

June 20, 1961

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2,989,092

FILLER NOZZLE ADJUSTING ASSEMBLY FOR FILLING MACHINE

Filed Feb. 9, 1959

3 Sheets-Sheet 1

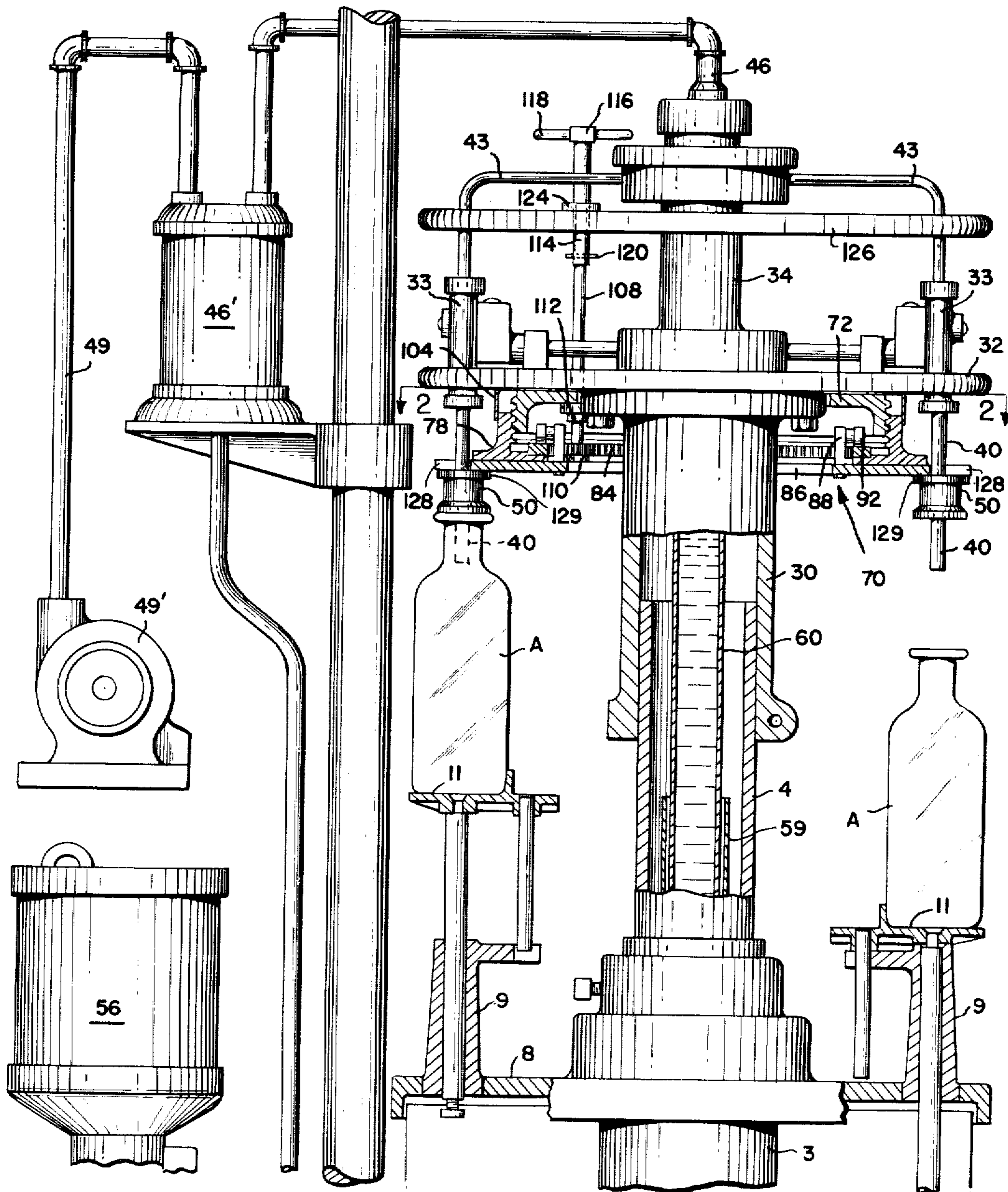


FIG. 1.

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3 Sheets-Sheet 2

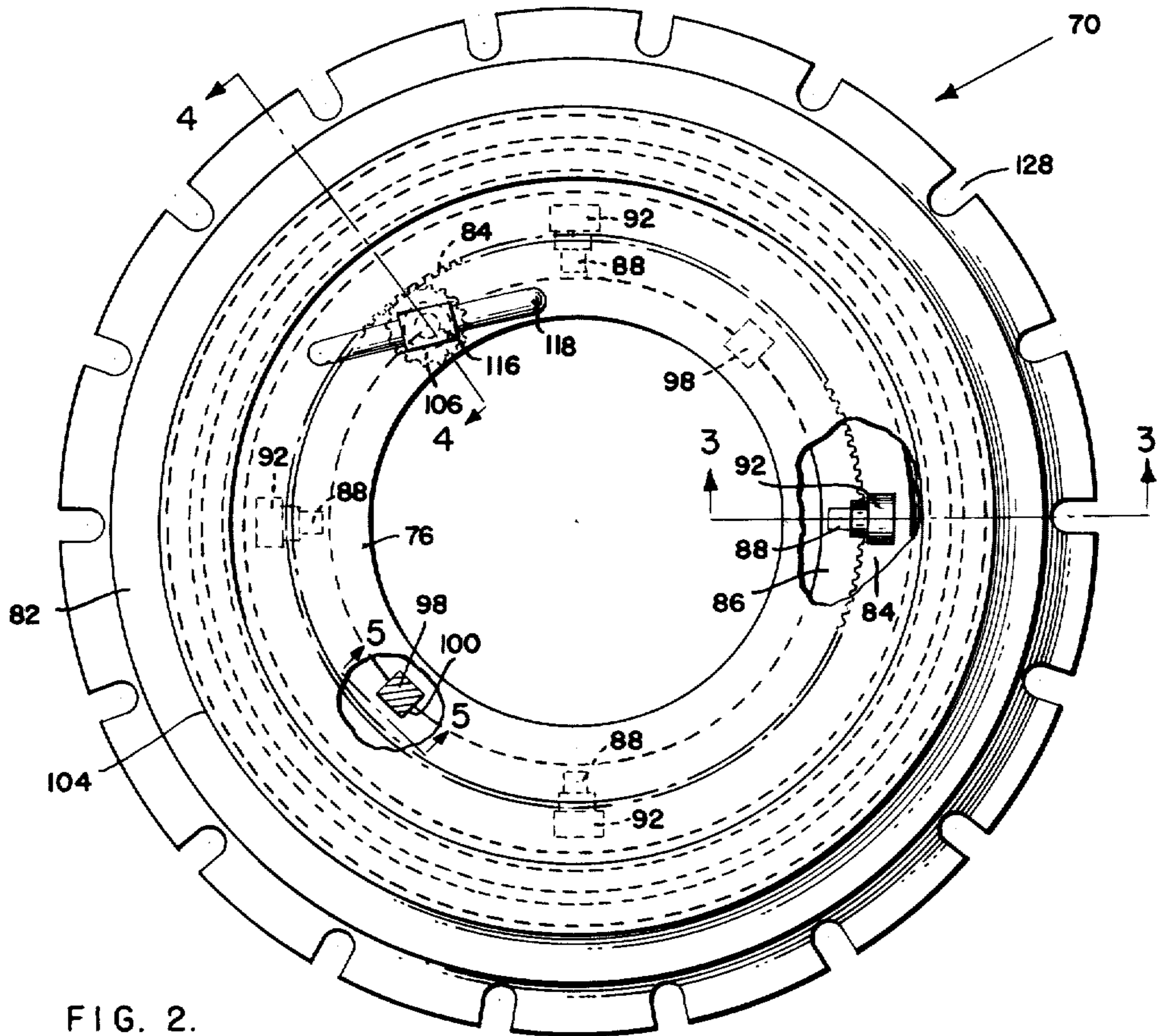


FIG. 2.

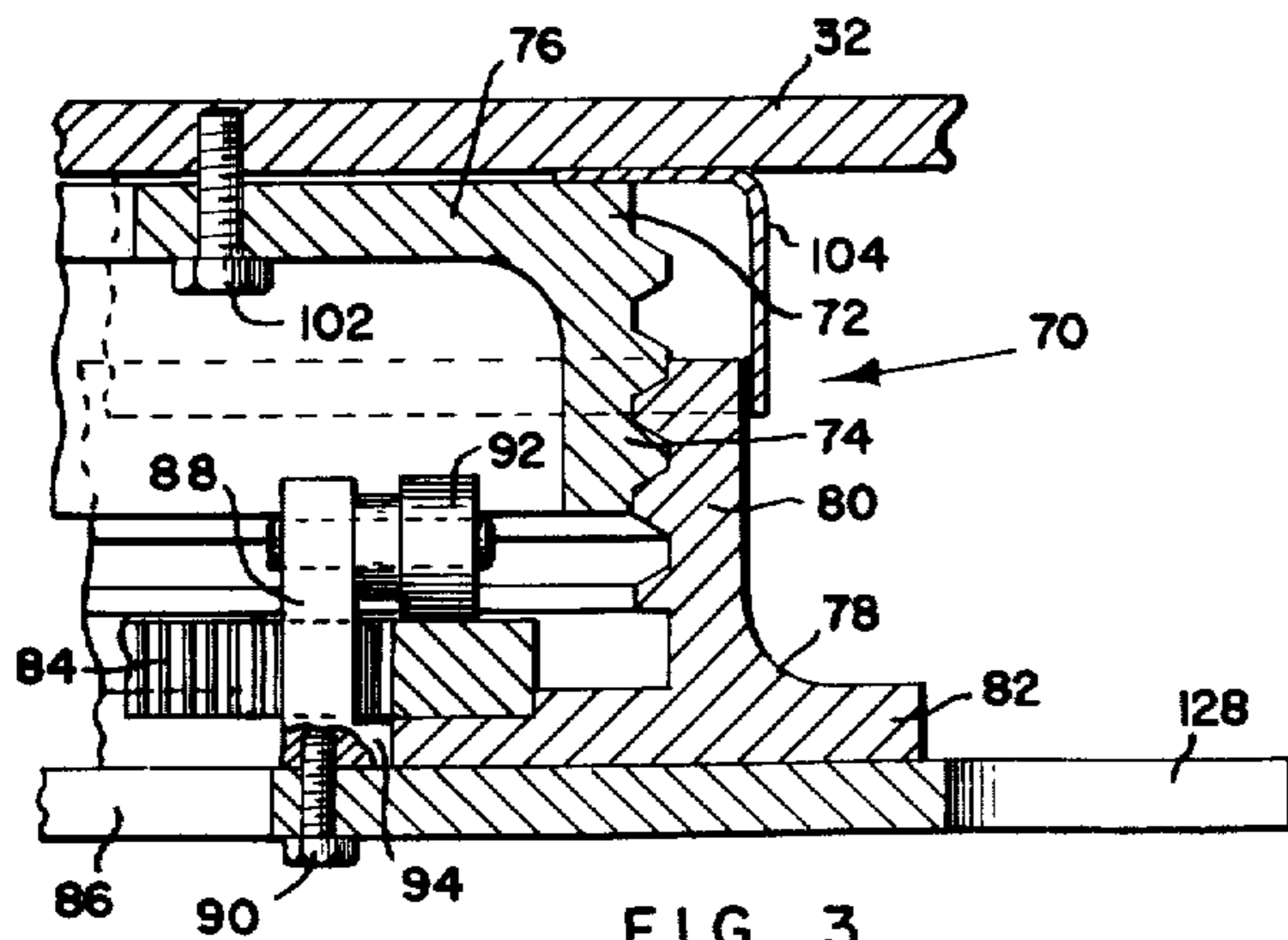


FIG. 3.

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3 Sheets-Sheet 3

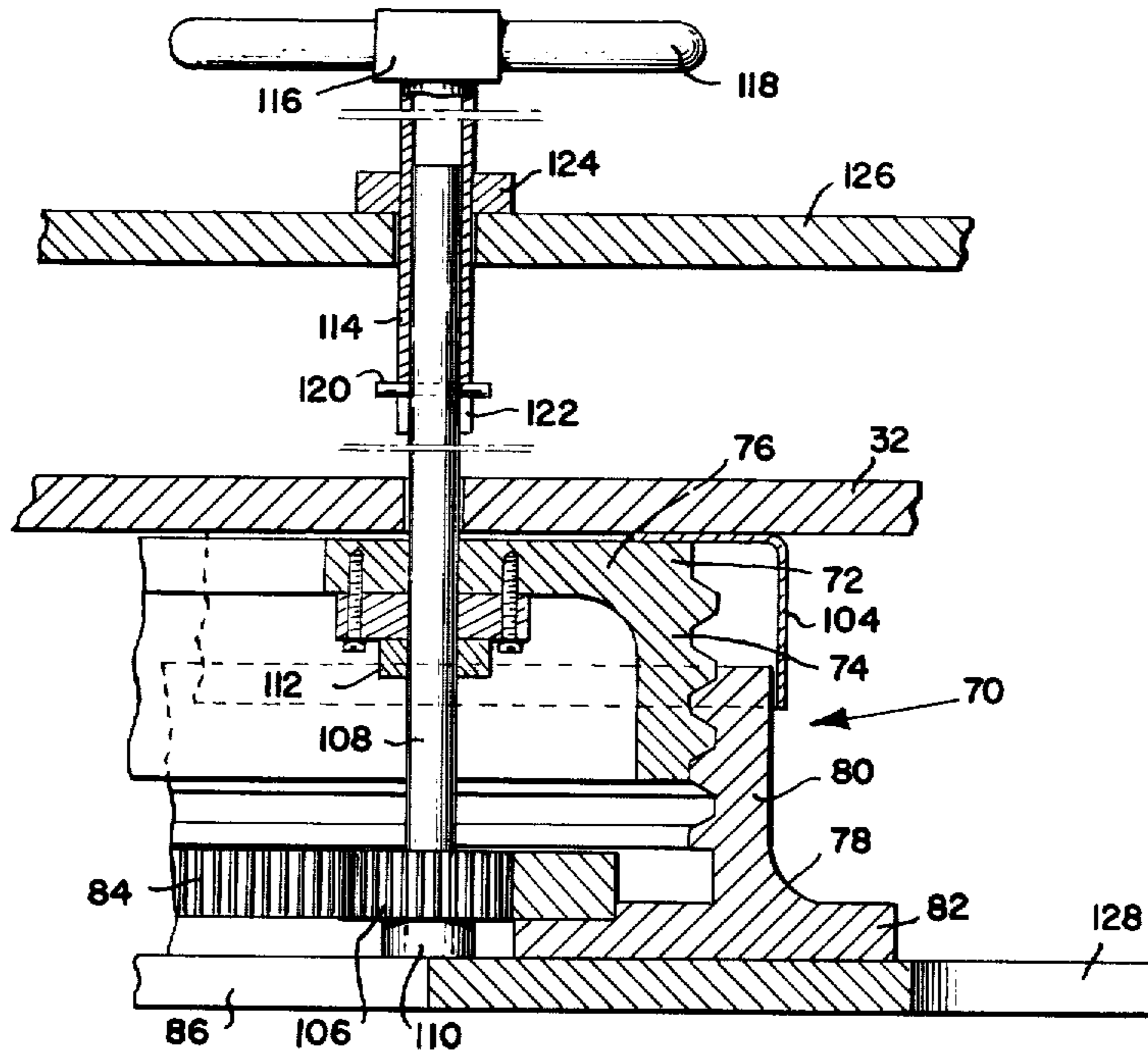


FIG. 4.

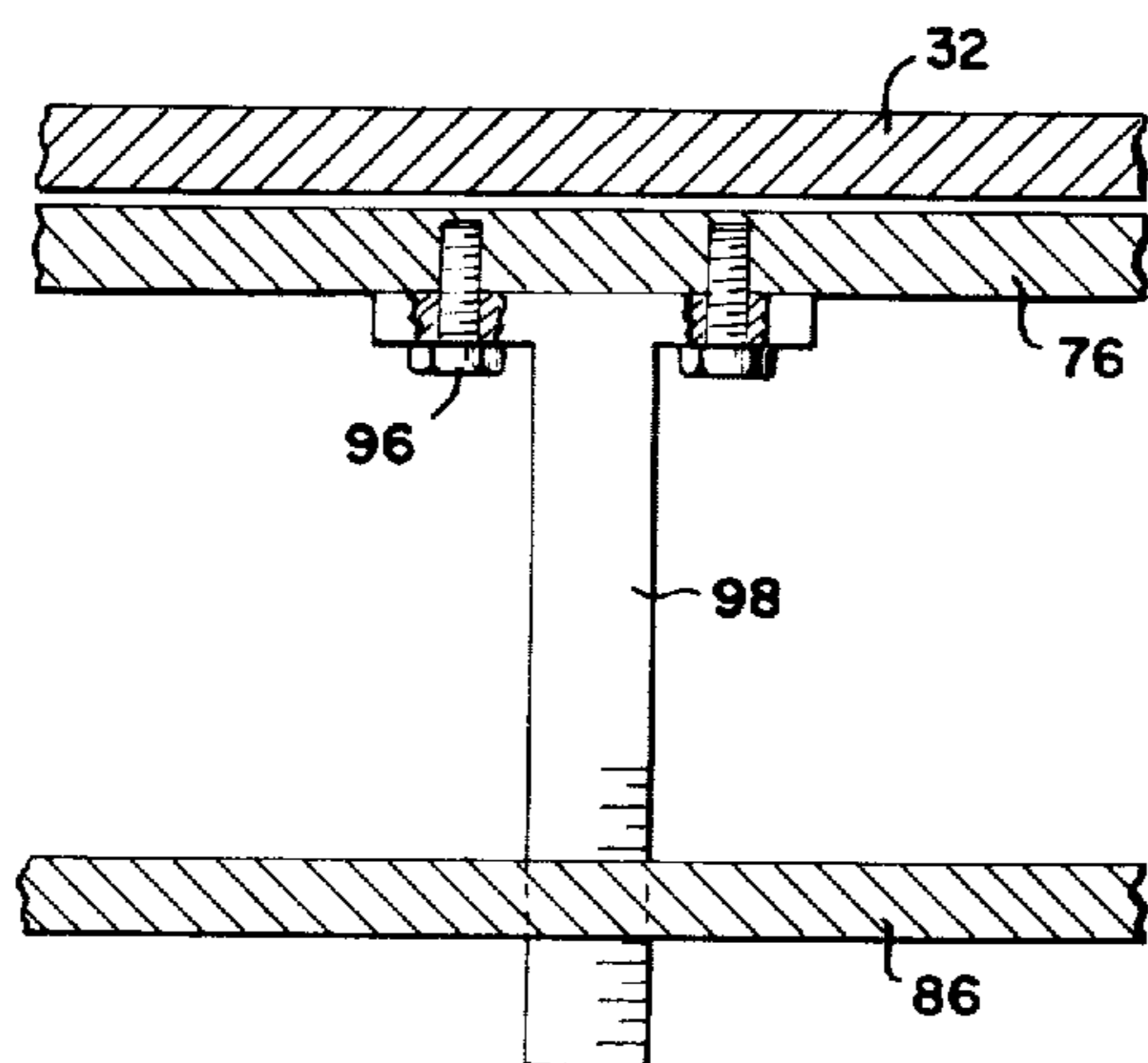


FIG. 5.

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1

2,989,092

**FILLER NOZZLE ADJUSTING ASSEMBLY  
FOR FILLING MACHINE**

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4 Claims. (Cl. 141-152)

This invention relates generally to machines for filling  
containers with liquid by the aid of suction, withdrawing  
the air from the containers and allowing the liquid to  
enter under atmospheric pressure, and more particularly  
to improvements in means for sealing the containers  
against atmosphere during the filling operation.

The principal object of the present invention is to pro-  
vide a machine of the type aforesaid with means for ad-  
justing the several container sealing means of the ma-  
chine simultaneously in one operation, instead of indi-  
vidually.

Other objects and advantages of the invention will ap-  
pear more fully hereinafter, it being understood that the  
present invention consists in the combination, construc-  
tion, location and relative arrangement of parts, all as  
will be more fully described hereinafter, as is shown in  
the accompanying drawings, and as will be pointed out in  
the appended claims.

In the accompanying drawings:

FIGURE 1 is a view of a machine constructed in  
accordance with and embodying the principles of the  
present invention, the view being a partial elevation, with  
fragments thereof shown in section;

FIGURE 2 is an enlarged plan view on line 2-2 of  
FIGURE 1, showing the filler nozzle adjusting assembly  
of the present invention detached from the rest of the  
machine; and

FIGURES 3, 4 and 5 are enlarged vertical sections re-  
spectively on lines 3-3, 4-4 and 5-5 of FIGURE 2.

The present invention is concerned principally with  
improvements in fitting machines of the type disclosed  
by U.S. Letters Patent No. 1,763,240, issued to Karl  
Kiefer, June 10, 1930, to which document reference may  
be had for the description and operation of all parts not  
specifically covered herein.

Referring particularly to FIGURE 1, in accordance  
with the disclosure of the aforementioned patent, a fixed  
hub 3 revolubly receives a column 4, which has affixed  
thereto a table 8 mounting a plurality of guide-hubs 9.  
Suitably mounted upon the latter respectively are a  
plurality of lifters 11 for carrying containers A, which  
latter are to be filled. A member 30 affixed to the up-  
per end of the column 4 mounts a spider or nozzle  
mount 32 and a valve head 34. Suitably mounted upon  
the spider 32 are a plurality of filler heads 33 from  
which depend filling tubes 40. Connecting the filling  
heads 33 to the valve head 34 are tubes 43, and con-  
necting the valve head 34 to a vacuum pump 49' are pipes  
46 and 49 having a trap 46' connected therebetween.  
Within the column 4 is a stationary liquid conductor 59  
connected (by means not shown) to a reservoir 56, and  
extending downwardly into the conductor 59 is a liquid  
conductor 60.

Fitted over a lower end portion of each filling tube 40  
is an elastic air-tight container connection 50. When the  
bottles A are raised by the lifters 11, they receive the  
portions of the tubes 40 extending below the elastic  
members 50, and the latter seal the containers against  
atmosphere. In the operation of the prior art machine,  
each elastic member 50 requires separate adjustment  
axially of its tube 40 and separate clamping thereof in  
adjusted position. Since the filling heads are substantial  
in number, the operation of adjusting the several filling

2

heads can be time consuming to the point of materially  
slowing up production. A machine constructed in ac-  
cordance with and embodying the principles of the pres-  
ent invention avoids the aforesaid disadvantage by omit-  
ting the several clamps and substituting therefor means  
operable for adjusting all of the elastic members 50 at one  
and the same time, said means being the filler nozzle ad-  
justing assembly now to be described in detail.

The assembly, generally designated 70, is annular in  
form, being positioned immediately below the spider 32  
and concentric with the column 4. A first annulus 72  
is provided with an externally threaded cylindrical por-  
tion 74 and a flange 76 at an end of and extending radial-  
ly inwardly from the cylindrical portion 74. Embracing  
the annulus 72 is a second annulus 78 provided with an  
internally threaded cylindrical portion 80 and a flange 82  
at one end of and extending radially both inwardly and  
outwardly from the cylindrical portion 80. The first and  
second annuli are interengaged through the medium of  
the threads aforesaid. Fixedly seated upon the upper  
surface of the inner marginal portion of the flange 82 is  
a third annulus in the form of a ring gear 84 having teeth  
formed in the inner marginal portion thereof. Underly-  
ing the flange 82 is a fourth annulus in the form of a  
flat ring 86 having affixed to circumferentially equally  
spaced inner marginal portions thereof four upright  
bracket members 88, as by studs 90. Journaled in the  
upper end portions of the bracket 88 are rollers 92 over-  
hanging and bearing upon the upper surface of the ring  
gear 84. It will be evident that the second, third and  
fourth annuli are so arranged that there can be no axial  
relative movement with respect to each other. The  
brackets 88 are provided with base portions 94 that abut  
the inner circumferentially extending edge of the flange  
82, in consequence of which the flat ring 86 is secured  
against movement cross-axially relative to the flange 82.  
Referring particularly to FIGURE 5, secured to dia-  
metrically opposite areas of the flange 76, as by studs 96,  
are a pair of key or spline members 98 that extend down-  
wardly freely through recesses 100 formed in the inner  
marginal portion of the flat ring 86, in consequence of  
which the latter cannot be turned about the axis of the  
assembly relative to the first annulus 72, while it is free  
to be moved axially relative to the first annulus 72.

The assembly 70 is affixed to the spider 32 through the  
medium of studs 102 projected through the flange 76 and  
threaded into the spider. Clamped between the spider  
and the flange 76 is the inner marginal portion of a sheet  
metal dust cap 104 which extends downwardly over the  
outside of the annulus 78.

Referring particularly to FIGURES 2 and 4, meshing  
with the ring gear 84 is a pinion 106 secured to the lower  
end portion of an upright shaft 108, and provided with a  
hub 110 resting upon an inner marginal area of the flat  
ring 86. An intermediate portion of the shaft 108 is  
journaled in a bearing 112 secured to the undersurface  
of the flange 76 of the annulus 72. From the bearing  
112, the shaft 108 extends upwardly freely through the  
spider 32 and into the lower end of a tubular main body  
part 114 of a key, generally designated 116, provided  
with a handle 118. The shaft 108 is provided with a  
cross-axially extending pin 120 the opposite end portions  
of which are removably fitted respectively into open slots  
122 formed in the lower terminal portion of the main  
body part 114 of the key 116. The part 114 is journaled  
in a bearing 124 affixed to a spacer ring 126. It will be  
observed that the shaft 108 and the main body part 114  
of the key 116 are slidably received respectively by the  
bearings 112 and 124, in consequence of which they may  
be shifted vertically with respect to the bearings.

The flat ring 86 is provided with a plurality of circum-  
ferentially equally spaced open notches 128, there being

3

one such notch for each filler head 33. The tubes 40 depending from the filler heads 33 extend freely respectively through the notches 128, and the elastic members 50 fitted over the tubes 40 underlie the notched flat ring areas, each being fitted with a rigid collar 129 abutting the overlying notched flat ring area, the collar being employed to distribute the pressure evenly all around the elastic member. When the bottles A are raised by the lifters 11, they receive the portions of the tubes 40 extending below the elastic members 50 and coact with the flat ring 86 to compress the elastic members 50, thereby to effect sealing of the containers against atmosphere.

The filler nozzle adjusting assembly of the invention is carried by the spider 32 and, as indicated hereinbefore, is mounted to turn with the spider 32, column 4 and table 8 as a unit. In the event that the vertical spacing of the elastic members 50 from the elevated lifters 11 is not that desired for effecting proper sealing of the containers by the elastic members 50, the spacing may be varied as desired merely by turning the key 116. For example, when the key is turned, the latter turns the ring gear 84, which causes the second annulus 78 to turn with respect to the flat ring 86, which is supported on annulus 78 by rollers 92 but is secured against turning by the spline members 98. As the second annulus 78 turns, its vertical position varies as it is threaded more or less upon the first annulus 72. Thus, the second annulus 78, flat ring 86, ring gear 84, pinion 106, shaft 108 and key 116 shift vertically relative to the first annulus 72 as a unit to position notches 128 at the desired elevation. The direction of the movement, of course, depends upon the direction in which the handle of the key 118 is turned. Referring particularly to FIGURE 5, one of the spline members 98 may be provided with a scale to serve as a guide when an adjustment is made. The key 116, it will be observed, is arranged so that it may be removed.

It will be understood, of course, that the present invention is susceptible of various changes and modifications which may be made from time to time without departing from the general principles or real spirit of the invention, and accordingly it is intended to claim the same broadly, as well as specifically, as indicated by the appended claims.

What is claimed is:

1. In a filling machine, the combination comprising a frame structure including a horizontally extending filler

4

nozzle mount having a vertically extending central axis, a plurality of filler nozzles distributed about said central axis each including a tubular member depending from said mount, and an elastic member shiftably fitted over said tubular member and adapted for sealing a container against atmosphere when the open mouth of the container is pressed firmly against the lower extremity thereof, and a filler nozzle adjusting assembly including a pair of threadedly engaged members, one of the latter being affixed to said nozzle mount and the other being turnable about said central axis relative to said nozzle mount, means for turning the last mentioned of said members about said central axis thereby to shift the same vertically, an annulus mounted upon said vertically shiftable member for vertical shifting movement therewith, and means for securing said annulus against turning movement about said central axis relative to said nozzle mount, said annulus being provided with means adapted respectively for overlying said elastic members thereby to limit approach thereof to said nozzle mount.

2. The combination defined in claim 1 wherein the turning means includes a ring gear affixed to the turnable member, and a meshing pinion disposed within said ring gear.

3. The combination defined in claim 1 wherein the member affixed to the nozzle mount includes an externally threaded cylindrical portion, the turnable member includes an internally threaded cylindrical portion and a flange extending radially inwardly therefrom, and the annulus is carried by a plurality of rollers in turn carried by said flange.

4. The combination defined in claim 1 wherein the means for securing the annulus against turning movement about the central axis, relative to the nozzle mount, includes a plurality of axially fixed upright key members mounted upon and depending from the member affixed to the nozzle mount, extending freely through the turnable member, and slidably, keyingly projecting through the annulus.

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