

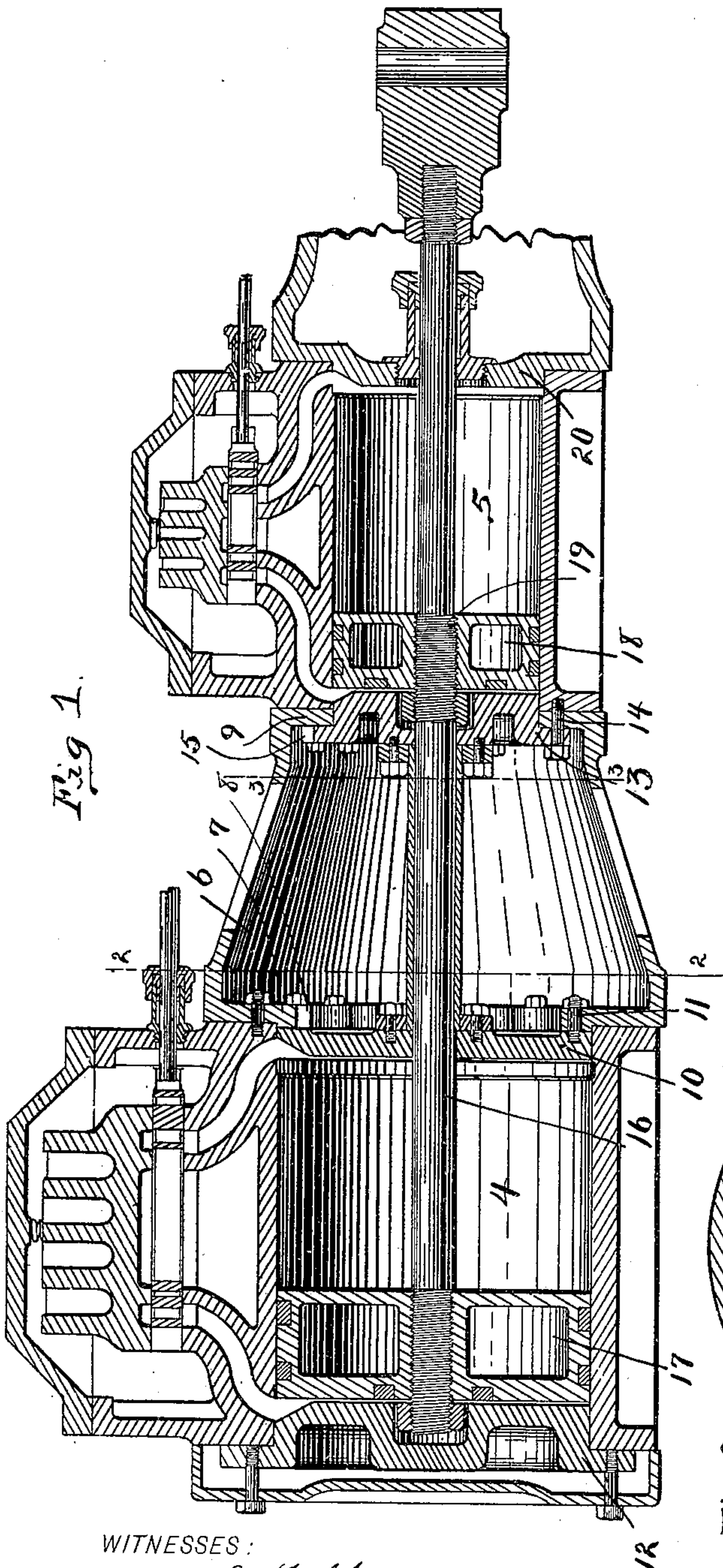
No. 621,958.

Patented Mar. 28, 1899.

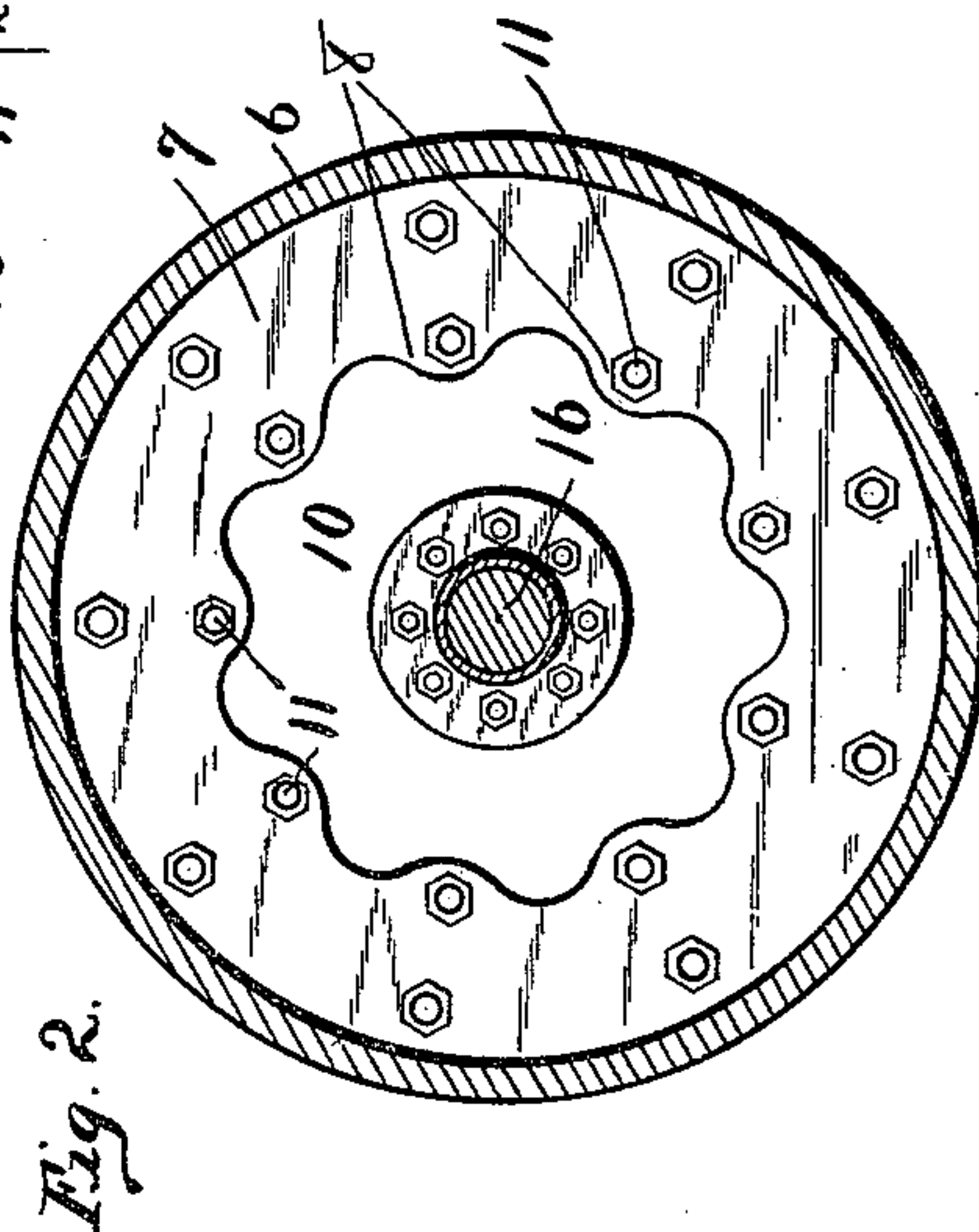
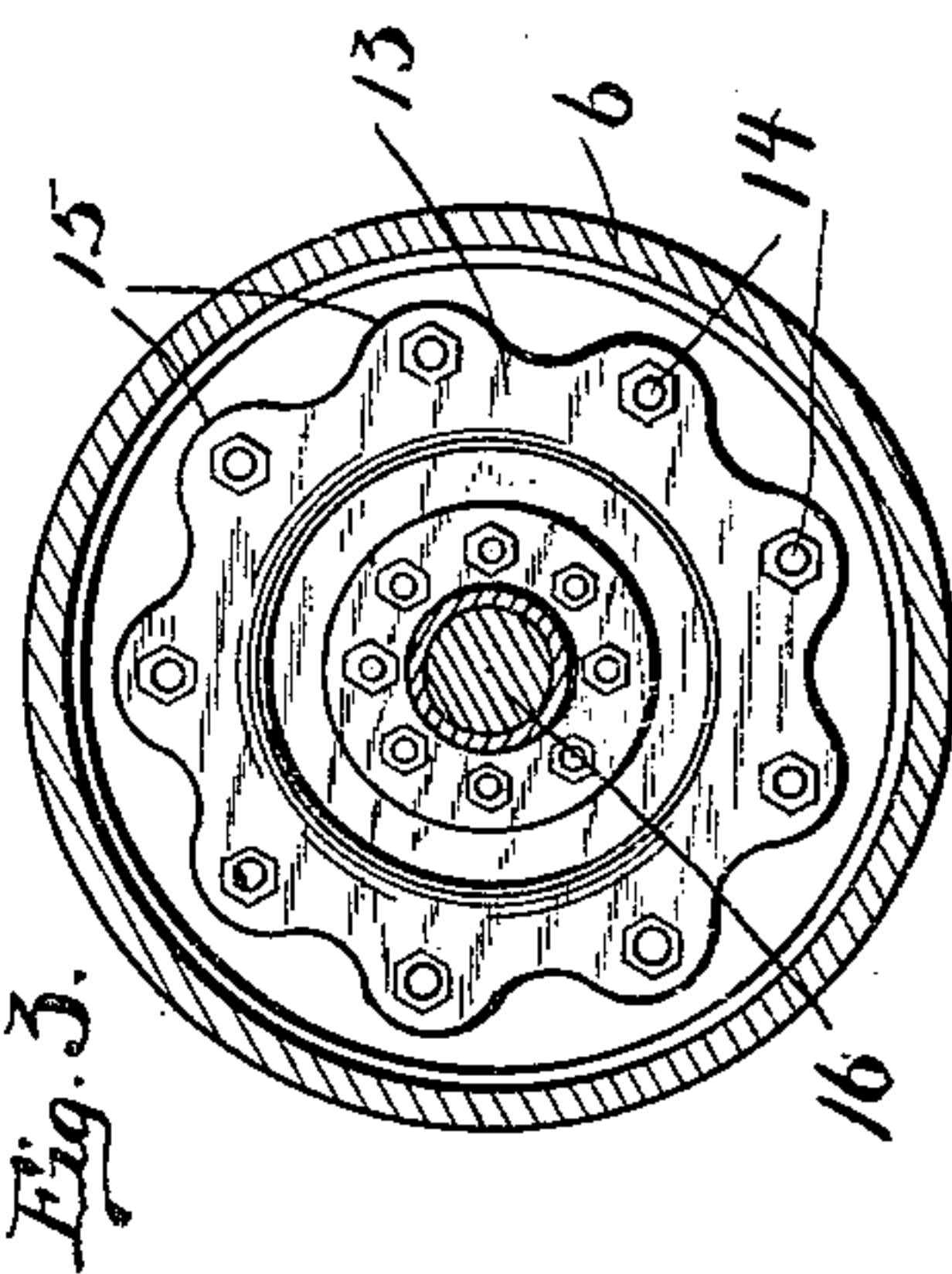
T. E. CHANDLER.
COMPOUND ENGINE.

(Application filed Aug. 5, 1898.)

(No Model.)



WITNESSES:
Frank A. Fable
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UNITED STATES PATENT OFFICE.

THOMAS E. CHANDLER, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE
CHANDLER & TAYLOR COMPANY, OF SAME PLACE.

COMPOUND ENGINE.

SPECIFICATION forming part of Letters Patent No. 621,958, dated March 28, 1899.

Application filed August 5, 1898. Serial No. 687,784. (No model.)

To all whom it may concern:

Be it known that I, THOMAS E. CHANDLER, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Compound Engine, of which the following is a specification.

My invention relates to an improvement in compound engines or other similar constructions in which there are tandem cylinders.

The object of my invention is to so arrange the several parts of tandem cylinders that the pistons may be readily secured to the single piston-rod and in which the said piston-rod and pistons may be removed as a whole from the cylinders.

The accompanying drawings illustrate my invention.

Figure 1 is a central section of a compound engine embodying my invention. Fig. 2 is a section on line 2 2 of Fig. 1. Fig. 3 is a section on line 3 3 of Fig. 1.

In the drawings, 4 indicates one cylinder and 5 another, the said cylinders being placed tandem and the cylinder 4 of larger diameter than the cylinder 5. Mounted between the adjacent ends of the two cylinders is a distance-piece 6, which is provided at one end next the cylinder 4 with an internal annular flange 7, the inner end of which projects over the end of said cylinder. The inner end of the flange 7 is serrated, so as to form a series of projecting fingers 8. The opposite end of the distance-piece is provided with an annular flange 9, to which the cylinder 5 may be secured. This flange, however, does not project over the cylinder 6. Mounted within the cylinder 4 is a head 10, which is of substantially the same diameter as the said cylinder and is secured to the inner face of the projecting portion of the flange 7 by means of suitable bolts 14. The opposite end of the cylinder 4 is closed by means of the usual head 12, removably secured to the end of the cylinder by any suitable means.

Secured to the flange 9 of the distance-piece or to the end of the cylinder 5 is a head 13, which closes the end of said cylinder and which is detachably secured in position by suitable means, such as the bolts 14. Head 13 is of substantially the same diameter (a trifle

less) as the largest diameter of the opening through flange 7, and the periphery of said head is serrated, so as to form a series of fingers 15, the arrangement being such that the fingers of the head 13 may be passed through between the fingers of the flange 7. Passing through the heads 10 and 13 in the usual manner is a piston-rod 16, and upon this rod within the cylinder 4 is mounted a piston 17 and within the cylinder 5 a piston 18. Rod 16 is preferably formed in one piece, and in order that the piston 18 may be conveniently secured thereto is provided with a shoulder 19, to which said piston is secured. The other end of the cylinder 5 is closed by the usual head 20, through which the piston-rod is also passed.

It will be readily understood that, if desired, the flange 7 may be integral with the cylinder 4, its only function being to form a support to which the head 10 may be secured. If desired, also, the distance-piece 6 may be dispensed with. In this case the cylinder 5 would be secured adjacent the flange 7, and the head 10 would then serve as a separating-diaphragm between the two cylinders and the head 13 be dispensed with.

In building this engine the pistons are secured to the piston-rod, and then the rod and pistons are turned upon the rod-centers and are not afterward disturbed.

In order to remove the piston-rod and pistons, head 12 of the cylinder 4 is removed, the nuts upon bolts 11 are removed, thus freeing the head 10, the nuts on bolts 14 are removed, thus freeing the head 13, and the piston-rod is disconnected from the cross-head. The piston-rod, together with the pistons secured thereto and the heads 13 and 10 mounted thereon, may then be drawn from the cylinders, the head 13 passing freely through the serrated opening in the flange 7.

By serrating the flange 7 and the head 13 plenty of bolt-space may be provided without necessarily altering the relative diameters of the two cylinders.

By the means above described it is possible to remove the piston-rod and pistons as a whole without disturbing their alinement and without disturbing the heavy parts of the machine.

I claim as my invention—

1. The combination with a pair of tandem cylinders, one of said cylinders being of larger diameter than the other, of an annular shoulder formed at the end of the larger cylinder adjacent the smaller cylinder, a piston-rod, a pair of pistons mounted thereon, one in each cylinder, a head, through which the piston-rod passes, mounted within the larger cylinder and adapted to be secured to said shoulder, and a second head adapted to be secured to that end of the smaller cylinder adjacent the larger cylinder, the said second head being adapted to pass through the opening formed by said annular shoulder.

2. The combination with a pair of tandem cylinders, one of said cylinders being of larger diameter than the other, of an annular shoulder or flange formed at the end of the larger cylinder adjacent the smaller cylinder and serrated on its inner periphery, a piston-rod, a pair of pistons mounted thereon, one in each cylinder, a head, through which the piston-rod passes, mounted within the larger cylinder and adapted to be secured to said flange or shoulder, and a second head, through which the piston-rod passes, adapted to be secured to that end of the smaller cylinder adjacent the larger cylinder, the said second head being serrated on its periphery so that it may be passed through the opening formed by the serrated periphery of the said shoulder or flange, substantially as described.

3. The combination with a pair of tandem cylinders, one of said cylinders being of larger diameter than the other, a distance-piece

mounted between the two cylinders, an internal annular flange carried by one end of said distance-piece and projecting over the end of the larger cylinder, a piston-rod, a pair of pistons mounted thereon, one within each cylinder, a head mounted within the larger cylinder and adapted to be secured to the said annular flange, a second head adapted to be secured to that end of the smaller cylinder adjacent the larger cylinder, the said second head being adapted to be passed through the opening formed by the said annular flange, substantially as and for the purpose set forth.

4. The combination with a pair of tandem cylinders, one of said cylinders being of larger diameter than the other, a distance-piece mounted between the two cylinders, an internal flange carried by one end of said distance-piece and projecting over the end of the larger cylinder, the inner periphery of said flange being serrated, a piston-rod, a pair of pistons mounted thereon, one within each cylinder, a head mounted within the larger cylinder and adapted to be secured to the said annular flange, a second head adapted to be secured to that end of the smaller cylinder adjacent the larger cylinder, the said second head being serrated upon its periphery so that it may be passed through the opening formed by the serrated periphery of the said annular flange, substantially as and for the purpose set forth.

THOMAS E. CHANDLER.

Witnesses:

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