

Feb. 28, 1939.

K. ISHIBASHI

2,148,695

SIGNALING APPARATUS

Filed Nov. 8, 1937

3 Sheets-Sheet 1

Fig. 1.

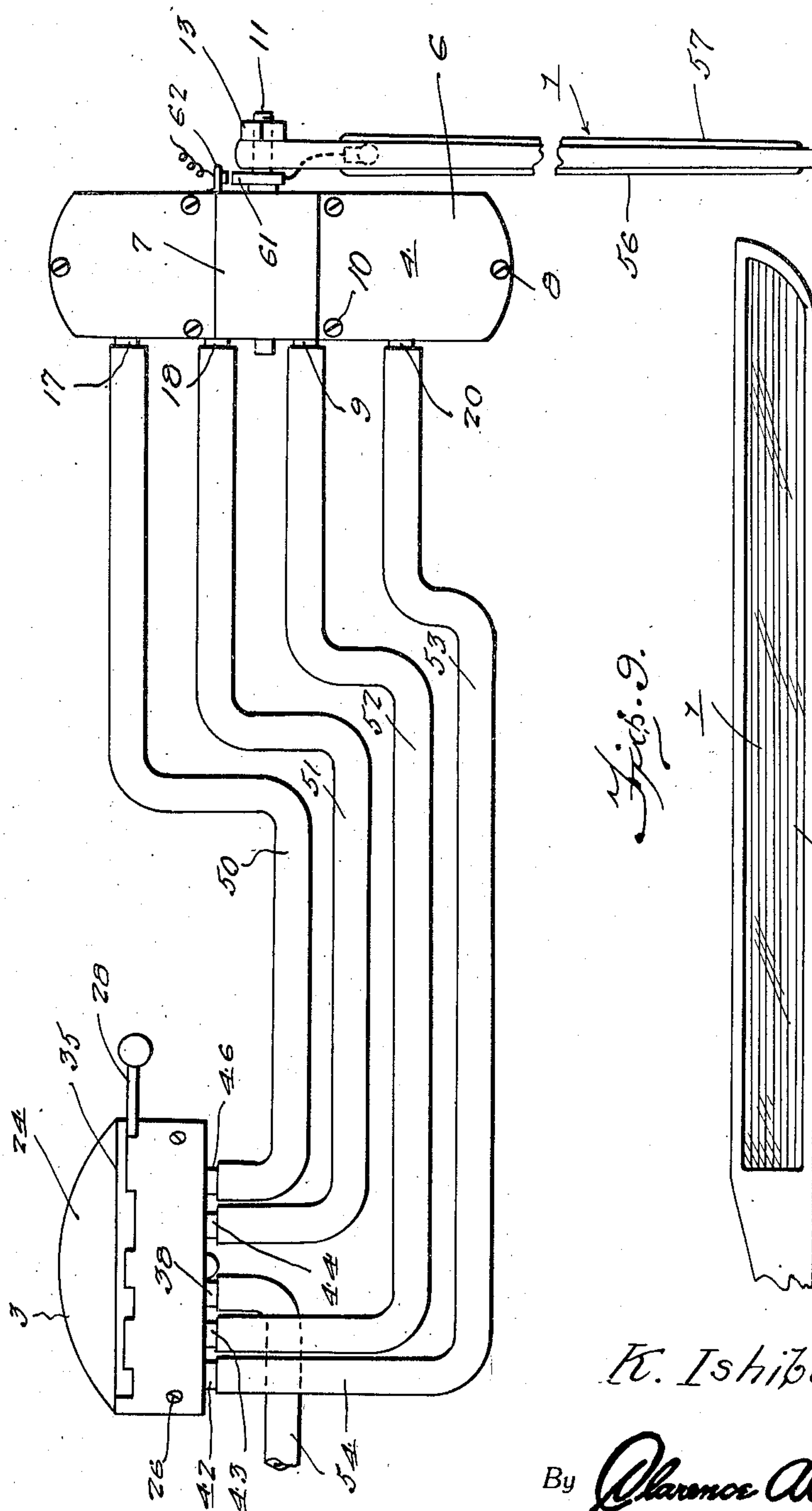
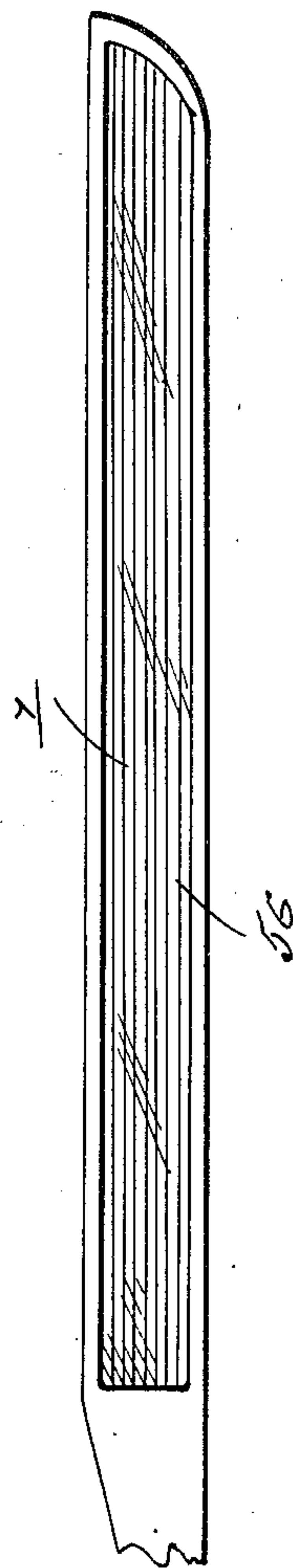


Fig. 9.



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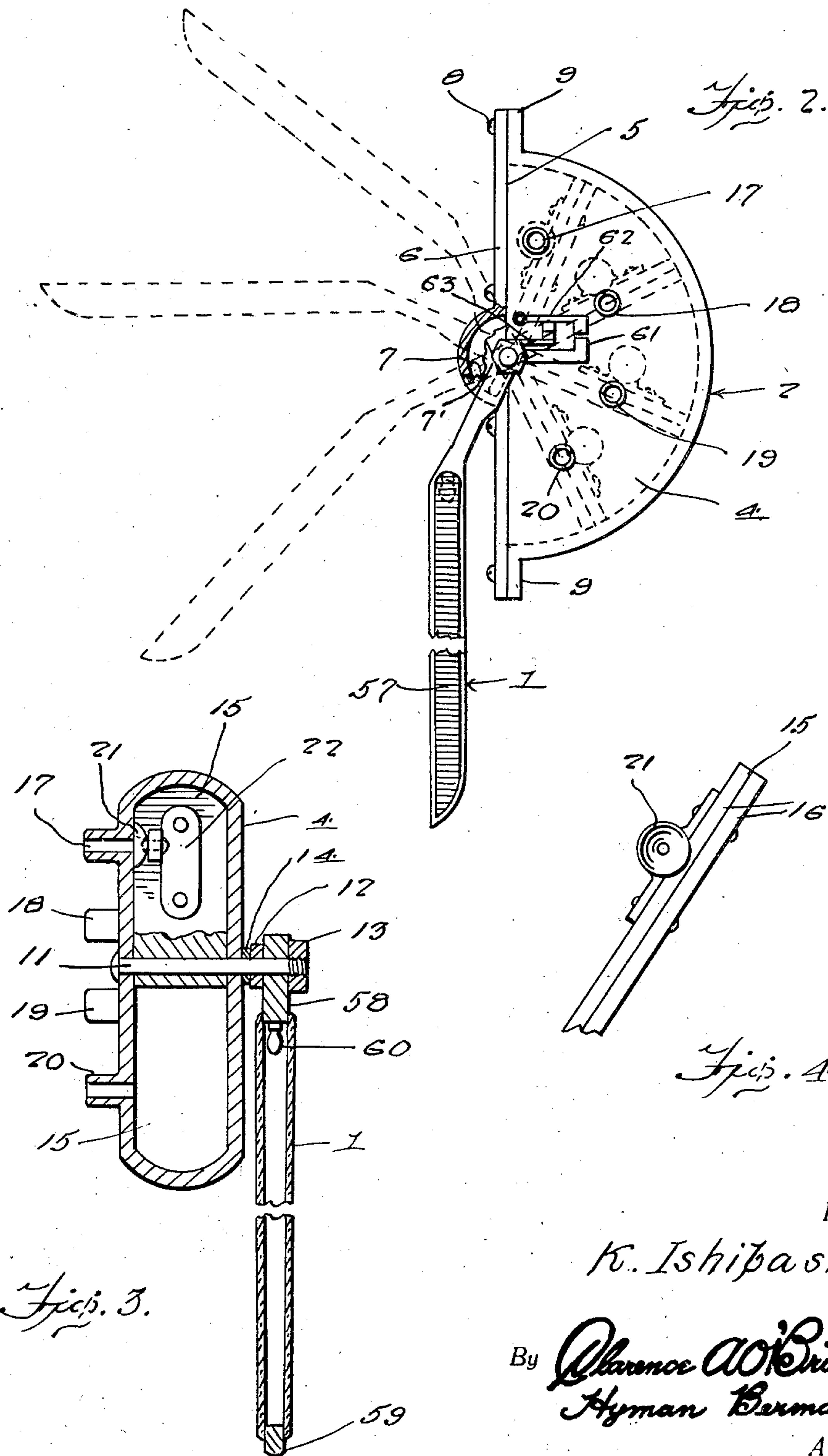
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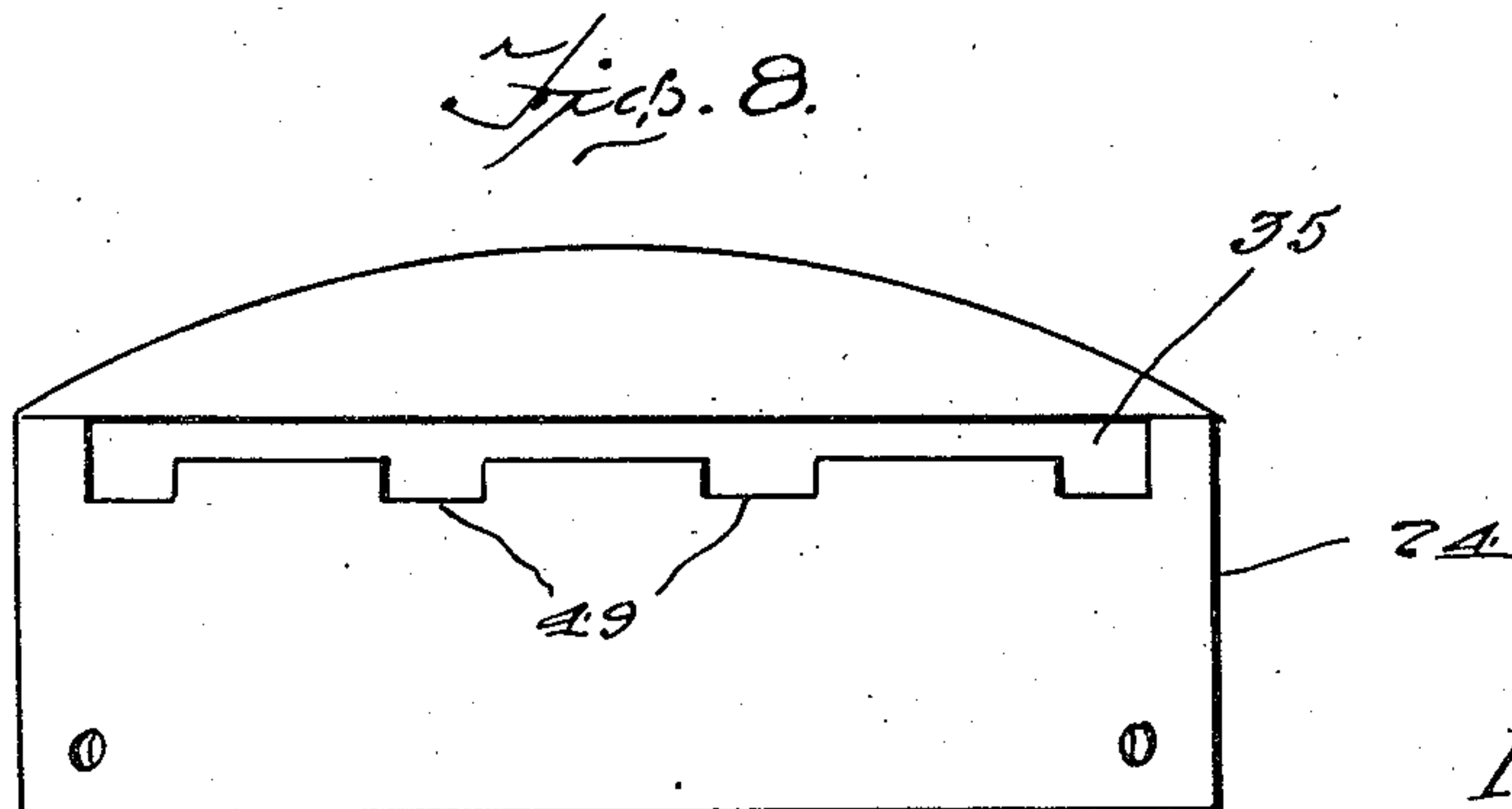
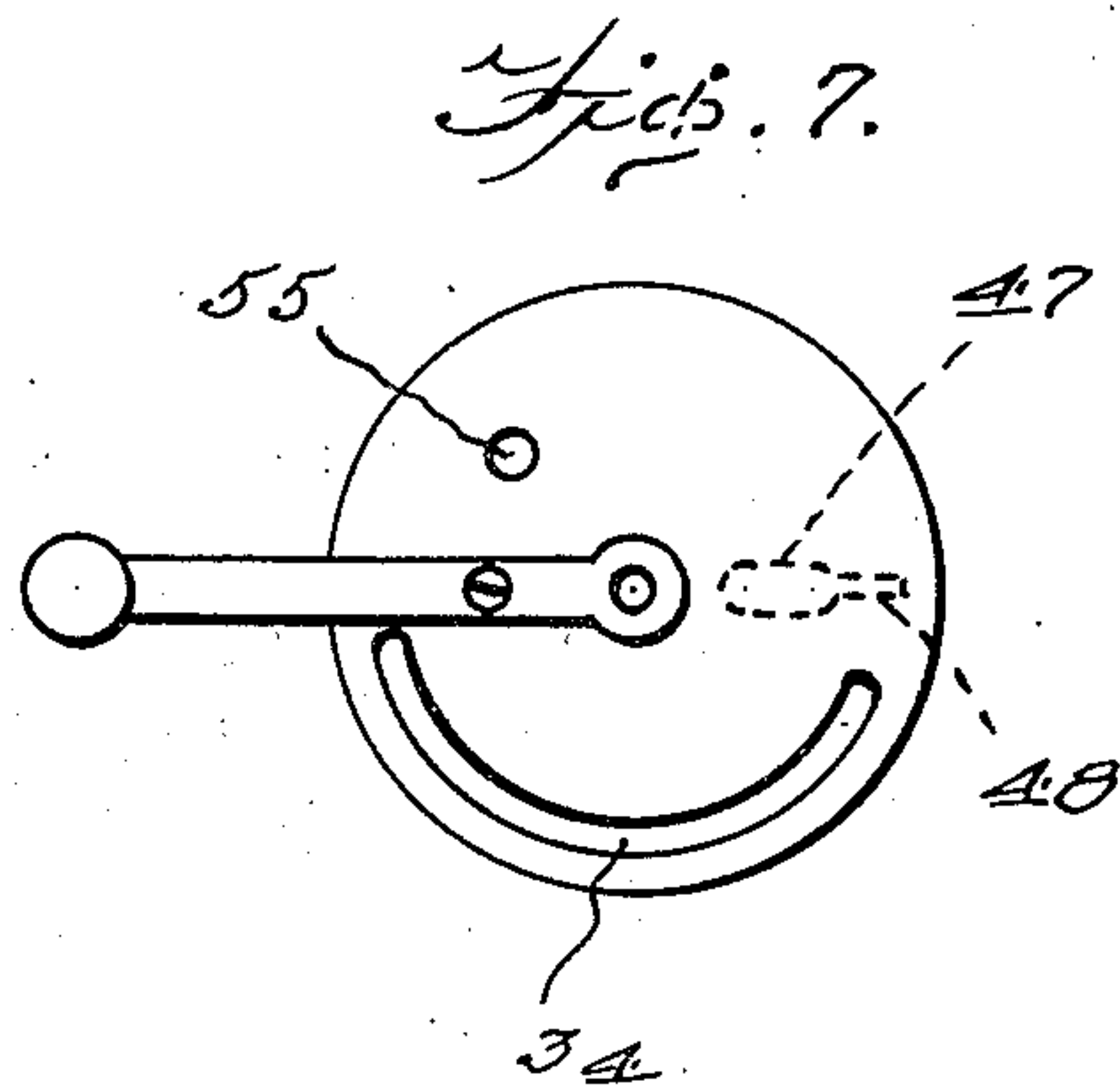
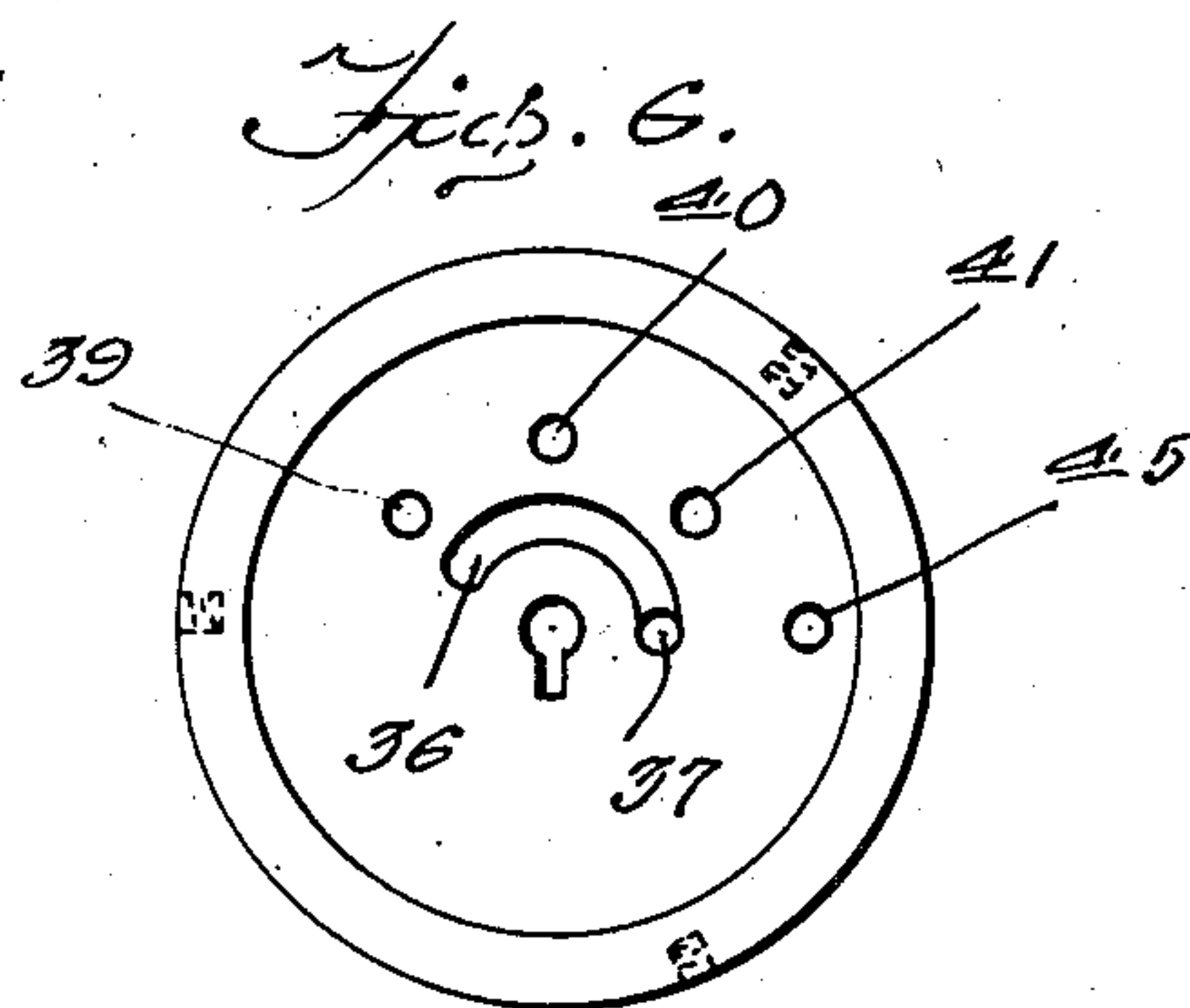
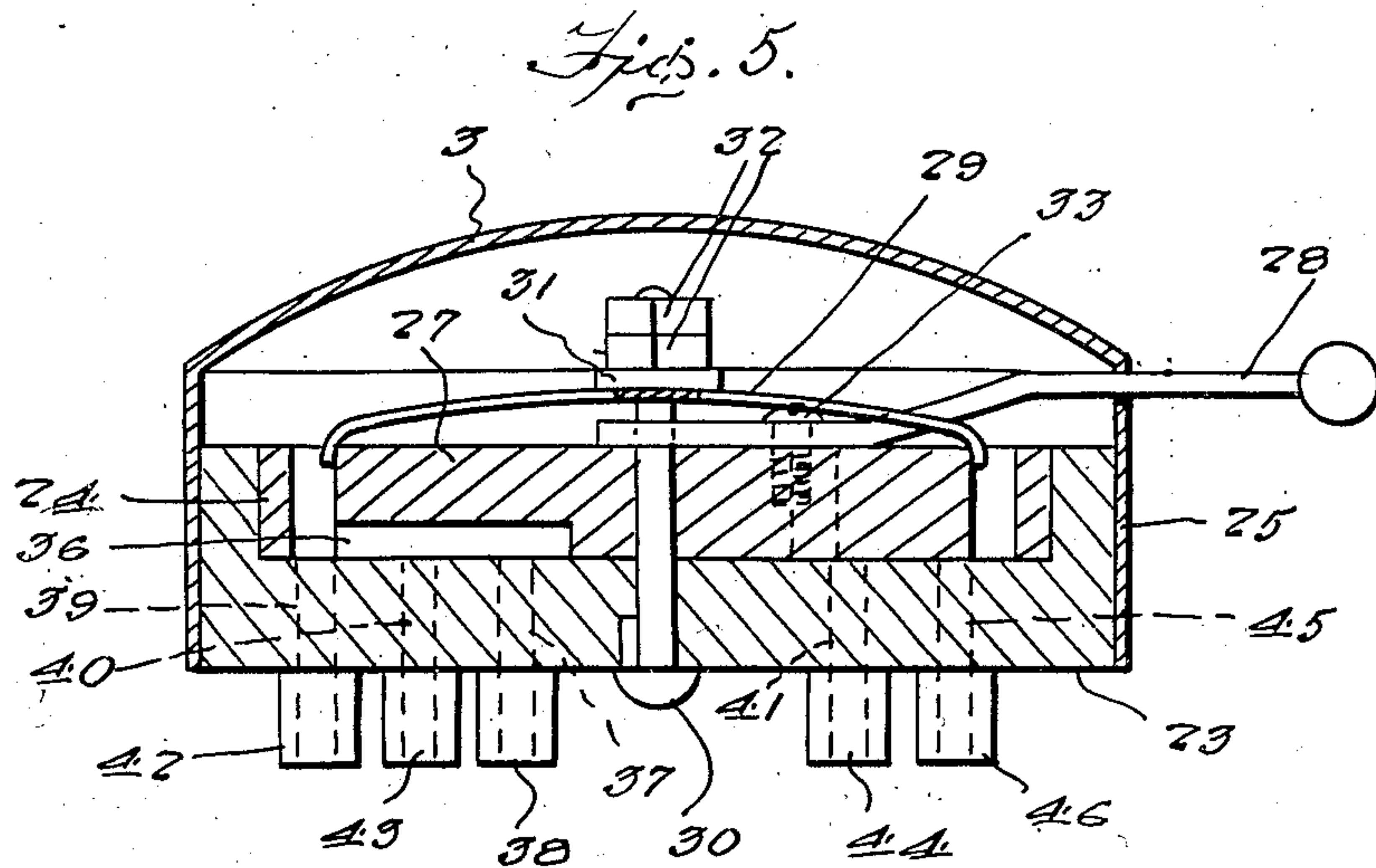
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SIGNALING APPARATUS

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Application November 8, 1937, Serial No. 173,500

1 Claim. (Cl. 116—39)

My invention relates to improvements in signaling apparatus for use on automobiles.

The primary object of my invention is to provide an efficient apparatus of this character which may be readily attached to present day automobiles to utilize the vacuum created in the intake manifold of the engine for selectively operating a signal arm into different signaling positions.

Another object is to provide apparatus of the character and for the purpose above set forth embodying a signal arm adapted for illumination from within the same and illuminated automatically in the different signaling positions thereof only.

Another object is to provide a device to replace physical arm signaling in inclement weather and at night thereby obviating danger due to lack of visibility of arm signals and negligence on the part of drivers in signaling under such conditions.

Other and subordinate objects are also comprehended by my invention, all of which together with the precise nature of my improvements will be readily understood when the following description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:—

Figure 1 is a schematic view in elevation illustrating a preferred embodiment of my apparatus,

Figure 2 is a view in rear elevation of a suction motor forming part of the apparatus and for operating the signal arm,

Figure 3 is a view in vertical section taken through the signal arm and motor,

Figure 4 is a fragmentary view in edge elevation of a piston with which the motor is equipped,

Figure 5 is a view in transverse section of a control valve for the motor,

Figure 6 is a view in top plan of the base of the valve,

Figure 7 is a similar view of a valve member settable to different positions in said base.

Figure 8 is a view in side elevation of the valve, and

Figure 9 is a fragmentary view in front elevation of the signal arm.

Referring to the drawings by numerals, the basic elements of my apparatus are a signal arm 1, a vacuum, or suction, motor 2 for operating said arm, and a control valve 3 for said motor.

First with reference to Figures 2, 3 and 4, the motor 2 comprises a semi-circular casing 4 having an open front end 5 closed by a rectangular

top plate 6 having an enlarged central bearing boss 7 opposite the axis of the casing 4. The casing 4 and plate 6 are detachably secured together by screws 8 passing through the ends of the plate into diametrically opposed lugs 9 on said end of the casing, and also by screws 10 passing through the plate 6 upon opposite sides of the boss 7 into the edges of said casing. A rock shaft 11, in the form of a bolt, is journaled in the bearing boss 7 and the said end of the casing 4 to extend transversely of the latter and beyond one side thereof. The signal arm 1 is fixed at one end on the extending end of said shaft 11 between a collar 12 on said shaft and a nut 13 clamping said arm against the collar. A spacing washer is mounted on the shaft 11 between the collar 12 and the casing 4. Fast on the rock shaft 11 within the casing 4 is a blade-like piston 15 preferably formed of two layers of suitable leather composition 16. The piston 15 extends at one end into an arcuate recess 7' in the boss 7 to form a seal at said end of the piston. The piston 15 is operative to rock the shaft 11 and to move the signal arm 1 from a normal to stop and right and left turn indicating positions respectively. In the normal position thereof said arm 1 depends from the shaft 11 in substantially vertical position as shown in full lines in Figure 2. In the stop position thereof said arm 1 extends obliquely downwardly from said shaft. In the right and left turn indicating positions thereof said arm 1 extends from said shaft obliquely upwardly on the one hand and horizontally on the other. The piston 15 is operative for moving the signal arm 1 to the described positions by movement thereof into corresponding positions hereinafter termed normal, stop, and right and left turn positions, respectively, such operation of said piston being accomplished by exhausting the air from the casing 4 at different points in one side thereof and by way of a series of exhaust nipples 17, 18, 19 and 20, respectively, extending from said side in spaced apart relation. The nipples 17, 18, 19 and 20 are spaced, preferably, in the arc of a circle concentric to the shaft 11 to control the degree of movement of the piston 15 in a manner now to be described. The nipple 17 is arranged slightly in advance of the normal position of the piston 15 to be covered in said position of the piston by a suction cup 21 mounted on the piston by a bracket 22 to wipe against the inner face of the casing 4 on the discharge side thereof, so that in said normal position of the piston, and the signal arm 1, suction through said nipple 17 is broken and said piston 15 and signal arm 1

held in normal position. The remaining nipples 18, 19 and 20 are arranged to be closed by one side edge of said piston 15 in the stop and left and right turn positions thereof, respectively, to establish in like manner the stop, right and left turn positions of said piston.

Coming now to the control valve 3, as shown in Figures 5 to 8, said valve comprises a dished circular base 23 forming a circular valve chamber 24, a dome like sheet metal casing 25 fitting over the base 23 and removably secured, as by screws 26, thereto, a disk valve 27 fitted into the chamber 24 for rotation therein flat against the base 23, and a resiliently mounted lever 28 for rotating said valve member. The valve member 27 is tensioned against the base 23 by means of a spider 29 of resilient metal bearing at its ends on said member, a bolt 30 keyed to and extending axially through said base 23, the member 27 and the center of said spider, and a washer 31 and a lock nut 32 on said bolt. The hand lever 28 is pivoted at one end to said bolt and secured to the valve member 27 by a screw 33. The other end of said lever 28 extends through a circumferential slot 35 in the casing 24.

The described valve 3 is suitably secured to the left front post of the automobile and adapted to be ported and connected to the motor 2 and the intake manifold of the engine to utilize the suction created in said manifold for operating the motor 2 as described in the following.

The base 23 has an arcuate recess 36 therein in the chambered side thereof concentric to the axis of the valve member 27 and opening into the chamber 24. An outlet port 37 extending through said base 23 opens into said recess and into a discharge nipple 38 extending from the bottom of said base. A series of three discharge ports 39, 40 and 41 are provided in the bottom of said base 23 opening into the chamber 24 and into nipples 42, 43 and 44 extending from said base. The ports 39, 40 and 41 are spaced apart circumferentially of the base 23 at the same radial distance from the axis of the valve member 27 and along the outer side of the recess 36. A fourth discharge port 45 extends through the bottom of said base 23 into a nipple 46, the port 45 being at a greater radial distance from said axis of the member 27 than the ports 39, 40 and 41 and spaced circumferentially from the series of said ports 39, 40 and 41. The valve member 27 is provided in its under face with a radially disposed recess 47 designed to bridge the recess 36 and the ports 39, 40 and 41, respectively, and to connect the former with the latter upon rotation of said member 27 into different set positions.

The recess 47 has a narrow extension 48 whereby in another set position of said member 27 said recess 47 bridges the recess 36 and port 45 thereby establishing communication therebetween, said extension 48 providing for slow return of the signal arm 1 to normal position. The set positions of the valve member 27 are determined by notches 49 in one edge of the slot 35 into which the lever 29 flexes. The nipples, 46, 44, 43 and 42 of ports 45, 41, 40 and 39 are connected to nipples 17, 18, 19 and 20, respectively, by flexible conduits 50, 51, 52 and 53. A similar conduit 54 extends from the nipple 38 for connection of the valve 3 to the intake manifold in any suitable manner whereby under operation of the engine of the vehicle suction is continuously created in the recess 36 of the valve member 27.

Referring at this point to the operation of the invention, as so far described, in the normal set

position of the valve member 27, as shown in Figure 7, the recess 47, 48 bridges recess 36 and port 45, whereby suction is created in the valve casing 4 by way of conduit 50 and the nipple 17 on the proper side of the piston 15 to hold the latter and the signal arm 1 in normal position by creating a vacuum in the beforementioned suction cup 21. In this position of the parts, air is admitted to the casing 4 on the other side of the piston 15 by way of a port 55 in the valve member 27 communicating with port 39 so that air is admitted to said casing 4 through nipple 42, conduit 53 and nipple 20. When it is desired to signal a stop, or a right, or left turn, valve member 27 is rotated, counter-clockwise as viewed in Figure 7, to set the same into proper position to establish communication between the recess 36 and port 41, 39, or 43, as the case may be, thereby creating suction in the casing 4 on the proper side of the piston 15 by way of the related conduit 51, 52, or 53, and the related nipple 18, 20, or 19, which draws the piston 15 to whichever nipple is concerned. At this point the piston 15 blocks the nipple concerned, in the manner previously described, and thereby establishes the position selected. During setting of the valve member 27 for stop, and right and left turn signaling, air is admitted to the casing 4 on the opposite side of the piston 15 by way of an arcuate port 34 in the valve member 23 which communicates during such settings with port 45, thereby admitting air to said casing on the proper side of the piston 15 by way of nipple 46, conduit 50 and nipple 17.

A particular feature of my invention is the signal arm 1 which is hollow, made of transparent material and provided with differently colored front and rear faces 56 and 57, respectively, the rear face being preferably green as indicated in Figure 2 and the front face blue as indicated in Figure 9. The opposite ends of said arm 1 are closed by plugs 58 and 59, said arm being secured to the shaft 11 by means of the first mentioned plug. The plug 58 has suitably secured thereto, within said arm 1, an electric light bulb 60 for illuminating the latter and designed to be connected in circuit with a suitable source of current such as the automobile battery. The signal arm 1 is designed to be illuminated when out of normal position. To this end a switch is provided comprising a pair of cooperating control fingers 61 and 62, one fast on the casing 4 and the other pivoted thereto to gravitate into engagement with the first mentioned finger. The fingers 61 and 62 are suitably connected in the circuit for the bulb 60. In the normal position of the signal arm 1 a fixed member 63 thereon, of insulating material, engages and raises the movable contact finger 62 from engagement with the fixed finger 61 to break the circuit to said bulb 60. In the other positions of said arm 1 the fingers 61 and 62 are engaged as and for a purpose which will be clear.

The operation of my invention has, it is believed, been set forth in the foregoing in sufficient detail to impart a clear understanding thereof without further explanation.

Manifestly the invention, as described, is susceptible of various modifications without departing from the inventive concept and right is herein reserved to all such modifications falling within the scope of the subjoined claim.

What I claim is:—

In apparatus of the class described for connection to a source of suction, a motor comprising a fixed casing, a rock shaft rotatably mounted

therein and having an end extending therefrom, a signal arm fast on said end of the shaft to be rocked thereby into different signaling positions, a blade-like piston fast on said shaft and fitted in said casing for oscillation therein to rock said shaft, a series of discharge nipples extending from one side of the casing and spaced apart around said shaft for exhausting the air from said casing at different points in the path of movement of the piston whereby movement of said piston in different degrees may be effected to swing said arm into said different positions, and means on said piston to close said nipples in

the different positions of the piston whereby communication between said source and casing is interrupted and the different positions of the piston thereby established, said means including a suction cup on said piston closing one of said nipples, said cup wipingly engaging said side of the casing and coacting therewith to yieldingly retain said piston in said different positions against operation under gravitational action of the signal arm when the motor is disconnected from said source of suction.

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