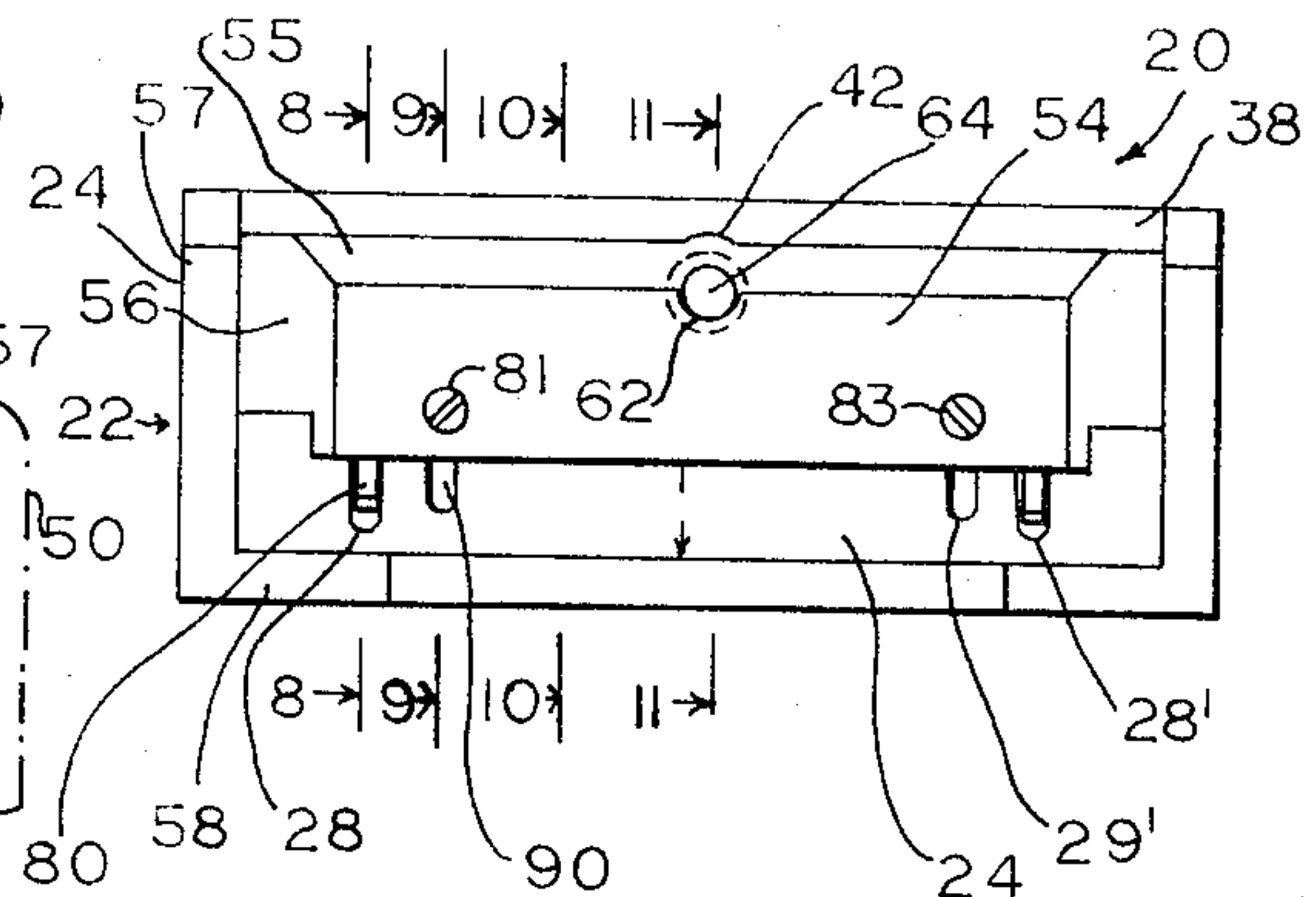
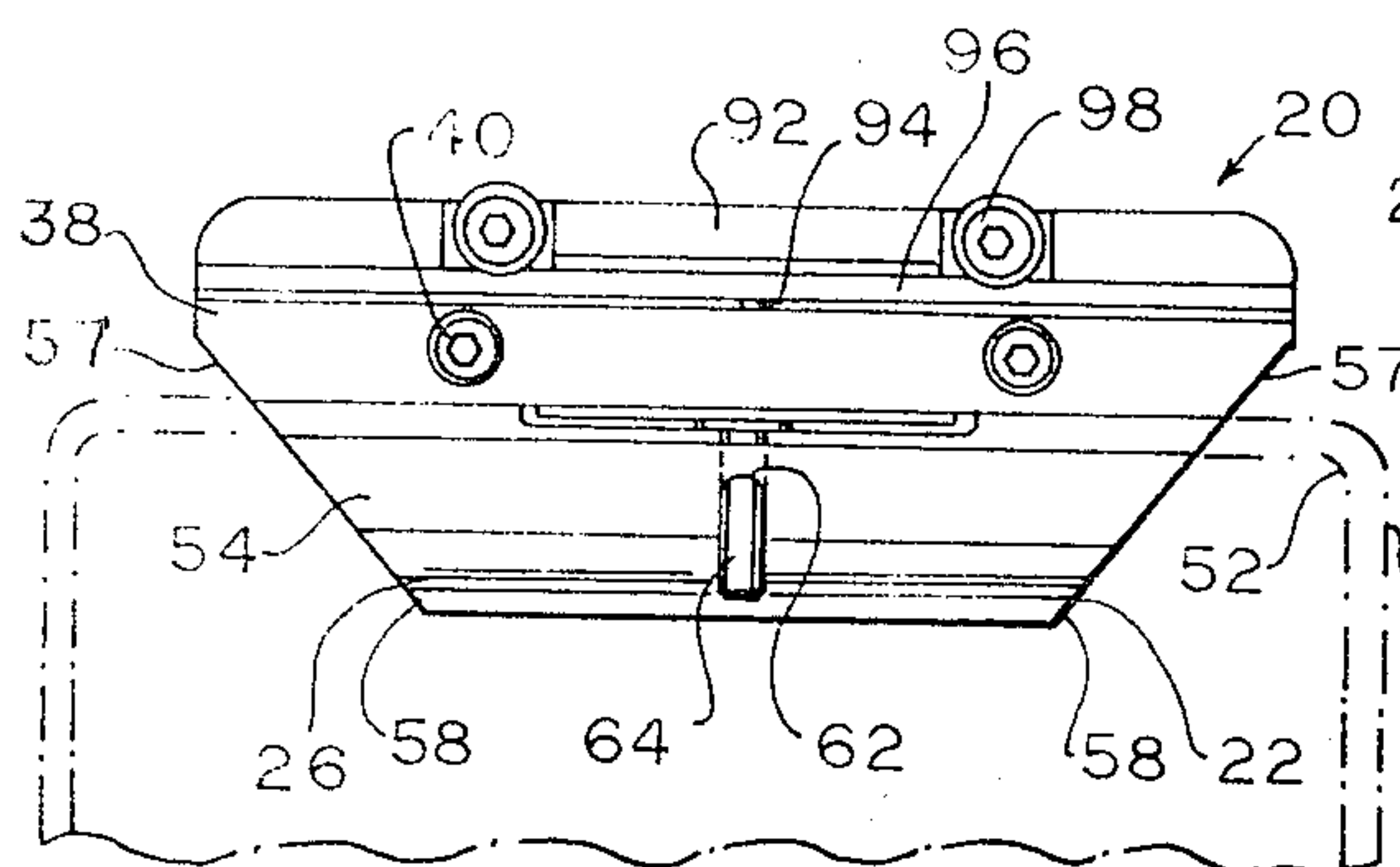
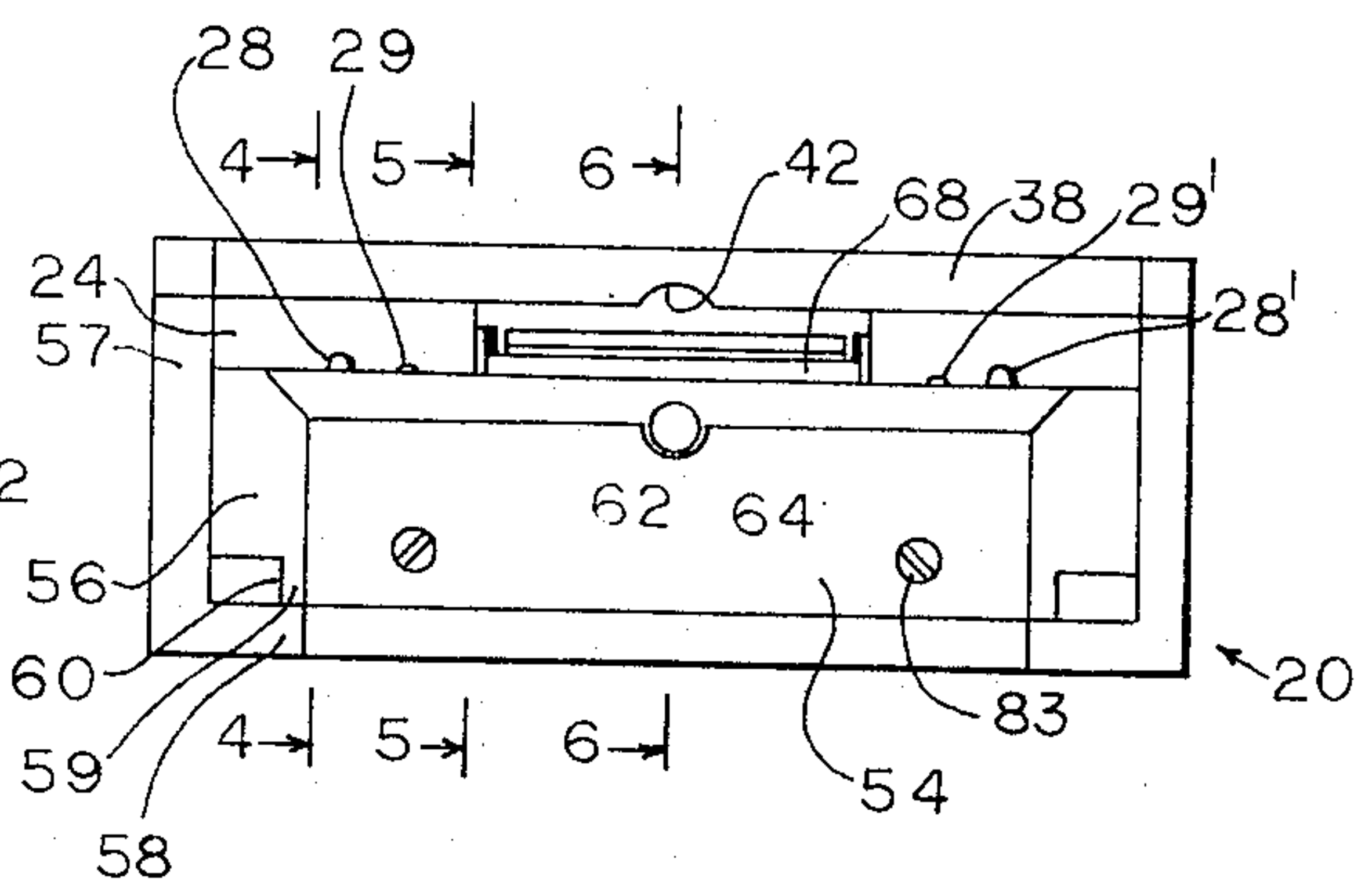
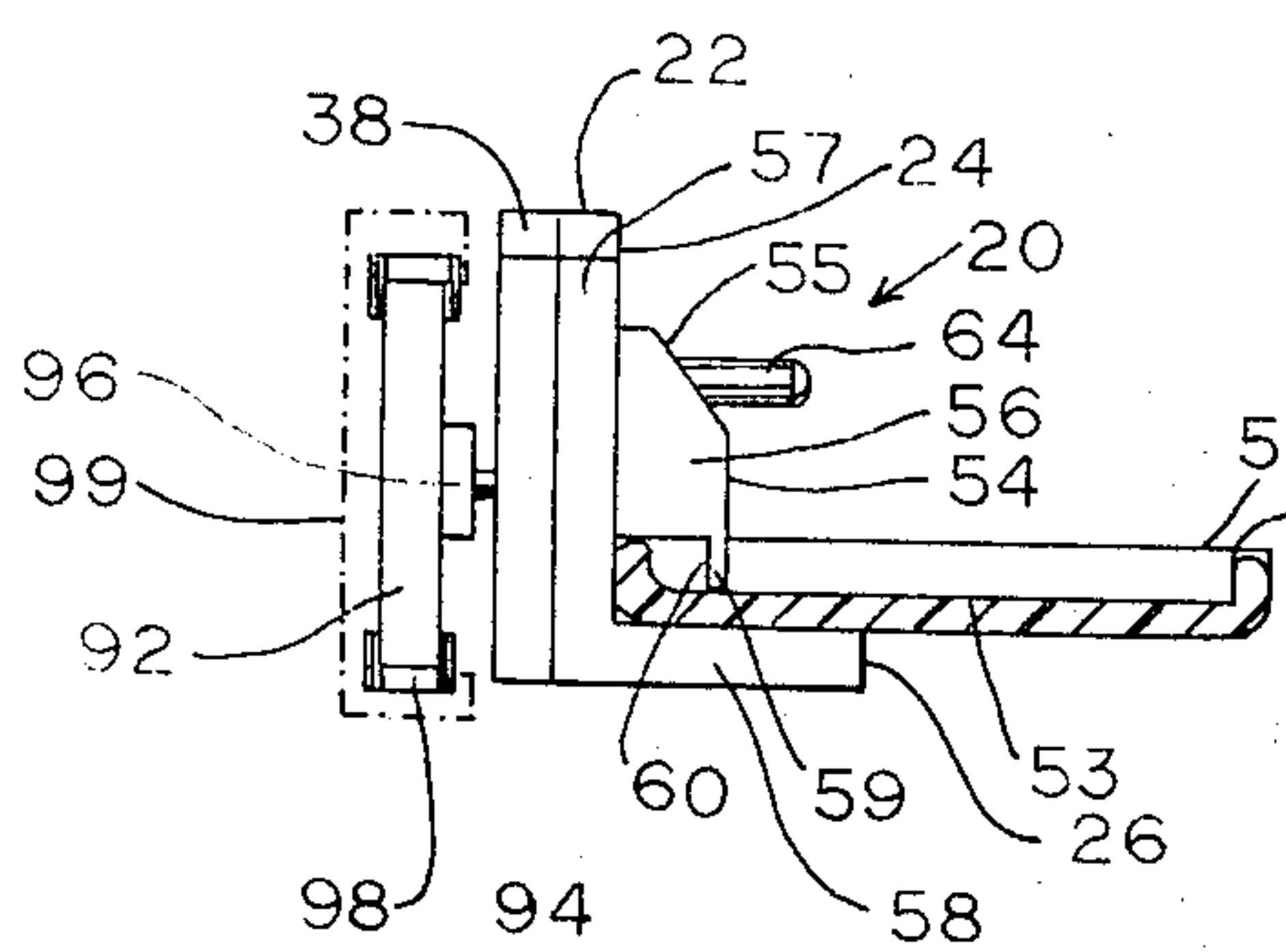
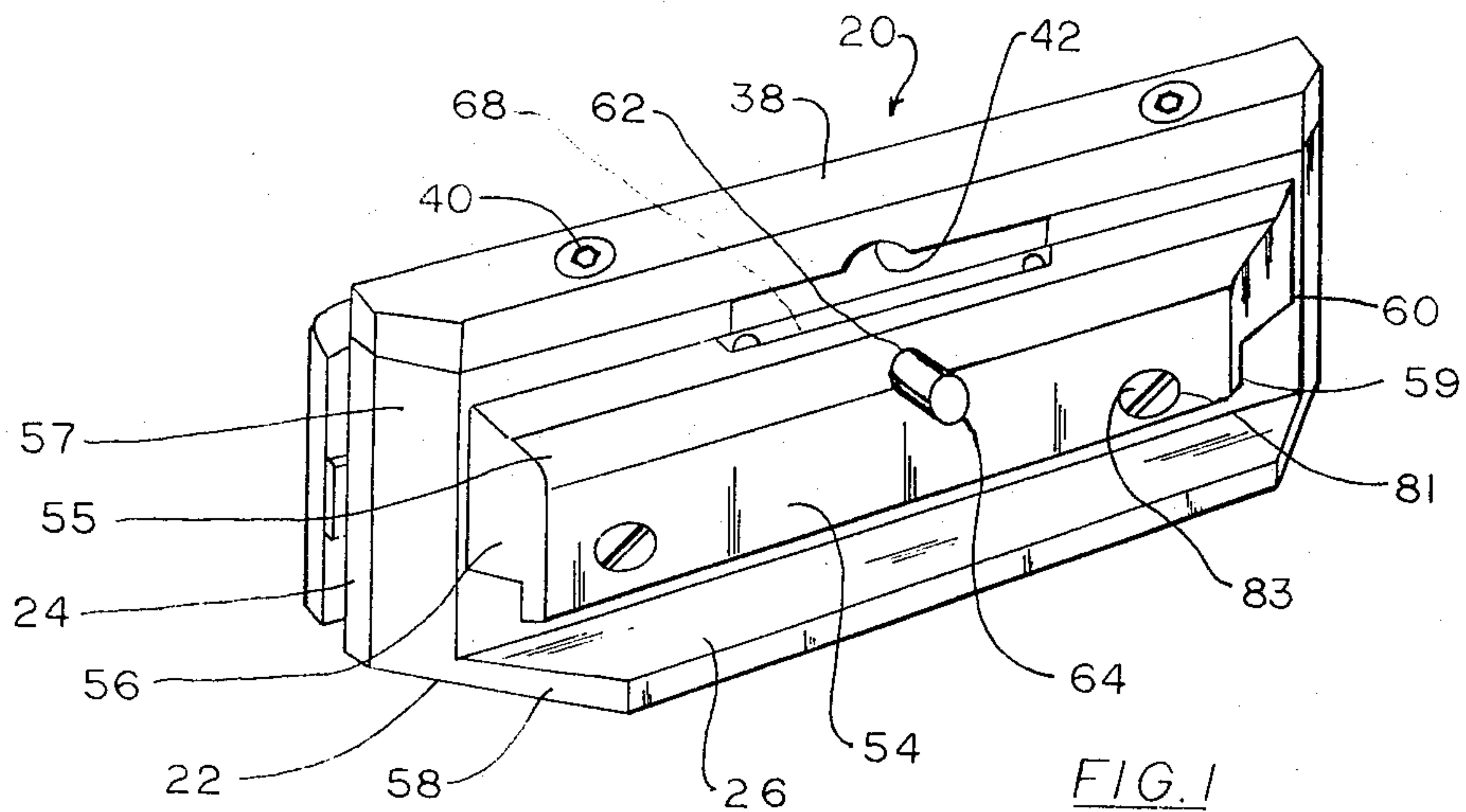
- [56] **References Cited**  
**UNITED STATES PATENTS**
- |           |         |            |           |
|-----------|---------|------------|-----------|
| 3,348,869 | 10/1967 | Zern.....  | 24/230 AL |
| 3,100,637 | 8/1963  | Brown..... | 271/79    |

[57] **ABSTRACT**

A carrier for an automatic conveying system includes an L-shaped support for a receptacle such as a tray. A flat plate movably mounted on the L-shaped plate is biased downwardly to engage the receptacle with a pushbutton operated elevation means for raising the flat plate against the bias to release the receptacle.

**9 Claims, 13 Drawing Figures**







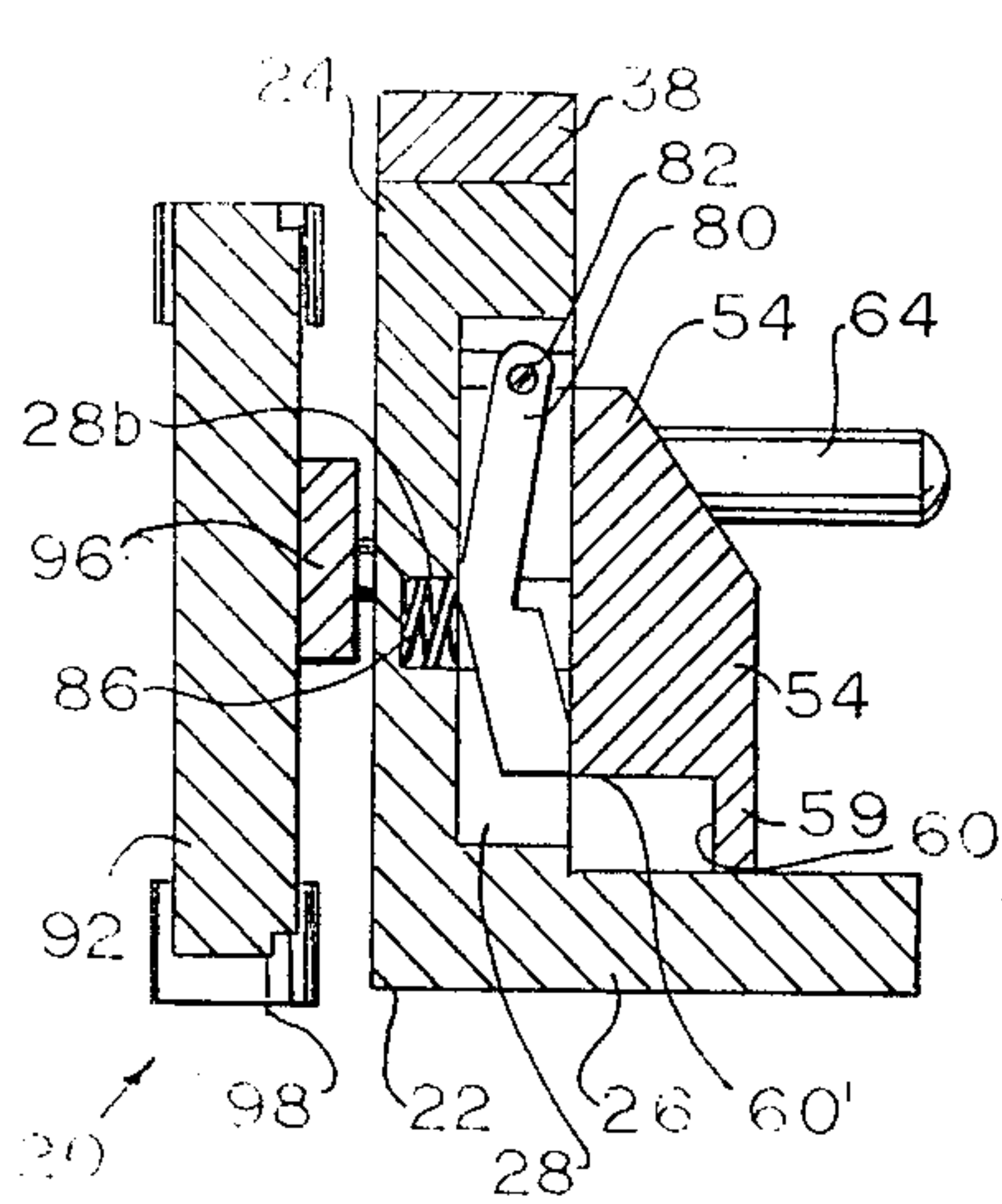


FIG. 4

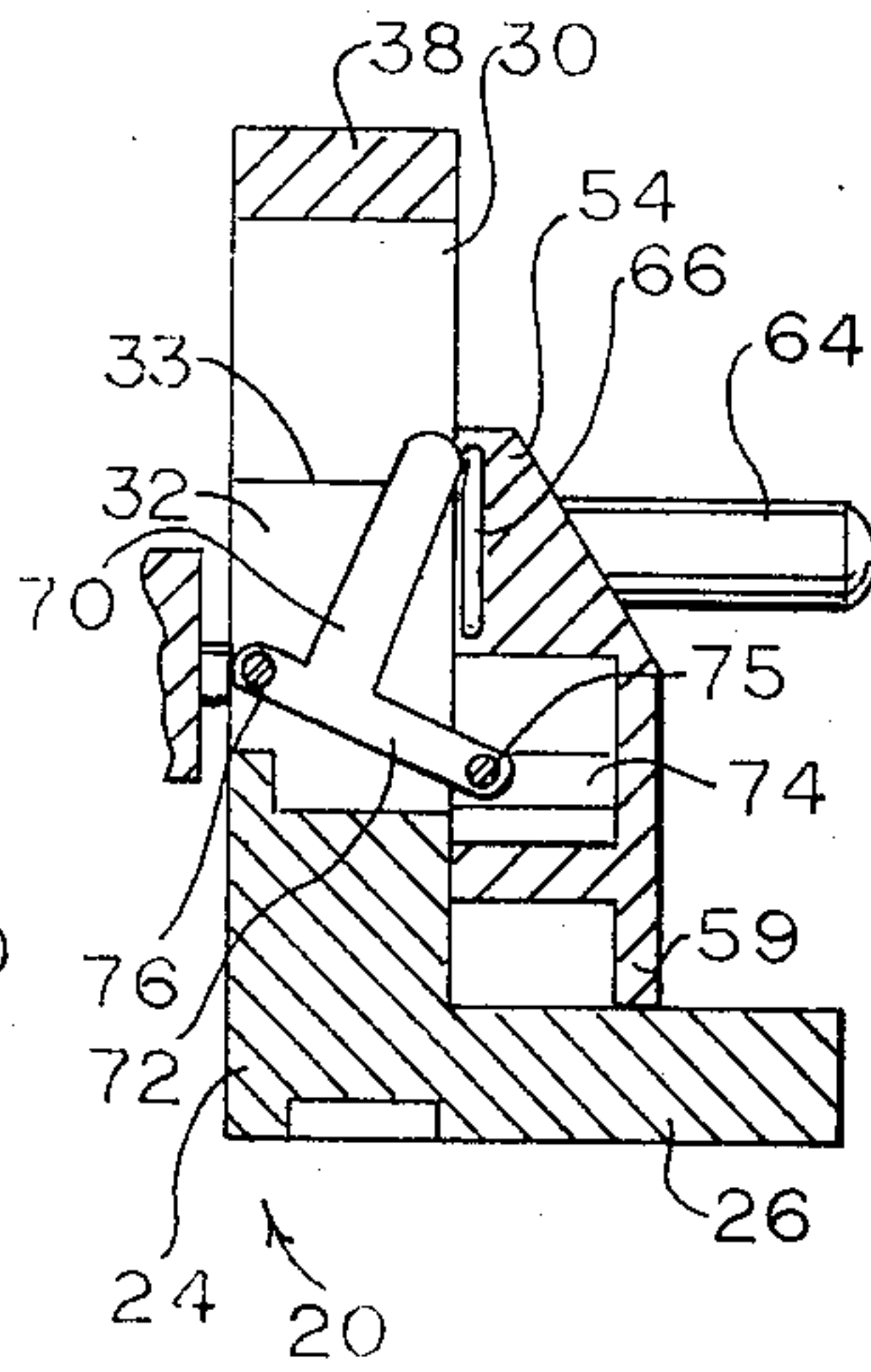


FIG. 5

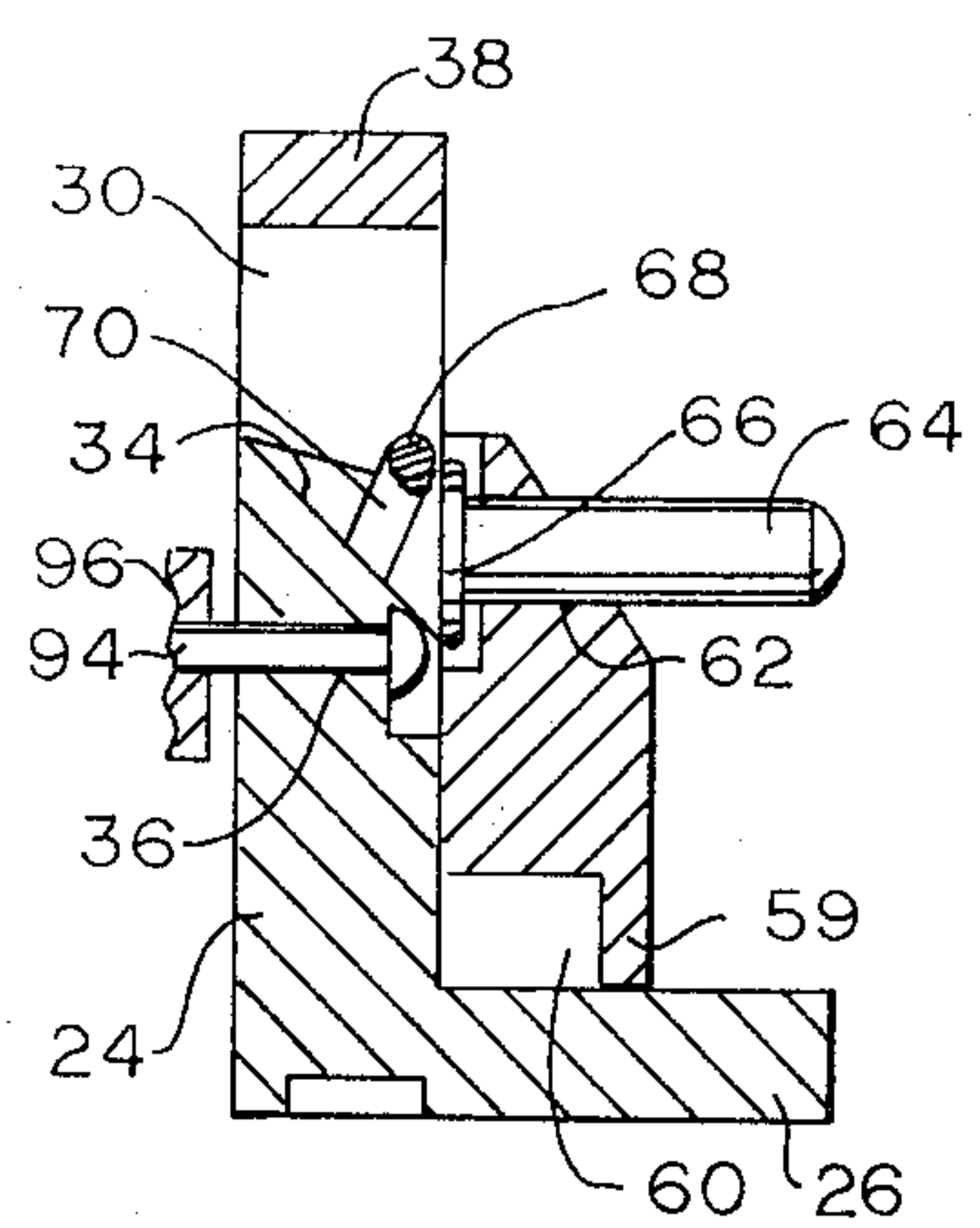


FIG. 6

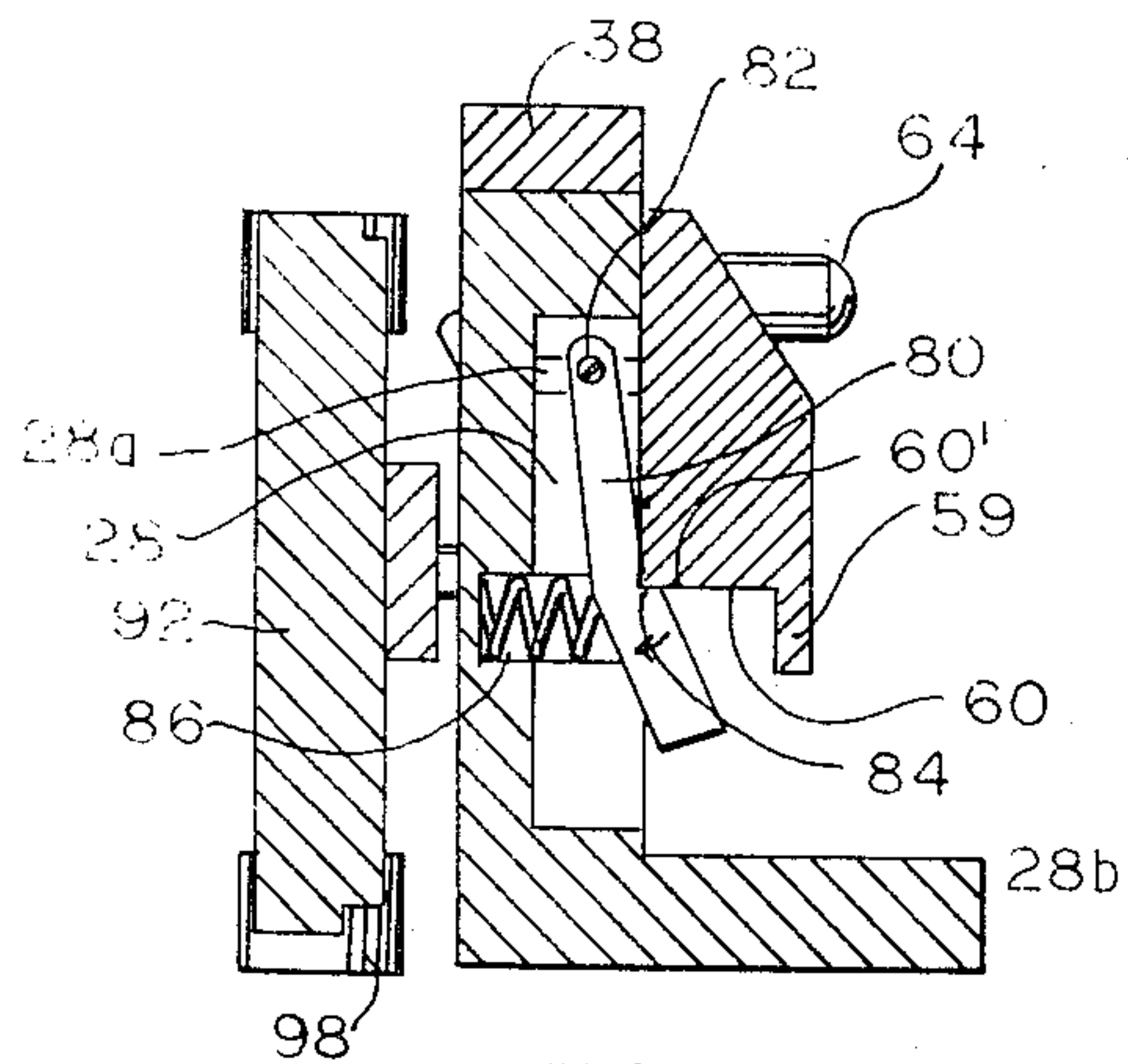


FIG. 8

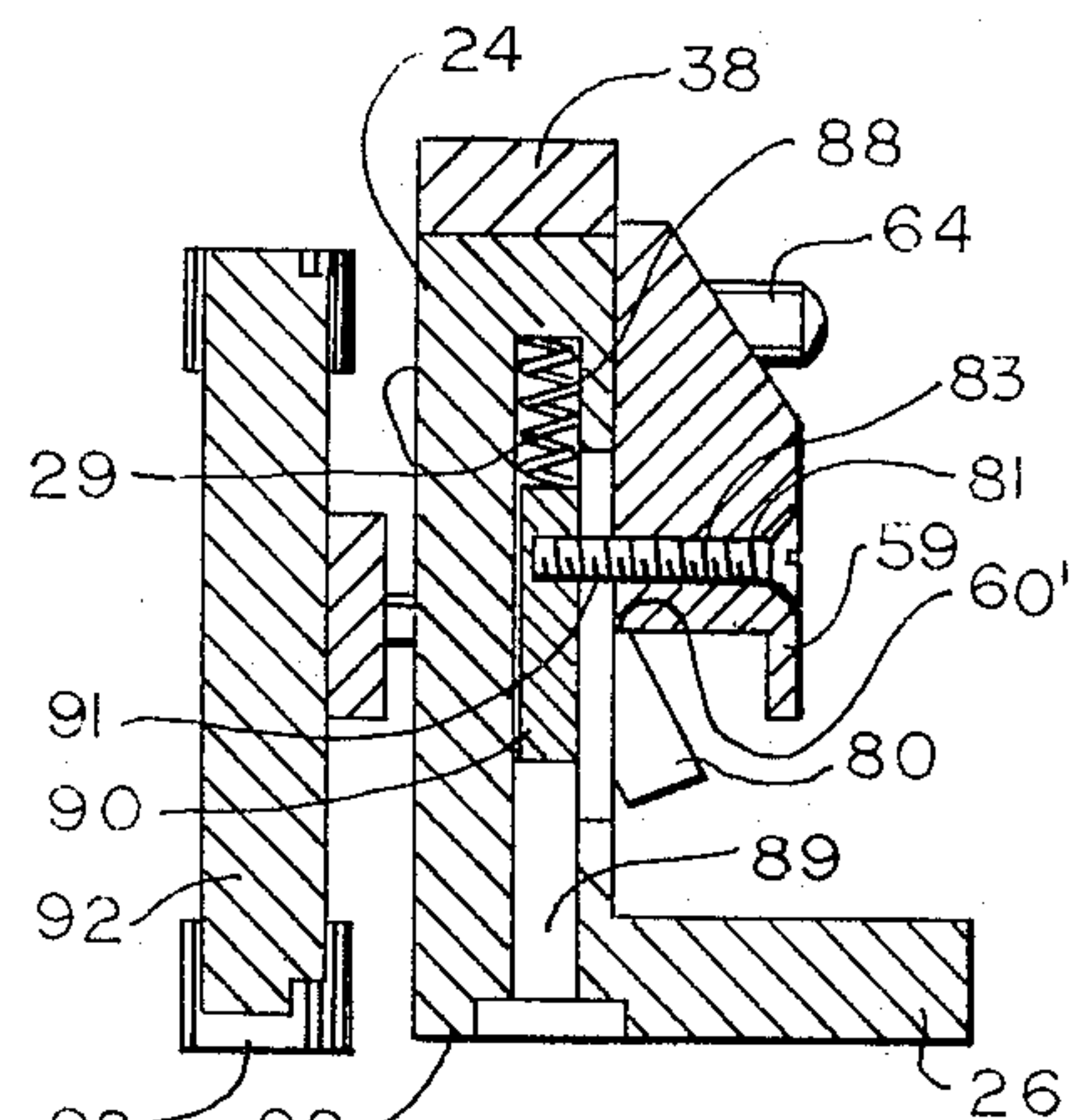


FIG. 9

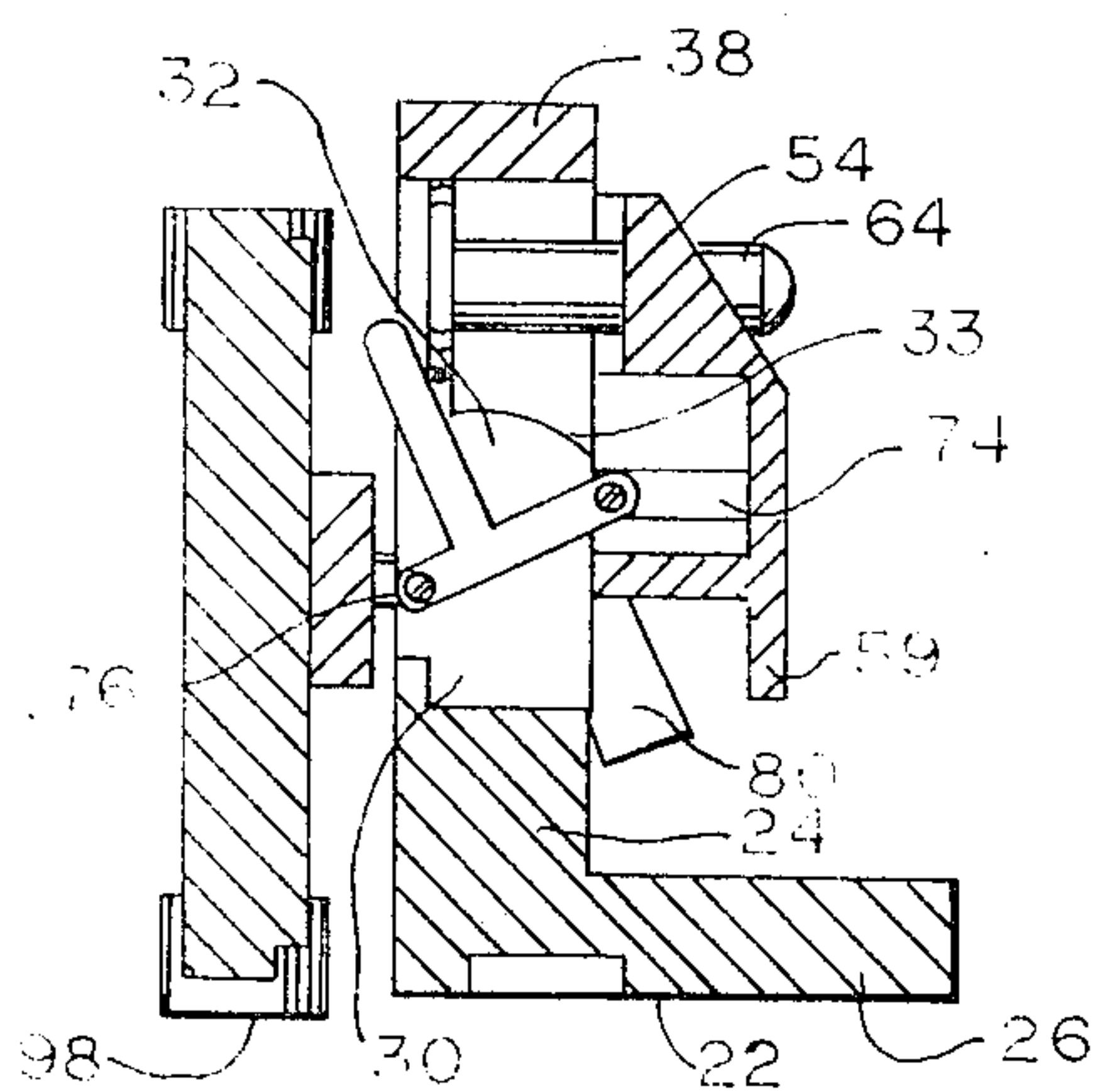


FIG. 10

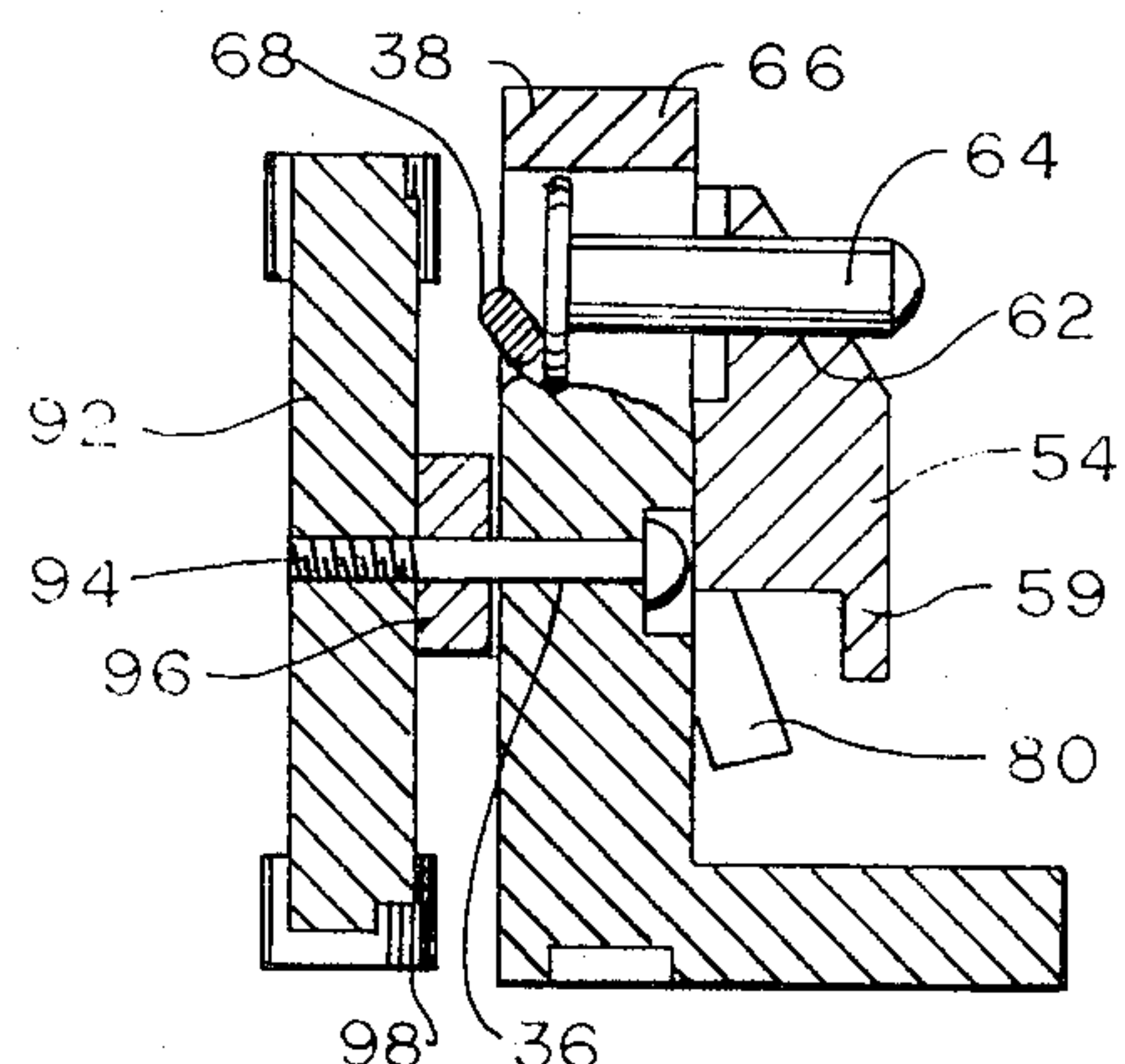


FIG. 11

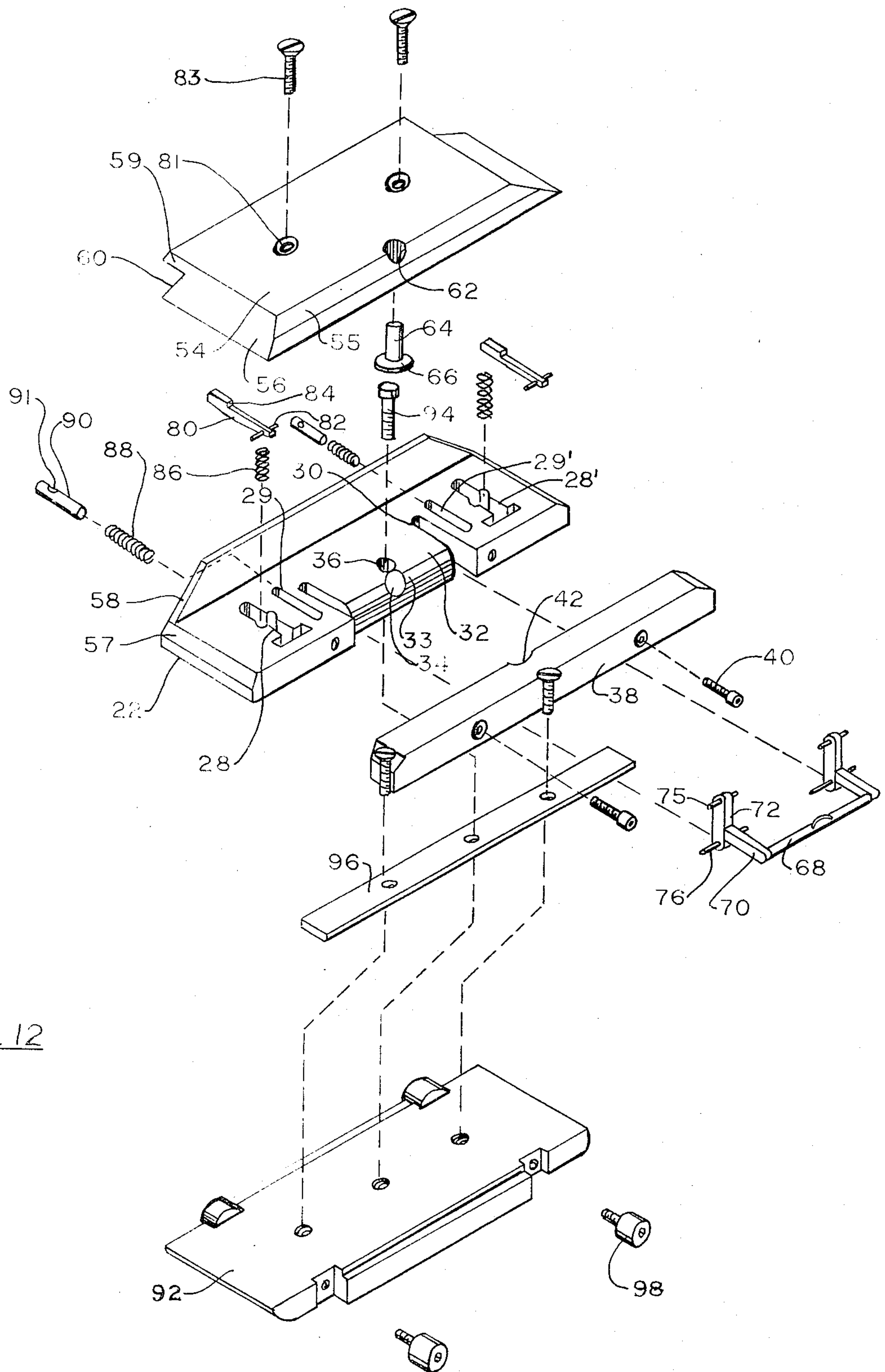


FIG. 12



# RECEPTACLE CARRIER FOR AN AUTOMATIC CONVEYING SYSTEM

This invention concerns a receptacle carrier for a conveyor system and more particularly concerns an improved receptacle carrier for a conveyor system having means for automatically loading and unloading the carrier.

Heretofore, in conveyor systems designed for installation in aircraft, hospitals, commissaries, freight handling, etc. difficulty has been experienced with receptacle carrier which are required to fulfill a number of important requirements. At times the receptacle carriers must hold such things as trays horizontal at all times even when traversing inclines. The carriers must automatically engage the trays at tray loading stations and must quickly release them wherever unloading is required. The receptacle carriers must be easily cleaned, must be attractive in appearance, and must be simple, safe and reliable in operation at all times.

The present invention is directed at a receptacle carrier construction which meets all the above mentioned requirements. In addition, the improved carrier includes pushbutton operated automatic self locking feature which keeps a receptacle holding bar in retracted position with means to automatically release the bar to engage a receptacle when spring biased catch fingers are retracted.

These and other objects and many of the attendant advantages of this invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings in which:

FIG. 1 is a perspective view of a receptacle carrier embodying the invention;

FIG. 2 is an enlarged end view of the carrier holding a tray shown in cross section;

FIG. 2A is a top plan view of the carrier;

FIG. 3 is a front elevational view of the carrier with receptacle holding bar shown in fully lowered position, the receptacle being removed;

FIG. 4 is a cross sectional view taken along line 4—4 of FIG. 3;

FIG. 5 is a cross sectional view taken along lines 5—5 of FIG. 3;

FIG. 6 is a cross sectional view taken along line 6—6 of FIG. 3;

FIG. 7 is a front elevational view similar to FIG. 3 with the receptacle holding bar shown in elevated or retracted position;

FIG. 8 is a cross sectional view taken along line 8—8 of FIG. 7;

FIG. 9 is a cross sectional view taken along line 9—9 of FIG. 7;

FIG. 10 is a cross sectional view taken along line 10—10 of FIG. 7;

FIG. 11 is a cross sectional view taken along line 11—11 of FIG. 7; and

FIG. 12 is an exploded perspective view of parts of the receptacle carrier.

Referring, now to the drawings wherein like reference characters designate like or corresponding parts throughout there is illustrated in FIGS. 2 and 3 a receptacle or tray carrier generally designated as reference numeral 20 which includes an L-shaped plate 22 having a vertical rear wall 24 and a horizontal ledge 26. In the front side of the wall 24 are formed outer spaced grooves 28, 28' and inner spaced grooves 29, 29' (FIG.

12). Also formed in wall 24 are two slots 30 defining a shortened central wall portion 32 which is curved or rounded at a top portion 33 and is formed with a rounded and slanted notch 34. This notch slants upwardly from the front to the back of the wall 24; (FIG. 6). Just under the notch 34 is a hole 36 (FIG. 12). A rigid bar 38 overlays the upper side of wall 24 and is secured in place by a pair of bolts 40. The top of the central wall portion 32 is spaced from the bar 38 which has a central notch 42 in its underside for alignment with the notch 34.

A receptacle or tray 50, shown in FIG. 2 is provided with a peripheral flange 52 for engagement on the ledge 26 and may be held thereon by a holding bar or plate 54. The bar 54 is flat and formed with a pair of beveled ends 57, of the wall 24 and a pair of beveled ends 58 of the ledge 26 as clearly illustrated in FIG. 3. The bottom edge of the bar 54 is undercut to define a depending front flange 59 and a recess 60 into which the flange 52 of the tray 50 fits. The flange 59 bears down on the bottom 53 of the tray 50 (as clearly shown in FIG. 2) when the bar 54 is in the tray holding position. The bar 54 is formed with a central hole 62 near its upper edge through which slidably extending outwardly thereof is a pushbutton 64.

On the inner end of the pushbutton 64 is an enlarged round head 66 which rests slidably on the curved bottom of the notch 34 and bears against a cross bar 68 which carries at each end thereof an arm 70 which in turn terminates in a cross leg 72, see FIG. 12. Each cross leg 72 has a front pin 75 and a rear pin 76 which are respectively engaged in a slot 74 in the bar 54 and the side of slot 30 in the wall 24. When the pushbutton 64 is pressed inwardly the head 66 rides rearwardly and upwardly in the notch 34. At the same time each of the legs 72 pivot upwardly on the pins 76 engaged in the sides of slots 30; see FIG. 10. The legs 72 and pushbutton 64 cooperate in raising the bar 54 to the upper position shown in FIGS. 7—11 where the bar is held by a pair of catch fingers 80. The bar 54 is further formed with a pair of spaced holes 81 for each receiving a screw 83 for reasons to be more fully described further below.

Each of the catch fingers 80 have a pin 82 at an upper end which is pivotally engaged in a cross portion 28a of the groove 28 and an abutment 84 which engages under an edge 60' of the recess 60 (see FIG. 8). A spring 86 is fitted in each of the curved portions 28b of the grooves 28 and bias the catch fingers 80 forwardly to hold them in engagement with the bar 54 to keep it in the upper position. When the bar 54 is elevated the ledge 26 is clear and may be wiped clean. Also a tray 50 may be placed on the ledge 26. When the flange 52 of the tray 50 contacts the lower portions of the catch fingers 80, it will retract them into the grooves 28 to disengage the abutments 84 and release the bar 54 which will then be lowered to the position of FIG. 2. If the tray 50 is not present, but the catch fingers are retracted manually or by a tool, the bar 54 will descend to the fully lowered position shown in FIGS. 3—6. It should be noted, however, that the bar 54 will not be lowered if only one of the catch fingers 80 is retracted into the groove 28.

The bar 54 is automatically lowered by a pair of springs 88 each of which is engaged in a respective groove 29, 29' and held by a sliding plug 90 which has a threaded hole 91 in which an inner end of a screw 83



is engaged, see FIG. 9. It will be apparent that the bar 54 is lowered by the bias of the springs 88 and when the bar 54 is raised by operation of the pushbutton 64 the springs 88 are compressed. The plugs 90 are inserted into the grooves 29, 29' through a hole 89 formed in the bottom of the plate 22 as shown in FIG. 9.

Pivotaly attached to the wall 24 of the plate 22 is a conveyor plate 92. A pivot bolt 94 extends through the hole 36 and is engaged centrally in the plate 92 which carries a spacer bar 96, (FIG. 11). Four cylindrical roller bearings 98 are carried by the plate 92 and engage a conveyor 99 (FIG. 2). During operation of the conveyor 99, the carriers 20 are moved therewith and the carrier plate 22 remains upright with the ledge 26 horizontal in all positions of the carrier 20 since the plate 22 is prevented from tilting by guide means (not shown but disclosed in my copending U.S. Pat. application No. 55,525 filed July 16, 1970) of the conveyor system, while the carrier plate 92 can move upwardly or downwardly.

To summarize the mode of operation of receptacle or tray carrier 20, holding bar 54 can be elevated by manually or mechanically pushing pushbutton 64 inwardly, i.e., rearwardly toward the plate 92. At the same time the fingers 80 tilt to engage the bar 54 at the abutments 84 when the bar 54 is fully elevated. The holding bar 54 is lowered automatically by the cooperating springs 88 and the screws 83, when both of the catch fingers 80 are manually or mechanically retracted. If only one catch finger is retracted the holding bar will not be lowered.

The construction described maintain the receptacle or tray 50 in horizontal position at all times. The tray is automatically engaged when fully inserted into the open carrier while bar 54 is elevated. The tray is easily released by pushing the pushbutton 65 inwardly of the carrier to raise the bar 54. The carrier is attractive in appearance, safe and simple to operate and reliable in operation.

It should be understood that the foregoing relates to only a preferred embodiment of the invention, and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

I claim:

1. A receptacle carrier for a supporting a receptacle on an automatic conveyor, comprising;
  - a support for said receptacle, comprising an L-shaped plate with a vertical back wall and a horizontal ledge, said back wall having a notch with a slanted bottom;
  - a spring biased movable receptacle holding means on said support arranged to engage said receptacle and hold it on said support;
  - a pushbutton operated elevation means arranged to elevate said receptacle holding means on said support and thereby release said receptacle said elevation means including a pushbutton having a head

slidable disposed in said notch and riding along said notch whereby said pushbutton and said receptacle holding means are elevated when said pushbutton is pushed inwardly of said back wall: and

a spring biased catch means on said support arranged to retain said receptacle holding means in an elevated position on said support.

2. A receptacle carrier as defined in claim 1, further comprising a conveyor member drivable by a conveyor and pivotally connected to said support to carry said receptacle in horizontal position in all positions of said conveyor member.

3. A receptacle carrier as defined in claim 1, wherein said receptacle holding means comprises a flat plate slidably mounted on said back wall and cooperating with said ledge in holding said receptacle on said support.

4. A receptacle carrier as defined in claim 3, wherein said elevation means comprises a cross bar supported by levers including spaced arms, and legs integral with said arms and pivotable in slots in both said back wall and said flat plate for elevating said flat plate when said pushbutton is pushed inwardly of said back of said L-shaped plate.

5. A receptacle carrier as defined in claim 4, wherein said catch means comprises catch fingers pivotally supported by said back wall, and spring means carried by said back wall and urging said catch fingers forwardly under said flat plate, said catch fingers being formed with abutments to engage under said flat plate for holding it in elevated position on said back wall of said L-shaped plate.

6. A receptacle carrier as defined in claim 5, further comprising other spring means carried by said back wall and operatively arranged to bias said flat plate in a downward direction toward said ledge for holding said receptacle thereon.

7. A receptacle carrier as defined in claim 6, wherein said flat plate is formed with a bottom recess defining a depending flange engageable with the bottom of said receptacle while said recess receives a peripheral rim of said receptacle,

said catch fingers being arranged to project into said recess when said flat plate is held in elevated position, for retraction by the rim of said receptacle when placed on said ledge of said L-shaped wall, whereby said receptacle holding means is automatically released to engage said receptacle on the ledge.

8. A receptacle carrier as defined in claim 7, further comprising a conveyor member drivable by said conveyor and pivotally connected to said back wall of said L-shaped plate to permit carrying said receptacle in horizontal position in all positions of said conveyor member.

9. A receptacle carrier as defined in claim 8, further comprising rollers carried by said conveyor member for guiding the same while being driven by said conveyor.

\* \* \* \* \*