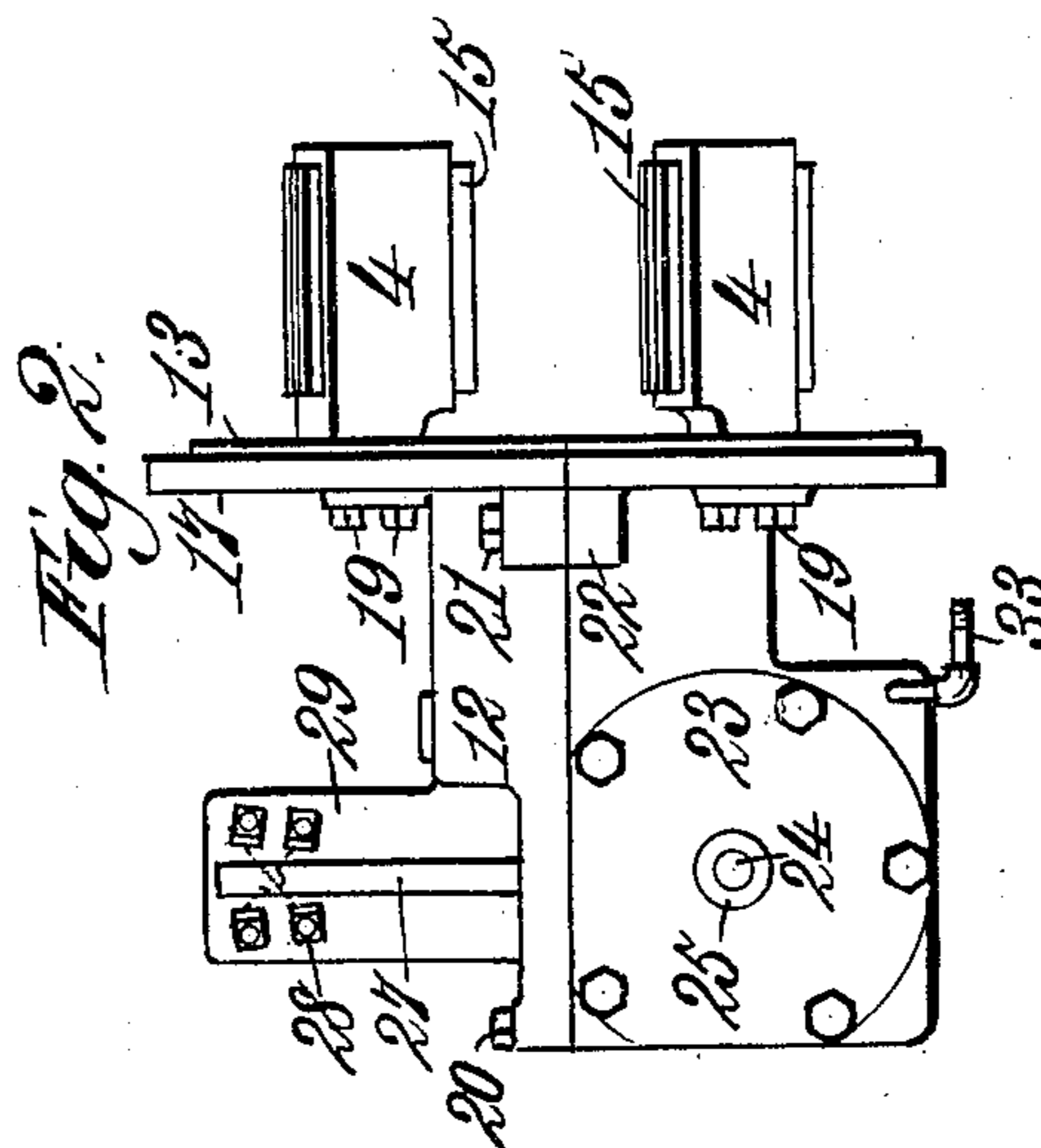
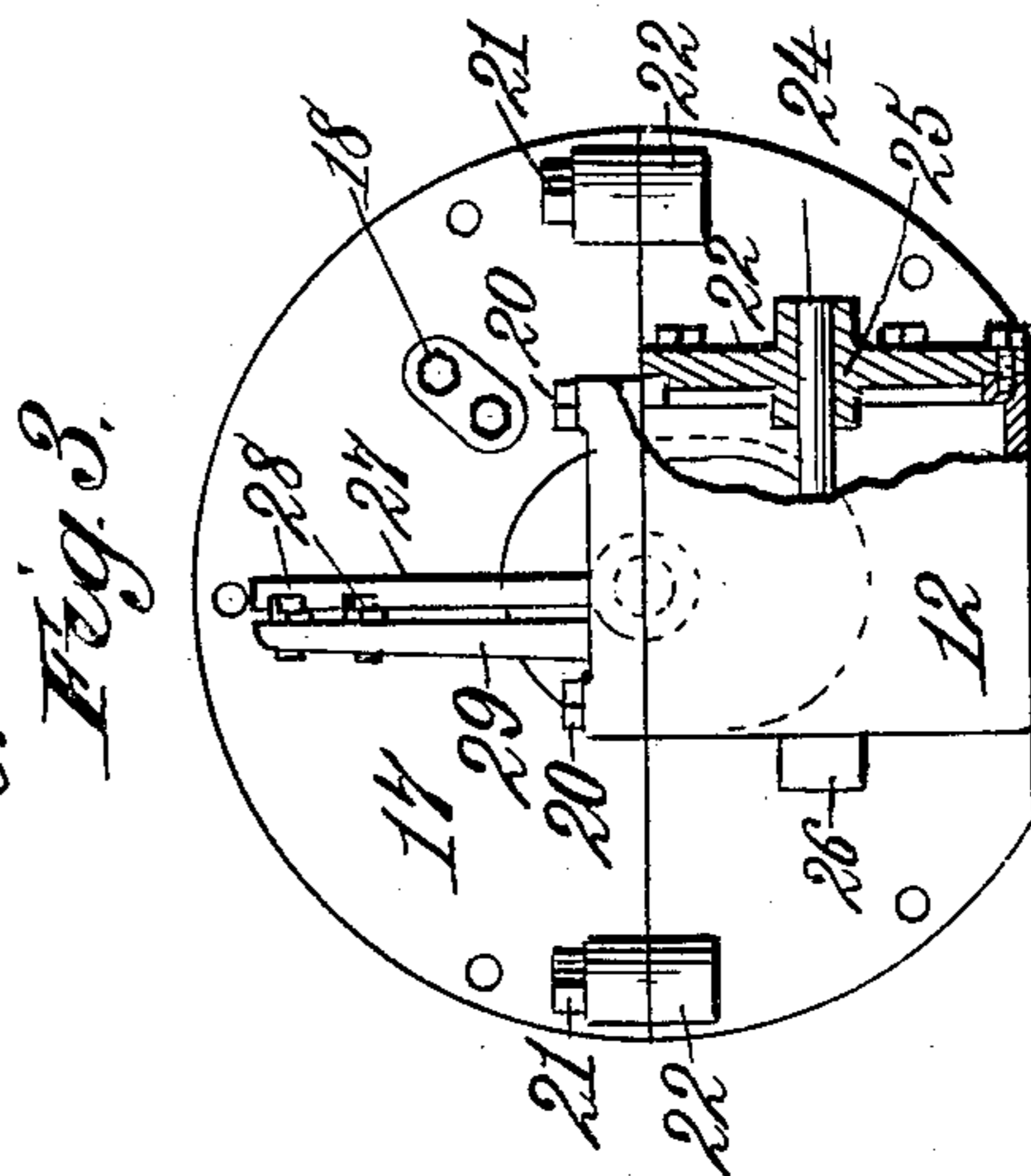
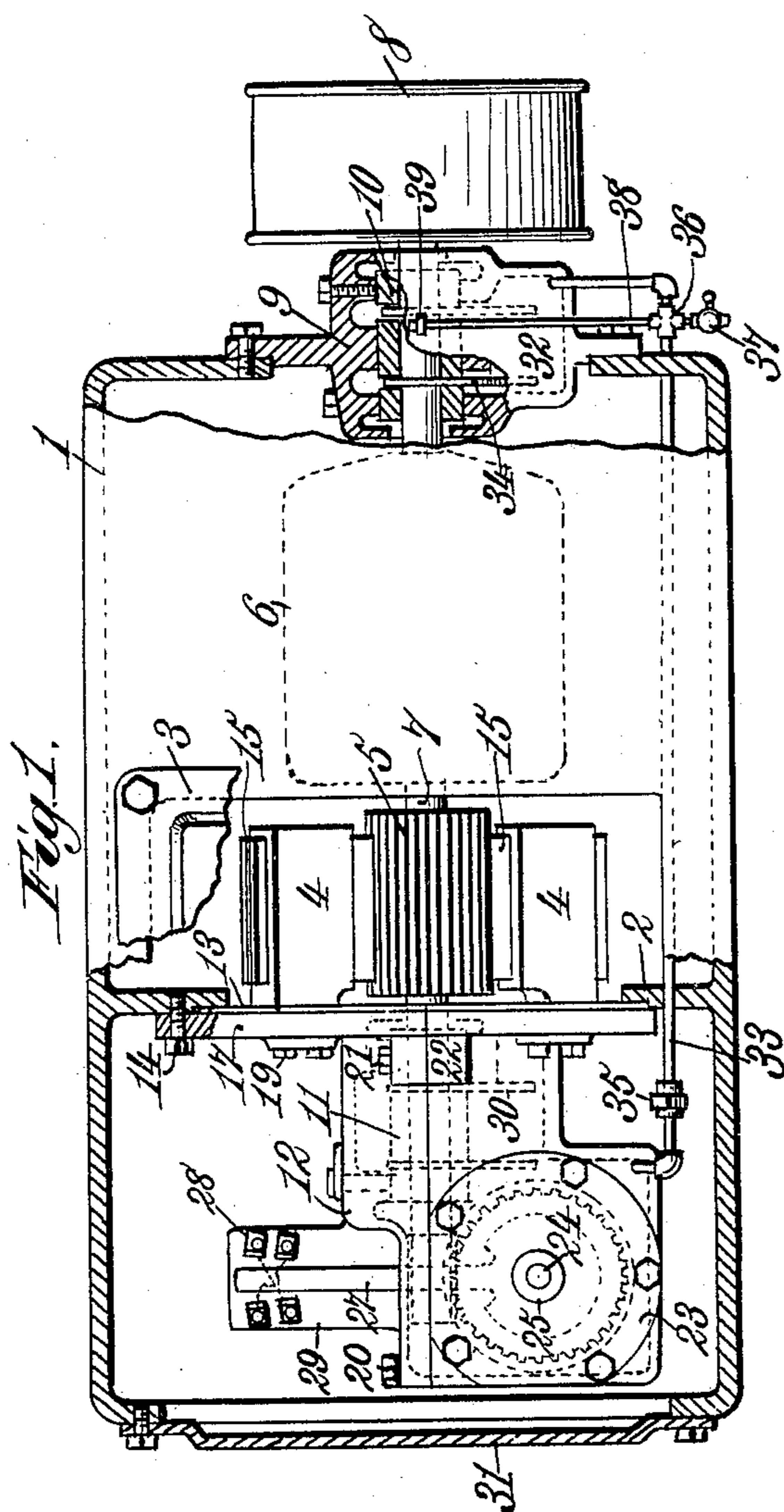


No. 759,122.

PATENTED MAY 3, 1904.

R. M. NEWBOLD.  
ELECTRIC DYNAMO.  
APPLICATION FILED NOV. 3, 1903.

NO MODEL.



Witnesses:  
Robert Everett,  
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By Robert D. Johnson Jr.  
Att'y.

# UNITED STATES PATENT OFFICE.

ROGER M. NEWBOLD, OF BIRMINGHAM, ALABAMA.

## ELECTRIC DYNAMO.

SPECIFICATION forming part of Letters Patent No. 759,122, dated May 3, 1904.

Application filed November 3, 1903. Serial No. 179,673. (No model.)

*To all whom it may concern:*

Be it known that I, ROGER M. NEWBOLD, a citizen of the United States, residing at No. 710 North Twenty-first street, Birmingham, in the county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Electric Dynamos, of which the following is a specification.

My invention relates to improvements in the construction of dynamo-casings designed for use in connection with electric lighting, heating, and ventilating systems on railway-cars and in the arrangement of operating parts therein.

When dynamos are suspended beneath the bottom of the car or secured to the truck, they are exposed to the most severe usage, necessitating constant inspection and repair, and this while the car is in active service. These repairs must often be made by those not particularly skilled in the art, and the expense and difficulty of the work is further increased by the inaccessibility of the machine and its parts.

It is the object of my invention to provide a casing especially adapted for axle-driven railway-car systems which will give ready access to the parts requiring the most frequent repairs and permit the armature to be removed without disturbing the other parts, while the pole-changer, which is disposed within the casing, and the commutator end bearings may also be taken out, repaired, and returned in the simplest and most expeditious manner.

It is a further object of my invention to avoid the use of a number of separate oil-receptacles by providing a large reservoir within the casing, from which all bearings are supplied and within which the pole-changer is located and operates.

My invention consists in these and other improvements, which will be hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the dynamo-casing broken away to show the pulley end bearing and the internal mechanism to which access is had through the side door. Fig. 2 is a detail view in elevation of the oil-reser-

voir and brush-holders. Fig. 3 is an end view of Fig. 2, partly broken away.

The same reference-numerals refer to the same parts throughout the drawings.

The dynamo-casing comprises a hollow cast body 1, having a transverse partition 2 dividing its interior into compartments. A door 3 at one side of the casing gives access to both of these compartments and also to the brush-holders 4, which engage the commutator 5 of the armature 6, which is mounted on a shaft 7. This shaft has a pulley 8, driven from an axle of the car, keyed to one end thereof, which passes out of the casting through an opening in the end in which a suitable reservoir bearing-cap 9 is bolted. The bearing 10 in this cap supports the outer or pulley end of shaft 7, while the inner end passes through an opening in the partition 2 and is supported in a bearing 11, mounted within an oil-reservoir chamber 12. This reservoir is provided at its end near the commutator with an enlarged substantially circular flange 17, which has a circumferential cut-away or rabbeted inner face, leaving a shoulder 13. This shoulder engages within a similarly-recessed portion of the partition to prevent any tendency toward sidewise movement when securely fastened to said partition by tap-screws 14.

The brushes 15 are disposed at an angle of ninety degrees to each other in front of the side opening, so that both can be readily inspected and repaired and, if desired, removed through said side door 3.

The brush-holders 4 have each two screw-threaded shanks passing through suitable openings 18 in the circular flanged wall 17 of the reservoir 12, and nuts 19, engaging said shanks, secure the holders to said reservoir-wall. This wall 17 is also provided with a central opening, through which shaft 7 passes into the reservoir and is supported in bearings 11, depending from the top wall of the reservoir. I preferably divide the reservoir 12 and wall 17 along a horizontal plane to form them in two sections, and I secure the sections together by bolts 20, passing down through the top section and engaging the outer end of the reservoir, and by bolts 21,

which engage lugs 22, oppositely disposed on each part of the wall 17. By thus forming the reservoir so that its top can be lifted off the whole of bearing 11 may be lifted out and  
5 repaired when necessary; but generally this may be done by removing a door 23 in the side of the enlarged body portion of the reservoir.

Within the reservoir 12 I place a pole-changing mechanism, preferably such as is described  
10 in my pending application, Serial No. 170,062, filed August 19, 1903, which comprises a rotating gear-wheel driven from a worm on the end of shaft 7 and mounted on a transverse shaft 24, having bearings 25 and 26, provided  
15 at one side of the reservoir and in the door 23. A switch-arm 27 is shifted over contacts 28 to reverse the polarity of the dynamo-mains leading from said contacts whenever the direction of rotation of the gear-wheel changes. The  
20 contacts 28 are mounted on a vertically-disposed plate 29, mounted on the top of reservoir 12. It will be noted that from its position in the reservoir the pole-changing mechanism will be submerged in oil when the res-  
25 ervoir is supplied and lubricant will be carried to bearing 11 by oiler-rings 30. A dust-cap 31 closes an enlarged end opening in the dynamo-casing, through which the reservoir parts complete, as shown in Fig. 2, may be  
30 passed out and repaired.

The reservoir 32 in the bearing-cap 9 is connected with the main reservoir 12 by a pipe 33, which leads from the bottom of the latter reservoir through partition 2 and passing  
35 through an opening in the casing end turns upwardly and enters the reservoir 32, where oiler-rings 34 supply the oil to bearing 10. The pipe 33 has a double coupling 35 within the casing, so that the reservoir 12 or end  
40 bearing 9 may be independently removed, and outside of the casing said pipe enters a four-way coupling 36. From one branch of this coupling a section of pipe 33 leads upwardly to reservoir 32. A clean-out plug or cock 37  
45 is connected to the downwardly-disposed branch of said coupling and is used to drain the reservoirs and oil-pipes. A supply and test tube 38 extends upwardly from the upper branch of said coupling above the oil-  
50 level in the reservoirs and is provided with a removable cap 39, covering its upper end. Through this tube the reservoir will be filled with oil, and at the same time it will indicate by the position at which the oil stands  
55 in it the amount in the reservoirs. It will thus be evident that every bearing in the dynamo, as well as the pole-changer, is supplied with lubricant from the same common source, which dispenses with the separate oil-  
60 ing of these parts and reduces the danger of injury to the machine from any one of the points having been overlooked. It also makes inspection easy, for it is only necessary to try the test-tube to know that everything is oiled  
65 and also the quantity of oil upon which each

bearing may draw. To prevent the accumulation of sediment in the reservoirs, they should be drained at intervals through cock 37.

The door 3 and the end closures 9 and 31 are provided with dust-proof linings around  
70 their edges to prevent sand, cinders, &c., gaining admission to the casing. By having these several openings I am enabled to make all slight repairs without removing the dynamo-casing from the truck or having to remove  
75 more of the internal mechanism than the part affected.

If desired, the casing may be shortened and the oil-reservoir secured to the end thereof, so that its circular flanged plate will form a sub-  
80 stitute for the end cap 31.

The advantages of the universal oiling system will be obvious, and the details of construction, whereby the several bearing parts are connected, may be varied at will without  
85 departing from the spirit of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a dynamo-electric machine, a casing, 90 an oil-reservoir detachably secured thereto and brush-holders secured to said reservoir and removable therewith.

2. In a dynamo-electric machine, a casing, an oil-reservoir, and a pole-changing mechan- 95 ism mounted within said reservoir.

3. A dynamo-machine comprising an oil-reservoir, an armature-shaft, a pole-changing mechanism within said reservoir and actuated by said shaft, said reservoir having a remov- 100 able section.

4. In a dynamo-machine, an oil-reservoir, an armature-shaft entering said reservoir, a pole-changing mechanism within said reser- 105 voir and actuated by said shaft and a suitable opening giving access to said pole-changing mechanism.

5. A dynamo-machine comprising a casing, an armature-shaft and bearings therefor, an oil-reservoir supplying lubricant to one of 110 said bearings and a separate reservoir for the other bearing communicating with the first-mentioned reservoir by a pipe and a coupling in said pipe.

6. In a dynamo-machine, a casing, an arma- 115 ture-shaft and bearings therefor, in combination with an oil-reservoir communicating with the several bearings of said machine.

7. A dynamo-machine, comprising an armature-shaft, end bearings therefor which are 120 independently removable from a machine-casing, and oil-reservoirs for said bearings communicating with each other.

8. A dynamo-machine, comprising a casing, an armature, commutator, and brush-holders 125 all suitably mounted therein, in combination with an oil-reservoir and a pole-changer mounted therein and adapted to change the circuits upon the reversal of direction of ro-  
130 tation of said armature.

9. In a dynamo-machine, an armature-shaft, bearings therefor, a pole-changing mechanism, and an oil-reservoir communicating with the several shaft-bearings and with said pole-changer.

10. A dynamo-machine, comprising an armature, commutator, an armature-shaft, and end bearings therefor, a main oil-reservoir supplying lubricant to one bearing, an auxiliary reservoir for the other bearing communicating with said main reservoir by a pipe, and a waste-cock in said pipe to drain said reservoirs.

11. A dynamo-machine, comprising an armature, commutator, an armature-shaft, and end bearings therefor, which are independently removable from a suitable machine-casing, in combination with oil-reservoirs for said bearings connected together by a pipe, and a coupling in said pipe.

12. In a dynamo-casing having end openings and a side door, a cap bolted over one end opening, a reservoir-bearing box bolted over the other, and a reservoir detachably secured within said casing and removable through an end opening.

13. In a dynamo-machine, a casing, an oil-reservoir detachably secured thereto, a pole-changing mechanism mounted in said reservoir, and an armature-shaft, to changes in the direction of rotation of which, said pole-changing mechanism responds.

14. In a dynamo-electric machine, the combination of an armature, commutator and shaft therefor, an oil-reservoir, a pole-changer, a casing in which said parts are mounted and which has an opening giving access to the brushes for said commutator and to said pole-changer, bearings for said shaft detachably mounted in said casing, and means to lubricate said bearings and a pole-changer from said reservoir.

15. In a dynamo-machine having a side and an end door, a support for brush-holders mounted within said machine and independent of said end door, brush-holders secured to said support and disposed opposite said side door, and removable through said door in an end of said casing.

16. In a dynamo-machine, a casing having removable end sections and a side door, one of said end sections comprising an armature-shaft bearing, a support for brush-holders mounted within said casing, brush-holders secured to said support and disposed on the same side of the machine opposite said side door, said brush-support being removable through an end of said casing when the other end section is removed.

17. In a dynamo-machine, a casing having a bearing at one end for an armature-shaft, a pulley on said shaft, an inner bearing for said shaft serving as a support for brush-holders, mounted within said casing and intermediate the ends thereof, and an opening through

which said inner bearing and brush-holders are removable.

18. In a dynamo, a casing having an opening at one end through which an armature-shaft enters, a pulley on said shaft, bearings for said shaft, the inner of which is mounted in a removable support detachably secured to a projection intermediate the ends of said casing, an end opening through which said inner bearing may be removed, and a side opening giving access to said bearing while in position.

19. In a dynamo-machine, a casing, an armature-shaft, bearings therefor, one of which is mounted within said casing and comprises two sections suitably secured together and provided with flanges which are connected to said casing, brush-holders secured to said flanges and removable therewith through a suitable door in said casing.

20. In a dynamo-machine, a casing, a combination oil-reservoir, armature-shaft bearing, brush-support and pole-changer casing, mounted within said casing, and a door giving access for inspection and repairs to said parts.

21. In a dynamo-machine, an oil-reservoir, a pole-changer mechanism mounted therein which responds to changes in the direction of rotation of an armature-shaft, a contact-arm extending through an opening in said reservoir and contacts engaged by said arm.

22. In a dynamo-machine, a casing divided into two compartments by a partition having a removable portion, an armature and commutator and a bearing for an armature-shaft disposed on one side of said partition, an oil-reservoir and bearing disposed on the other side of said partition and connected to its removable portion, and brush-holders connected to said removable portion, brushes in said holders engaging said commutator, and a door in said casing giving access to the parts connected to said partition.

23. In a dynamo, a casing, means to subdivide the interior of said casing into two compartments within one of which an armature, commutator, and brush-holders are disposed, a pole-changer, oil-reservoir and bearing for an armature-shaft disposed in the other compartment, a side door giving access to said commutator, brush-holders, and to the parts within said latter compartment, and means to remove said parts from the casing.

24. In a dynamo, an integral casing having end openings and a side door, caps closing said end openings, an armature-shaft leading through an end opening, a pulley keyed to said shaft, a commutator and brush-support within said casing and independent of said caps, brush-holders carried by said support and disposed to be accessible for inspection and repair through said door, said brush support and holders being removable through an end opening in said casing.

25. In a dynamo, a casing formed in one

piece and provided with a side and end openings, covers or closures for said openings, a removable partition dividing the interior of the casing into two compartments, an armature-shaft, a commutator, a bearing for said shaft and brushes, said bearing and brushes being supported by said partition and removable therewith from said casing.

26. In a dynamo-machine, a casing, a storage-reservoir for oil detachably secured thereto, a door in said casing, an armature-shaft, a bearing for said shaft within said reservoir which is lubricated by its contents and removable therewith, and a door in said reser-

voir disposed opposite to the door in said casing. 15

27. In a dynamo-machine, a casing, a door therefor, a main oil-reservoir having a flange projection by which it is secured within said casing, and brush-holders secured to said flange projection and removable therewith through the door in said casing. 20

In testimony whereof I affix my signature in presence of two witnesses.

ROGER M. NEWBOLD.

Witnesses:

R. D. JOHNSTON,  
WILLIAM E. FORT.