

No. 771,587.

PATENTED OCT. 4, 1904.

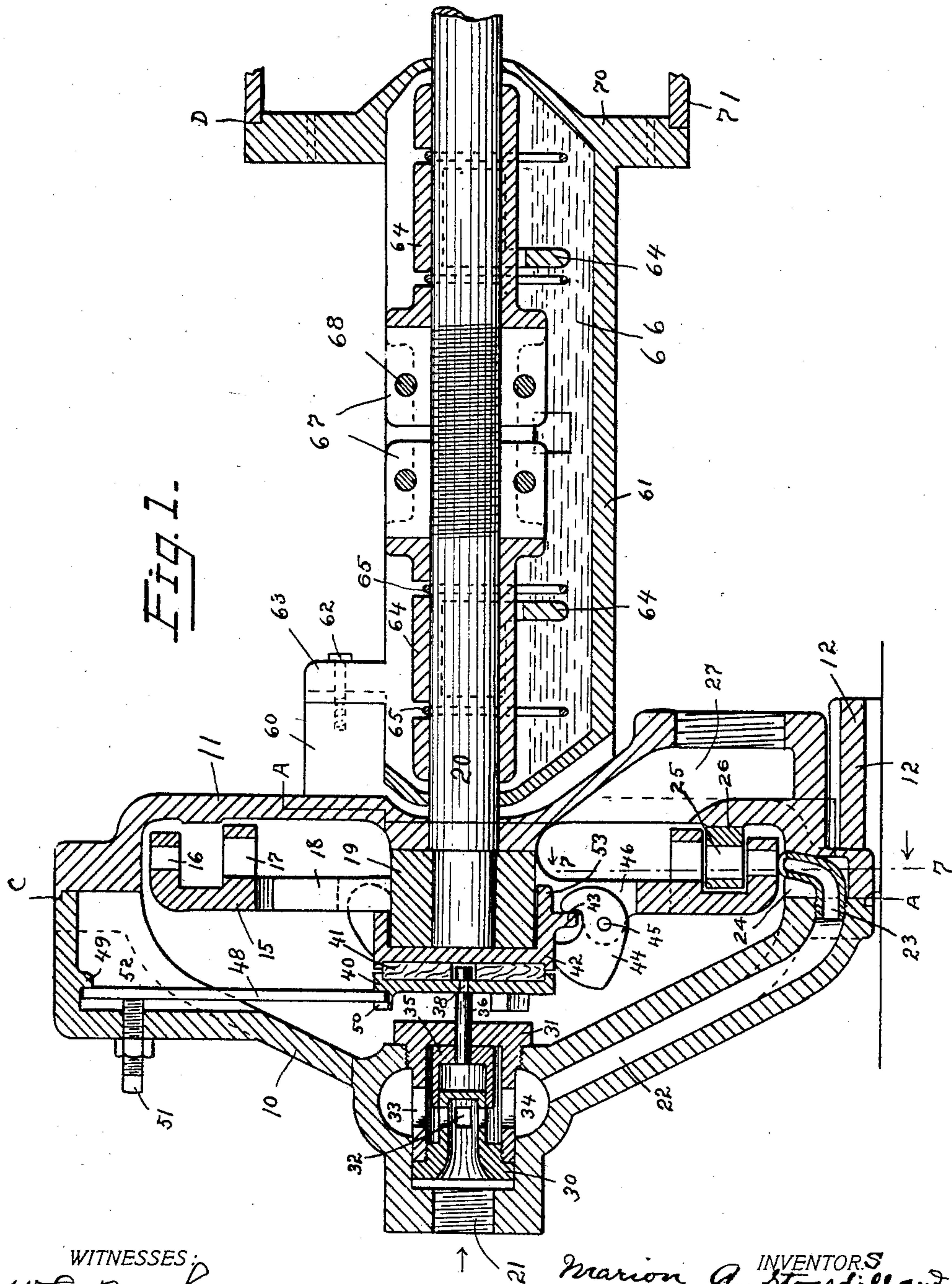
M. A. STOGSDILL & E. J. SCHATZ.

ROTARY ENGINE.

APPLICATION FILED FEB. 28, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES:  
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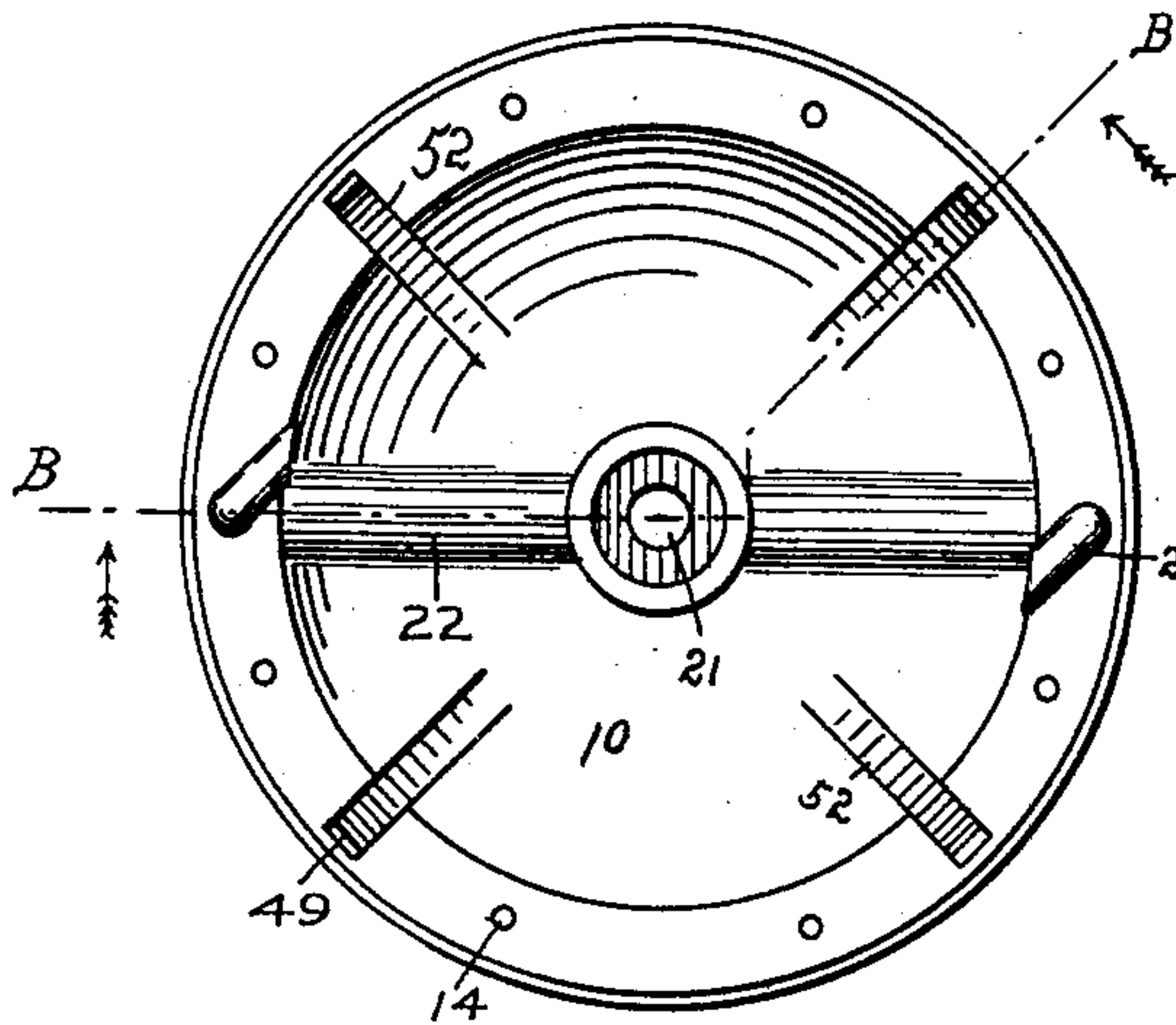
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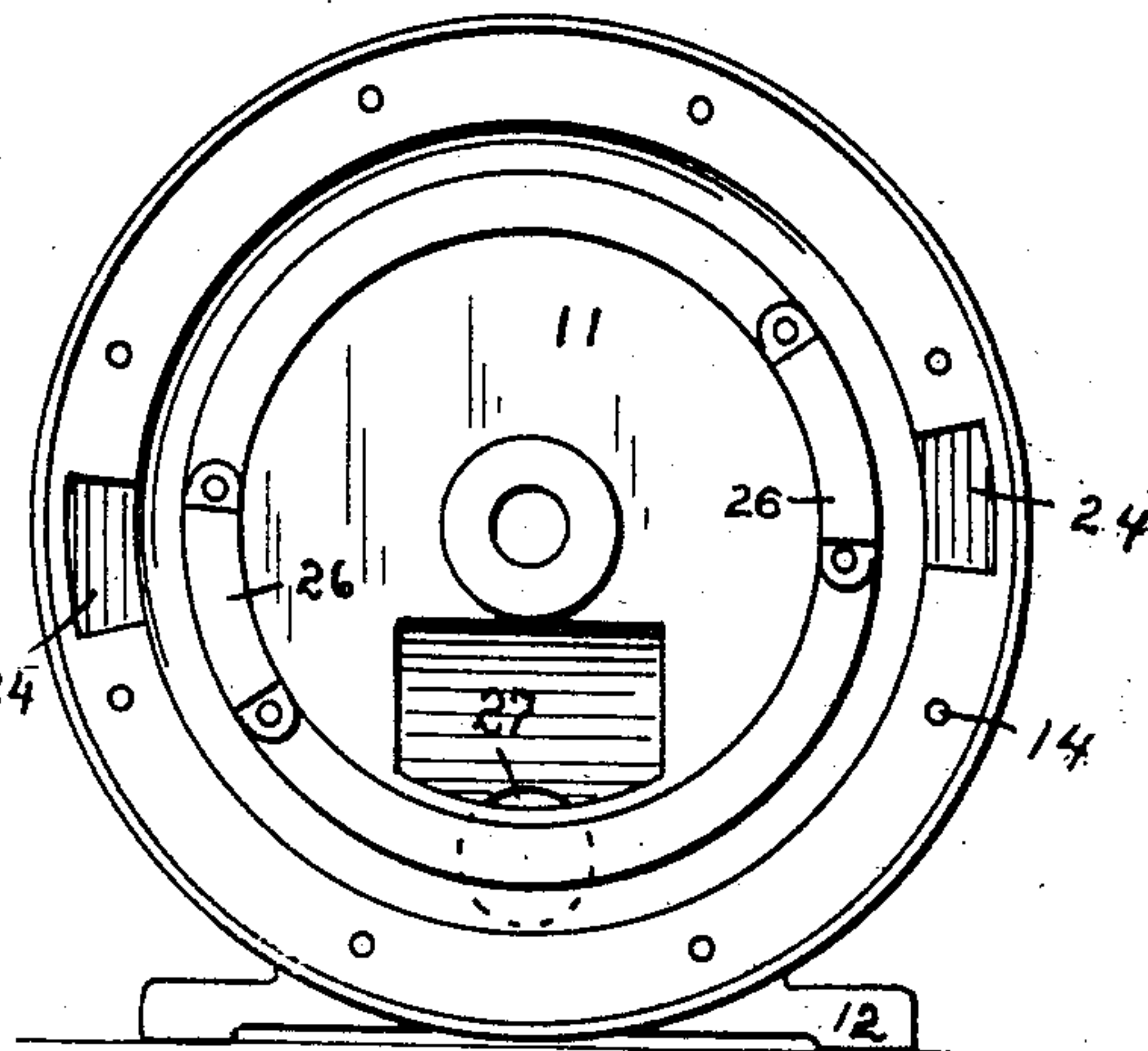
NO MODEL.

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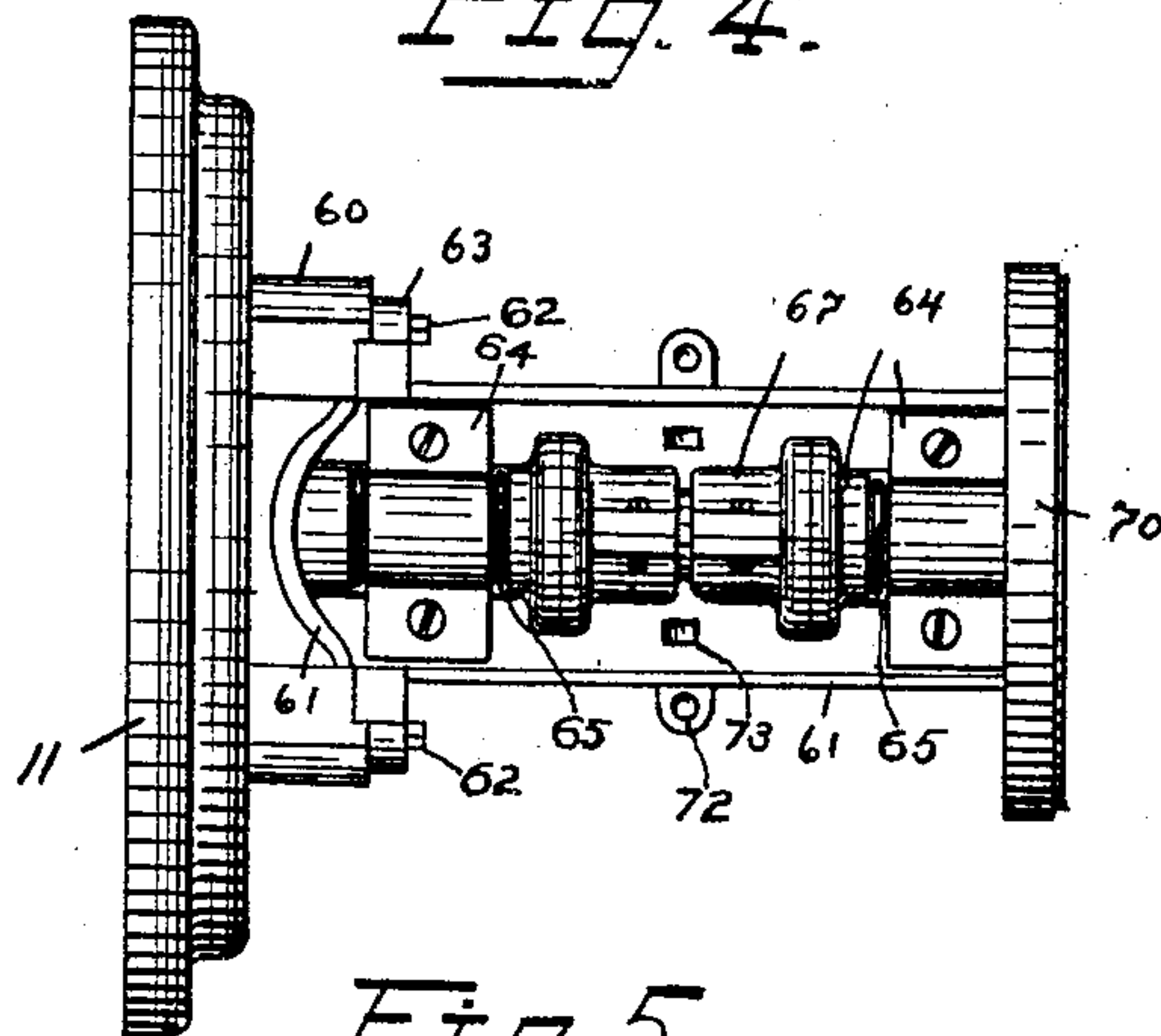
*Fig. 2.*



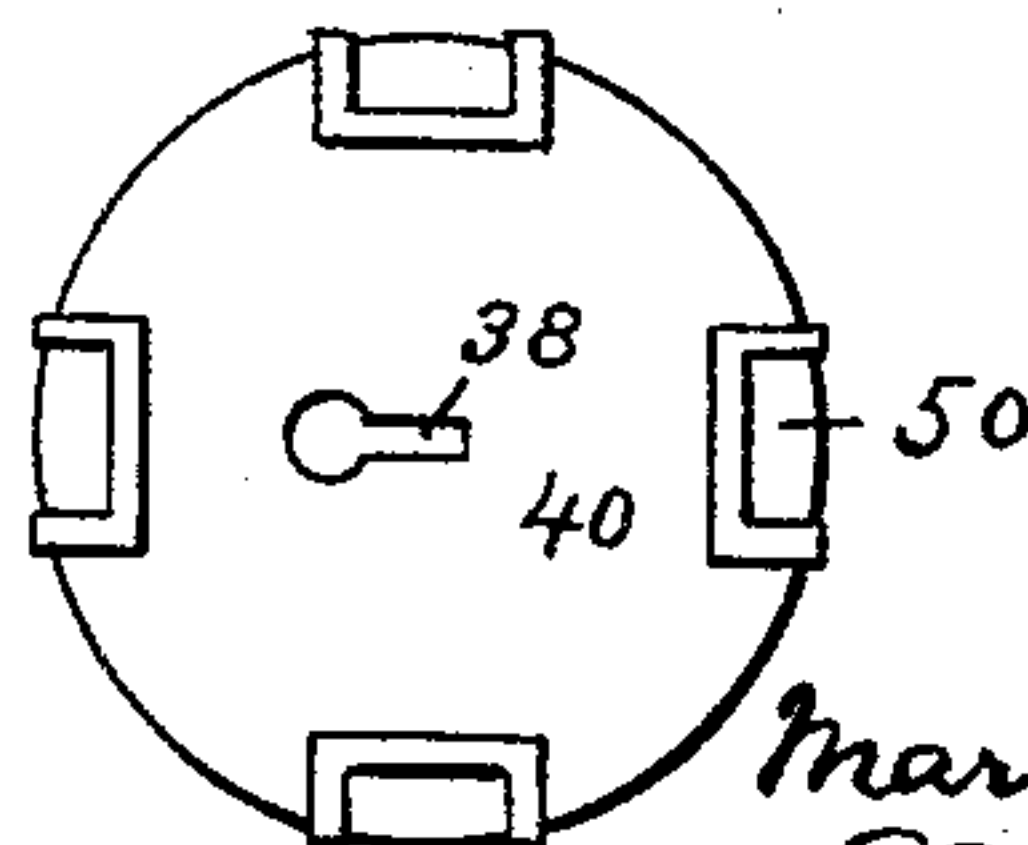
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



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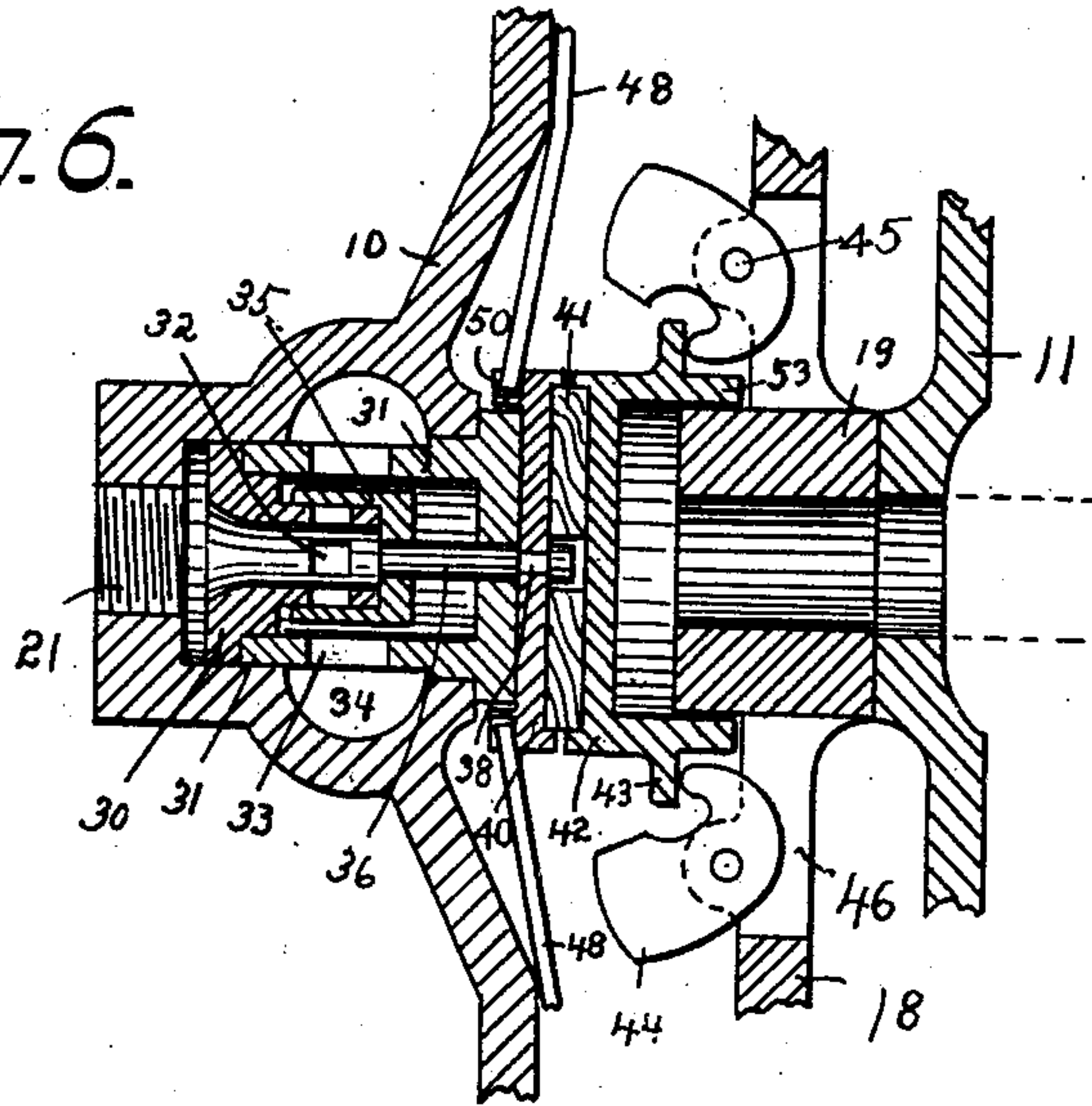
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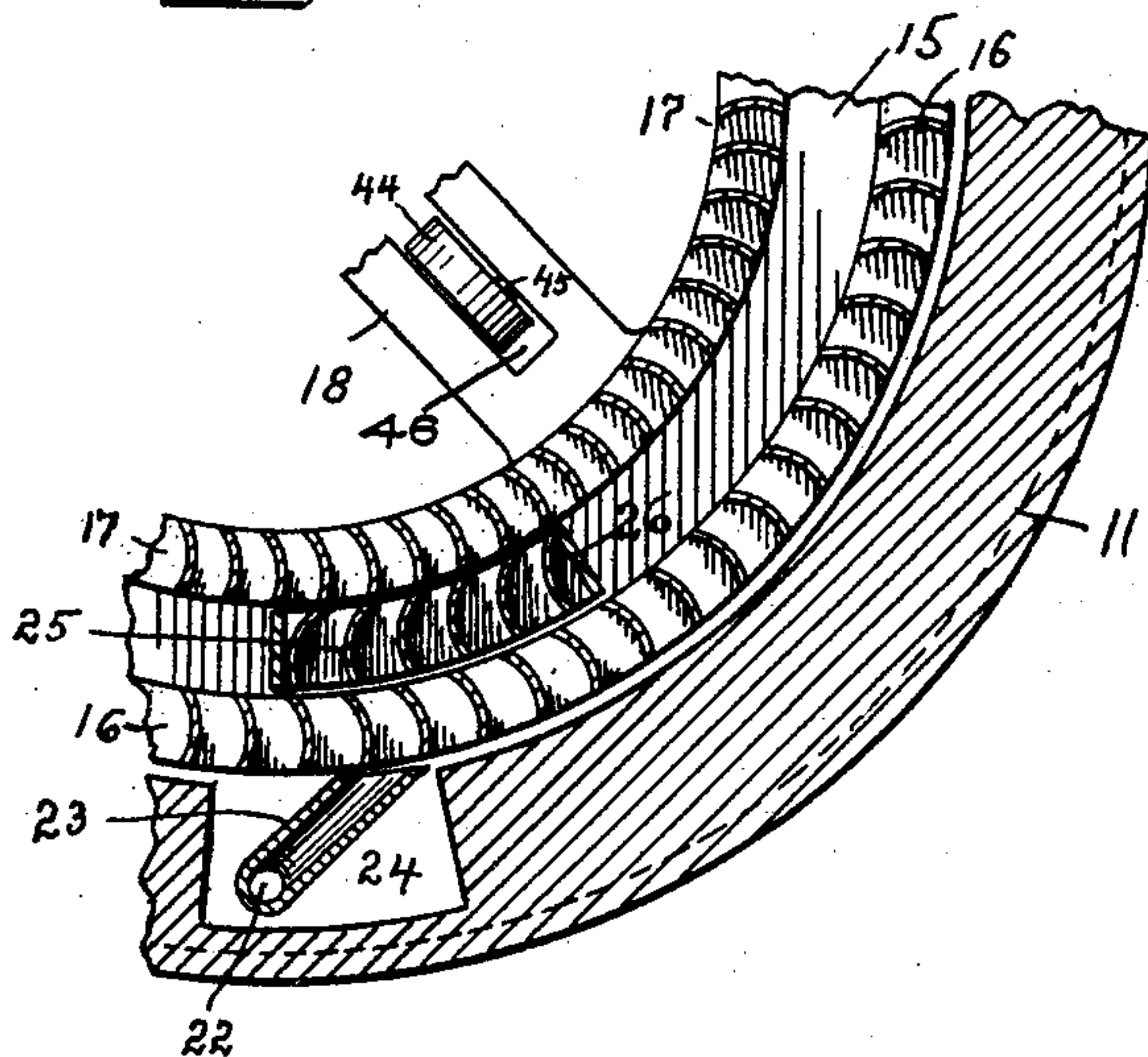
NO MODEL.

3 SHEETS—SHEET 3.

*Fig. 6.*



*Fig. 7.*



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# UNITED STATES PATENT OFFICE.

MARION A. STOGSDILL, OF INDIANAPOLIS, AND EDWARD J. SCHATZ, OF GREENFIELD, INDIANA, ASSIGNORS TO THE PYLE ELECTRIC HEAD-LIGHT COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF INDIANA.

## ROTARY ENGINE.

SPECIFICATION forming part of Letters Patent No. 771,587, dated October 4, 1904.

Application filed February 28, 1903. Serial No. 145,531. (No model.)

*To all whom it may concern:*

Be it known that we, MARION A. STOGSDILL, of Indianapolis, county of Marion, and EDWARD J. SCHATZ, of Greenfield, county of Hancock, State of Indiana, have invented a certain new and useful Rotary Engine; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like figures refer to like parts.

The object of our invention is to improve the construction of rotary engines.

The main feature of improvement consists in the governor apparatus or means for cutting off and regulating the admission of steam. There are also novel features of construction all of which will appear more fully from the accompanying drawings and the following description and claims.

In the drawings, Figure 1 is a sectional view of the rotary engine, all to the right of the line marked A A being in vertical section and all to the left being on the line B B of Fig. 2, the end connected with the thing to be driven being broken away. Fig. 2 is an inside elevation of the left member of the casing surrounding the wheel. Fig. 3 is an inside elevation of the right member of said casing. Fig. 4 is a plan view of the machine from the point C to the point D of Fig. 1. Fig. 5 is an elevation of the plate against which the springs act. Fig. 6 is a transverse section through the governor apparatus and connected parts, showing the position of the governor apparatus when the ports are closed by it. Fig. 7 is a section through a portion of the machine on the line 7-7 of Fig. 1.

The casing which incloses the rotary wheel in this engine consists of two members or halves 10 and 11, secured together and supported on the base 12, that is integral with the member 11. These two members of the casing are secured together by bolts through the holes 14 to be seen in Figs. 2 and 3. The casing formed of the two members 10 and 11 has a chamber in it in which the wheel 15 is mounted, it having a rim portion carrying two annular series of buckets 16 and 17 simi-

larly curved, as shown in Fig. 7. The rim portion is supported on four spokes 18, mounted on the hub 19, that is secured to the shaft 20. Steam is supplied to drive the wheel through the steam-inlet port 21 and the governor apparatus, which will hereinafter be explained, and a pair of oppositely-diverging steam passage-ways 22, each of which is provided at its outlet end with a nozzle 23, formed of a pipe screwed into the passage-way and turned at an angle to the wheel, as shown in Fig. 7. The nozzles are located in a recess 24 in the inner face of the member 11 of the casing. It is thus seen that the steam passes out of the nozzles 23 and tangent to the wheels and outer series of buckets, and from said outer buckets the steam is deflected in the other direction against the concave faces of the stationary blades 25, and from those stationary blades it is deflected again against the concave faces of the inner series of buckets 17. The stationary deflecting-blades 25 are secured between separate plates forming a part of the frame 26, that is secured to the member 11 of the casing, as shown in Fig. 3. There is one of said frames opposite each recess 24 and steam-inlet nozzle 23. They do not extend entirely around, because the steam can act on the stationary blades only in the neighborhood of the steam-inlet. This leaves space between the two series of buckets 16 and 17 on the wheel during most of the distance around the same, so that there is nothing between said two series of buckets to interfere or tend to oppose the free rotation of the wheel from the impulse given it by the steam while passing through the buckets at the steam-inlets. After passing through the buckets the steam leaves through the outlet-port 27.

The governor apparatus will now be explained.

From the steam-inlet port 21 the steam passes into a steam-chest formed of two thimble-shaped ends 30 and 31. The end or portion 30 screws into the end or portion 31 and the latter screws into a threaded opening in the casing for holding it in place. The member 30 of this chest has a longitudinal open-



ing that is closed at its inner end and has on the sides four ports 32. The member 31 has likewise four ports 33 on the side opening into an annular chamber 34, surrounding said steam-chest, and from which the steam passages 22 lead in opposite directions. In said steam-chest, between the two members thereof, there is a chamber occupied by a circular slide-valve 35, adapted to cut off or regulate the size of the steam-ports 32 in the member 30 of said steam-chest. Said slide-valve 35 is secured on the stem 36, longitudinally movable through an opening in the large end of the member 31 of the steam-chest. The other end of said stem 36 is turned down at 38, so as to leave a head on the inner end thereof. The turned-down portion of said stem extends through a narrow opening in the spring-supporting plate 40. This plate is shown in Fig. 5 to have an opening like a keyhole, the opening 38 being the small portion thereof and there being a large portion to one side of the center of said plate. The purpose of this is to enable the head of the stem 36 to be inserted, in assembling the apparatus, first through the large end of the opening 38 and then moved over into the small portion of said opening to a point at the center of the plate 40. This permits the easy assembling of the parts and yet prevents the escape of the stem 36, as its only movement is longitudinal. The plate 40 is held down against a block of lignum-vitæ 41, that is supported between said plate 40 and the cap 42, that fits loosely over the hub 19 of the wheel, as shown in Fig. 1. Said cap has some radially-extending lugs 43, that are engaged by governor-weights 44, pivoted at 45 to spokes 18 of the wheel, within suitable recesses 46 in said spokes for the movement and operation of said weights. There are preferably four of these equidistant about the cap 42, and they are pivoted between the end which engages and presses against the lugs 43 and the weighted end of said weights, so that the rotation of the wheel will tend to throw the weighted ends outward radially and cause the hooked ends of the weight to force the cap 42 in a direction longitudinal of the main shaft from the position shown in Fig. 1 to the position shown in Fig. 6, and said longitudinal movement of the cap 42 causes the slide-valve 35 to close or partially close the steam-ports 32.

By the means above described the amount of steam under an engine is controlled by the speed of the wheel. However, the springs 48 coöperate with the other parts of the governor apparatus to effectually govern the admission of steam by acting against the weights. They are flat springs, four of them equidistant around the circular casing, with their outer ends resting against the lugs 49 and their inner ends resting in recesses 50 in the plate 40, and they are pressed inward by the set-screws 51, whereby the action of said springs may be

externally adjusted. The outer ends of said springs extend into a recess or chamber 52, made in the member 10 of the casing, as appears in the upper part of Fig. 1 and Fig. 2. In this way the action of the weights 44 can be retarded, more or less, according to the needs of the particular engine. It is noted that the plate 40 does not rotate, while the cap 42 does rotate. It is caused to rotate by having lugs 53, which extend into the recesses or slots 46 in the spokes of the wheel. It is to be noted also that the adjustment of the springs is external and is effected by the set-screws 51, through the stationary casing, so that the governor apparatus can be adjusted while the machine is running.

The member 11 of the casing has on its right-hand side a rearwardly-extending flange 60, which extends down on each side, and to which the casing 61, connecting the engine with the thing to be driven, is secured by bolts 62, through the upwardly-extending ears or flanges 63 from said casing 61. Extending inward from the side walls of the casing 61 are the bearings 64 at each end for the shaft 20, the said bearings being cut away on the upper side for the oil-rings 65 as oil 66 is placed in the chamber formed by the casing 61 for the lubrication of the bearings of said shaft. The exact longitudinal position of said shaft is regulated and maintained by a pair of split nuts 67, placed on the threaded portion of said shaft 20, between said two bearings 64. Said split nuts are clamped on the shaft by bolts 68. The object of this is to cause the bearings 64 to take the end thrusts of the shaft rather than the member 11 of the casing of the engine. Said shaft extends centrally through said member 11 of the casing and carries on its inner end the hub of the wheel; but at that point the bearing is loose and free despite the end thrusts of the shaft 20 by reason of the split nuts, combined with the bearings 64, taking up such end thrusts. 70 is a circular flange cast with the casing 61 at the right-hand end that has holes in it, whereby the dynamo or other thing to be driven may be secured to the engine. 71 is a portion of a brass ring which separates the flange 70 from the dynamo, when the dynamo is used, to avoid any magnetic connection between the dynamo and engine. This appears here, inasmuch as this engine has been adapted for use in connection with a dynamo. 72 are oil-cups and 73 outlets from said cups.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In a rotary engine, a steam-driven wheel, a governor apparatus actuated by and rotative with said wheel for controlling the supply of steam thereto, a stationary spring resisting the action of the governor, and means for regulating the tension of the spring.

2. In a rotary engine, a stationary casing, a steam-driven wheel mounted therein, a gov-



ernor apparatus within the casing and actuated by said wheel for controlling the supply of steam thereto, a stationary spring resisting the action of the governor and means operative outside of said casing for regulating the tension of the spring.

3. In a rotary engine, a stationary casing, a steam-driven wheel mounted therein having a hub, means fitting loosely on said hub and longitudinally movable for controlling the supply of steam to said wheel, governor-weights pivotally connected with said wheel which under the influence of centrifugal force actuate said steam-controlling means, springs mounted in the stationary casing that act against said steam-controlling means and said governor-weights, and means externally operated for adjusting the tension of said springs.

4. In a rotary engine, a stationary casing, a steam-driven wheel mounted therein having a hub, a cap fitting loosely on said hub that rotates therewith and is movable away from the hub, governor-weights pivotally connected with said wheel which under the influence of centrifugal force move said cap in a direction away from the wheel, means actuated by the movement of said cap for controlling the supply of steam to the wheel, a stationary plate bearing against said cap, flat springs with their outer ends mounted in said casing and with their inner ends bearing against said plate, and set-screws extending through the casing against said springs for regulating their tension.

5. In a rotary engine, a stationary casing, a steam-driven wheel mounted therein, a steam-chest centrally located on one side of said casing through which the steam enters said casing, a slide-valve for regulating the passage of steam through said steam-chest, means mounted on the hub of the wheel longitudinally movable for controlling the movement of said slide-valve, and governor-weights pivoted to said wheel for actuating said longitudinally-movable means.

6. In a rotary engine, a stationary casing, a steam-chest centrally located on one side thereof through which the steam enters said casing, a steam-driven wheel mounted in said casing having a hub, means fitting loosely on said hub and longitudinally movable, a slide-valve actuated by said means for controlling the steam-ports in said steam-chest, governor-weights pivotally connected with said wheel which under the influence of centrifugal force

actuate said steam-controlling means, springs mounted in the stationary casing that act against said steam-controlling means and said governor-weights, and means externally operated for adjusting the tension of said springs.

7. In a rotary engine, a stationary casing, a steam-driven wheel mounted therein, a steam-chest mounted in said casing to receive the steam as it enters, said steam-chest being formed of two members, one screwed within the other and provided with corresponding ports and a chamber between them, a slide-valve mounted in said chamber in said steam-chest for closing said ports, and means controlled by said wheel for moving said slide-valve.

8. In a rotary engine, a steam-driven wheel, a valve for regulating the supply of steam thereto, a longitudinally-movable cap mounted on the hub of said wheel for actuating said slide-valve, said cap having lugs extending into recesses in the wheel to cause the cap to rotate with the wheel, radially-extending lugs on said cap, governor-weights pivoted on said wheel in suitable recesses to permit their movement, one end of said governor-weights acting against the lugs on said cap and the other end weighted so as to be influenced by the centrifugal force of the wheel.

9. In a rotary engine, a casing formed of two members or halves secured together, a wheel mounted therein, a steam passage-way leading to the joint between said members of the casing, and a nozzle secured in the outlet end of said steam passage-way that leads tangentially to the periphery of said wheel.

10. In a rotary engine, a casing formed of two members or halves secured together, a wheel mounted therein, a chamber or recess in one of said members adjacent the periphery of said wheel, a steam passage-way leading from the central portion of the other member of said casing to said chamber or recess, and a nozzle secured in the outlet end of said passage-way and extending through said recess tangentially to a point near the periphery of said wheel.

In witness whereof we have hereunto affixed our signatures in the presence of the witnesses herein named.

MARION A. STOGSDILL.  
EDWARD J. SCHATZ.

Witnesses:

CHAS. C. CROFT,  
ROBERT E. MONGER.