

March 7, 1967

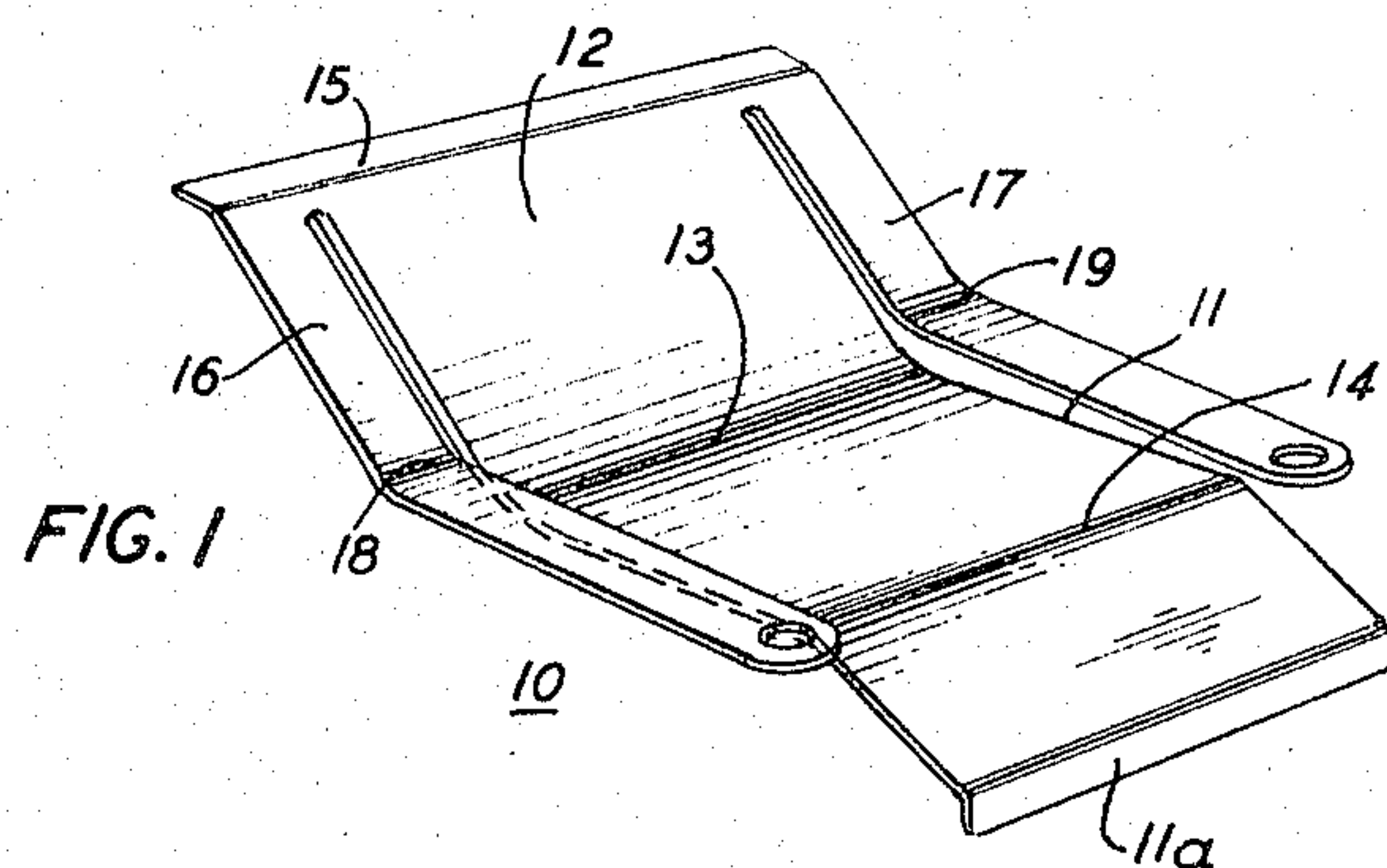
R. R. STOKES

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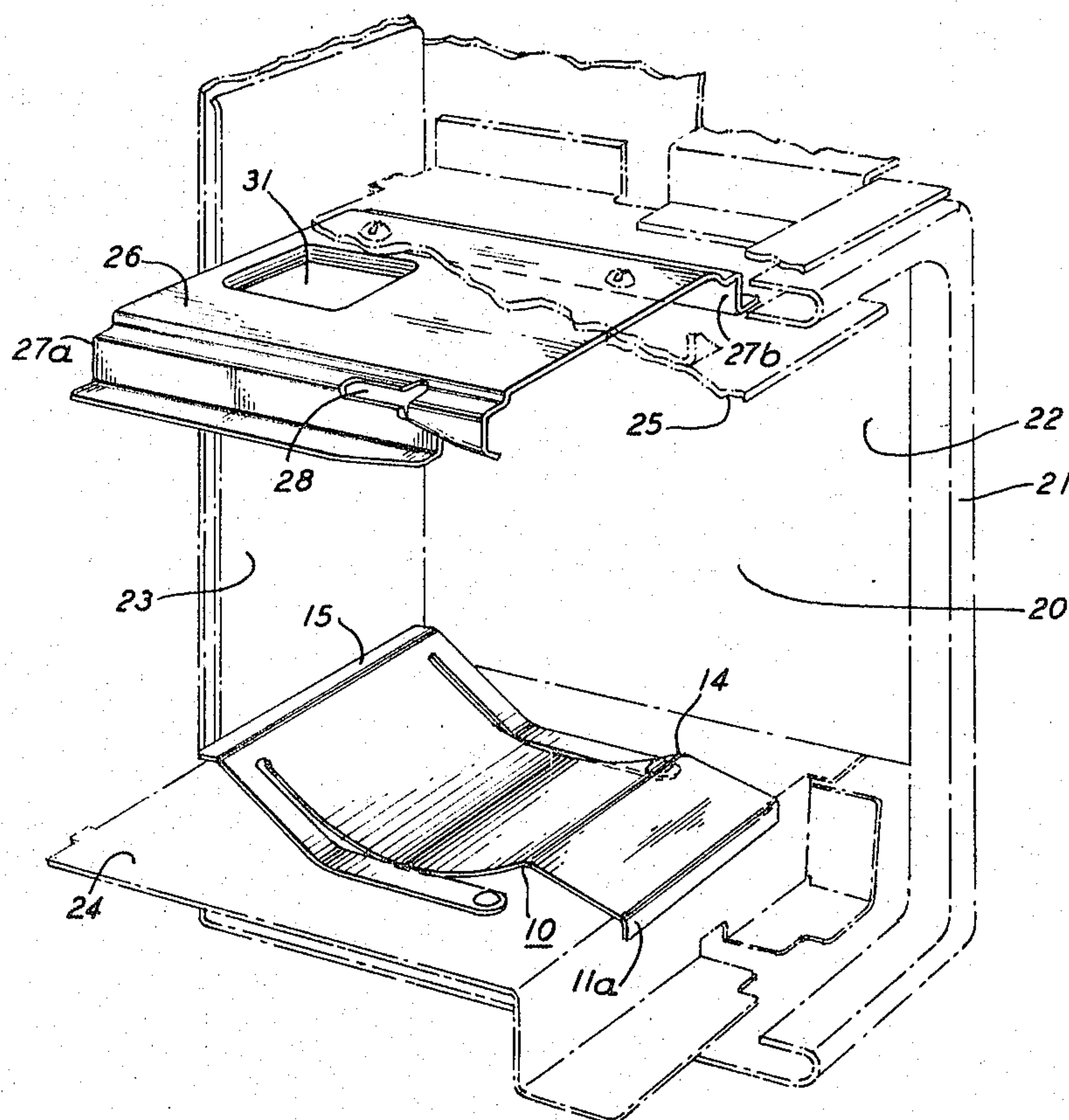
COIN TELEPHONE CASH BOX BOOSTER SPRING

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**FIG. 2**



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FIG. 3

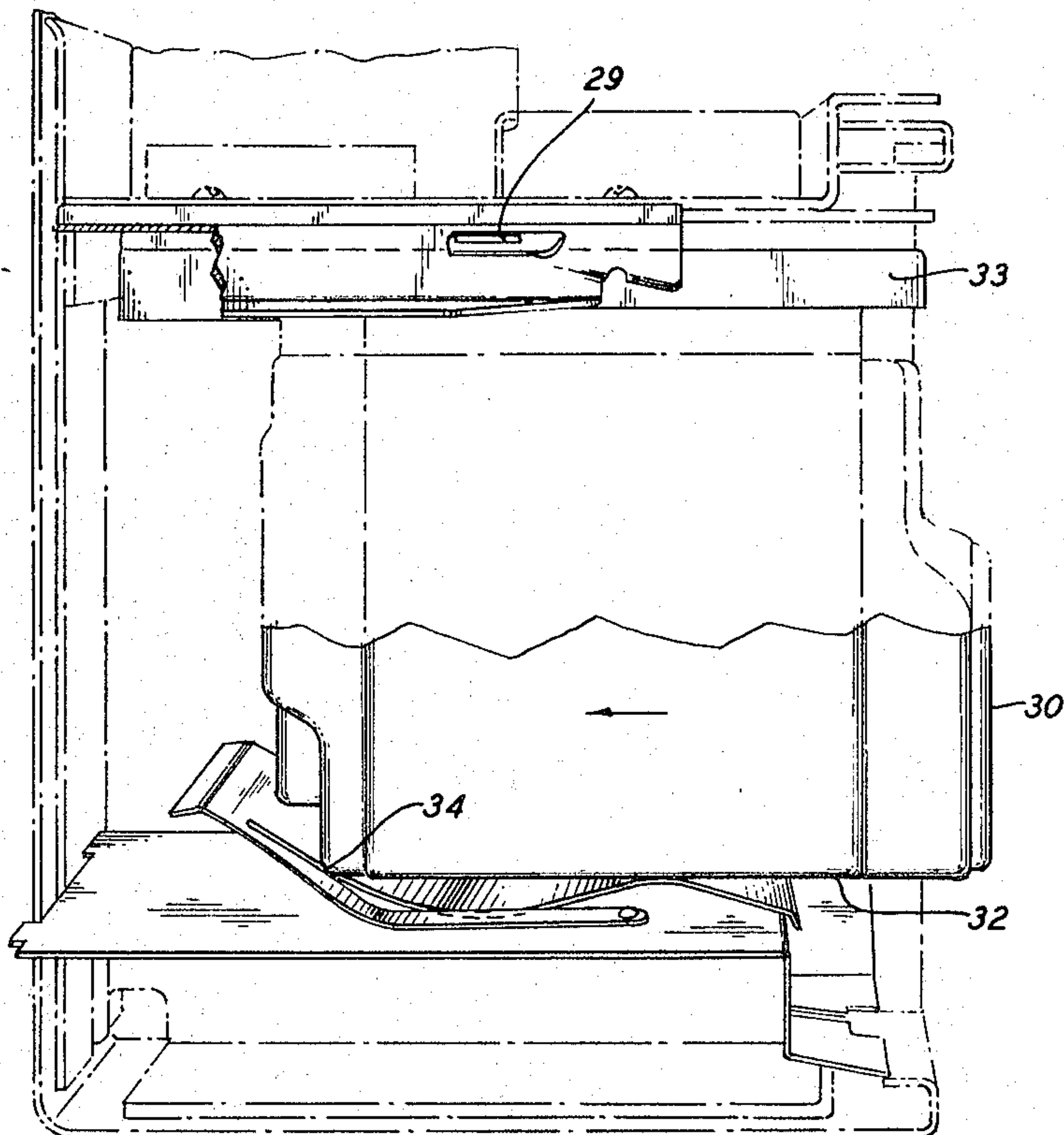
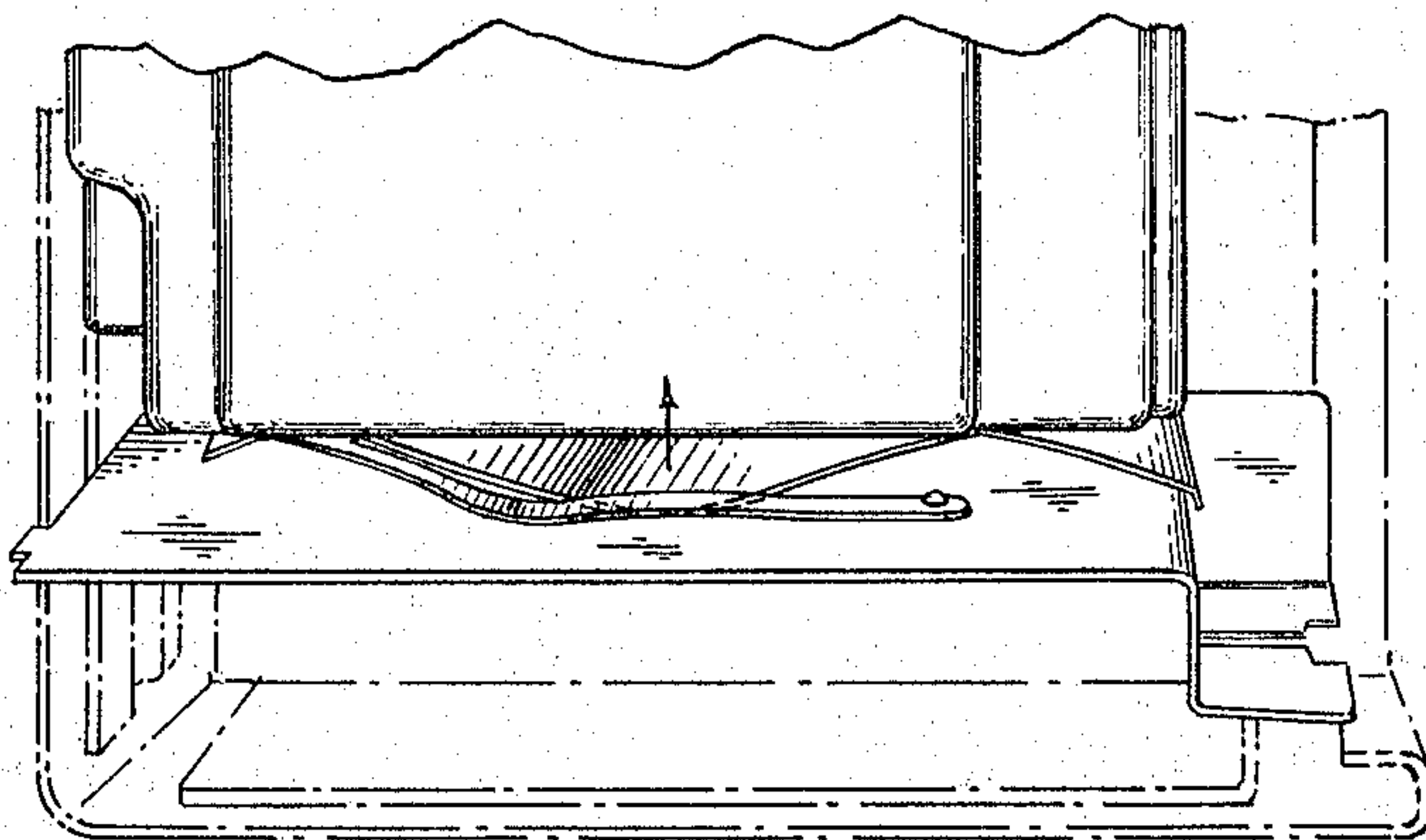


FIG. 4



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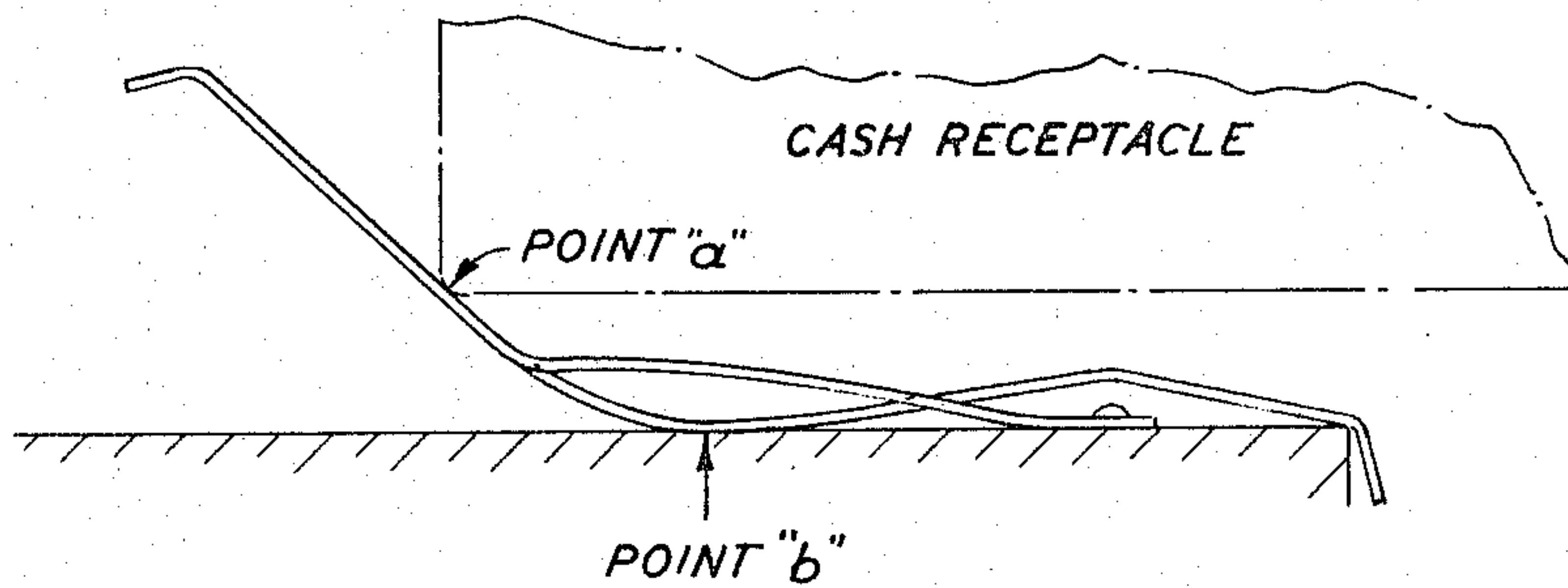
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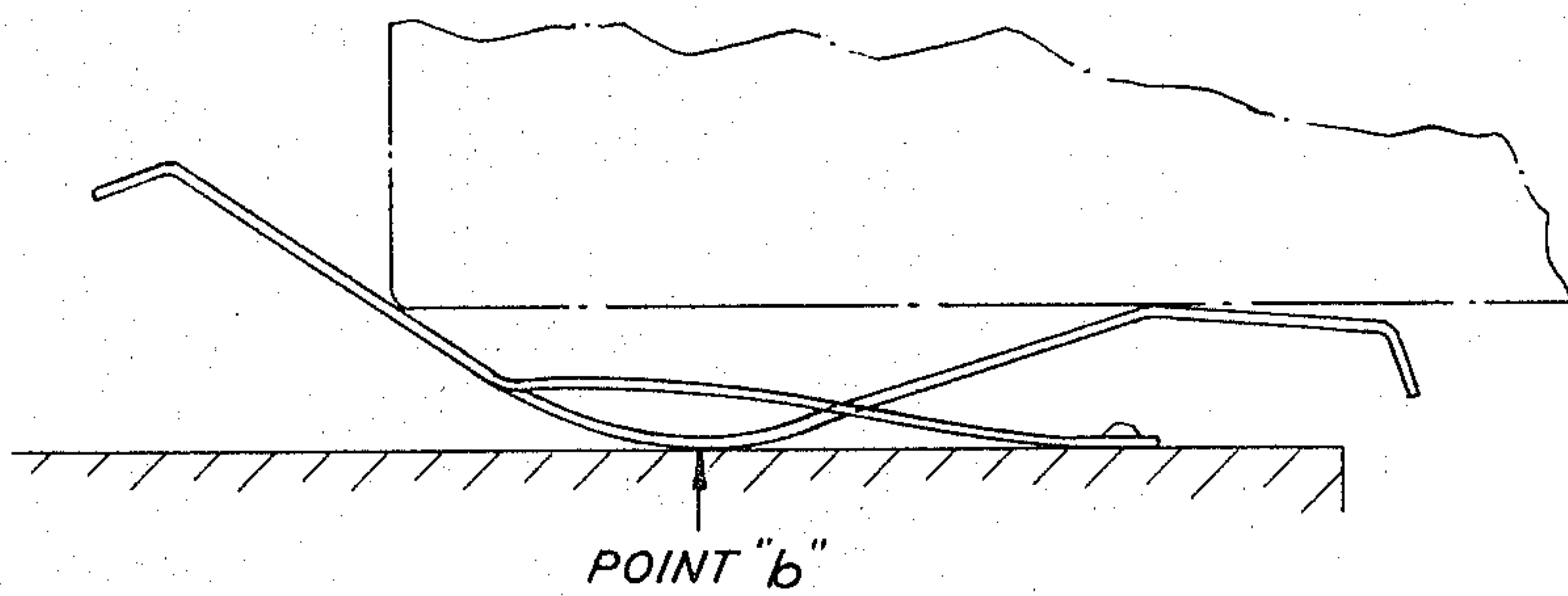
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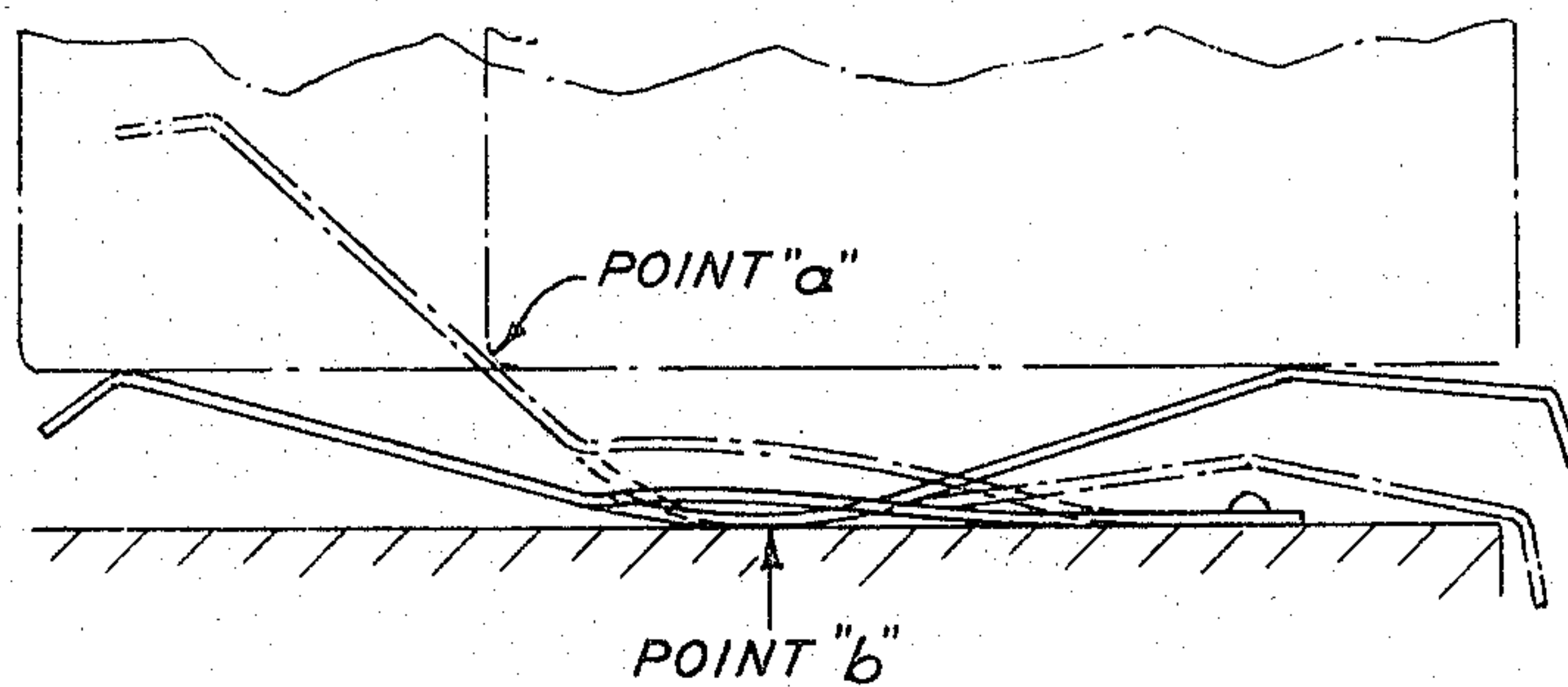
**FIG. 5**  
INITIAL CONTACT POSITION



**FIG. 6**  
DOUBLE CONTACT POSITION



**FIG. 7**  
FULLY INSERTED POSITION



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**COIN TELEPHONE CASH BOX BOOSTER SPRING**  
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7 Claims. (Cl. 232-1)

This invention relates to coin telephones and in particular to cash receptacle booster springs for the telephone housing cash vault.

In most coin telephones the deposited coins are chuted into a cash receptacle which is slidably supported within a guide rail in a lower vault of the telephone housing. The access in the receptacle top is controlled by a shutter positioned directly beneath the chute end when the cash box is fully inserted. This shutter is opened through engagement of a lever with the guide rail during insertion of the receptacle and is closed again by reverse action of this mechanism when the receptacle is removed.

In such systems there is a tendency for a gap to exist between the chute end and the access which, with heavy coin loads is wide enough to allow the last-deposited coins to pass through and fall outside of the receptacle. To eliminate this gap, various strong booster springs have been fastened to the vault bottom to exert an upward force on the receptacle. These springs, however, interfered with movement of the cash receptacle in that as the cash box was inserted the booster spring raised the rear edge thereof before the shutter lever could make proper engagement with the guide rail. To counteract this, the person inserting the box concurrently had to bear down hard from an unfavorable angle to force the box against the booster spring. If the spring were placed toward the vault rear to avoid early contact, the lift was then applied too far from the receptacle's center of gravity and the box would eventually tilt. This revived the original gap problem. In brief, therefore, known cash receptacle booster springs were unable to provide adequate lift without at the same time interfering with insertion of the cash receptacle.

Accordingly, the prime object of this invention is to prevent any gap from occurring between the chute end and the cash box access without complicating the task of telephone cash box insertion.

This and other objects are achieved pursuant to the invention by a wide-angle two-armed spring supported on a floating hinge which maintains the spring's forward arm flush with the vault floor until its rear arm is contacted by the inserted cash box to force the floating hinge down and the forward arm up and into contact with the cash box bottom.

In one embodiment of this invention, the booster spring is supported from the extremity of its inner arm by a pair of cantilever supports which provide a floating hinge at one end and fasten at the other end to the vault floor. Such a spring is easily formed in one piece.

A feature of the invention, accordingly, requires a telephone cash box booster spring with a floating hinge that controls the attitude of the spring in response to insertion of the cash box.

A further feature of the invention involves a booster spring with two support arms, pivotally mounted from one of these arms by an integral pair of cantilever springs.

In the drawing:

FIG. 1 is a perspective view of one embodiment of the booster spring;

FIG. 2 is a perspective in partial cutaway showing the booster spring mounted in the cash vault of a coin telephone housing;

FIGS. 3 and 4 are perspective views showing the spring operation at two stages of cash box insertion; and

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FIGS. 5, 6 and 7 are schematic diagrams showing the booster spring operation and the cantilever principle at three stages of cash box insertion.

As shown in FIG. 1, the inventive concept is embodied in a booster spring designated generally as 10, that includes a forward arm 11 and a rear arm 12, formed in a bow which hinges principally at 13. A bend 14 in arm 11 defines a forward support surface and a bend 15 in an arm 12 defines a rear support surface. Adjoined to either side of rear arm 12 at points substantially adjacent bend 15 are two cantilever supports 16, 17. These are bowed similarly to spring 10, with hinge portions 18, 19, respectively. Arm 11 terminates in a lip or flange 11a.

FIG. 2 shows spring 10 in place within a coin receptacle vault 20 of a coin telephone housing such as disclosed in Patent 3,142,522, issued to N. Hall and R. K. Thompson on July 28, 1964 and assigned to applicant's assignee. Vault 20 is situated within the lower portion of telephone housing 21 and includes two side walls 22 (only one shown) a rear wall 23, a floor 24, a roof 25 and a front door and lock mechanism (not shown). A plate 26 affixed to the underside of roof 25 includes a pair of guide rails 27a, 27b which serve principally to position the cash receptacle laterally. Conventionally, on insertion of coin receptacle 30 (FIG. 3) a key slot 28 in rail 27a engages a shutter lever 29 which trips open the receptacle access (not shown). This access is directly below aperture 31 in plate 26 and in turn is aligned with the end of a coin chute (not shown).

As earlier noted, when the cash receptacle is fully inserted, it is necessary that the shutter be positioned in abutting relation with aperture 31 so that no space between them exists through which coins might pass. This is achieved pursuant to the invention by spring 10 which is fastened by suitable means to the floor 24 of vault 20 so that its support surfaces 14, 15 are substantially perpendicular to the direction of slide of the receptacle. The supports 16, 17 of spring 10 are so biased with respect to arms 11, 12 that when installed as per FIG. 2, the flange 11a is forced down upon the edge of floor 24.

As shown in FIGS. 3 and 5, when the receptacle 30 is initially inserted in the vault its bottom 32 clears the forward support surface 14. The two sides 33 (only one shown) engage rails 27a, 27b and the box is moved more than half way in.

After this amount of travel, the back bottom edge 34 of receptacle 30 engages rear arm 12 at point a shown in FIG. 5. Further displacement of the box causes arms 16, 17 to deflect. Simultaneously, as shown in FIG. 6, arm portions 11, 12 of spring 10 pivot about their hinge 13 which rests at point b of vault floor 24. As rear arm 12 is displaced downward, forward arm 11 pivots upward. Initially there is negligible opposition to forward arm 11 as it rises against the load of deflecting side arms 16, 17. With no load on arm 11, there is no displacement between arms 11 and 12. As the box is further inserted, the forward support surface 14 contacts the bottom 32 of the cash box 30. Thereafter, the final movement of the box displaces or flattens arms 11 and 12, and this flattening produces the upward thrust on box 30, as shown in FIG. 7. During this forward travel the insertion force increases substantially and then falls off when the box overrides surface 15. This marked "breakthrough" action assures the person concerned that the box is properly positioned.

The final spring action lends firm two-point cradling to the cash receptacle. The total vertical lift on the box may be made sufficiently greater than the weight of a full coin load so that the box is supported regardless of the specific distribution of the coins. Importantly, in accordance with the invention, the spring does not interfere with insertion because it is completely out of the way

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until well after the shutter lever 29 and key slot 28 have engaged. Removal of the cash receptacle is easy, and allows spring 10 to return to its original position.

One illustrative embodiment of the inventive concept has been shown and described. It is to be expressly understood that various changes and modifications may be made therein without departing from the spirit and scope of the invention.

What is claimed is:

1. In combination with a coin telephone housing including a cash receptacle vault for containing a cash box and means for guidably inserting said box in said vault and into alignment with a coin chute, the improvement which comprises:

- (a) a bow spring including front and rear support surfaces;
- (b) means for resiliently mounting the bow spring on the floor of said vault so that the front support surface extends below the level of the cash box bottom during insertion and the rear support surface extends above the level of the cash box bottom during insertion;
- (c) means responsive to insertion of the cash box for depressing the rear support surface into supportive contact with the rear end of the cash box bottom; and
- (d) means responsive to the downward deflection of the rear support surface for pivoting the front surface upwardly and into supportive contact with the front end of the cash box bottom.

2. Apparatus in accordance with claim 1 wherein the front support surface of the bow spring further comprises an offset lip portion and wherein the bow spring mounting means normally urges said lip portion against the vault floor.

3. Apparatus in accordance with claim 1 wherein the

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resilient mounting means comprises at least one compliant arm extending from the rear surface of the bow spring and connected to the vault floor for elevating the rear support surface and for depressing the forward support surface.

4. Apparatus in accordance with claim 1 wherein the resilient mounting means comprises a pair of compliant arms on opposite sides of the bow spring, each extending from the rear of the bow spring to a connection with the vault floor.

5. Apparatus in accordance with claim 4 wherein the means for depressing the rear support surface comprises the rear bottom edge of the cash receptacle.

6. Apparatus in accordance with claim 5 further including means for mounting the compliant arm pair onto the vault floor so that when the cash box is fully inserted in the vault, the forward support surface engages the front end of the cash box bottom and the rear support surface engages the rear end of the cash box bottom.

7. Apparatus in accordance with claim 6 wherein the bow spring further comprises means responsive to the full insertion of the cash box into the vault for applying a supportive force through each of the support surfaces, each force being greater than the maximum weight of the cash box.

#### References Cited by the Examiner

##### UNITED STATES PATENTS

|           |         |           |        |
|-----------|---------|-----------|--------|
| 1,489,771 | 4/1924  | Lanham    | 232—1  |
| 1,685,219 | 9/1928  | Lorentzen | 232—15 |
| 1,932,614 | 10/1933 | Bell      | 237—7  |
| 3,175,759 | 3/1965  | Teale     | 232—1  |

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