

Sept. 20, 1960

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2,953,652

MAGNETIC DISTRIBUTOR ASSEMBLY

Filed Oct. 1, 1958

2 Sheets-Sheet 1

Fig. 1

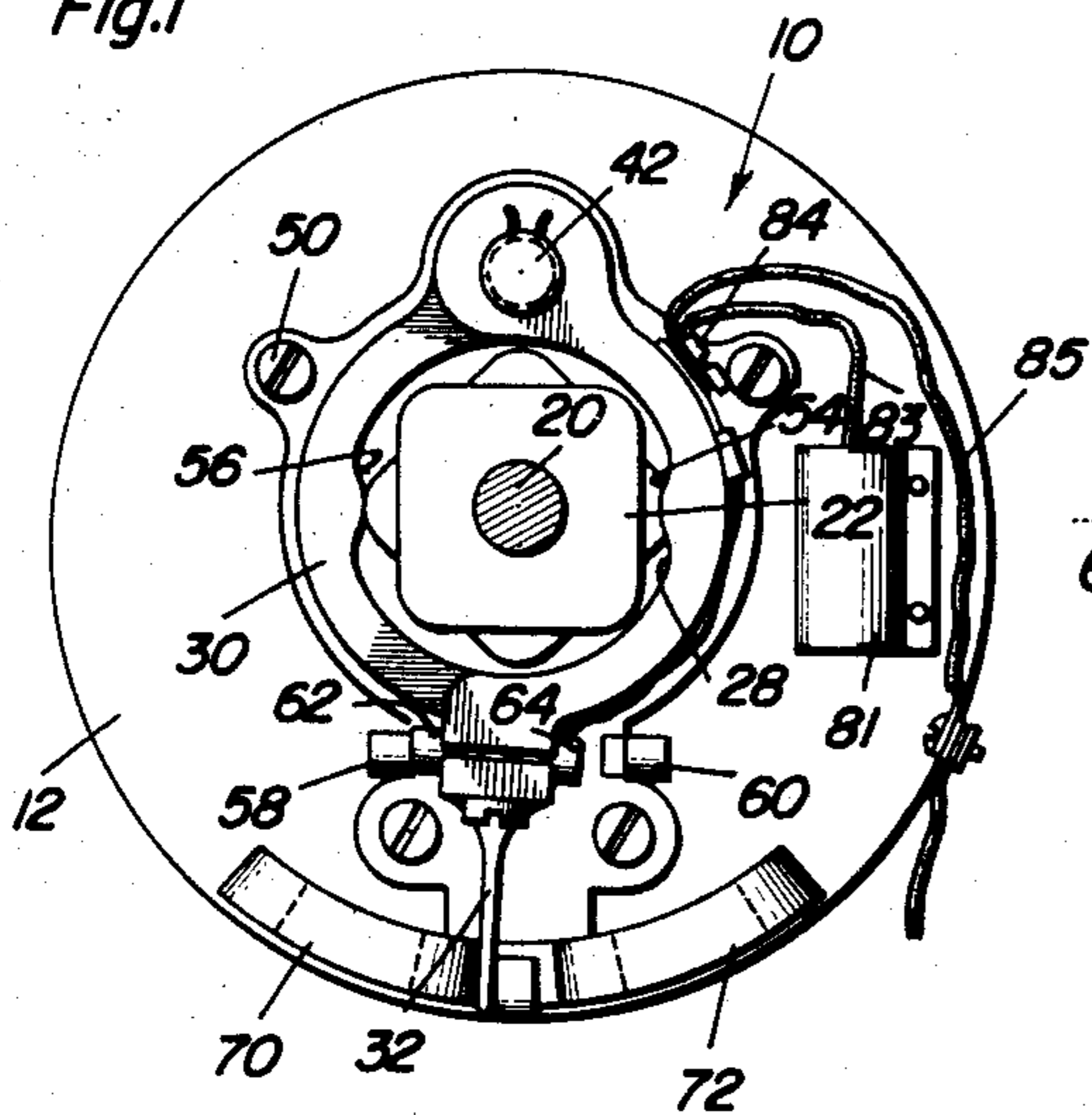


Fig. 3

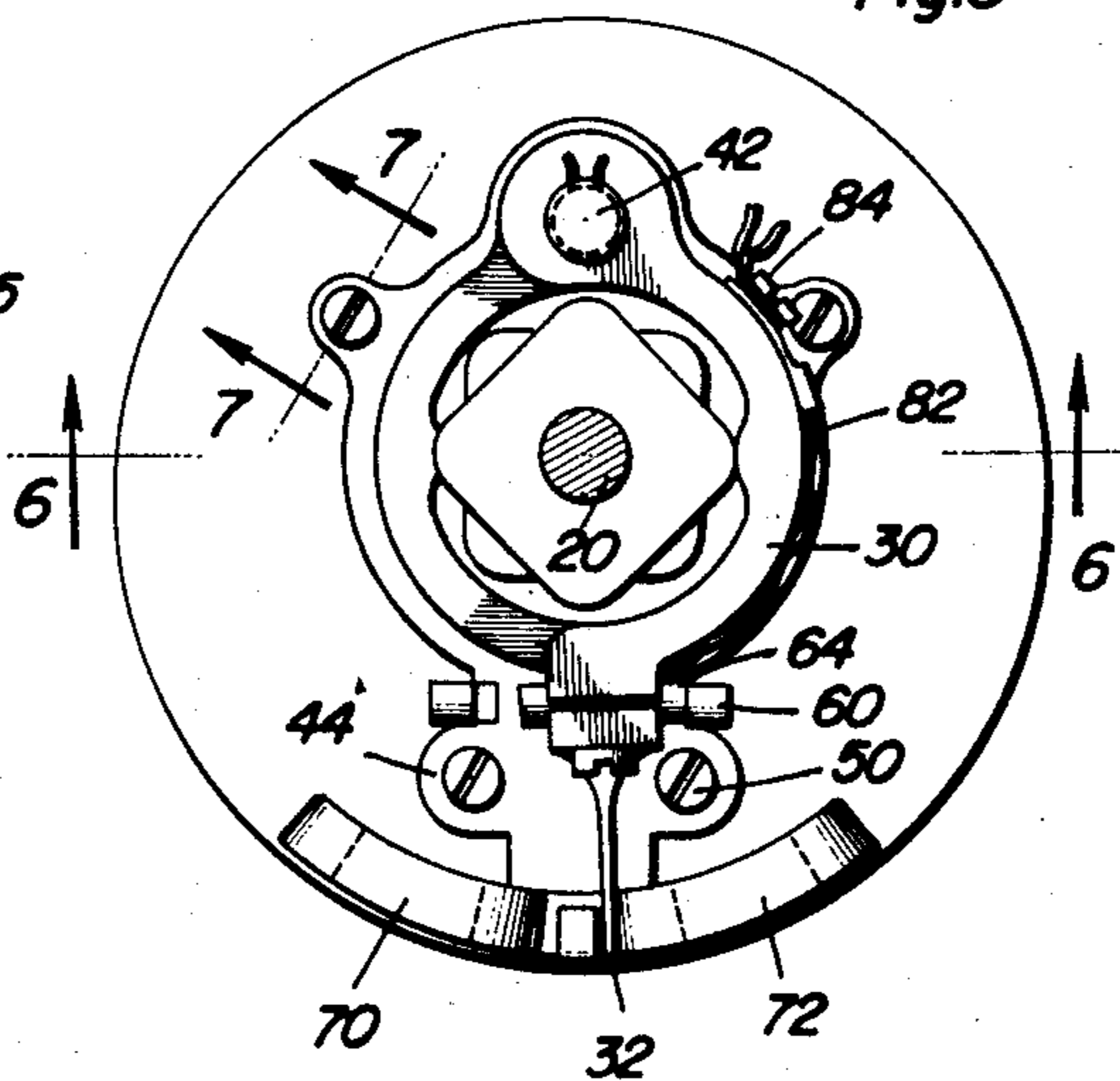


Fig. 2

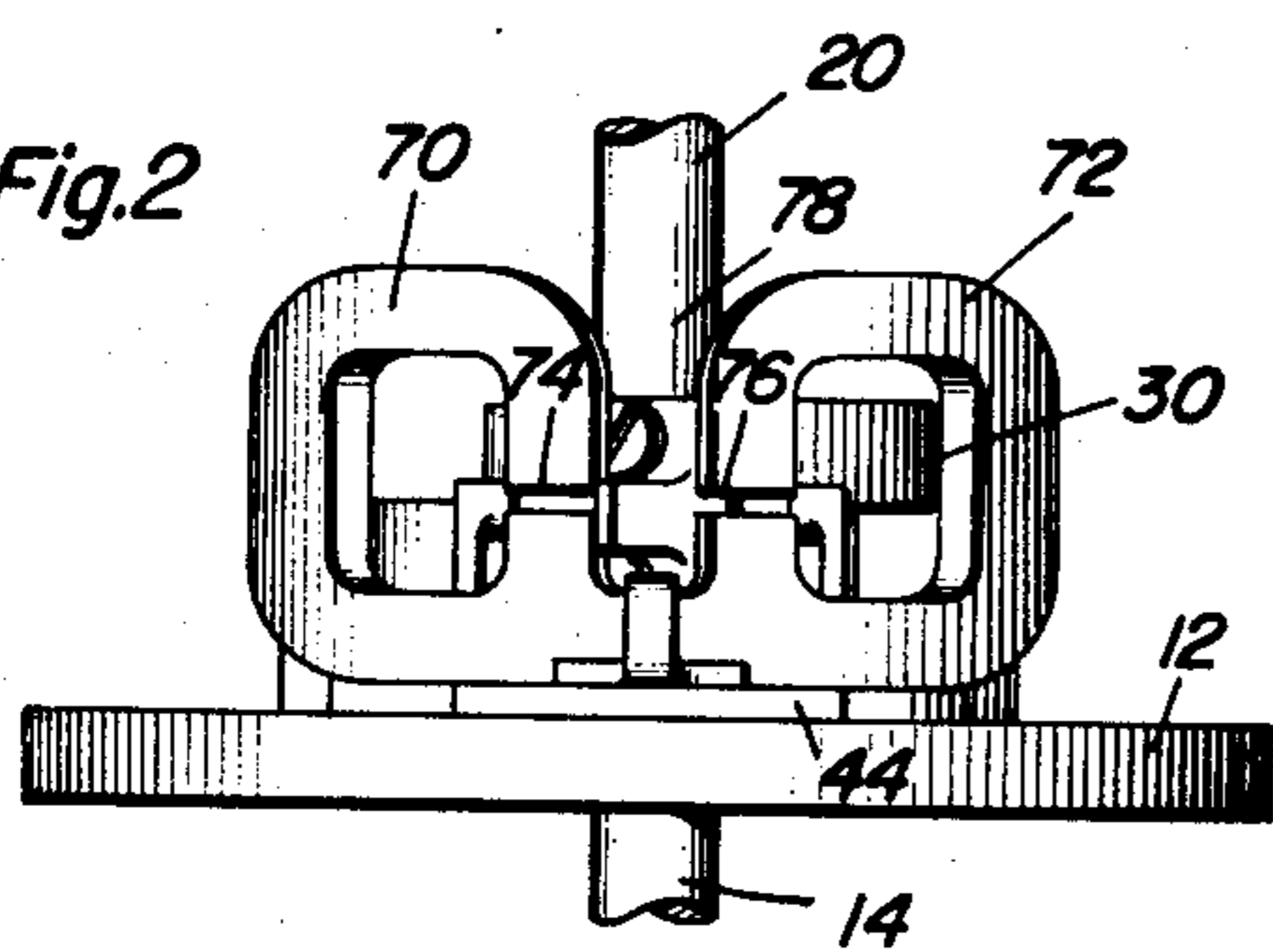


Fig. 4

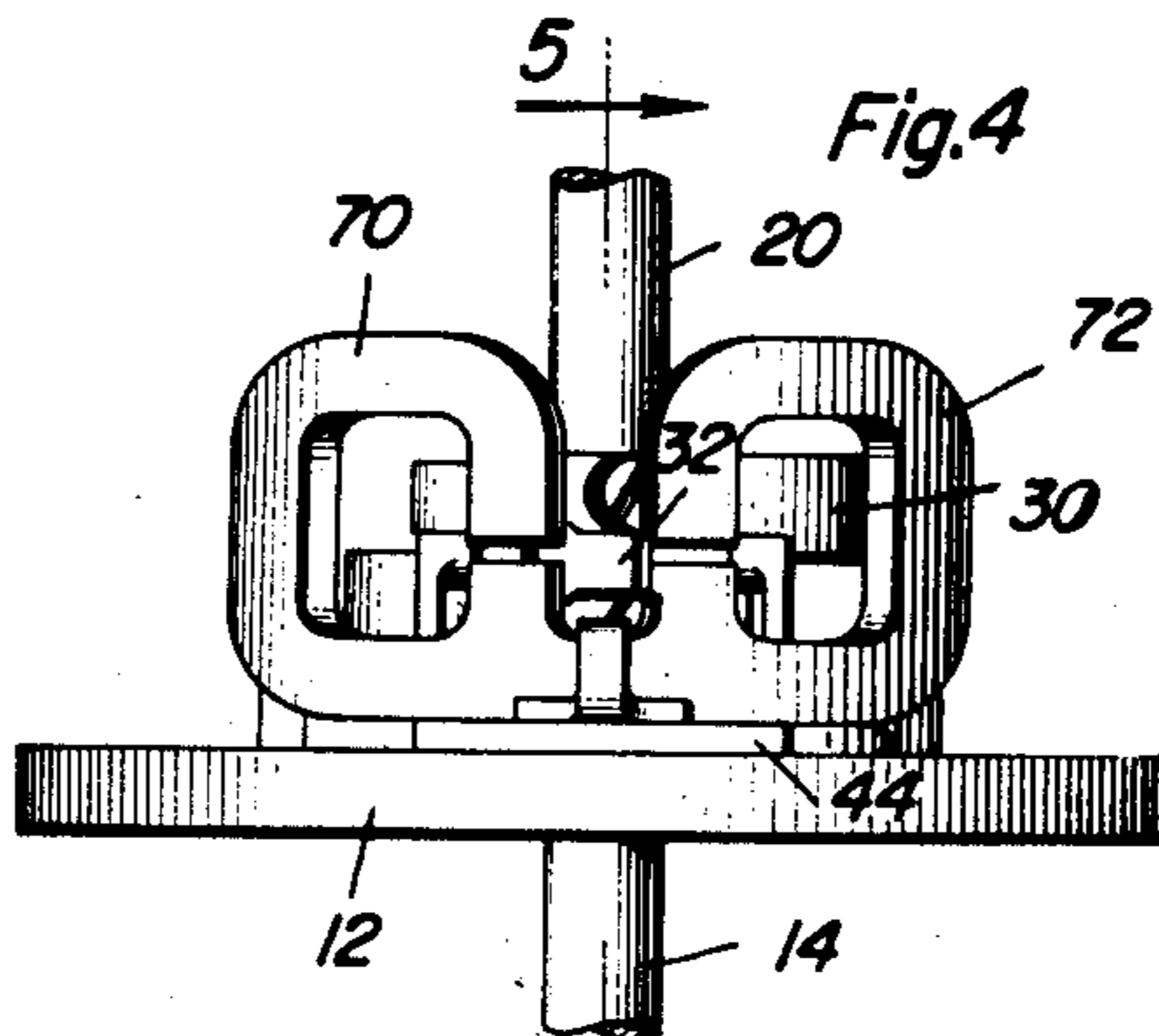
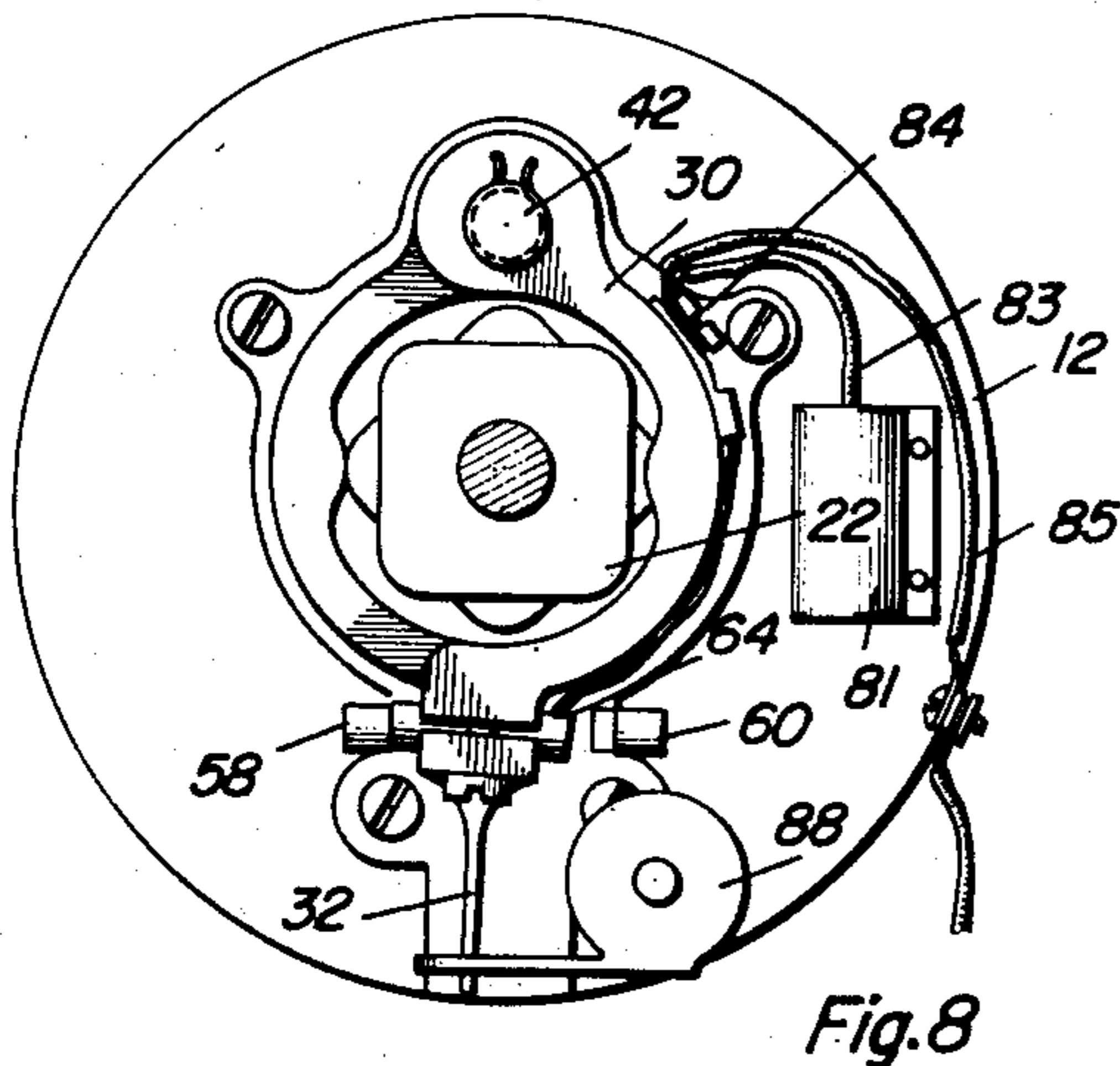
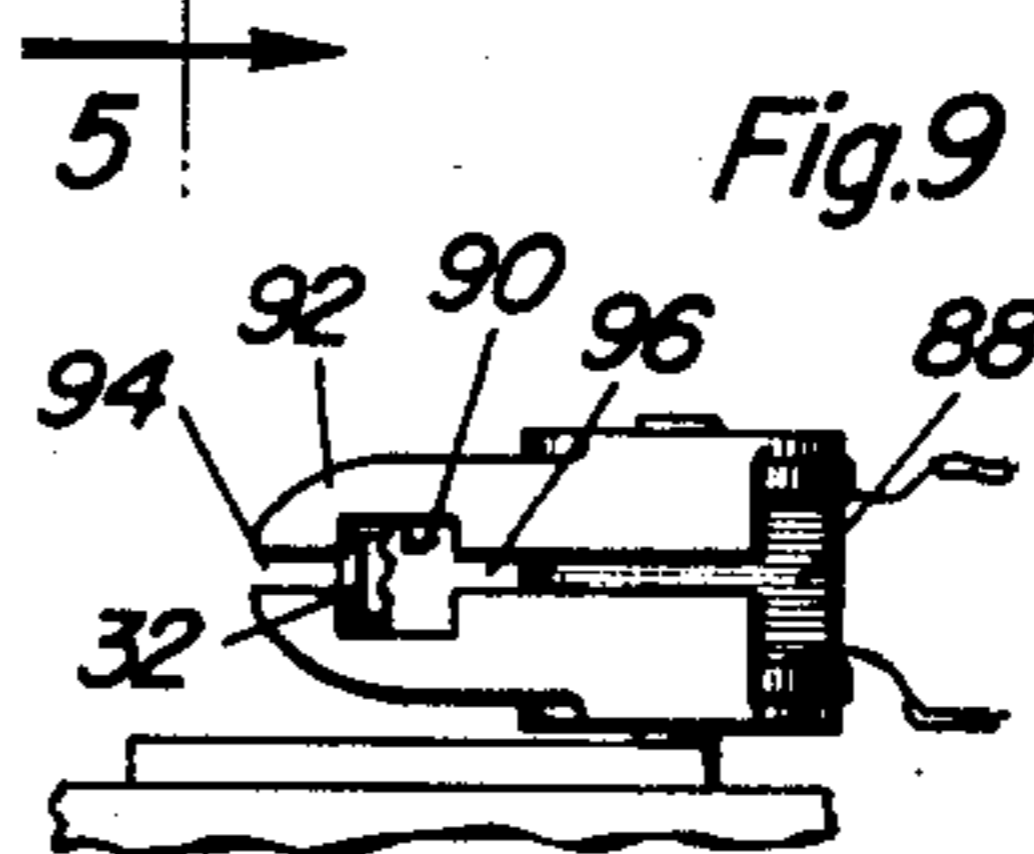


Fig. 9



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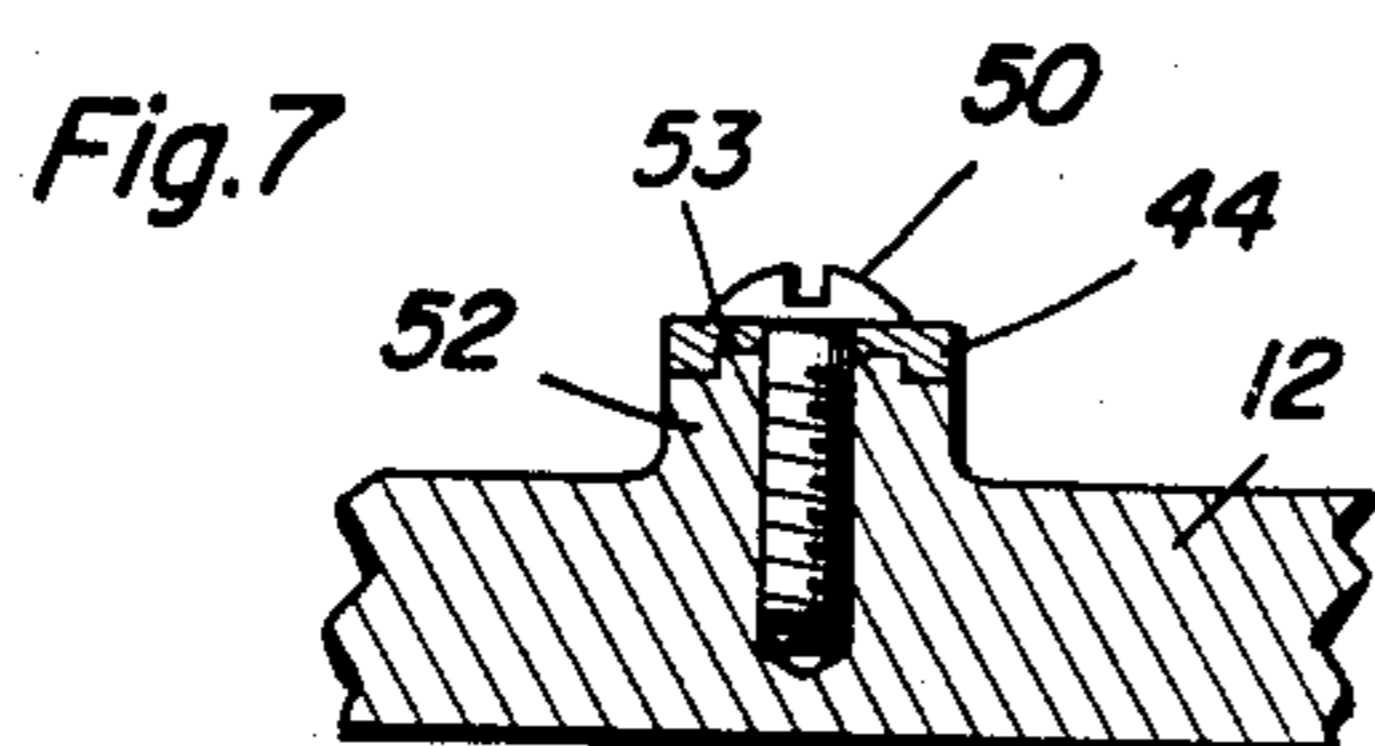
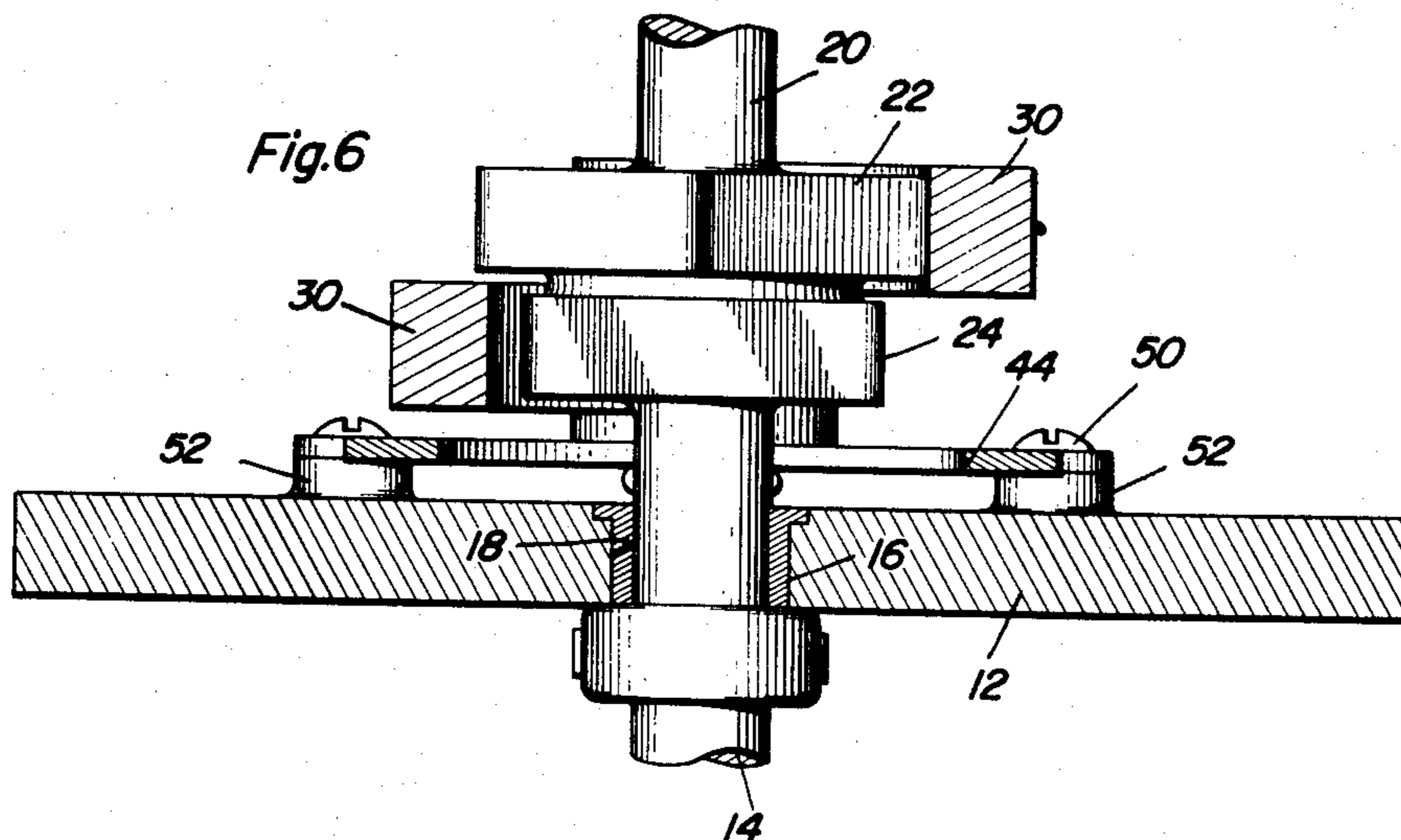
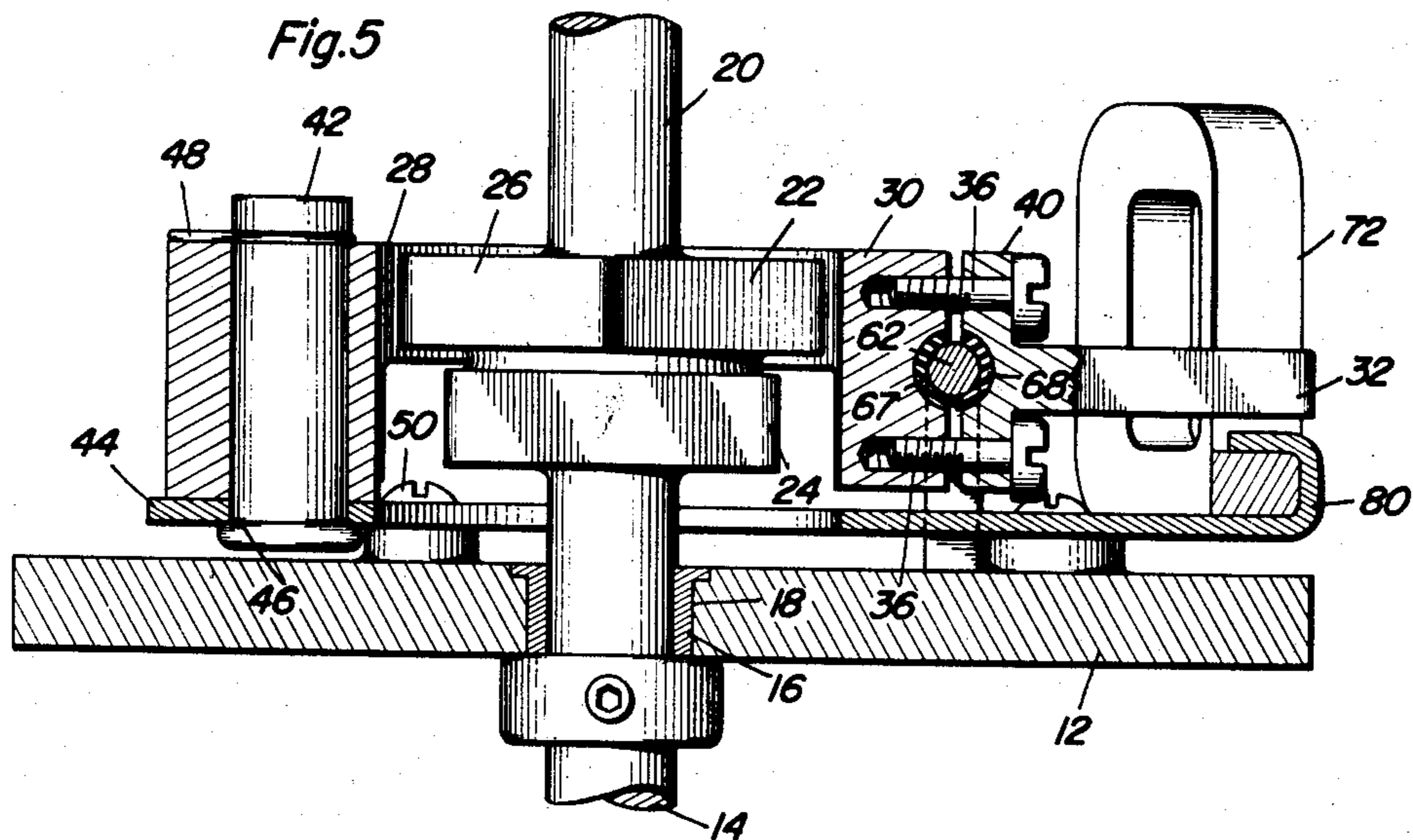
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MAGNETIC DISTRIBUTOR ASSEMBLY

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2 Sheets-Sheet 2



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1

2,953,652

MAGNETIC DISTRIBUTOR ASSEMBLY

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Filed Oct. 1, 1958, Ser. No. 764,617

3 Claims. (Cl. 200—30)

This invention relates to distributors for internal combustion engines.

An object of the invention is to provide a motor vehicle distributor wherein the condenser is definitely and positively ungrounded at the proper instant during engine operation thereby providing more time for the condenser to build up a charge for the next firing. Therefore, the problem of having the engine cut-out at high speed operation is overcome.

Another object of the invention is to provide a novel and improved distributor for an internal combustion engine, wherein an arm is movable to positions at which the distributor points are opened and closed, and when moved exceedingly near the closed position, the arm is magnetically actuated the remaining distance, for instance three thousandths of an inch. Accordingly, the distributor points are magnetically held, by retention of the arm, in the closed position thereby avoiding flutter and thereby assuring that there will be a complete closing of the points at the times during distributor operation that the points should be closed.

A further object of the invention is to provide a practical distributor which is magnetically actuated to a partial extent, the magnetic forces being used to assure that the points are brought to the closed position and remain closed until they are supposed to open.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a top view of a distributor constructed in accordance with the invention.

Figure 2 is an elevational view of the distributor in Figure 1.

Figure 3 is a top view of the distributor in Figure 1 showing the same in a second position.

Figure 4 is an elevational view of the distributor in Figure 3.

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a cross sectional view taken on the line 6—6 of Figure 3.

Figure 7 is an enlarged sectional detail taken on the line 7—7 of Figure 3.

Figure 8 is a top view of a modification of the invention.

Figure 9 is a fragmentary elevational view of the modification in Figure 8.

In the accompanying drawings there is a distributor 10 adapted to be used in conjunction with the electrical system of an internal combustion engine. The distributor is constructed of a base 12 that has a rotor shaft 14 extending through a bushing 16 in opening 18 thereof. The rotor shaft has an upper part 20 to which the distributor rotor (not shown) is adapted to be separably secured in the usual way. There are either two indi-

2

vidual cams or a single cam with lobes properly placed, on shaft 14 above base 12. The cam 22, for an eight cylinder engine, has four lower lobes 24 and four upper lobes 26 which are rotatable in an opening 28 of an arm supporting frame 30. Arm 32 (Fig. 5) is attached to the arm supporting frame 30 by any suitable means, for instance by bolts 36 that pass through flange 40 at the inner end of arm 32. Frame 30 is mounted so that it oscillates back and forth about the longitudinal axis of spindle 42, the latter being mounted on distributor plate 44 that is securely carried by base 12. The spindle 42 has a head 46 at one end beneath the lower surface of plate 44 and has a horseshoe fastener 48 in a groove at the top thereof above the top surface of frame 30. The means mounting plate 44 on base 12 may assume several forms, one of which is to have a plurality of bolts 50 (Fig. 7) passed through openings in the plate 44 and engaged with threads in upstanding projections 52 on base 12. Plate 44 is set in proper position by having small sockets 53 on the bottom of plate 44 fit over a portion of each projection 52.

Frame 30 has a pair of cam lobes 54 and 56 (Figs. 1 and 2) which project inwardly of the otherwise cylindrical surface thereof, and cam lobes 54 and 56 are engaged by the lobes of cam sections 24 and 26 in response to rotation of the distributor shaft 14. Due to the spacing of the cam lobes, the frame is oscillated back and forth about the longitudinal axis of spindle 42, and each time that the frame oscillates, the distributor points are opened and closed respectively.

There are a pair of fixed distributor points 58 and 60 connected to distributor plate 44, and a pair of movable distributor points 62 and 64 carried by frame 30. The movable distributor points are attached to the frame 30 by fitting in insulation lines 67 in pocket 68 formed between the confronting surfaces of flange 40 and frame 30 (Fig. 5) and held firmly fastened in place when bolts 36 are tightened.

Two permanent magnets 70 and 72 are carried by distributor plate 44 and they have their north-south pole gaps 74 and 76 (Figs. 2 and 4) spaced apart. Arm 32 fits in the space 78 between the gaps of the poles of magnets 70 and 72. The magnets may be held in place by any means suitable for the purpose, for instance there may be a mounting bracket 80 formed at one end of plate 44 (Fig. 5) to embrace extensions on both of the magnets. Other standard fasteners may be used in place of the crimped bracket 80. As the distributor cam is rotated, the arm 32 is moved, for instance from the position shown in Figure 1 to the position shown in Figure 3. When the arm moves past the center of space 78, the magnet 72 starts to attract the arm 32. When the arm 32 becomes very close to the gap 76, if the distributor is adjusted properly, the cams will move the arm 32 no further. However the magnet attraction for arm 32 by magnet 72, will pull the arm 32 to the position shown in Figure 3. As is illustrated, the distributor points 64 and 60 make contact at this point. Condenser 81, shown only in Figs. 1 and 8, is mounted in the distributor and has its wire 83 connected with low voltage wire 85 from the coil (not shown) to insulated screw 84 in a tapped opening in one side of frame 30. Wire 82 is connected to screw 84 and to the movable distributor point 64. Frame 30 has another tapped opening on the opposite side so that the frame may be turned over when the lobes thereon become worn, and a place for screw 84 is furnished.

The embodiment in Figures 8 and 9 is absolutely the same as the embodiment in Figures 1-7 with the exception of electromagnet 88 to take the place of the two permanent magnets. The electromagnet has an opening 90 in electromagnetically energized frame 92, through

3

which arm 32 is passed. The two flux gaps 94 and 96 on opposite sides of arm 32 and in registry with opening 90, form the magnetic attracting means in the electromagnet 88 for pulling arm 32 the last few thousandths of an inch in the travel which causes the distributor points to open and close. The coil of the electromagnet 88 is constantly energized, it being unnecessary to intermittently operate the electromagnet, although other embodiments of the invention contemplate intermittent electromagnetic operation. In such a form of the invention, electromagnets would merely be substituted for magnets 70 and 72 and in approximately the same relationship as shown in Figure 2.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A distributor comprising the combination of a base, a distributor shaft, a cam on said shaft, a frame, means mounting said frame adjacent to said base for oscillatory movement, said frame having a cam adapted to be contacted by the cam on said distributor shaft to oscillate said frame, a movable distributor point, means adjustably securing said movable distributor point on said frame and including a pocket in said frame, a magnetically attractable arm attached to said frame, and magnet means on opposite sides of said arm to attract said arm during a portion of the movement of said frame for each oscillation of said frame, and stationary distributor points located adjacent to said movable distributor point against which said movable distributor point is brought by the attraction of said magnetic means.

2. A distributor comprising the combination of a base, a distributor shaft, a cam on said shaft, a frame, means mounting said frame adjacent to said base for oscillatory movement, said frame having a cam adapted to be contacted by the cam on said distributor shaft to oscillate said frame, a movable distributor point, means adjust-

4

ably securing said movable distributor point on said frame and including a pocket in said frame, a magnetically attractable arm attached to said frame, and magnet means on opposite sides of said arm to attract said arm during a portion of the movement of said frame for each oscillation of said frame, and stationary distributor points located adjacent to said movable distributor point against which said movable distributor point is brought by the attraction of said magnetic means, said stationary points being electrically connected, and a capacitor electrically connected between said movable point and said stationary points, said magnetic means comprising an electromagnet provided with a member having an opening in which said arm is disposed, and a pair of gaps in said member on opposite sides of said arm.

3. A distributor comprising the combination of a base, a distributor shaft, a cam on said shaft, a frame, means mounting said frame adjacent to said base for oscillatory movement, said frame having a cam adapted to be contacted by the cam on said distributor shaft to oscillate said frame, a movable distributor point, means adjustably securing said movable distributor point on said frame and including a pocket in said frame, a magnetically attractable arm attached to said frame, and magnet means on opposite sides of said arm to attract said arm during a portion of the movement of said frame for each oscillation of said frame, and stationary distributor points located adjacent to said movable distributor point against which said movable distributor point is brought by the attraction of said magnetic means, said stationary points being electrically connected, and a capacitor electrically connected between said movable point and said stationary points, said magnetic means comprising a pair of permanent magnets having flux gaps on opposite sides of said arm.

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