

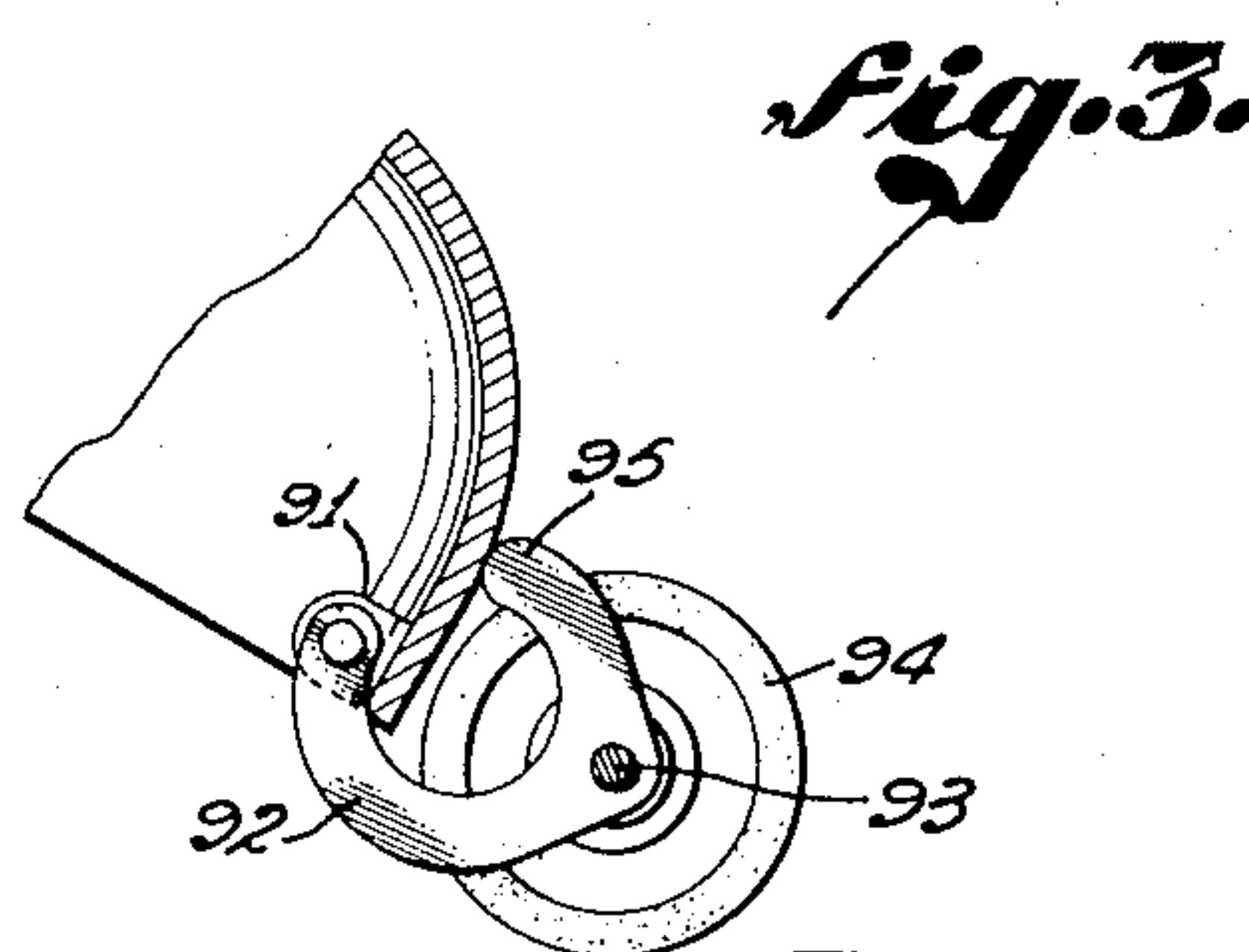
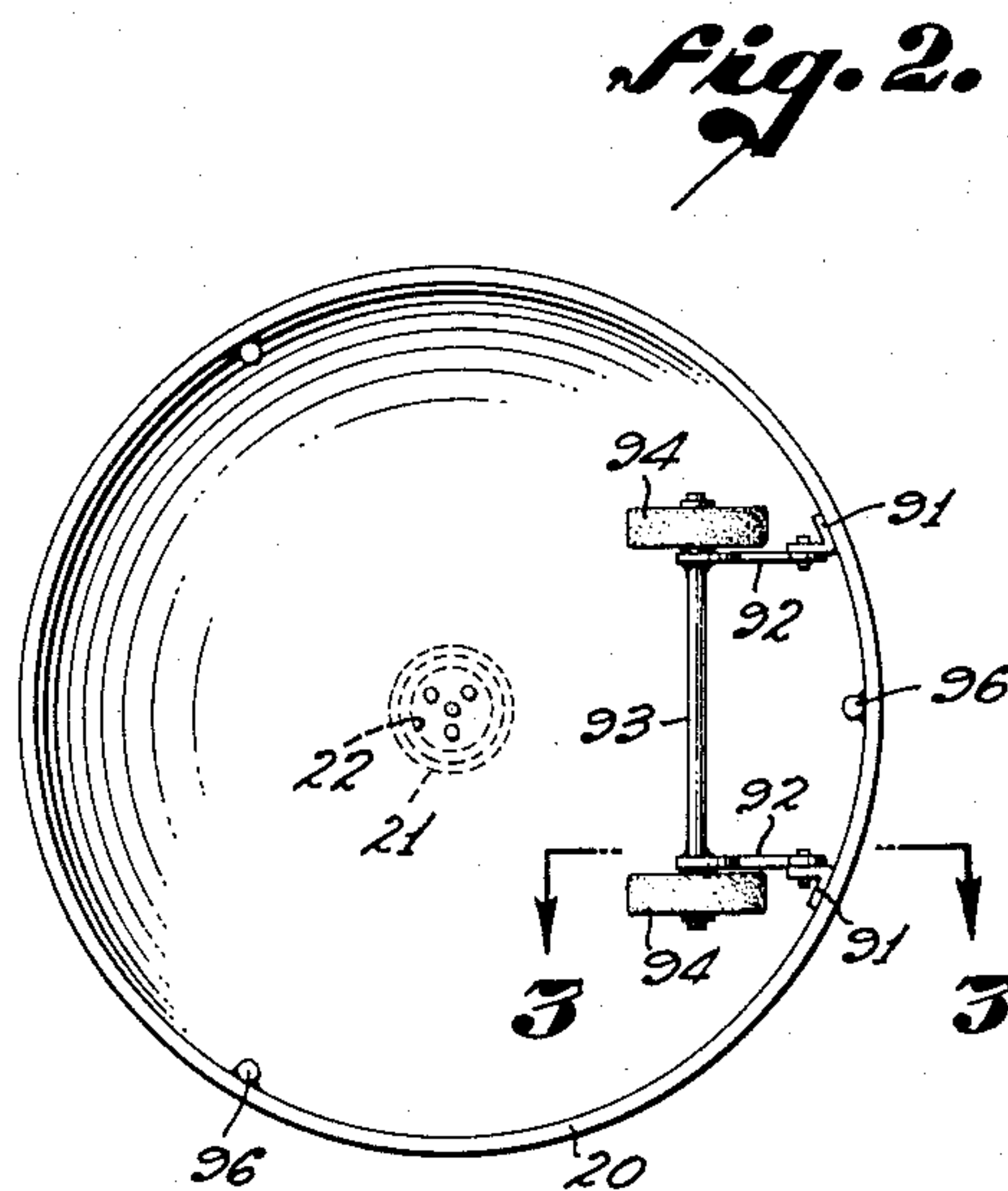
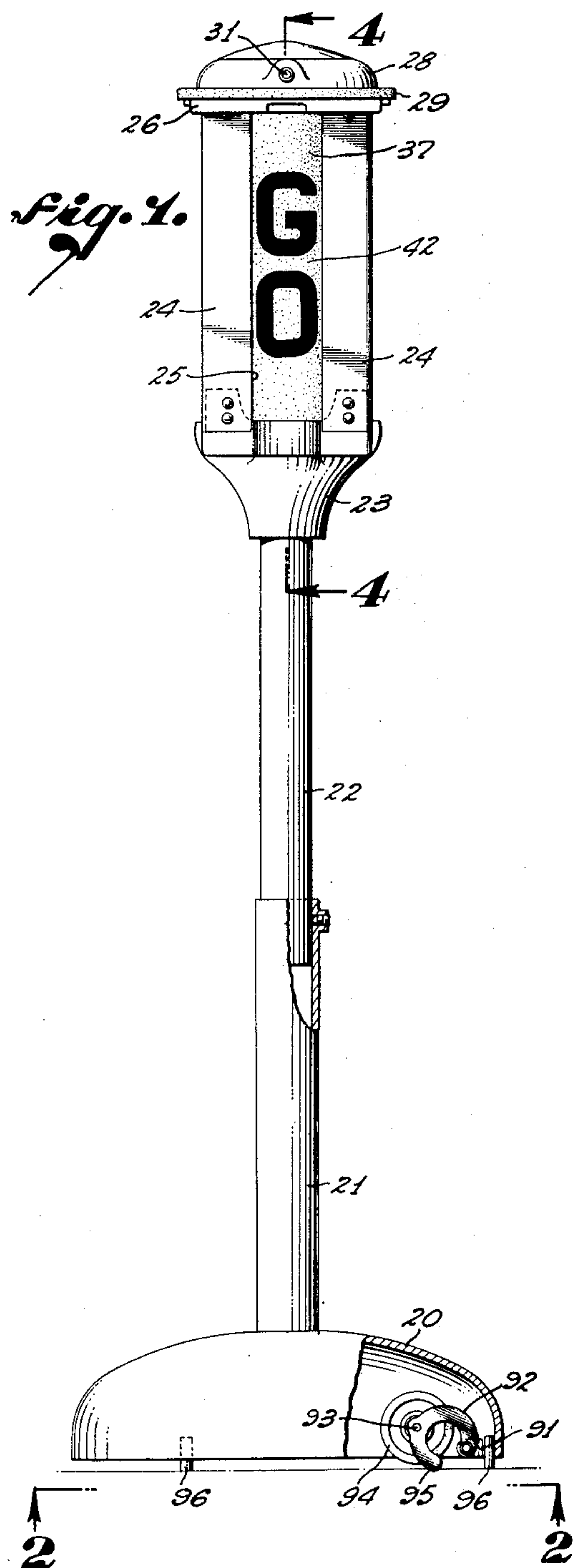
Feb. 17, 1953

F. PETERS ET AL  
AUTOMATIC TRAFFIC SIGNAL

2,628,587

Filed Sept. 12, 1949

4 Sheets-Sheet 1



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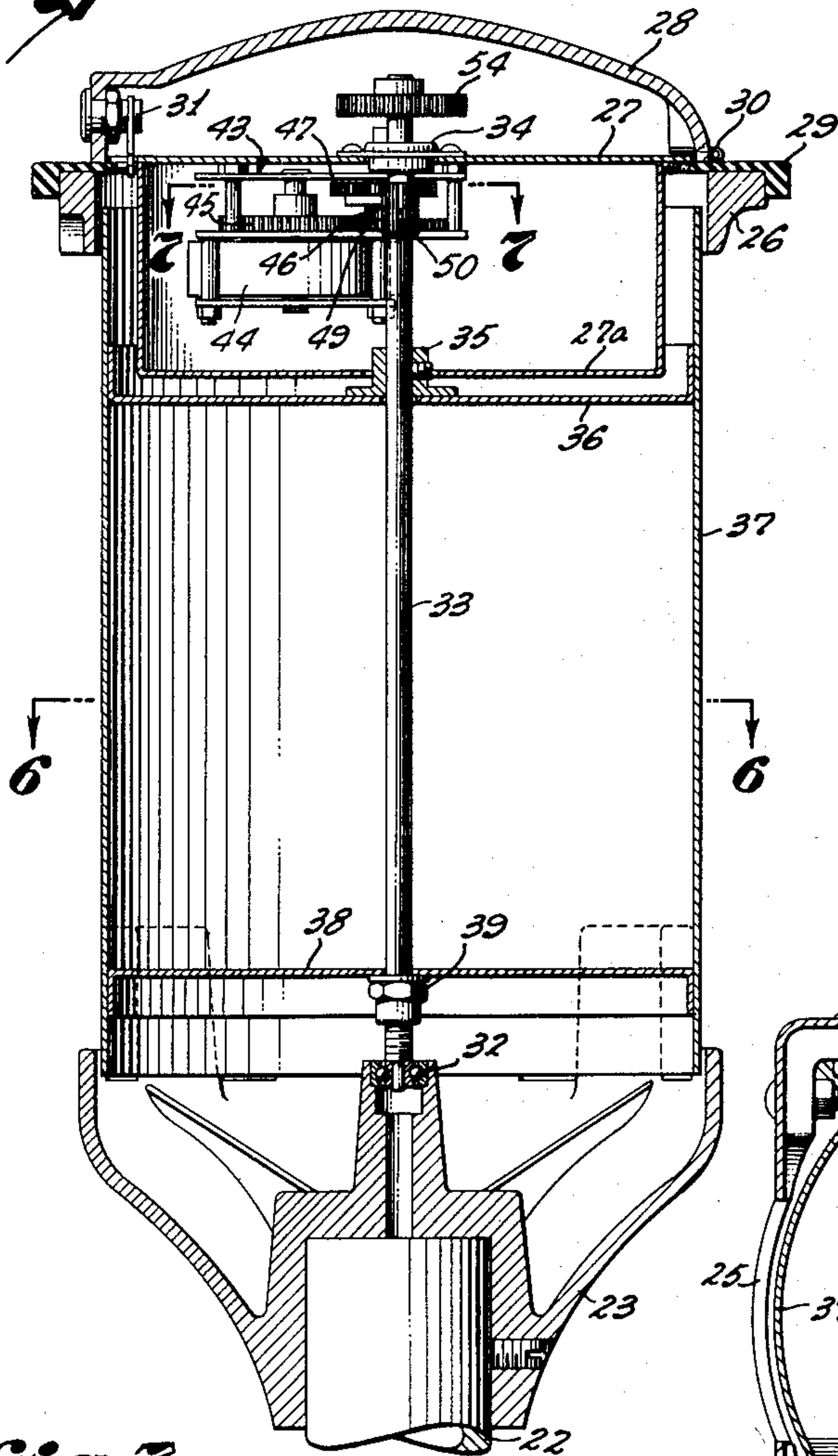
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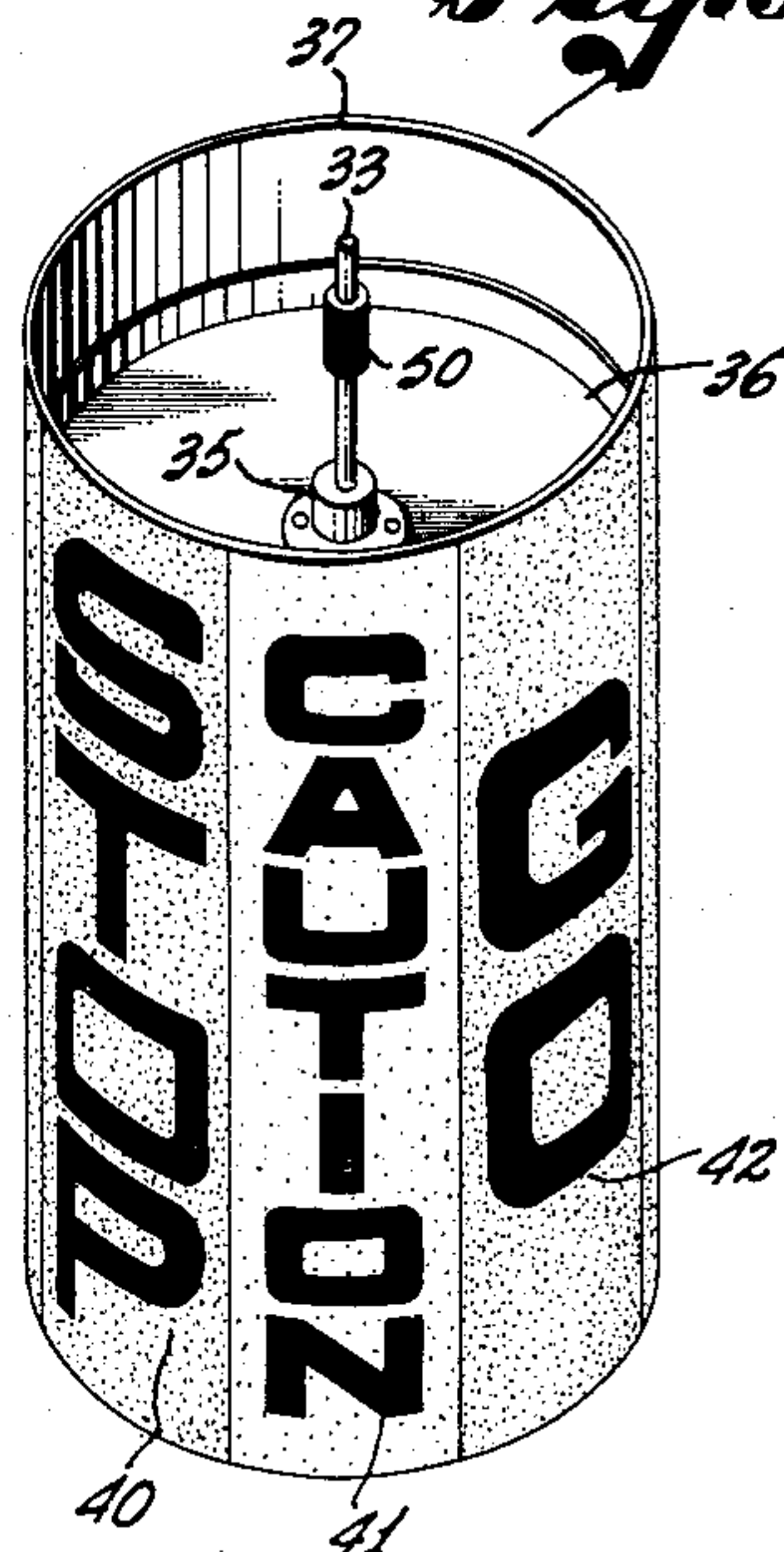
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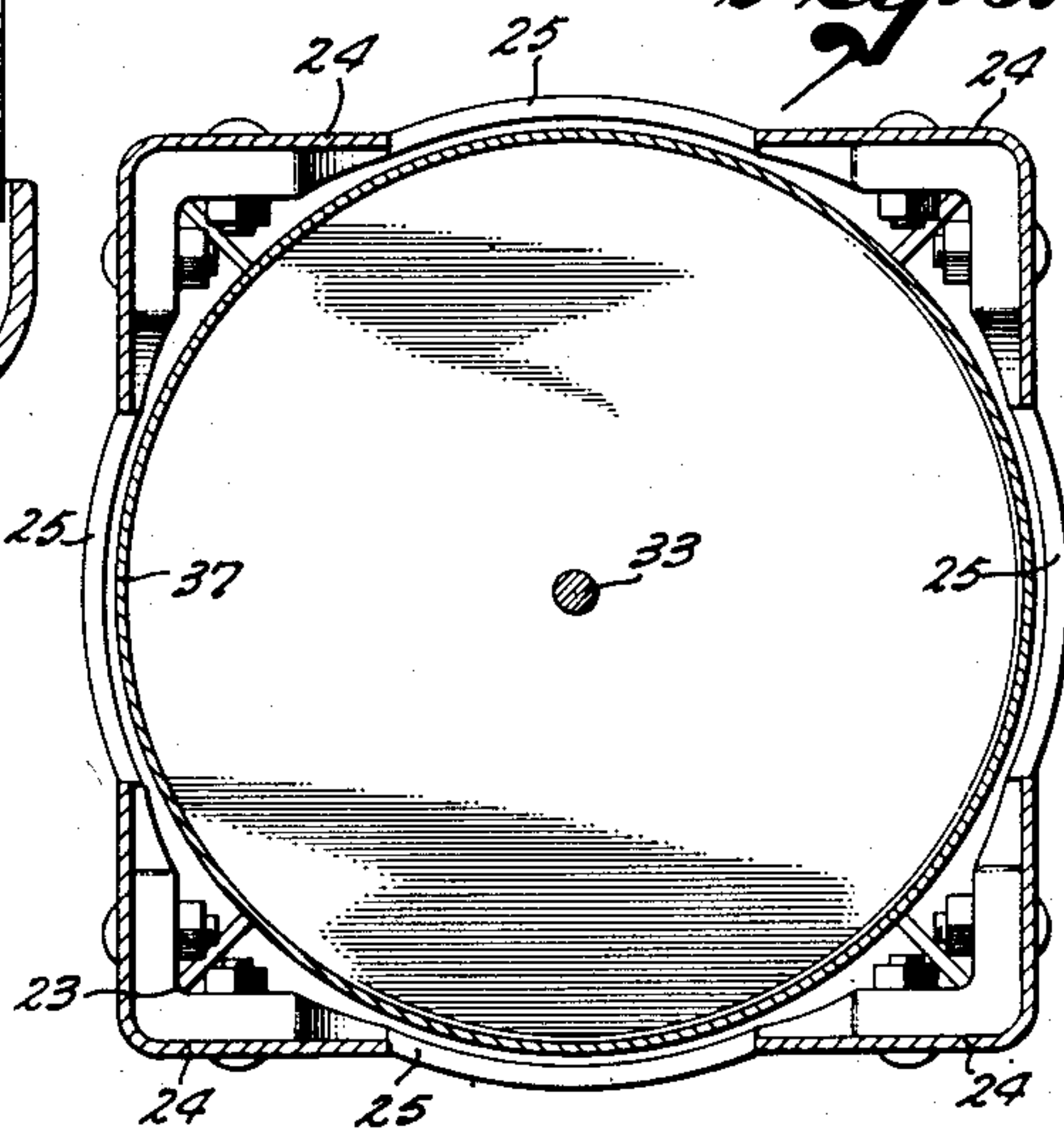
*Fig. 4.*



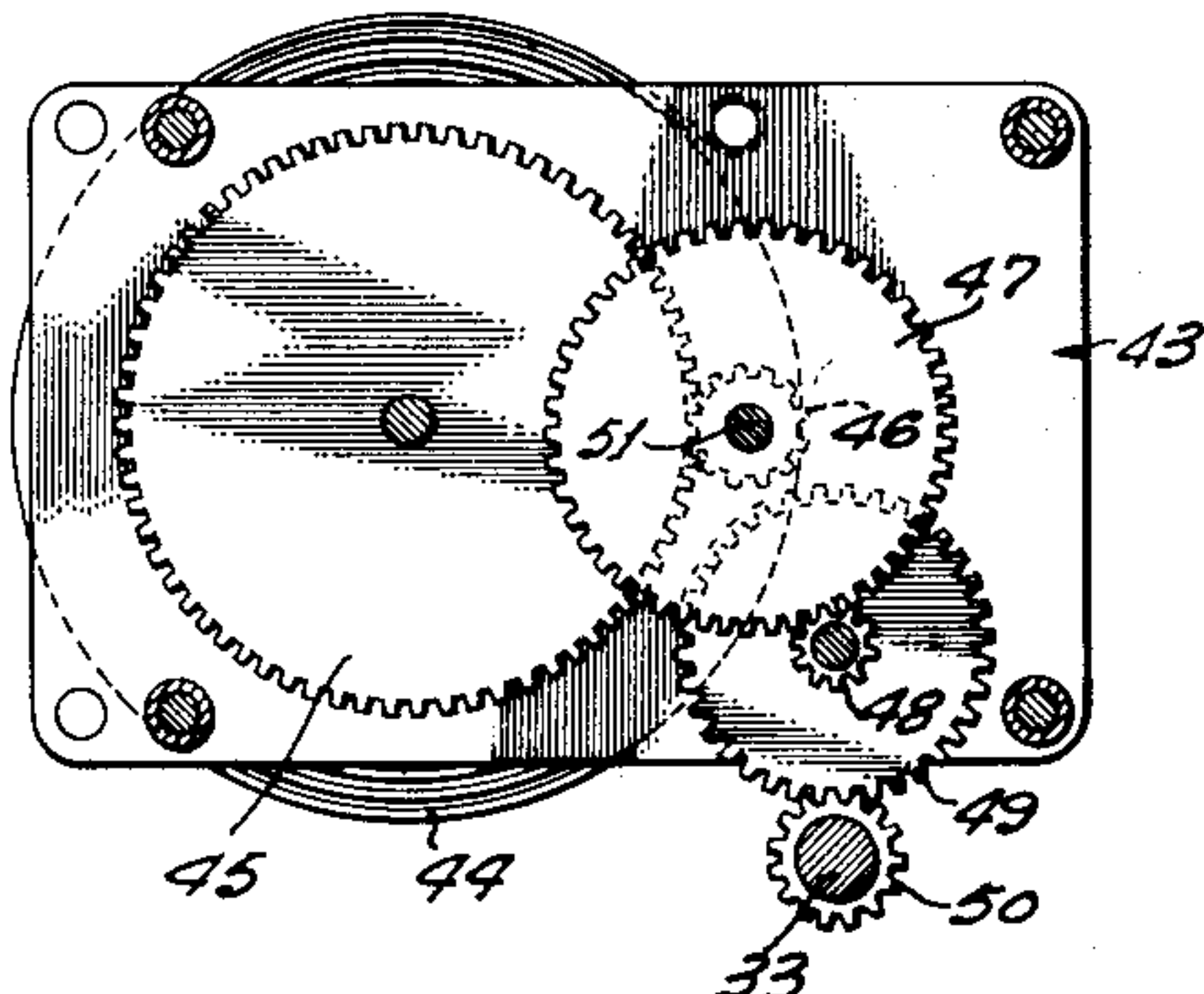
*Fig. 5.*



*Fig. 6.*



*Fig. 2.*



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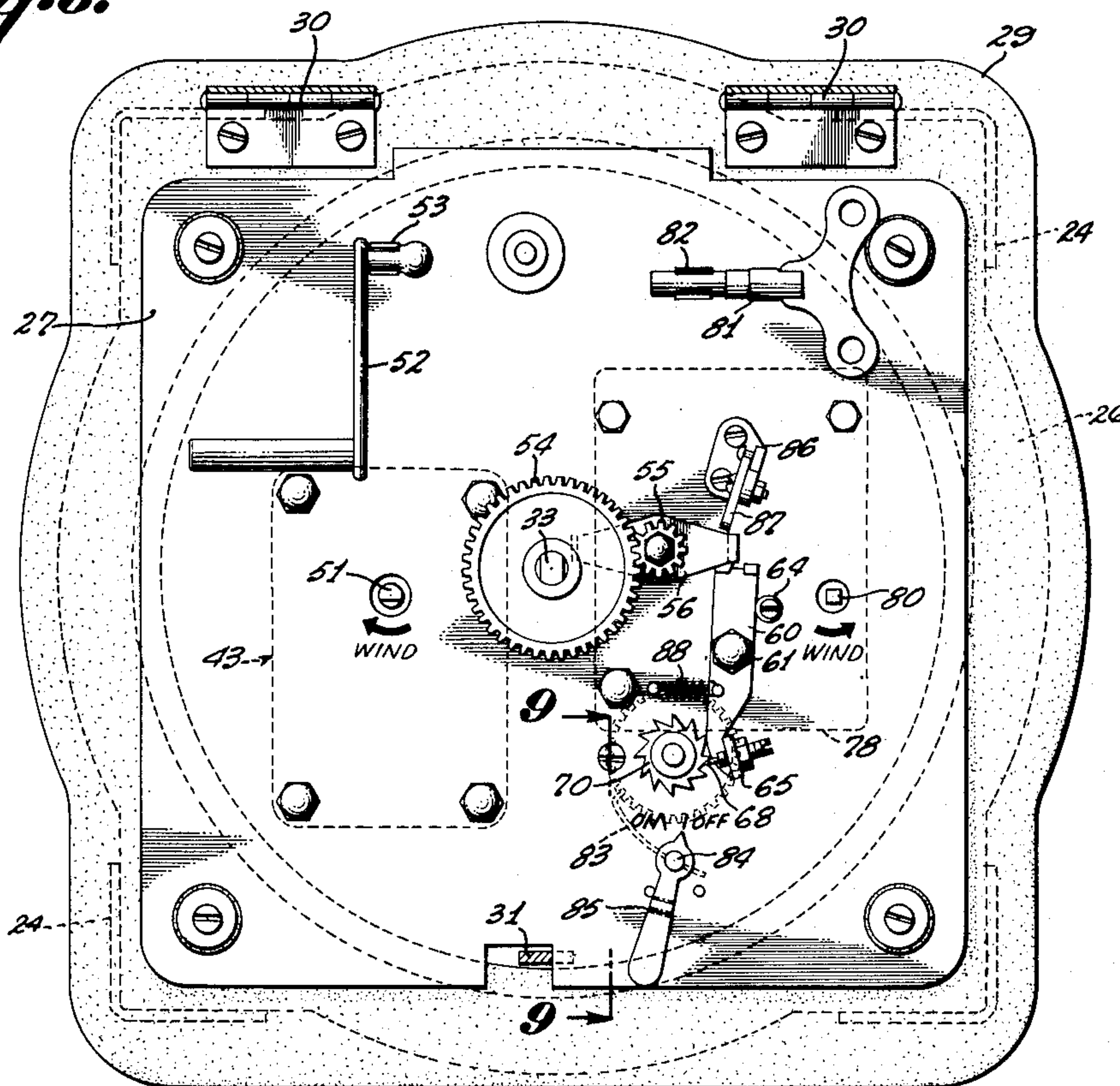
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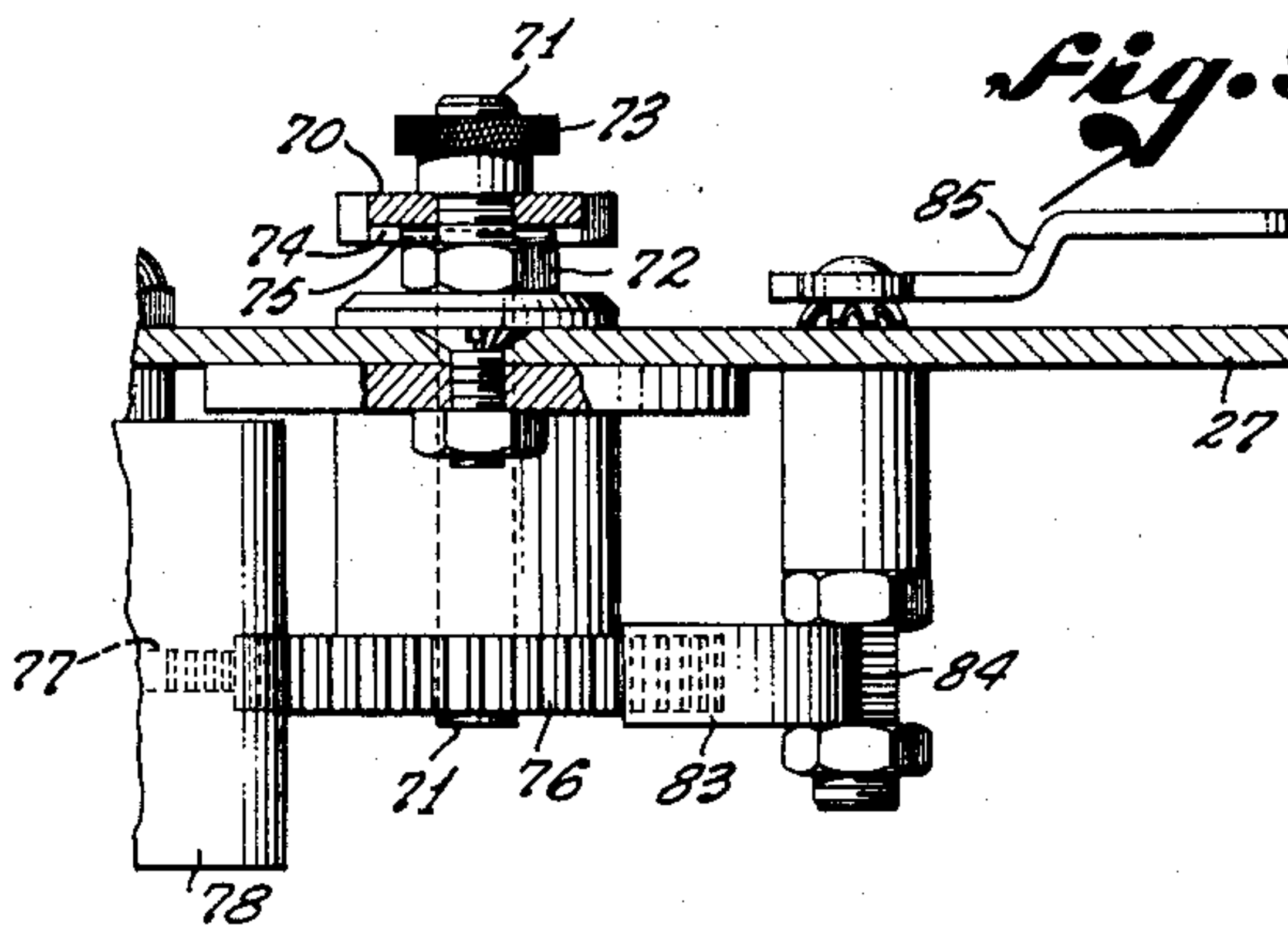
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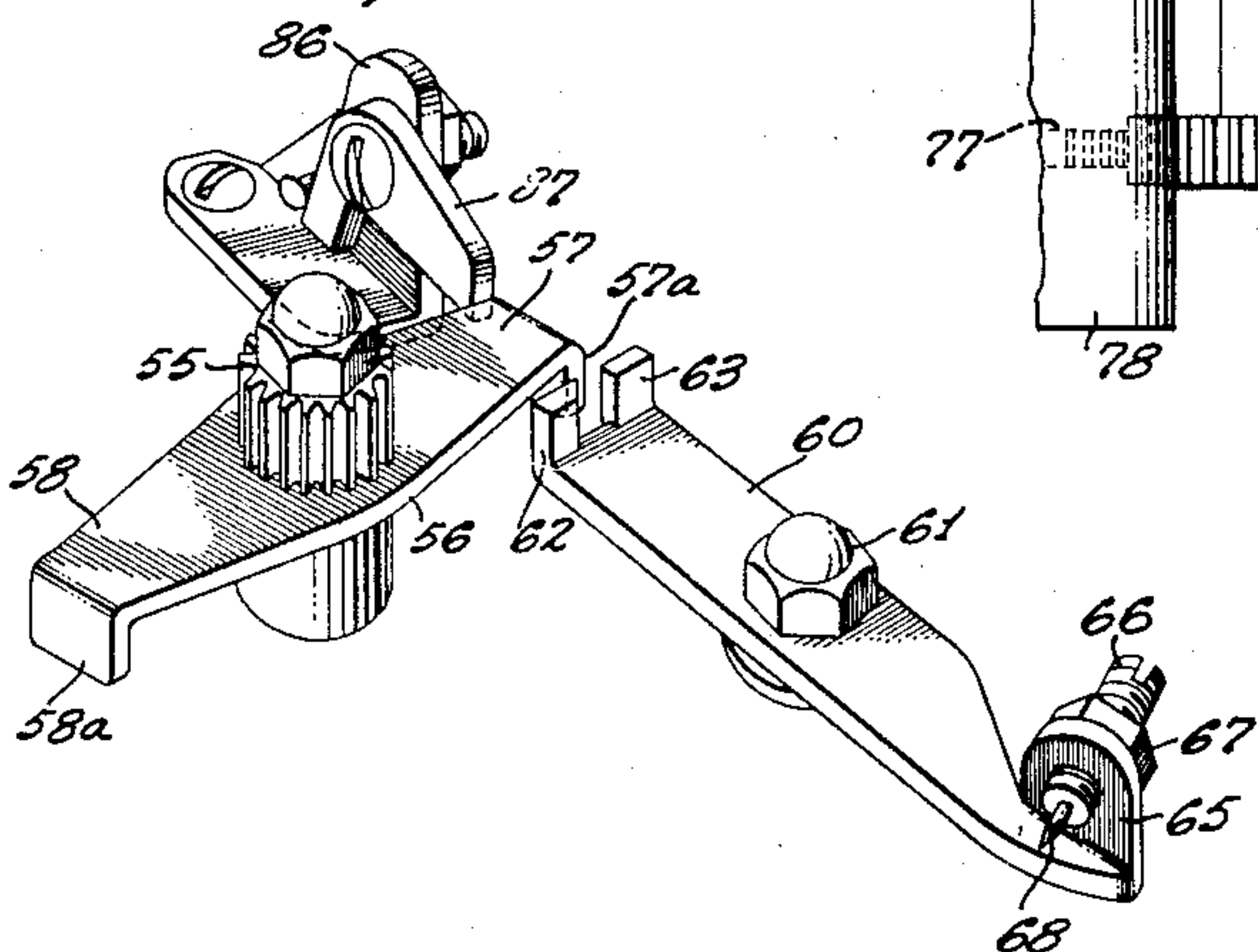
*Fig. 8.*



*Fig. 9.*



*Fig. 10.*



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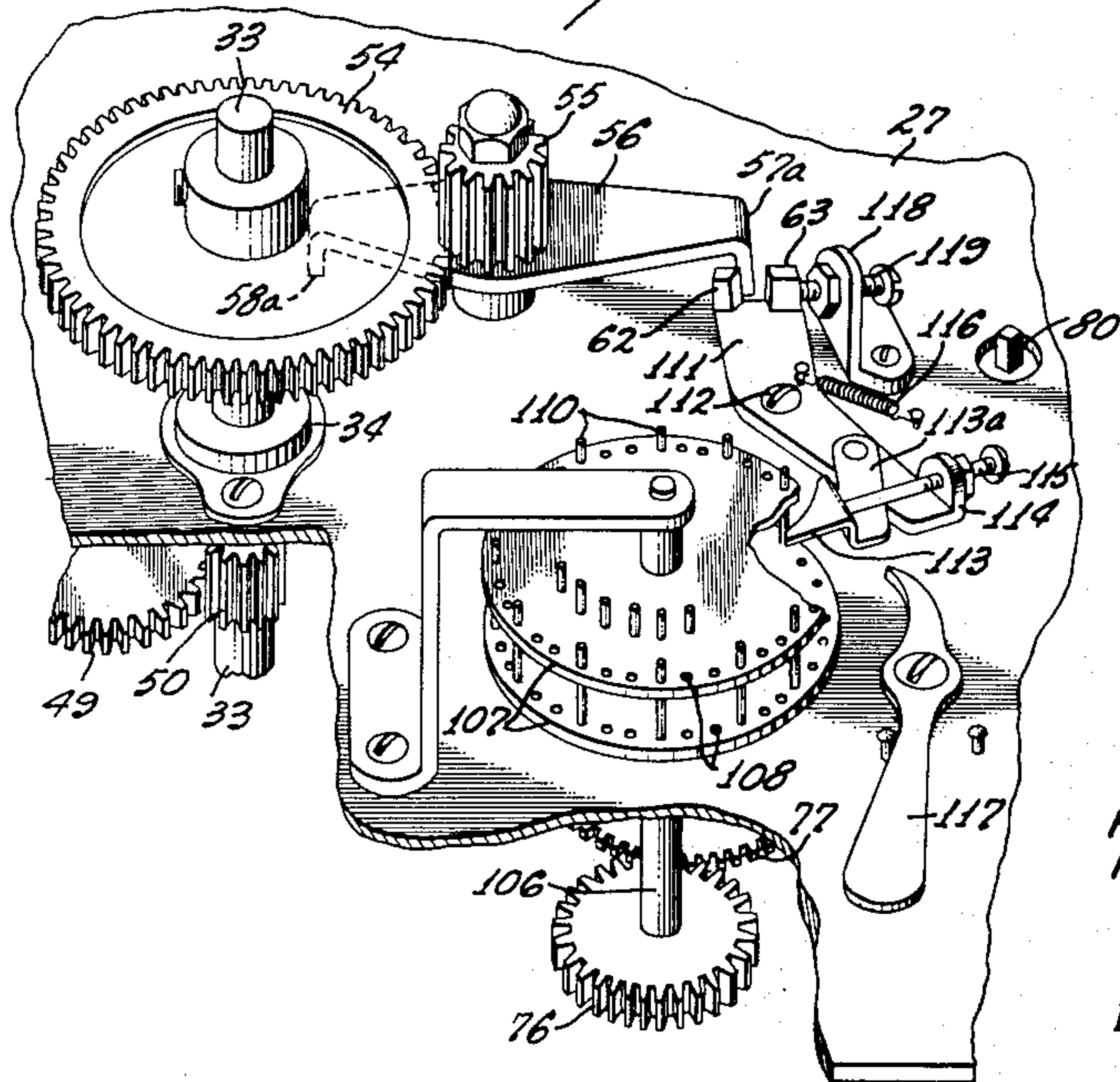
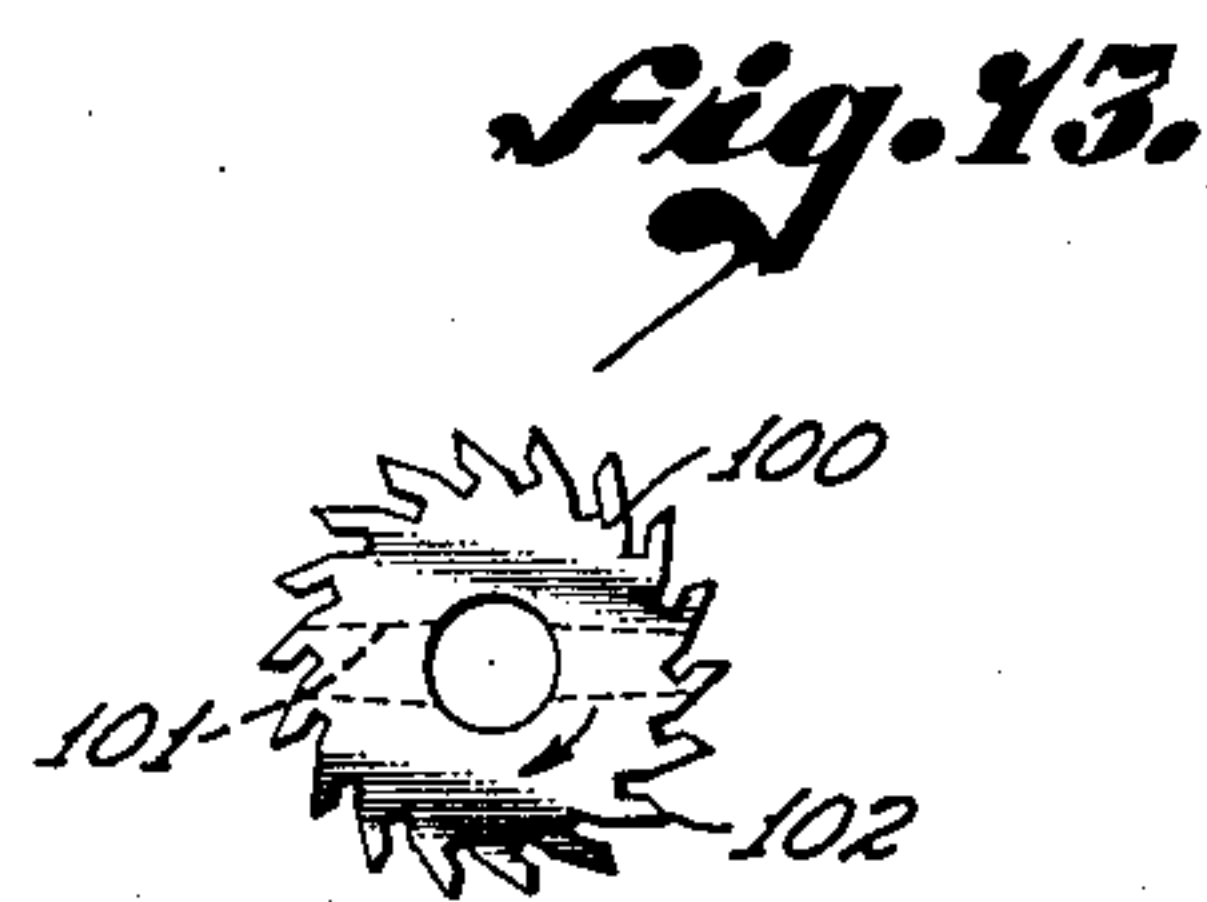
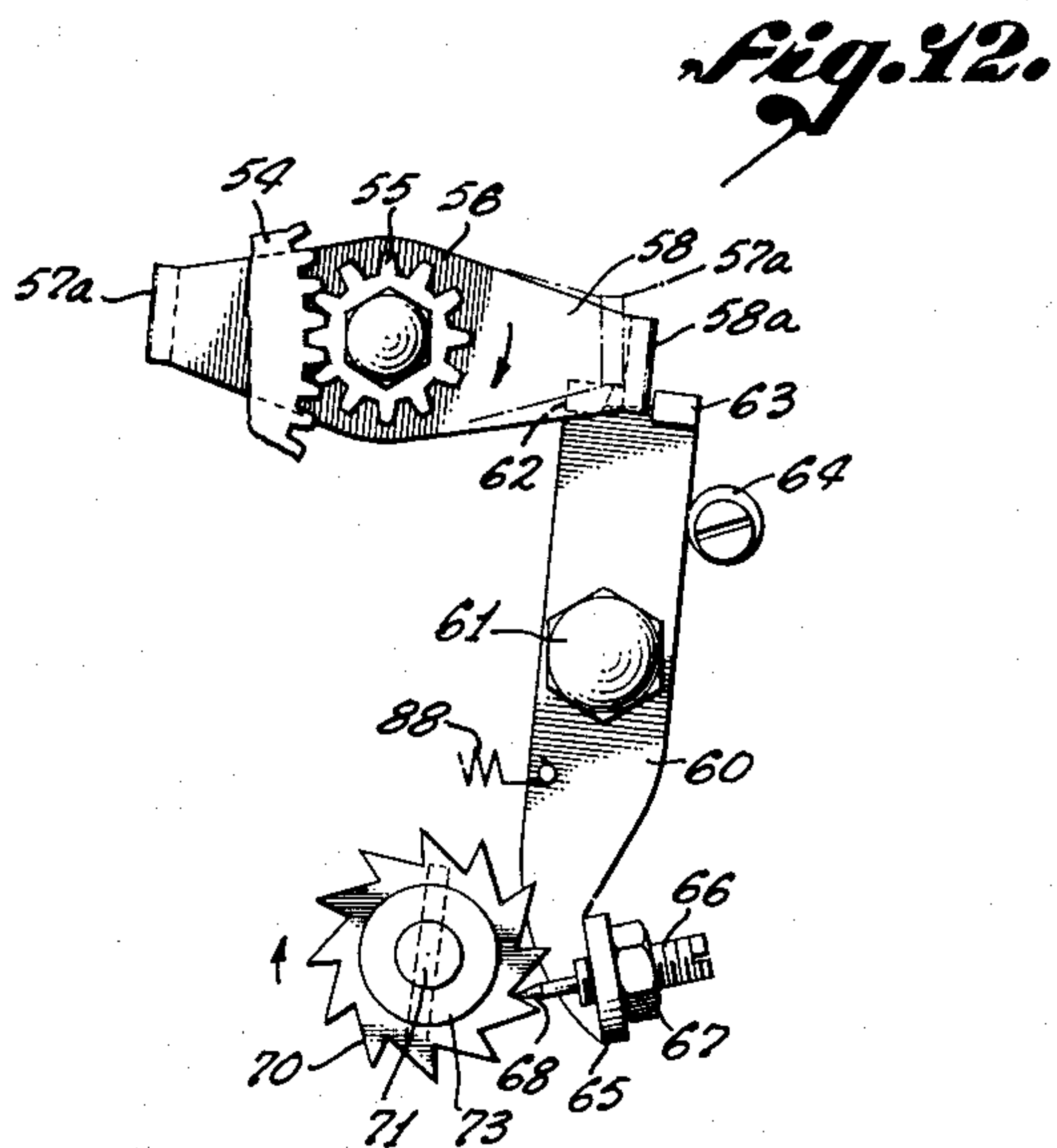
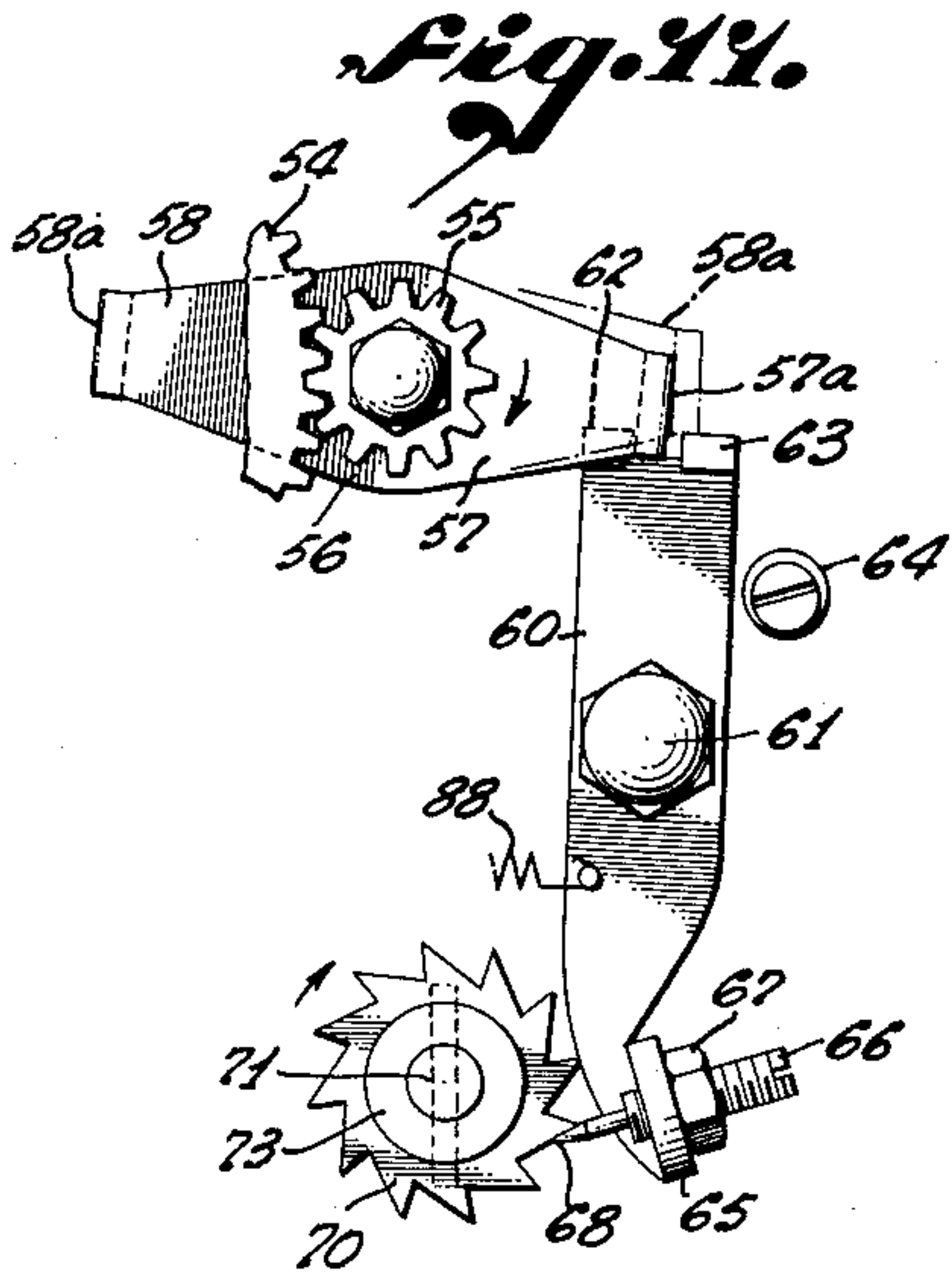
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AUTOMATIC TRAFFIC SIGNAL

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4 Sheets-Sheet 4



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## UNITED STATES PATENT OFFICE

2,628,587

## AUTOMATIC TRAFFIC SIGNAL

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Application September 12, 1949, Serial No. 115,222

4 Claims. (Cl. 116—63)

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This invention relates to traffic signals and more especially to a self-actuating and portable traffic signal of the stop and go type.

An object of the invention is to provide an improved traffic signal of the stop and go type which is self-contained, self-operating and portable.

Another object of the invention is to provide improvements in an automatic traffic signal whereby the signal can be readily moved to an intersection or other location for use during relatively short periods of time, and removed therefrom during such additional time periods when it may not be needed and its location in such place would not be desirable.

A further object of the invention is to provide in a traffic signal of the character described novel roller means to facilitate moving the signal to and from the desired location.

An additional object of the invention is to provide in a traffic signal of the character described novel self-actuating motor means capable of actuating the signal for a time period of the order of thirty-six hours.

Another object of the invention is to provide a traffic signal of the character described having self-actuated timing mechanism adapted to be adjusted for a variety of signal time periods.

Another object of the invention is to provide in a portable self-actuating traffic signal having stop, caution and go periods, novel means for varying the timing of the caution period with respect to relatively fixed stop and go periods.

Other objects and advantages will appear and be brought out more fully in the following specification, reference being had to the accompanying drawings wherein:

Fig. 1 is an elevation view of a traffic signal embodying the invention.

Fig. 2 is a bottom view as seen from the line 2—2 of Fig. 1.

Fig. 3 is an enlarged partial view, partly in section, taken along the line 3—3 of Fig. 2.

Fig. 4 is an enlarged sectional view taken along the line 4—4 of Fig. 1.

Fig. 5 is a perspective view of the rotary signal drum.

Fig. 6 is a sectional view taken along the line 6—6 of Fig. 4.

Fig. 7 is an enlarged sectional view taken along the line 7—7 of Fig. 4 and showing the actuating motor.

Fig. 8 is a plan view as seen with the cover removed.

Fig. 9 is an enlarged sectional view of the tim-

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ing lock mechanism as seen from the line 9—9 of Fig. 8.

Fig. 10 is a perspective view of the drum release actuator and the timing oscillator features of the invention.

Fig. 11 is a top view of the same as seen at a point in the timing cycle.

Fig. 12 is another view of the same as seen at another point in the timing cycle.

Fig. 13 is a top view of an alternate timing cam wheel.

Fig. 14 is a top view of another alternate timing cam wheel.

Fig. 15 is a partial perspective view showing a modified timing wheel and timing oscillator, the cam features being formed as a part of a timing oscillator.

Referring more particularly to the drawings and especially to Figures 1 to 8, we show an automatic and auxiliary traffic signal having a hollow base 20 on which is secured a pedestal member 21, a pedestal member 22 being telescopically secured thereto, the latter supporting a signal base casting 23. Four angle plates 24 are secured to and extend upwardly from the corners of base casting 23 and together provide four windows 25 at the four sides of the signal. Plates 24 support a top ring 26 having leg portions secured thereto, and a top plate 27 is suitably secured on ring 26. A hollow cover 28 is secured as by hinges 30 to ring 26, and a lock 31 of any suitable type is provided for cover 28 on plate 27. Ring 26 has a rubber cushion 29.

Base casting 23 is provided with a thrust bearing 32 on which a vertical shaft 33 is rotatably supported, the shaft extending through top plate 27 which provides a bearing 34 for the shaft. A hub 35 is suitably secured to shaft 33 and extends through an opening in shell or casing 27a secured to plate 27. A plate 36 is secured to hub 35 and is positioned in and secured to signal drum 37 supported by a plate 38 which is supported on a collar 39 having a threaded engagement on shaft 33. The vertical position of drum 37 with respect to shaft 33 may thus be readily adjusted. Drum 37 is provided with stop, caution and go insignia 40, 41 and 42 disposed angularly at 22½ degrees of arc. Thus on each half of the drum there appears the indicia caution-stop-caution-go.

A clock spring motor 43 is suitably supported by and under plate 27, the motor having a driving spring 44 which actuates a gear 45 which drives a pinion 46 secured to a gear 47 which in turn actuates a pinion 48 secured to a gear 49



which meshes with and drives a pinion 50 secured on shaft 33. Motor 43 has a winding stem 51 which may be wound by winding key 52 which may be held by a clip 53 on plate 27 when not being used.

An escapement gear 54 is secured on shaft 33 above plate 27 and meshes with a gear 55 secured on a shaft to which a drum release actuating lever 56 is also secured. Lever 56 has a pair of arms 57 and 58, the ends of which arms are bent, forming flanges 57a and 58a, as shown, arm 58 being slightly longer than arm 57. A timing oscillator lever 60 is pivoted at 61 on plate 27, and has a pair of upstanding flange stops 62 and 63 which are spaced apart sufficiently to permit drum release actuating lever flanges 57a and 58a to pass therebetween when the oscillator lever is moved by the timing cam. An eccentric stud 64 having a screw driver slot provides a limiting stop for oscillator lever 60, and may be adjusted to facilitate the actuation of the drum release actuator and the timing oscillator. Oscillator lever 60 has a flange 65 which provides a threaded mounting for an adjusting screw 66 which has a lock nut 67 thereon, and screw 66 has a sharpened end or point 68. A timing cam wheel 70 is mounted on a shaft 71 which extends through plate 27, the upper end of the shaft being threaded and having a lock nut 72 thereon, and a knurled lock collar 73 secures cam wheel 70 on the shaft, as may be clearly seen in Figure 9. Cam wheel 70 has a diametral groove 74 in the lower face thereof, and a pin 75 which extends through shaft 71 serves to fix the position of the cam wheel with respect to the shaft 71.

A gear 76 is secured to shaft 71 below plate 27 and meshes with and is driven by a gear 77 of a clock motor 78. Motor 78 has a winding shaft 80 and a key 81 therefor is provided and may be suitably held by clip 82 on plate 27 for ready use. A dog 83 is mounted on a shaft 84 which is actuated by lever 85 whereby dog 83 may be engaged between the teeth of gear 76 to stop the clock motor 78 during periods of non-use. A bracket 86 mounts a back-lash stop lever 87, which lever drops behind arms 57 and 58 when actuated and prevents back-lash. A spring 88 is secured to and biases timing oscillator lever 60 in a clockwise direction whereby the pointed end 68 of adjusting screw 66 is held in contact with the faces of cam wheel teeth 90.

A pair of brackets 91 are secured in base 20 and pivotally support a pair of C-shaped members 92, between which is mounted a shaft 93 which carries a pair of rollers 94. Members 92 have tips 95 which bear against the outside of base 20, as shown in Figure 3. A retractable roller construction is thus provided by which the signal may be moved to and from a location. Base 20 may, if desired, be provided with a plurality of feet 96. The rollers 94 may be readily shifted from the position shown in Figure 1 to that shown in Figure 3 by a slight tipping of the signal to the left, accompanied by a shaking movement which will cause the rollers to swing outwardly to the position of Figure 3, and if the right side is quickly lowered the roller members 92 will be held in the extended position. An obvious return movement may be readily made.

The operation of the invention as thus far described should be clear from the foregoing description. Gears 54 and 55 have a four to one ratio and each time drum release actuating lever 56 is released by movement of timing oscillator lever 60, gear 55 is permitted to make a

one-half turn, and gear 54 will make one-eighth of a turn, permitting shaft 33 and drum 37 to make a one-eighth turn and move the Stop, Caution and Go indicia to move one step. Motor 43 constantly urges the gear train 45-50 to rotate in a counterclockwise direction and tend to turn gear 55 in a clockwise direction.

Timing clock motor 78, after being released to running position by the movement of lever 85 to disengage dog 83 from gear 76, will rotate timing cam wheel 70 in clockwise direction at a constant speed of one revolution in six minutes. Cam wheel 70 has twelve teeth 90, and points 68 of adjusting screw 66 on timing oscillator lever 60 will be moved over the point of a cam tooth every thirty seconds. Oscillator lever 60 will thus be rocked, permitting flanges 57a and 58a of drum release actuating lever 56 to pass through the space between stops 62 and 63.

A timing cycle as referred to herein, may be considered to start with either a go or stop period and extend through the following caution period to the start of the next succeeding stop or go period, the stop and go periods being equal because of the uniform formation of cam wheel teeth 70. An example of such a cycle starts with the parts as shown in Figure 12 with the short arm 57 of lever 56 being held against stop flange 62 of oscillator lever 60. As the timing cam 70 rotates, point 68 will move outwardly and at a time period depending upon the adjustment of screw 68, lever 60 will have been rocked far enough to permit flange 57a to escape past stop flange 62 and permit escapement wheel 54 to turn drum 37 from the stop-go position (or go-stop position for cross-traffic). Actuating lever 56 will thus be turned a one-half turn, being stopped by flange 58a engaging stop flange 63. Figure 11 shows the adjusting screw point 68 approaching the tip of the cam tooth during the caution period. After the point 68 passes the cam wheel tooth tip, spring 88 will rock oscillator 60 to release flange 58a from stop flange 63, and lever 56 will make another one-half circle turn, thus completing a cycle.

In Figure 13 we show a modified form of timing cam. In this figure the cam wheel is designated 100 and is adapted to be positioned on shaft 71 and is provided with a groove 101 for engagement with pin 75. Cam wheel 100 has 18 teeth 102, and since shaft 71 makes one revolution in ninety-six minutes, the timing cycle of each tooth 102 will be twenty seconds.

In Figure 14 we show another modified form of timing cam wheel 103. This cam wheel is similar to cam wheels 70 and 100, and is interchangeable therewith on shaft 71. Cam wheel 103 has six cam teeth 104 and six teeth 105 disposed alternately. The cam surfaces of teeth 104 are timed for thirty seconds, and the cam surfaces of teeth 105 are timed for twenty seconds. This cam wheel would be used for controlling an intersection where it was desired to give traffic in one direction a two to one preference over that transverse thereto. It will be clear that other cam wheels with differing time periods and cycles may be substituted for the cam wheels shown and described herein.

In Figure 15 we show a modified form of timing mechanism. A shaft 106 is mounted to be driven by timing gear 76 and carries a pair of spaced discs 107 formed with a peripheral row of apertures 108, there being thirty-six of such apertures, the time period from one aperture to the next being ten seconds. A plurality of pins 110



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are adapted to be selectively positioned in apertures 108 as shown, and Figure 15 shows pins in every third aperture for timing cycles of thirty seconds. A timing oscillator 111 is mounted on plate 107 and pivoted at 112, and formed with stop flanges 62 and 63, similar to timing oscillator lever 60. A dog lever 112 is pivotally mounted on lever 111 and has a cam dog 113 which engaged by pins 110 as cam discs 107 are rotated. Lever 111 has a flange 114 which mounts an adjusting screw 115 secured to dog 113. A spring 116 biases lever 111 for cam dog and timing disc pin engagement, and a locking lever 117 is provided for engaging pins 110 for stopping the timing motor. A bracket 118 secured on plate 27 mounts an adjusting screw 119 providing a stop for oscillator lever 111.

The operation of the timing mechanism of Figure 15 should be clear. As shaft 106 turns, discs 107 rotate causing successive engagement of pins 110 with oscillator lever dog 113. During an initial portion of each cam and pin engagement lever 111 will be rocked to permit flange 57a of drum release actuating lever 56 to escape past stop flange 62, thus starting the caution period of the signal cycle. After the engaging pin 110 moves past the point of dog 113, lever 111 will be actuated in clockwise direction to disengage flange 58a from stop flange 63, thus permitting the drum 37 to turn to the stop-go position in a manner substantially similar to the drum release and timing mechanism of Figures 1 to 14.

Having described our invention what we claim is:

1. In an automatic traffic signal having a rotatable signal drum and drive shaft means constantly urging said drum into rotation and having an escapement gear, the combination of a control pinion for said gear a mid-pivoted gear release lever rotatable with said pinion and having axially directed flanges at each end at unequal distances from the pinion axis, a timing lever oscillator having stops for said gear release lever flanges, and a timing cam wheel for actuating said oscillator to periodically release said gear release lever to permit said drum to rotate a first predetermined amount and thereafter a second predetermined amount to complete a cycle of operation, said oscillator having means adjustably engageable with said cam wheel whereby the time period of said first rotation may be varied.

2. In an automatic traffic signal having a rotatable signal drum and drive shaft means constantly urging said drum into rotation and having an escapement gear, the combination of a control pinion for said gear, a mid-pivoted gear release lever rotatable with said pinion and having axially directed flanges at each end at un-

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equal distances from the pinion axis, a timing lever oscillator having stops for said gear release lever flanges, and a timing cam wheel for actuating said oscillator to periodically release said gear release lever to permit said drum to rotate a first predetermined amount and thereafter a second predetermined amount to complete a cycle of operation, said lever being rotated a one-half turn during each of said drum rotation movements each of said oscillator stops being engageable with one of said gear release lever flanges.

3. In an automatic traffic signal having a rotatable signal drum and drive shaft means constantly urging said drum into rotation and having an escapement gear, the combination of a control pinion for said gear, a mid-pivoted gear release lever rotatable with said pinion and having axially directed flanges at each end at unequal distances from the pinion axis, a timing lever oscillator having stops for said gear release lever flanges, and a timing cam wheel for actuating said oscillator to periodically release said gear release lever to permit said drum to rotate a first predetermined amount and thereafter a second predetermined amount to complete a cycle of operation, said cam wheel having alternately arranged portions for actuating said oscillator to control said drum rotation in a second cycle of time different from said first cycle.

4. In an automatic traffic signal having a rotatable signal drum and drive shaft means constantly urging said drum into rotation and having an escapement gear, the combination of a control pinion for said gear, a mid-pivoted gear release lever rotatable with said pinion and having axially directed flanges at each end at unequal distances from the pinion axis, a timing lever oscillator having stops for said gear release lever flanges, and a timing cam wheel for actuating said oscillator to periodically release said gear release lever, to permit said drum to rotate a first predetermined amount and thereafter a second predetermined amount to complete a cycle of operation, said cam wheel having a plurality of cam portions each arranged for actuation of the oscillator through one cycle.

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