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2,014,506

COIN COLLECTION APPARATUS

Filed April 21, 1934

FIG. 1

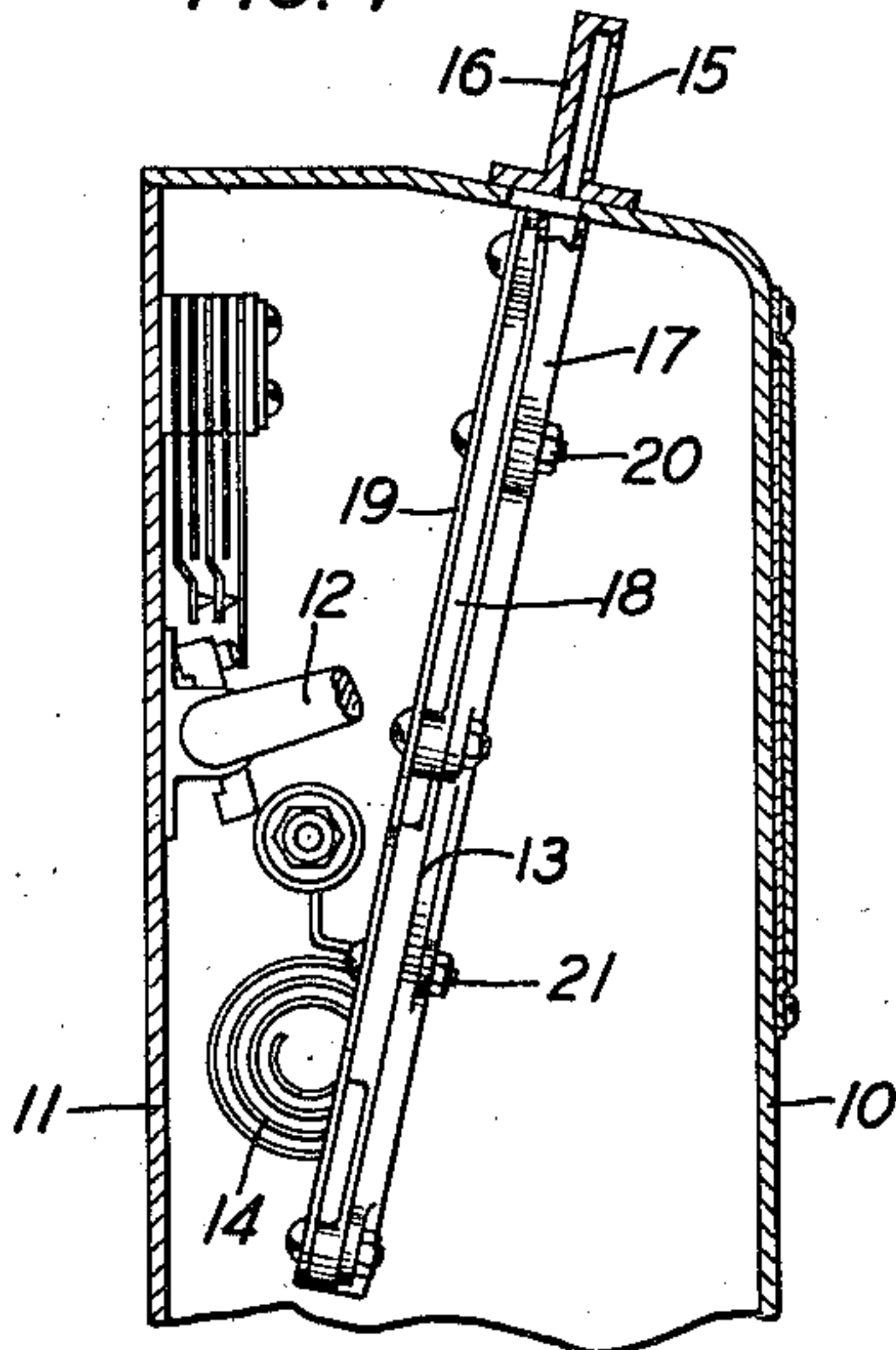


FIG. 2

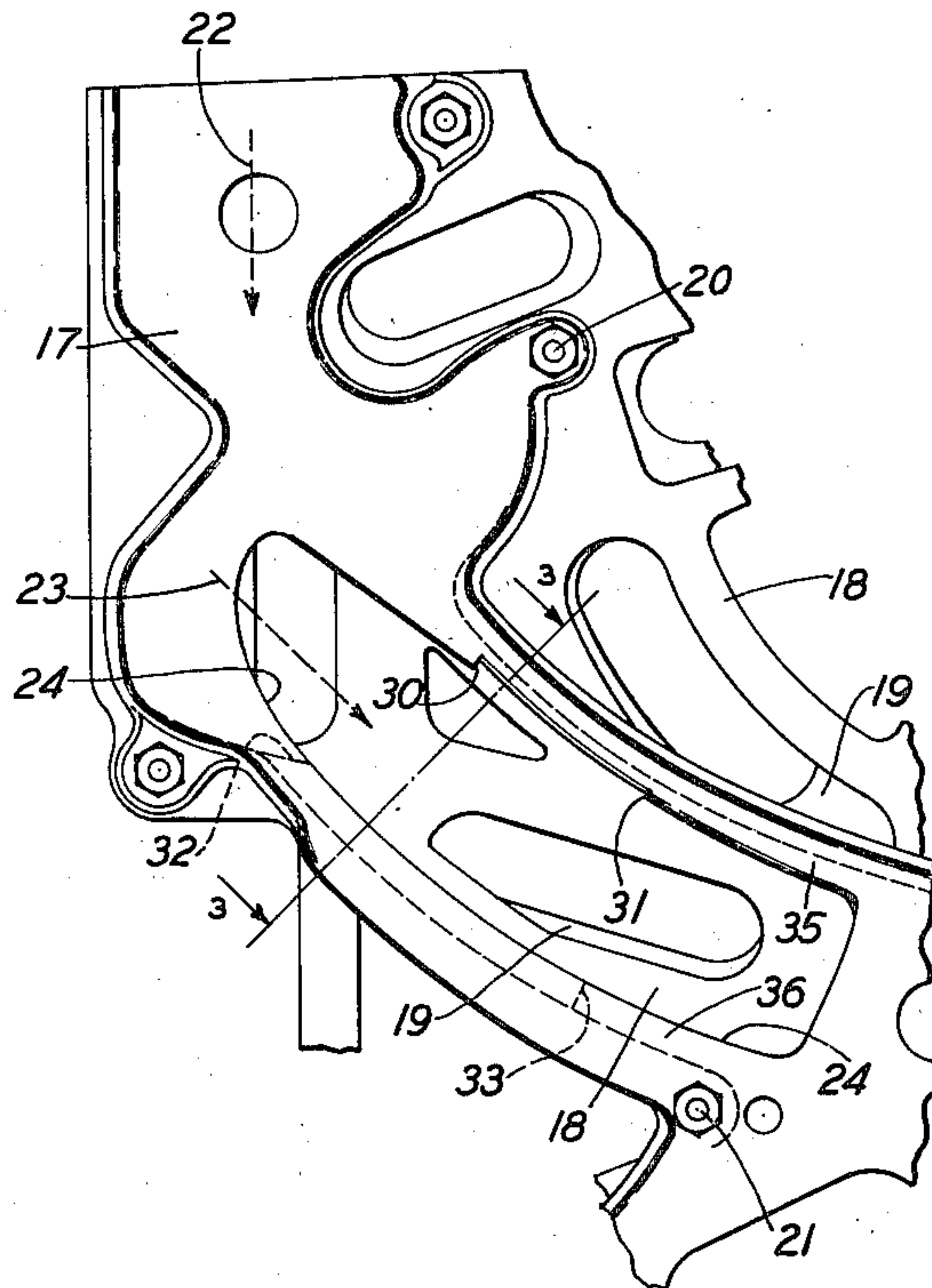


FIG. 3

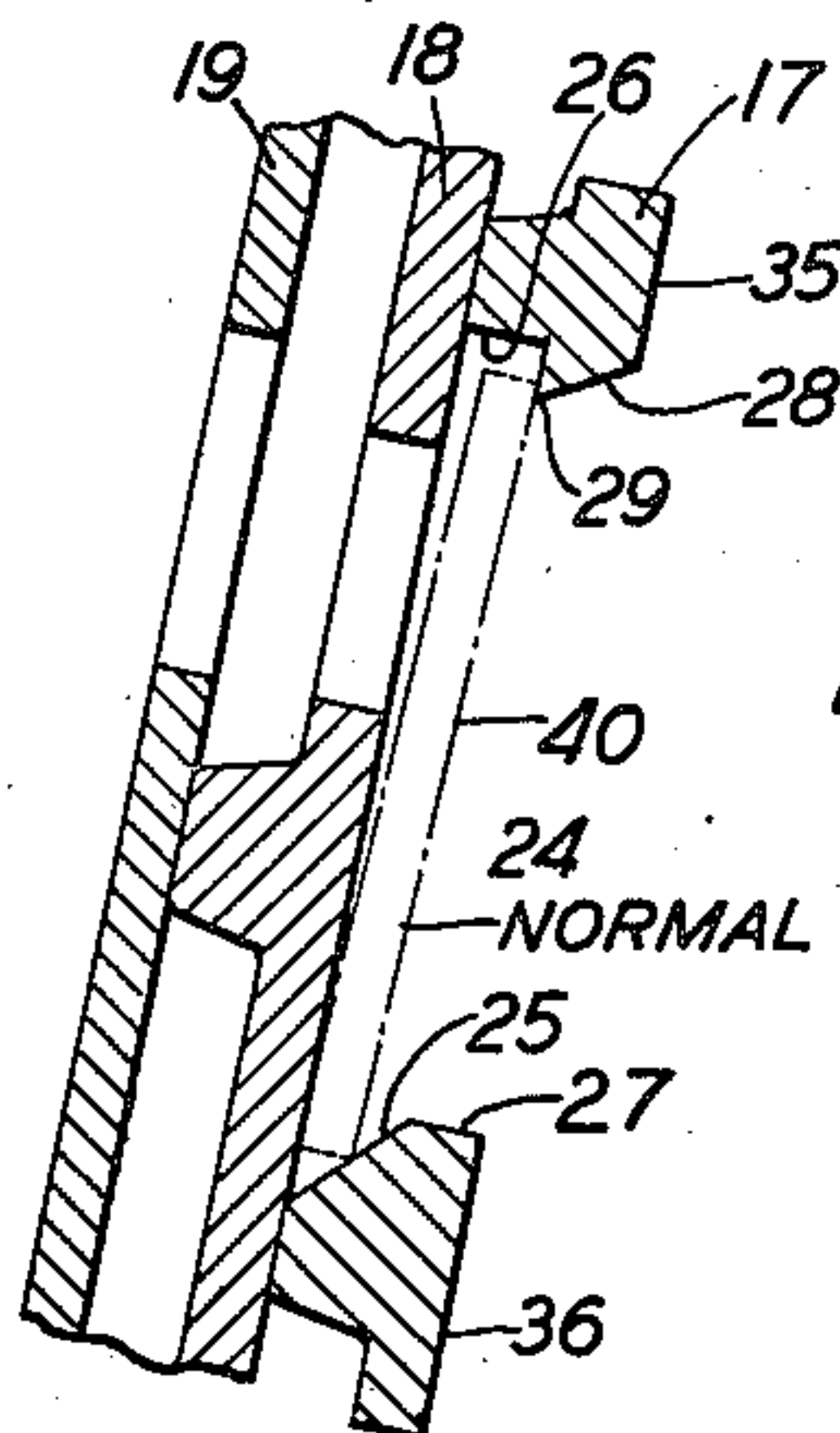


FIG. 5

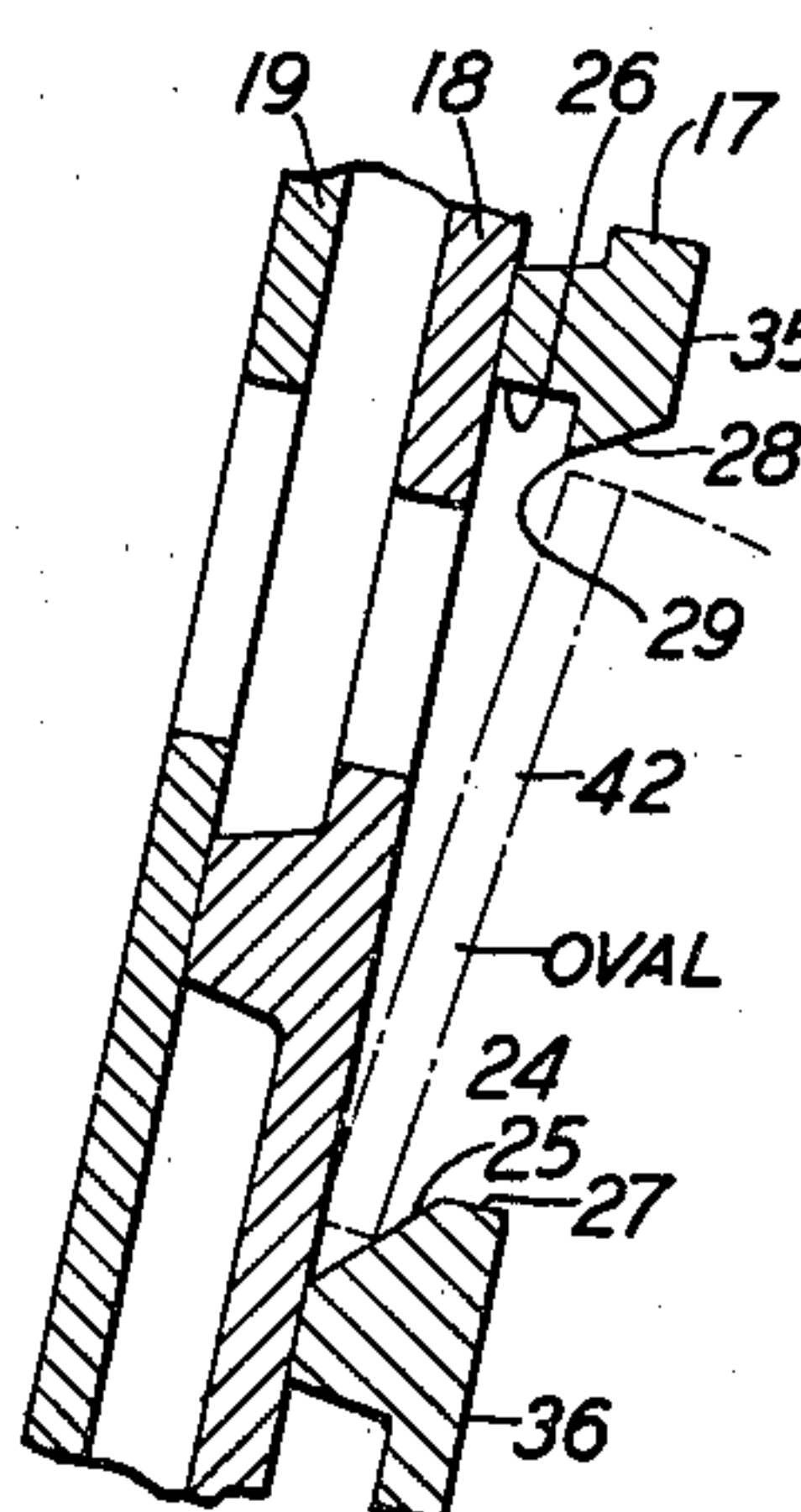


FIG. 6

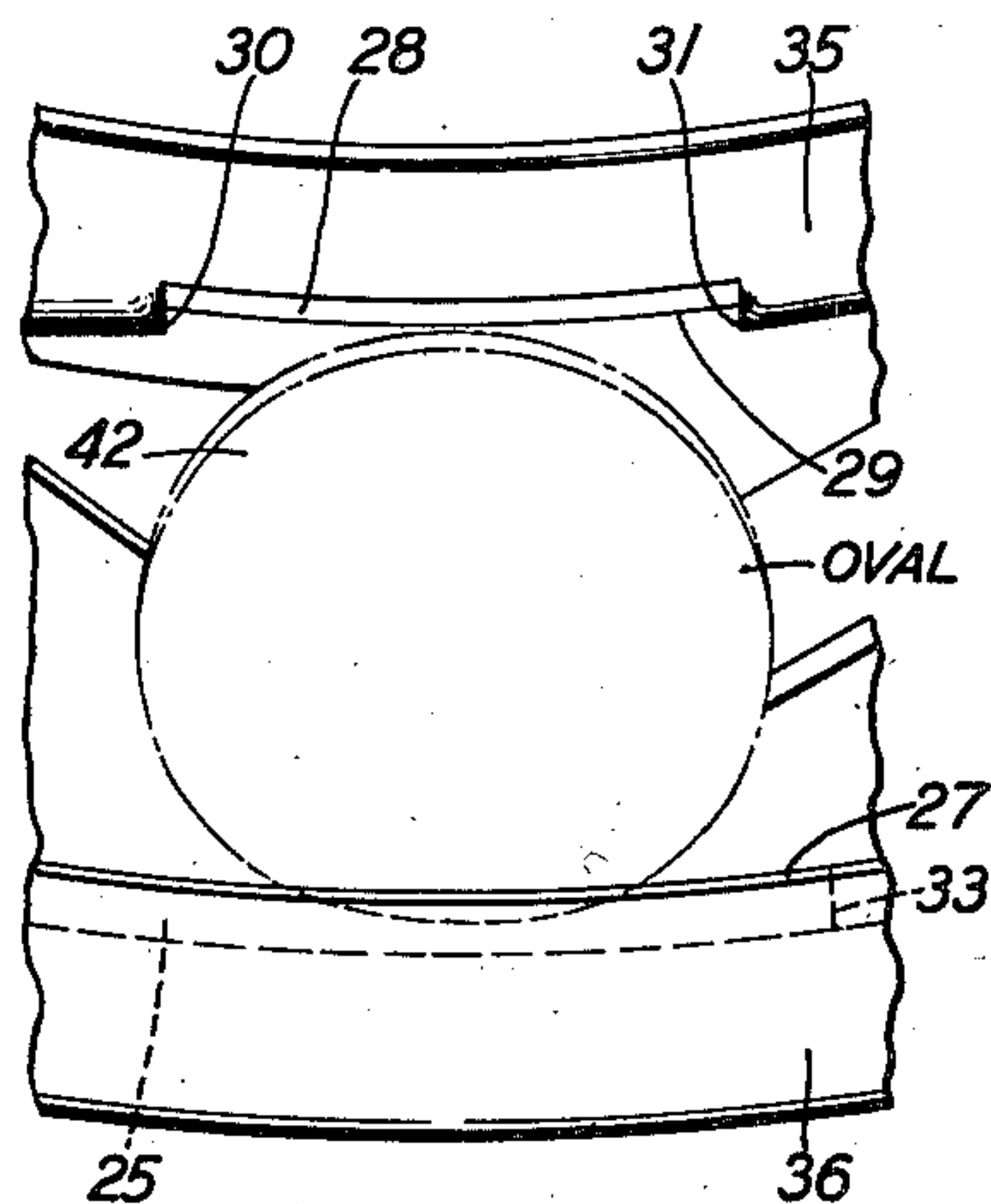
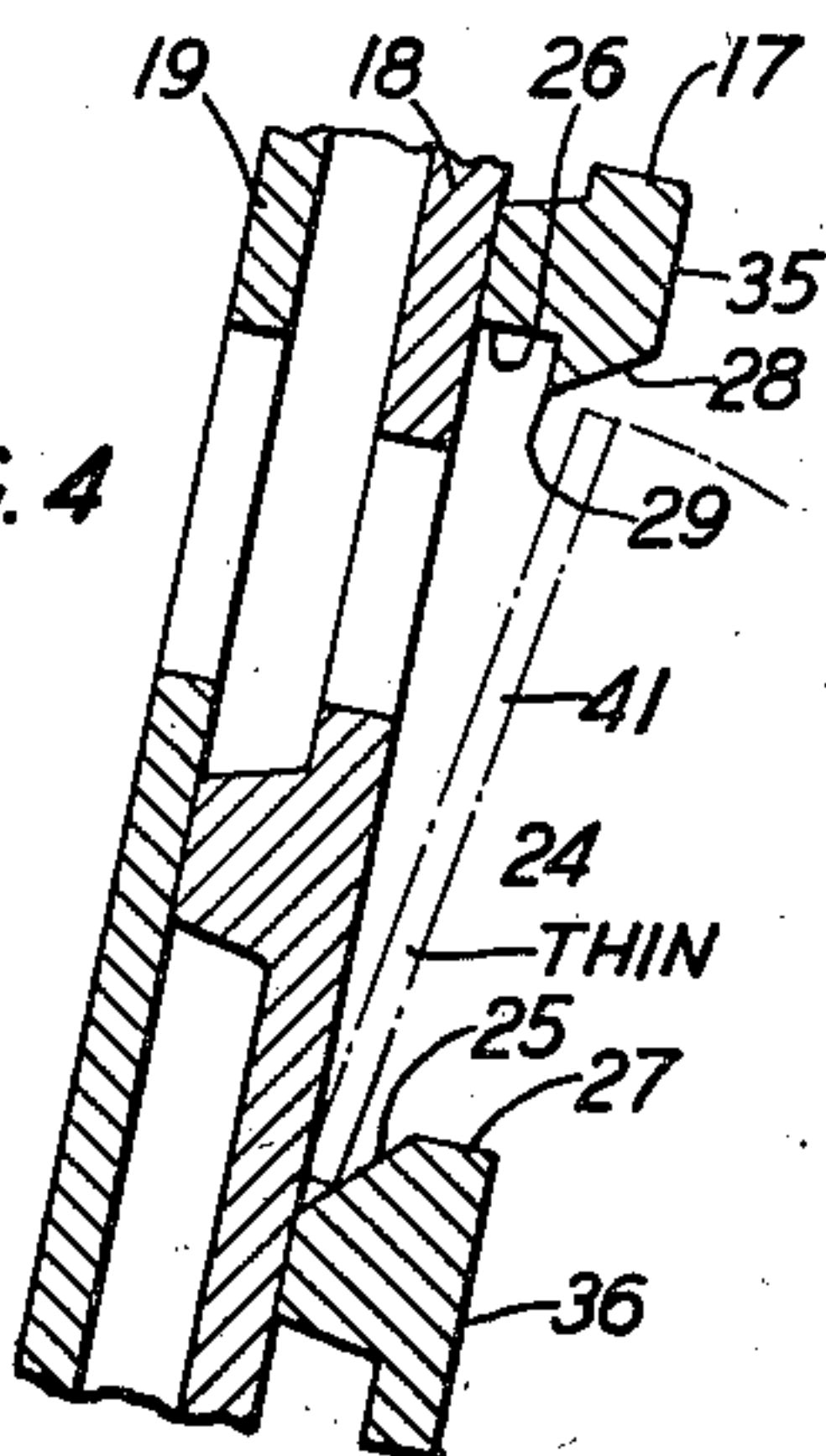


FIG. 4



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COIN COLLECTION APPARATUS

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3 Claims. (Cl. 194—102)

This invention relates to coin collection apparatus in which a coin or token is deposited for the use of an instrument or for the purpose of services or supplies from a vending device.

5 More particularly the invention relates to telephone apparatus such as described in the United States patent to O. F. Forsberg, 1,043,219, issued November 5, 1912 where one or more coins are deposited for the use of a telephone instrument, the deposited coins indicating to a remote telephone operator through the instrumentality of a signal the fact that they have been deposited. This type of apparatus is incorporated in what are known as telephone paystations.

10 A common form of signaling apparatus used in connection with telephone paystations or the like includes a coin chute in which channels are formed and along which the deposited coins travel and are guided to a signaling device that is sounded or operated by the impact of the coin or otherwise.

An object of the present invention is to prevent the fraudulent use of coin collection apparatus.

25 A further object is to reduce the choking or clogging of the chutes by coins, tokens or slugs of non-standard dimensions.

30 For convenience this invention will be described as applied to the quarter runway or chute of a telephone coin collector although the invention is of general application to chutes designed for other sizes of coins or tokens.

35 It is customary as shown in the above mentioned Forsberg patent to support a coin chute in a laterally inclined position with an elongated reject opening of non-uniform width in the lower side wall thereof so that under-diameter coins or slugs will fall through reject opening and, therefore, will be prevented from proceeding farther down the chute to strike the gong or other signal and give the remote telephone operator incorrect information as to the character of the coin or token deposited. The present invention provides improved features for such a reject opening particularly for coins or tokens having dimensions which are close to the critical dimensions for rejection.

40 In accordance with this invention it is proposed to gauge at the said reject opening not only the diameter but the thickness of each deposited coin or coin substitute so that the deposited object may be rejected if its diameter or thickness is less than standard for United States quarter pieces, for example. This may be accomplished by providing a V-shaped bottom in that part of

the chute having the reject opening. With such an arrangement a slug of the same diameter as a quarter but thinner would when deposited ride farther down the V-shaped bottom than a coin of standard thickness to such an extent that the upper edge of the slug would not be supported by the side wall above the reject opening and hence would fall out the chute.

Certain problems, however, have been encountered in the use of a V-shaped bottom for a reject opening of the usual type where the opening for gauging the coin extends along the chute for a distance comparable with the circumference of a standard coin or greater so that a coin makes substantially a complete revolution during its travel past the reject area, thereby gauging the coin at all points around its periphery. With such an extended reject opening the use of a V-shaped bottom tends to increase the probability of choking or clogging the chute by coins or tokens whose combined thickness and diameter is slightly less than standard, as such a non-standard disc may fall partially out of the chute only to become stuck between the upper and lower edges of the opening. With such a long reject opening this sticking may also occur even with a coin which is standard along one diameter but is below standard along another diameter, since the coin will be gauged for both diameters and the coin may start to pass out of the chute when the shorter diameter is effective so that with the coin revolving as it passes out, the larger diameter may later become effective to block its complete exit. It will be apparent that when a coin chute becomes choked in the above manner the apparatus associated therewith is put out of service until the trouble has been cleared and a clogged runway is not only an expense to the owner but an inconvenience to its patrons.

45 In accordance with the preferred form of this invention the length of the reject opening having a V-shaped bottom is made small with respect to the circumference of the standard coin to be gauged and the critical reject opening is made of substantially constant width along its entire length. Improved results in preventing the sticking of coins in the reject opening are also secured by having the upper rail along the reject area beveled or tapered to a sharp edge at the inside wall of the rail to reduce to a minimum the thickness of the upper edge of the opening, which edge may contact with a coin or slug during the process of rejection. It has also been found that for a given size coin and speed of travel there is

an optimum angle for the V-shaped bottom. For example, in a quarter runway laterally inclined at the angle shown in the above mentioned Forsberg patent the bottom of the runway for the reject opening should for best results be beveled to give a slope of the order of 45 degrees with respect to a plane at right angles to the inner face of the runway.

This invention will be better understood by reference to the following detailed description taken in connection with the accompanying drawing in which

Figure 1 represents a side view partly in cross-section of the upper section of a telephone coin collector showing the relation of the usual coin chute with other parts of the apparatus;

Fig. 2 illustrates a portion of a coin chute embodying the present invention;

Figs. 3, 4 and 5 are enlarged sectional views of the coin chute of Fig. 2 taken across the reject area of the quarter runway; and

Fig. 6 is an enlarged front view of the reject area of the quarter runway of Fig. 2 showing a non-standard coin in process of rejection.

This invention for convenience will be described in connection with a coin chute of the general type disclosed in the above mentioned Forsberg patent to which reference is made for a disclosure of the complete coin chute and the apparatus associated therewith at a telephone paystation. The portion of the usual telephone coin collection apparatus disclosed in Fig. 1 is a side elevation of the upper part of the coin collector housing 10 with the side wall of the housing removed. The coin collector has a back plate 11 upon which are mounted the usual telephone receiver hook 12 and other parts of the telephone and signaling apparatus. The housing carries the forwardly inclined coin runways or passages indicated generally by character 13 and one of the coin signaling devices is shown at 14. The upper ends of the said coin runways project through the top of housing 10 and terminate in openings such as opening 15 in plate 16, one for quarters, one for dimes and one for five cent pieces. In the view shown in Fig. 1 the opening 15 is the one for quarters or twenty-five cent pieces. Thus, a quarter deposited in opening 15 will drop into a runway defined by front plate 17 and intermediate plate 18 of the chute assembly. The openings in plate 16 for dimes and for five cent pieces are aligned so that such coins drop into runways between back plate 19 and intermediate plate 18. Thus, a coin deposited in the proper opening in plate 16 will pass down its runway and after striking the signaling device will pass into the lower part of the housing (not shown) for subsequent collection or refund. The three plates which with their flanges define the said coin runways are suitably bolted together as at points 20, 21.

Such coin runways are usually constructed with openings of the proper dimensions in the side walls in a longitudinally inclined section so that slugs, tokens, etc. which are not of a proper diameter will not be permitted to strike the coin signaling device but will fall out of the runways from said openings due to the laterally inclined position of the chute as shown in Fig. 1.

The manner in which the improved reject area of this invention may be embodied in a coin chute of the general type of Fig. 1 is shown in Fig. 2 where the invention is applied to the quarter runway. Referring particularly to Fig. 2 the upper part of the runway for a quarter deposited in

opening 15 comprises between plates 17 and 18 a vertical section indicated by a dotted arrow 22, and a longitudinally inclined section indicated by dotted arrow 23, the rest of the runway being omitted since it is not concerned with this invention. The longitudinally inclined section 23 has a longitudinal opening 24 in the vertical wall 17 only a portion of which opening is critical as a reject area for coins or slugs which are only slightly undersize as compared with a standard quarter. As disclosed more clearly in Fig. 3 the quarter runway in the region of the reject area has a V-shaped bottom due to the sloping surface 25 extending downwardly from the lower edge of opening 24 to the inner face of plate 18. The top of the coin slot in the reject area is defined by surface 26 located substantially at right angles to the front face of plate 18. Reject opening 24 is defined on the lower rail 36 by a flat surface 27 formed substantially at right angles to the face of plate 17 and is defined on the upper rail 35 by a beveled surface 28 which with the inner face of plate 17 forms a knife edge 29 on the inside of the upper rail.

As shown in Fig. 2 the beveled surface 28 extends only between points 30 and 31 and not for the entire length of opening 24. Above point 30 and below point 31 the upper rail 35 extends downwardly a greater distance than between said points. The V-shaped bottom, however, is of greater length beginning at the point 32 and ending at the point 33 so that a coin passing down the runway will ride on the inclined bottom before reaching point 30 and will continue to ride on the inclined bottom for a short distance after passing point 31. The change in the runway from a flat to an inclined bottom occurring at the point 32 should be effected gradually so as to prevent any abrupt change in the path of a coin traveling down the chute. The opening 24 is, therefore, critical for rejection of undersize coins or slugs only in that portion between 30 and 31 which region will hereinafter be termed the reject area. The angle which the inclined bottom 25 makes with the inside face of plate 18 should be constant for the critical reject area, that is, between the points 30 and 31. Also the distance between edge 29 and surface 27 should be constant for the length of said edge from point 30 to point 31.

The width of the reject opening between points 30 and 31 is such that a standard quarter will ride in the chute substantially in the manner shown in Fig. 3 where the bottom of the quarter rides about half-way down slope 25 and the top of the quarter projects a short distance above edge 29, thereby holding a standard quarter in the chute while passing the reject area 30 and 31. However, if a slug of the same diameter as the standard quarter but of substantially less thickness is deposited in the chute such a slug 41 when it reaches the reject area will ride farther down the slope 25 as shown in Fig. 4 and hence will not be supported by upper rail 35 and will fall out of the chute. It will, therefore, be apparent that in reject area 30, 31 the coin is gauged both for diameter and for thickness and any coin or token whose diameter or thickness is appreciably less than that of a standard quarter will be rejected.

One problem involved in having a reject opening in a coin chute is to reduce the chances that a non-standard coin which is close to the critical diameter for rejection may not pass out of the reject opening but will become stuck or

wedged in the opening, thereby placing the chute out of commission until the offending coin has been removed. The probability of sticking may be reduced by using a knife edge such as edge 23 on the inner side of the top rail so that once the top of the coin falls beyond edge 29 the upper rail offers no further impediment to the falling coin as would be the case if surface 28 were formed at right angles to the front face of rail 35. Another feature of this invention which reduces the probability of sticking is in having the critical reject area started and terminated abruptly. Thus, this reject area in Fig. 2 is begun and is terminated by substantially right angle faces in the upper rail 35 at points 30, 31, although shoulder 31 may be rounded off slightly except at the inner face of plate 17.

The probability of a given coin sticking in the reject opening may be further reduced by gauging the coin for a distance considerably less than the circumference of the coin. Thus it is preferred to have the length of reject area 30, 31 only about one-third the circumference of a standard quarter. This is very important for coins that may be slightly oval as is occasionally found in worn coins that are otherwise standard. If the length of the reject area is equal to or greater than the circumference of the coin then the coin would be gauged for both its long and short diameters; and with such a coin sticking will frequently occur by reason of the fact that the coin may be first gauged by its shorter diameter to start its rejection only to have its larger diameter become effective before it has entirely left the chute, which larger diameter may be of a size to wedge the coin in the opening. Hence in accordance with this invention it is preferred to limit the length of the reject opening so that if an oval coin happens to be gauged by a shorter diameter the larger diameter can not later become effective before the coin has left the chute. Furthermore, by having the critical reject area 30, 31 of constant width instead of a non-uniform width as previously proposed there is a considerable reduction in the range of coin dimensions within which sticking is liable to occur.

Figs. 5 and 6 illustrate the rejection of an oval coin 42 that is being gauged in these figures along its shorter diameter. It will be apparent that such an oval coin will be safely rejected by reject area 30, 31 without danger that the larger diameter will cause the coin to be wedged as the coin is falling out of the opening.

It has also been found that the efficiency of the reject area 30, 31 depends upon the angle of the inclined bottom 25. For a quarter coin chute disposed in the general manner shown in the Forsberg patent it has been found that best results have been obtained if the surface 25 is at an angle of approximately 45 degrees to the surface 27. But with a different chute construction resulting in a different speed of travel the 45 degree angle would not be the optimum value. In general the slower the coin speed the smaller this angle should be. For example, in applying this invention to a nickel coin chute disposed in the general manner of the Forsberg patent this angle for a minimum of sticking should be about 35 degrees due to the slower speed of travel of the nickel in such a chute compared with the speed of a quarter in the quarter runway.

Although the angle of slope 28 on the upper rail is not as critical as the angle of the slot bottom it has been found preferable for quarter runways to make slot 28 have an angle of about 30 degrees with respect to a plane perpendicular to the face of plate 18.

It should, therefore, be appreciated that the above specified features of reject area 30, 31 greatly minimize the chance of sticking of slugs or coins which are close to the critical dimension for rejection and hence this invention enables a chute of such construction to be used for longer periods without servicing.

It is to be understood that this invention is not limited in its use to a quarter runway but may be applied to a chute for any other standard coin or token. While several enumerated features are proposed herein for increasing the efficiency of a coin chute it is to be understood that improved results will be obtained without the necessity of employing all of said specified features in the same chute. In using the word "coin" in the appended claims the word is not intended to be limited in its meaning to a piece of money but is intended to include a token, slug, check or other article of an equivalent character.

What is claimed is:

1. A coin chute for collecting coins of a given standard size comprising a coin channel through which a deposited coin travels, one side of said channel having an elongated slot defined by upper and lower rails which prevent said standard coin from being discharged through said slot when said chute is supported in a laterally inclined position but will reject undersize coins by discharging them through said slot, one portion of said slot having a constant width extending over a length less than one-half the circumference of said standard coin, said slot being of a shorter width immediately above and below said constant width portion, said channel having a V-shaped bottom extending along said channel under said slot for a distance greater than the length of said constant width portion.

2. A coin chute in accordance with claim 1 in which said slot for said portion of constant width is defined at the top by a sharp edge on the inside of said upper rail.

3. A coin chute for collecting coins of a given standard size comprising a coin channel having front and rear side walls between which a deposited coin travels, said front wall having an elongated slot defined by upper and lower rails which prevent said standard coin from being discharged through said slot when said chute is supported in a laterally inclined position and will reject undersize coins by discharging them through said slot, one portion of said slot having a constant width for a distance comparable with the diameter of said standard coin, said slot having a shorter width immediately above and below said constant width portion, said channel having a bottom inclined downwardly from said front wall towards said rear wall for a distance along said slot greater than the length of said constant width portion, said upper rail having a sharp downwardly projecting edge extending the length of said constant width portion and substantially aligned with the inner face of said upper rail.

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