

Sept. 20, 1960

A. E. WHITECAR
AMPUL ORIENTING DEVICE

2,953,237

Filed June 25, 1958

3 Sheets-Sheet 1

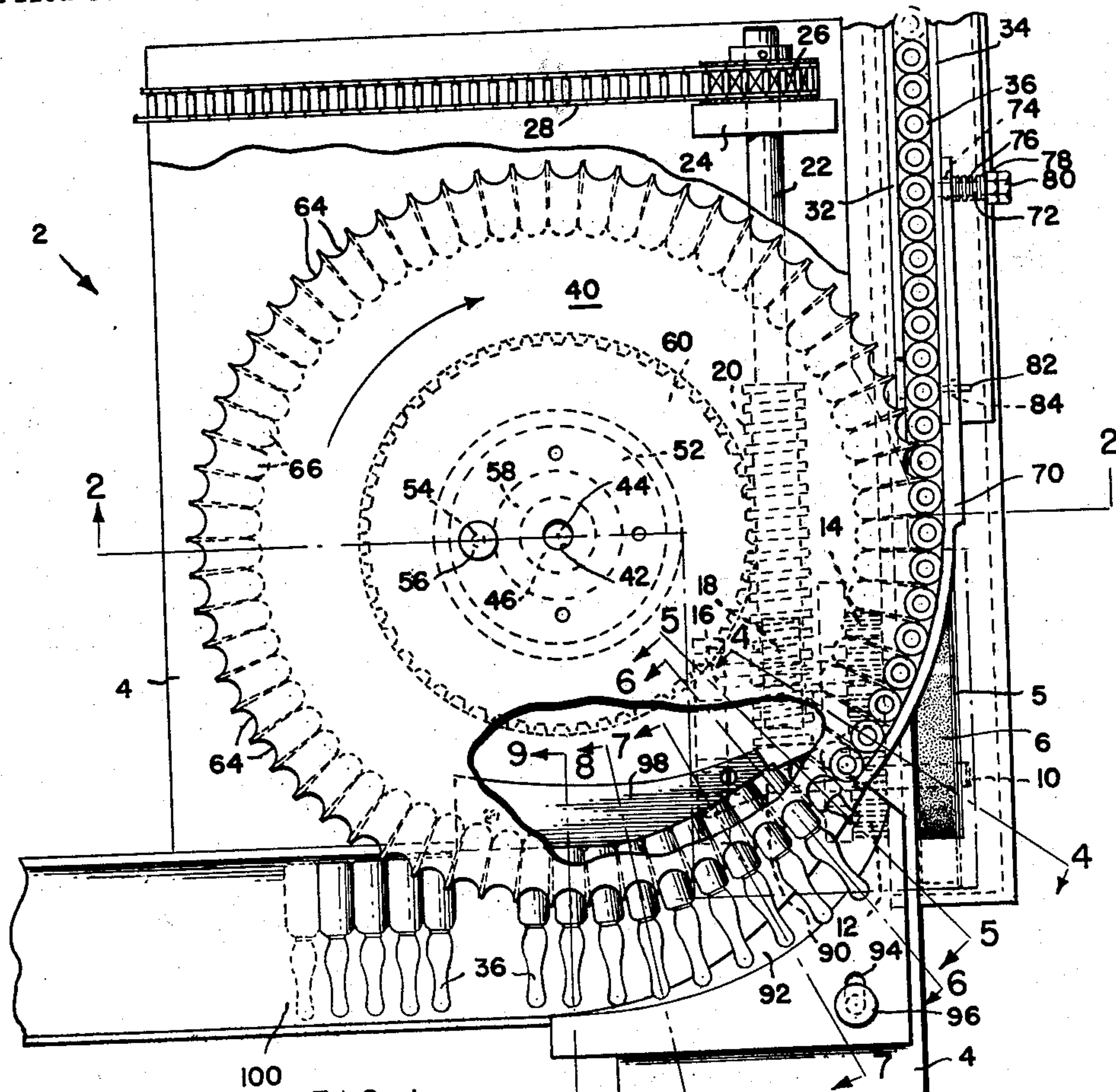


FIG. 1

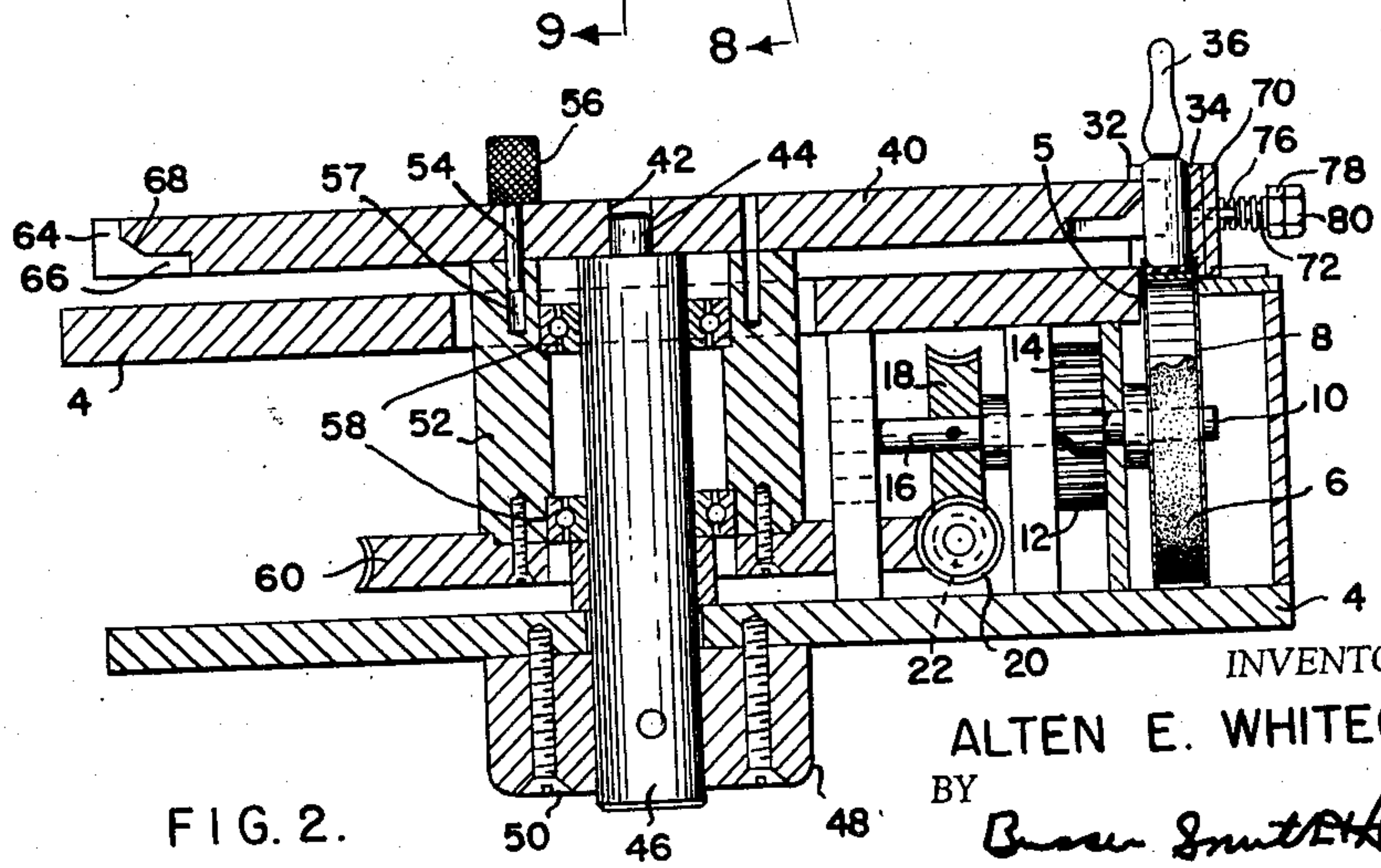


FIG. 2.

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3 Sheets-Sheet 2

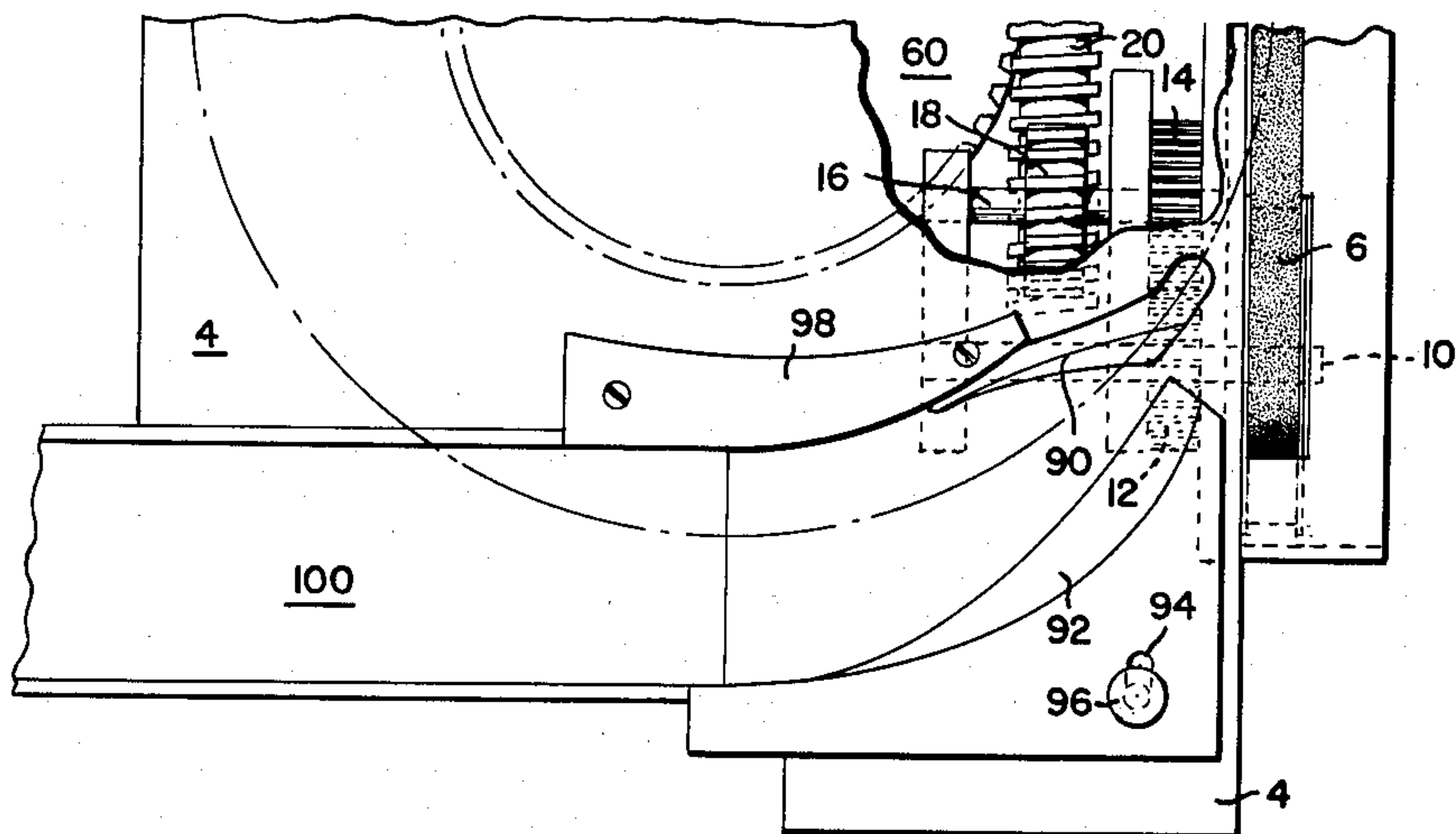


FIG. 3.

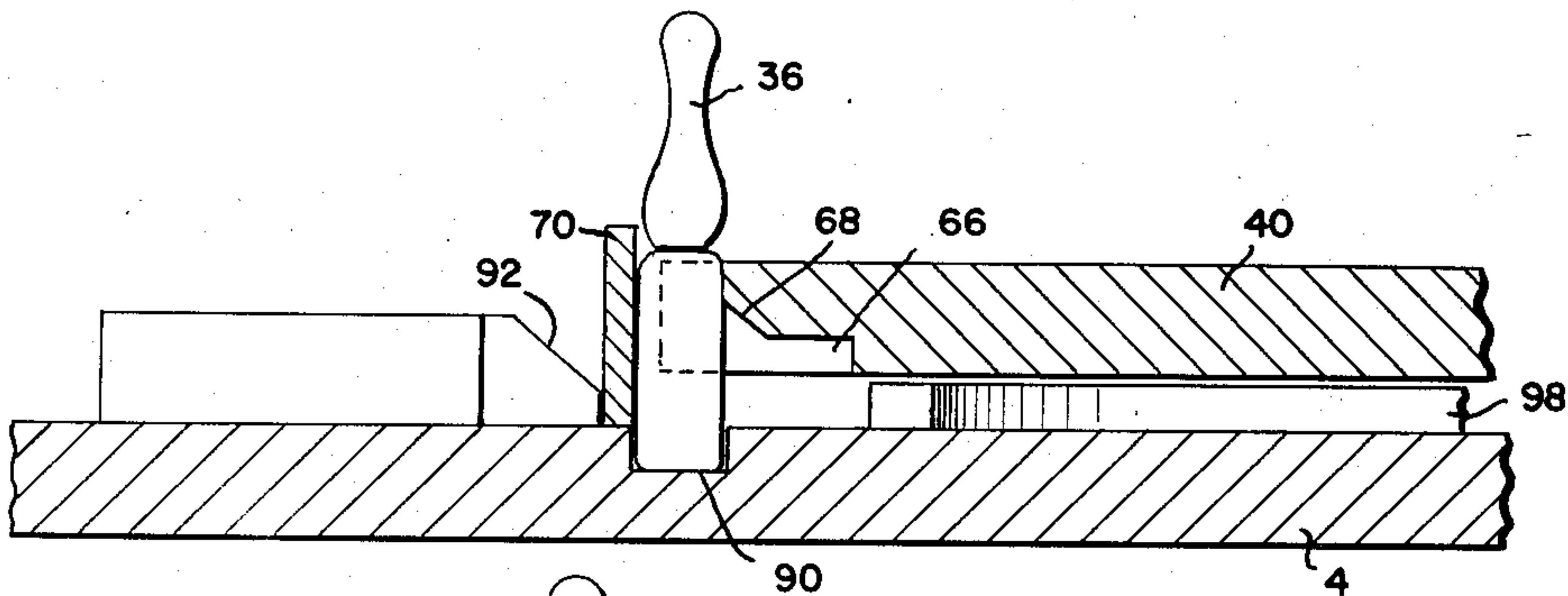


FIG. 4.

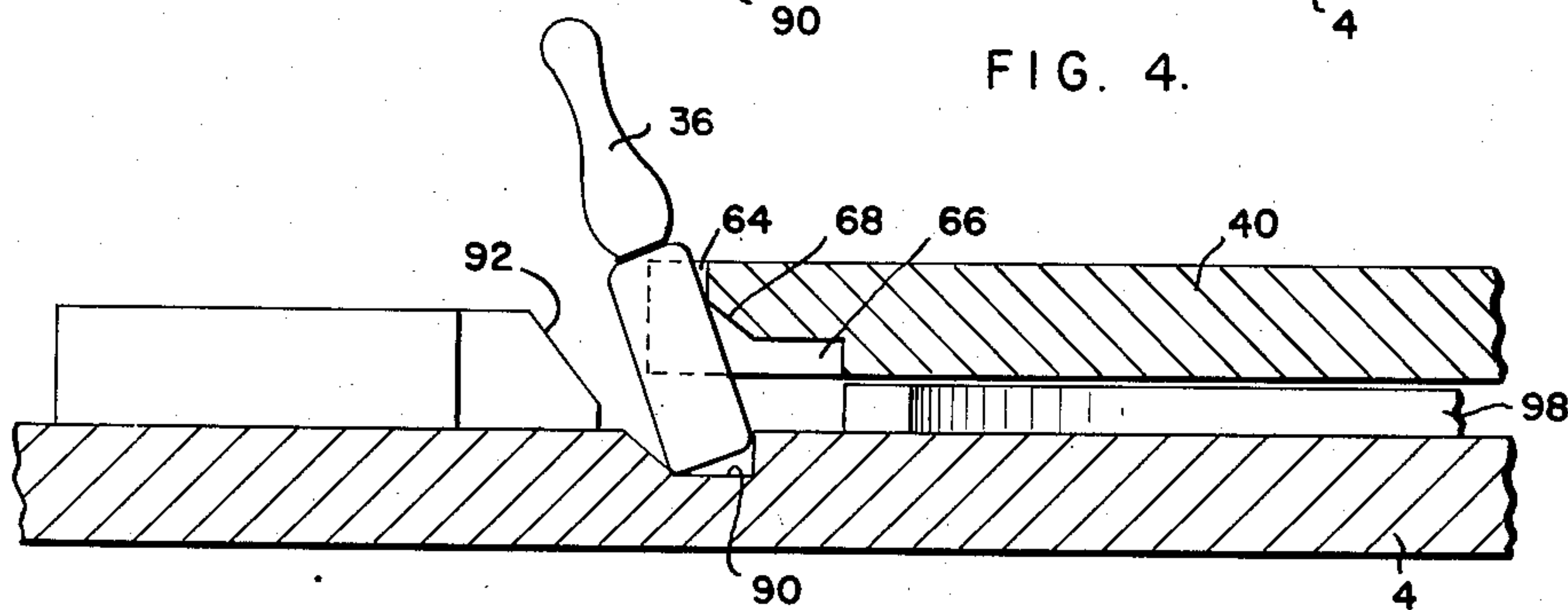


FIG. 5.

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3 Sheets-Sheet 3

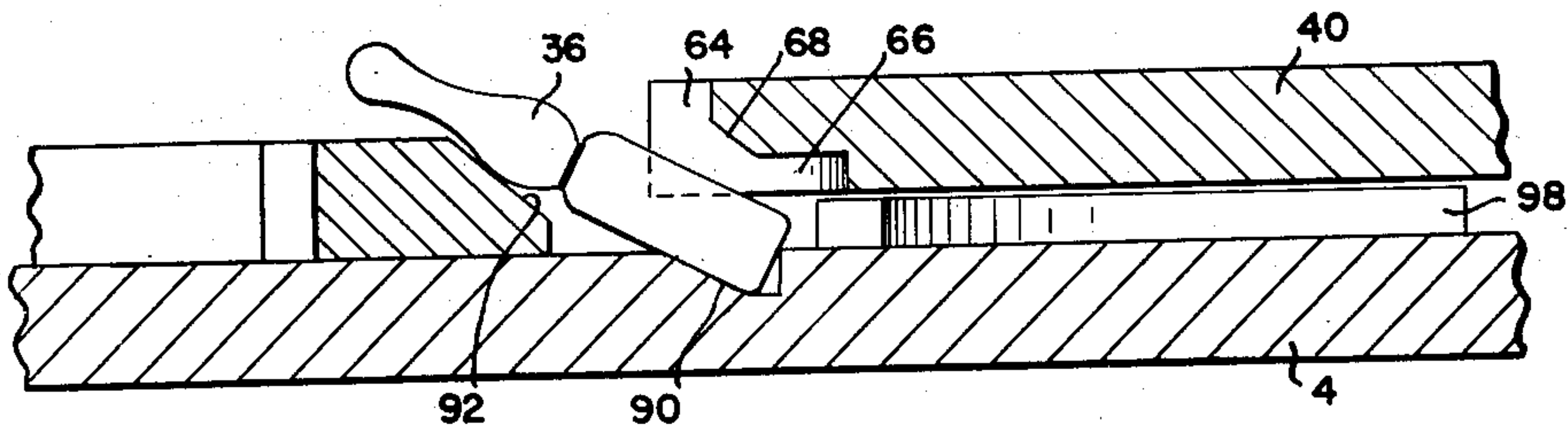


FIG. 6.

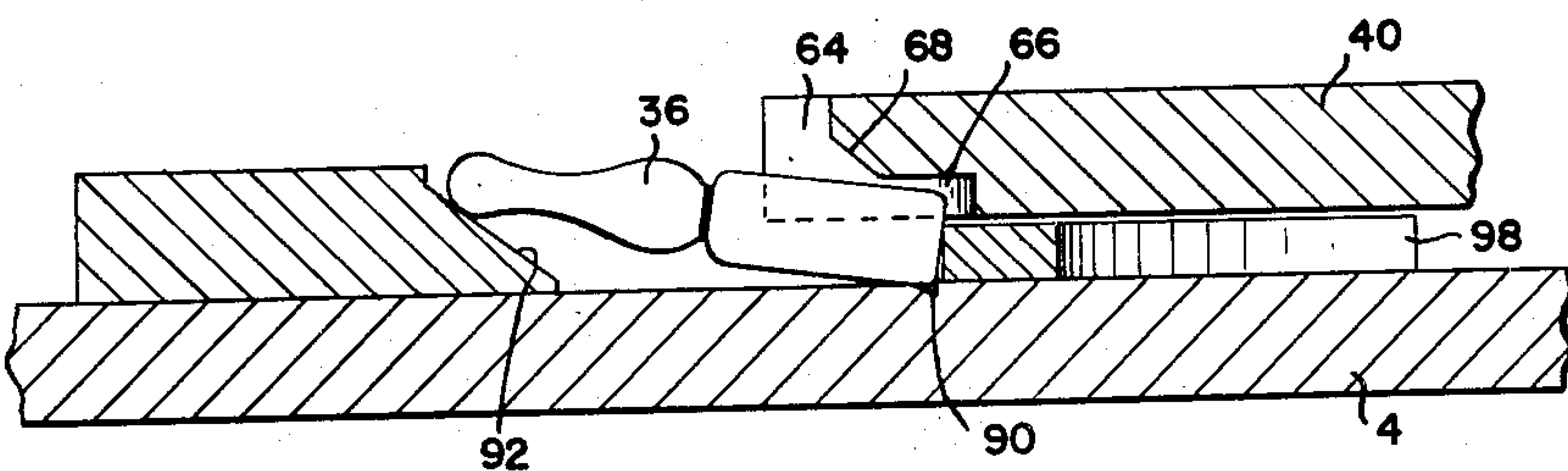


FIG. 7.

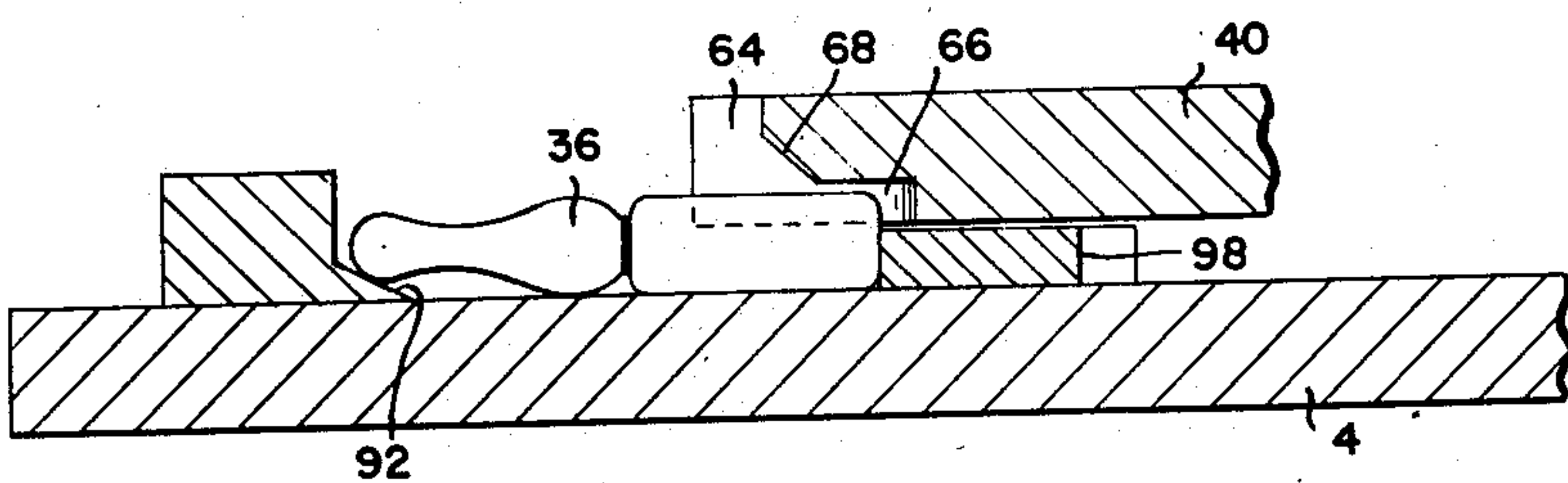


FIG. 8.

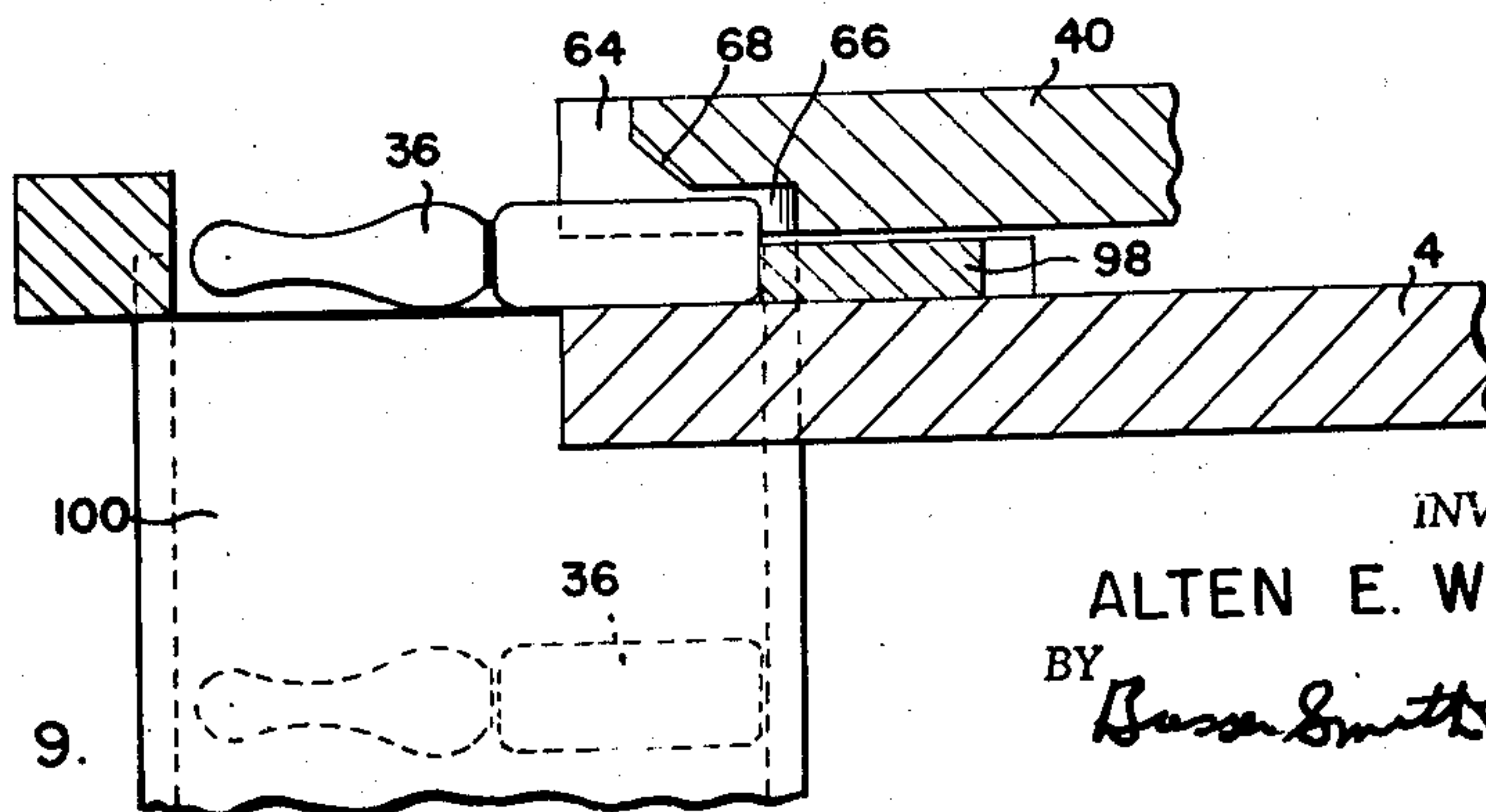


FIG. 9.

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2,953,237

AMPUL ORIENTING DEVICE

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4 Claims. (Cl. 198—33)

This invention relates to an ampul orienting device and, more particularly, relates to such a device which is adapted to take ampules oriented in a vertical position and reorient them to a horizontal position.

In the handling of ampules, they are frequently oriented in the vertical or upright position, for example, for filling and sealing the ampules. For subsequent operations such as, for example, printing information on the filled ampul and for packaging, it is more convenient to have the ampul oriented in a horizontal position. The apparatus in accordance with this invention solves the problem of reorienting the ampules from an upright position to a horizontal position.

This and other objects of this invention will become apparent on reading the description in conjunction with the accompanying drawings in which:

Figure 1 is a plan view of an apparatus in accordance with this invention;

Figure 2 is a vertical section taken on the planes indicated by the lines 2—2 in Figure 1;

Figure 3 is a plan view of cams employed in the apparatus of Figure 1;

Figure 4 is a vertical section taken on the plane indicated by the lines 4—4 in Figure 1;

Figure 5 is a vertical section taken on the plane indicated by the lines 5—5 in Figure 1;

Figure 6 is a vertical section taken on the plane indicated by the lines 6—6 in Figure 1;

Figure 7 is a vertical section taken on the plane indicated by the lines 7—7 in Figure 1;

Figure 8 is a vertical section taken on the plane indicated by the lines 8—8 in Figure 1; and

Figure 9 is a vertical section taken on the plane indicated by the lines 9—9 in Figure 1.

As shown in Figures 1 and 2, ampul orienting apparatus 2 in accordance with this invention has a frame 4 having a longitudinal opening 5 through which a conveyor belt 6 extends. Conveyor belt 6 is driven by a wheel 8 fixedly secured to shaft 10 which, in turn, is driven by a gear 12. Gear 12 meshes with a gear 14 fixedly secured to shaft 16 which carries worm wheel 18. An endless screw 20 on shaft 22 engages and drives worm wheel 18. Shaft 22 passes through bearing block 24 and is driven by a sprocket 26 which, in turn, is driven by a chain 28. Chain 28 is driven by a conventional drive (not shown). Frame 4 is provided with upright guide members 32 and 34 which guide the upright ampules 36 which are advanced by conveyor 6.

Ampules 36 are removed from conveyor 6 by a wheel 40 which has an opening 42 for the reception of reduced portion 44 of post 46. Post 46 is fixedly secured to ring 48 which is screwed to frame 4 by screws 50.

Wheel 40 is driven clockwise as viewed in Figure 1 being connected to hub 52 by removable shear pin 54 having a knurled top 56, pin 54 engaging an opening 57 in hub 52. Hub 52 is mounted on post 46 by bearings 58. A worm gear 60 is secured to the bottom of hub 52 and is driven by endless screw 20.

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Wheel 40 is provided with upstanding peripheral notches 64 for the engagement of ampules 36. Extending inwardly from each notch 64 is a groove 66 in the lower face of wheel 40. Each groove 66 is adapted to engage an ampul. The inner portion of each notch 64 and the upper portion of each corresponding groove 66 is connected by a sloping face 68.

A guide member 70 is provided to retain ampules 36 within notches 64 as they are advanced by wheel 40. Guide member 70 is secured to guide member 34 so that it can move outwardly with respect to the latter guide member. A bolt 72 is fixedly secured to guide member 34 as by welding and passes through an opening 74 in guide member 70. A compression coil spring 76 is held against guide member 70 by securing nuts 78 and 80. A guide pin 82 is secured to guide member 34 as by welding and passes through a slot 84 in guide member 70.

A cam track 90 is developed to engage the base of each ampul 36 and cam it inwardly towards the center of wheel 40 to cause the ampul to topple over with its base facing towards the center of wheel 40. As the ampul is toppled over it falls on a cam surface 92 which is developed to provide for the gradual lowering of ampul 36 into a horizontal position. It will be noted that terminal end of cam 90 is developed to raise the base of ampul 36 to facilitate arrival at a horizontal position of the ampul. Cam 92 is adjustably mounted on frame 4 by virtue of slot 94 and clamping bolt 96. A barrier 98 engages the base of ampules 36 and prevents the ampules from moving inwardly out of proper alignment with cam 92 and also insures that the ampules will be properly aligned for discharge into discharge chute 100.

Operation

The vertical ampules 36 are advanced to a position where they can be engaged by wheel 40, by means of conveyor 6 and guide members 32 and 34. Each ampul is engaged by an upstanding notch 64 in wheel 40 and thus advanced in a clockwise direction by wheel 40 as viewed in Figure 1. Barrier 70 holds the ampules in contact with notches 64 and is provided with outward play to accommodate for variations in the sizes of the ampules by virtue of being urged into position by spring 76.

As the ampules are advanced by wheel 40 their bases are engaged by cam 90 which is developed to move the bases towards the center of wheel 40 which causes the ampules to topple onto cam 92. As the ampul topples it falls into the inwardly extending groove 66 associated with the notch and, thus, is still advanced by wheel 40. The development of cams 90 and 92 place the ampul in substantially a horizontal position as wheel 40 advances. Barrier 98 acts to keep the ampules properly aligned with respect to cam 92 and acts to insure the ampules are properly aligned to fall into discharge chute 100 which carries the ampules off in a substantially horizontal position.

It is not desired to be limited except as set forth in the following claims.

What is claimed is:

1. Apparatus for manipulating ampules generally cylindrical in transverse section and abutting one another in a horizontally advancing single file thereof so as to successively turn the same from an upright to a horizontal position without interrupting the advance of said file of ampules comprising a member revoluble about an upright axis and having a series of ampule receiving notches formed in its periphery and adapted respectively for receiving the upright ones of said ampules in the advancing line thereof, and cam means for successively engaging the ampules in said notches and coaxing with said revoluble member to turn the lower end portions thereof

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radially inwardly under said revolvable member, the latter having a series of ampule receiving grooves formed in the underside thereof and adapted respectively for receiving the ampules turned under the revolvable member as aforesaid.

2. Apparatus for manipulating ampules generally cylindrical in transverse section and abutting one another in a horizontally advancing single file thereof so as to successively turn the same from an upright to a horizontal position without interrupting the advance of said file of ampules comprising a wheel revolvable about an upright axis and having a series of arcuate ampule receiving notches formed in its periphery and adapted respectively for receiving the upright ones of said ampules in the advancing line thereof, and cam means for successively engaging the ampules in said arcuate notches and coacting with said revolvable member to turn the lower end portions thereof radially inwardly under said revolvable member, the latter having a series of ampule receiving grooves formed in the underside thereof and communicating respectively with said arcuate ampule receiving notches for receiving the ampules turned under the revolvable member as aforesaid.

3. Apparatus for manipulating ampules generally cylindrical in transverse section and abutting one another in a horizontally advancing single file thereof so as to successively turn the same from an upright to a horizontal position without interrupting the advance of said file of ampules comprising a wheel revolvable about an upright axis and having a series of semicircular ampule receiving notches formed in its periphery and adapted respectively for receiving the upright ones of said ampules in the advancing line thereof, cam means for successively engaging the ampules in said semicircular notches and coacting with said revolvable member to turn the lower

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end portions thereof radially inwardly under said revolvable member, the latter having a series of ampule receiving grooves formed in the underside thereof and adapted respectively for receiving the ampules turned under the revolvable member as aforesaid, and a sloping face interposed between the upright base wall of each notch and the horizontally extending base wall of its associated groove adapted to facilitate turning of the ampules in the manner aforesaid.

4. Apparatus for manipulating ampules generally cylindrical in transverse section and abutting one another in a horizontally advancing single file thereof so as to successively turn the same from an upright to a horizontal position without interrupting the advance of said file of ampules comprising a member revolvable about an upright axis and having a series of ampule receiving notches formed in its periphery and adapted respectively for receiving the upright ones of said ampules in the advancing line thereof, and cam means for successively engaging the ampules in said notches and coacting with said revolvable member to turn the lower end portions thereof radially inwardly under said revolvable member, the latter having a series of ampule receiving grooves formed in the underside thereof and adapted respectively for receiving the ampules turned under the revolvable member as aforesaid, said cam means being formed to gradually lower the upper end of said ampules to a substantially horizontal position.

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