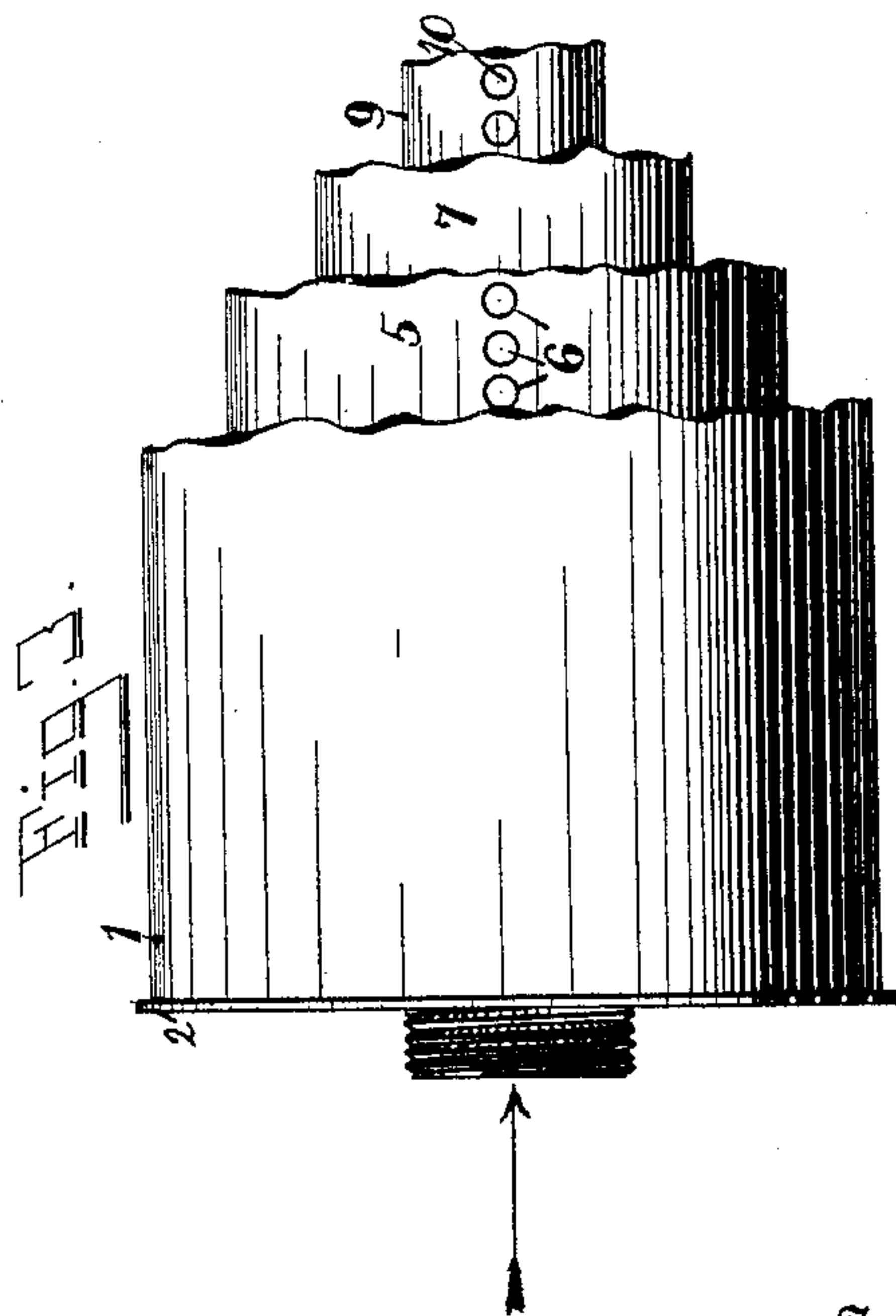
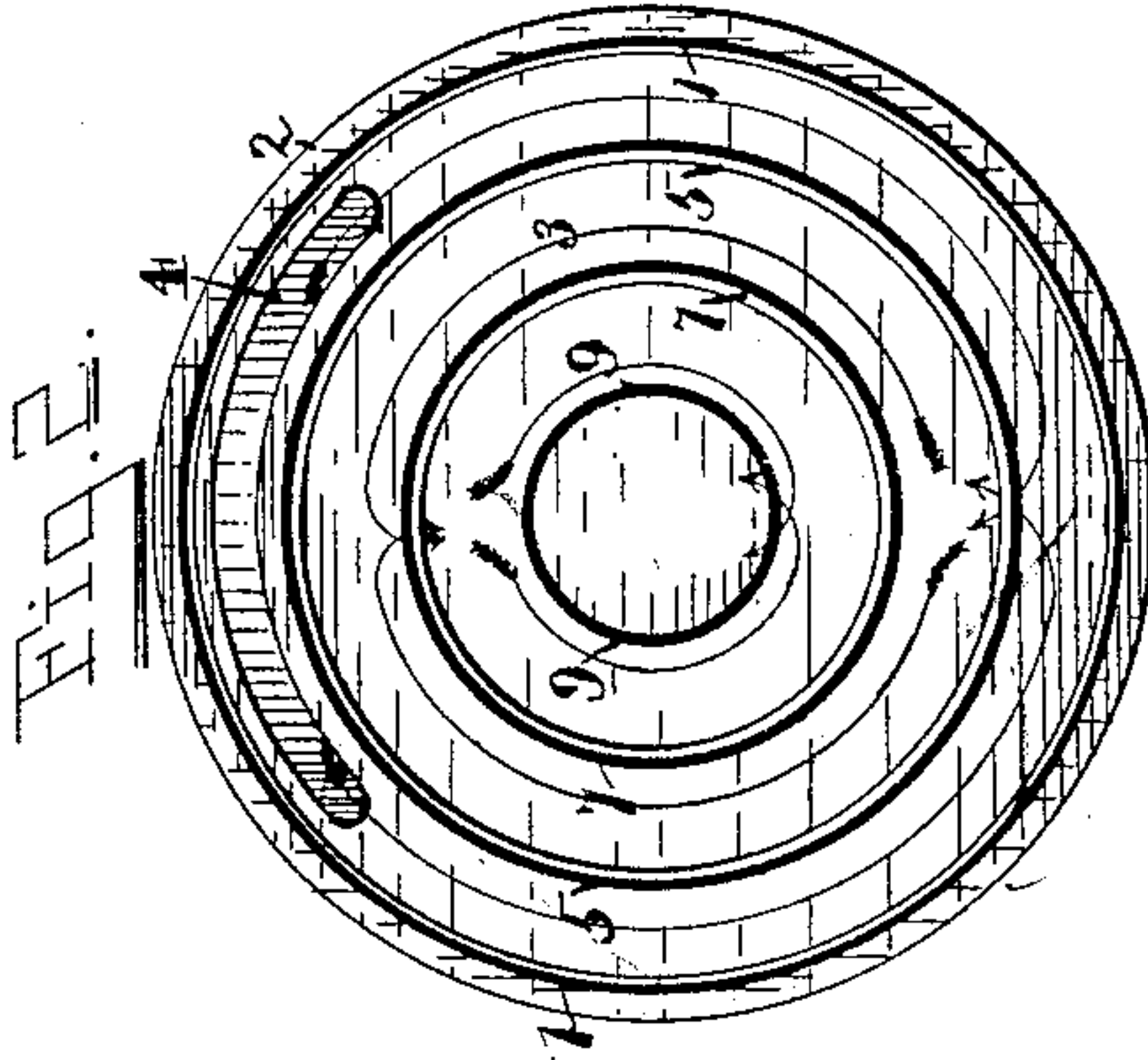
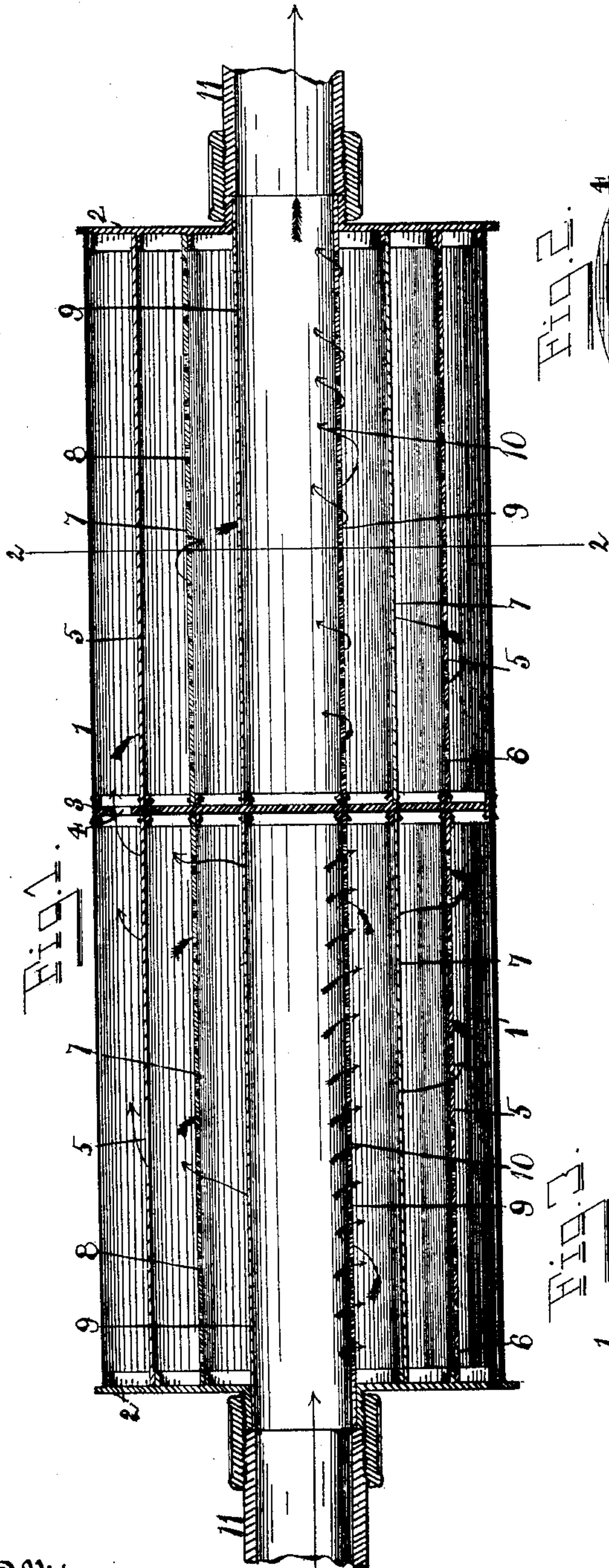


(No Model.)

M. O. & M. T. REEVES.
EXHAUST MUFFLER FOR ENGINES.

No. 582,485.

Patented May 11, 1897.



Witnesses
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John Jewell

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UNITED STATES PATENT OFFICE.

MILTON O. REEVES AND MARSHAL T. REEVES, OF COLUMBUS, INDIANA,
ASSIGNORS TO THE REEVES PULLEY COMPANY, OF SAME PLACE.

EXHAUST-MUFFLER FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 582,485, dated May 11, 1897.

Application filed January 11, 1897. Serial No. 618,757. (No model.)

To all whom it may concern:

Be it known that we, MILTON O. REEVES and MARSHAL T. REEVES, citizens of the United States of America, residing at Columbus, in the county of Bartholomew and State of Indiana, have invented certain new and useful Improvements in Exhaust-Mufflers for Engines, of which the following is a specification.

Our invention is especially adapted for use with high-tension explosion-engines to be used in propelling motorcycles. It has been found best in practice to use a high-tension explosion-engine on motorcycles, so as to attain a maximum power with a minimum weight of engine; but one of the objectionable features of this class of engine is the noise due to the sudden release of the exploded mixture after it has accomplished its work in driving the piston.

The object of our invention is to provide means for expanding the exhaust product gradually, and in so doing to break it up and cool it to such an extent that when it is finally exhausted into the atmosphere its pressure and temperature are practically normal.

Our invention consists in interposing between the engine-exhaust and final exhaust means for accomplishing these objects, and, further, in the combination and arrangements of parts hereinafter described and claimed.

In the drawings, Figure 1 is a central vertical section; Fig. 2, a section on line 2 2 of Fig. 1; Fig. 3, a side elevation, broken away.

The numeral 1 represents an outer shell, preferably cylindrical and supported between flanged ends 2. A central flanged partition 3, provided with a slot-opening 4, divides the shell into two cylindrical compartments.

Concentric with the shell 1, but of smaller diameter, are the shells 5, one in each compartment, extending between an end 2 and the central partition 3, each provided with a longitudinal row of perforations 6. Concentric with shells 5, but of smaller diameter, are two shells 7, one in each compartment and each provided with a row of longitudinal perforations 8 on the opposite side from perforations 6. Concentric with shells 7, but of smaller diameter, are two shells 9, one in each compartment and each provided with a row

of longitudinal perforations 10 on the opposite side from perforations 8.

Leading from each of the small chambers, formed by the smaller shells, is a pipe 11. A gas or liquid entering the small chamber at one end must, before being expelled at the other end, pass through 180° in each annular chamber between the shells. For illustration, suppose the pipe 11, at the left, is connected with the exhaust of an engine. The exhaust product first passes into the small chamber, then through perforations 10 into the annular chamber between shells 9 and 7, around within this chamber, through perforations 8, into the chamber between shells 7 and 5, thence to perforations 6, into the chamber between shells 5 and 1, thence through opening 4 in partition 3 into the chamber at the right-hand side. In this latter chamber the gas passes from the larger to the smaller chamber through a path similar to that described, only reversed, and is finally exhausted from the smaller chamber into the latter series. The gas is thus gradually expanded and exposed to a large cooling-surface, whereby it is reduced in pressure and temperature to a point nearly normal, thereby preventing the report incident to the engine-exhaust. We find that the efficiency of the device is materially increased by filling the annular chambers with a granular material, such as coke about the size of hickory-nuts, which breaks up and cools the gas more rapidly.

We have shown a preferred form of device, but it is obvious that the same results would be attained if the partitions were perforated circumferentially at alternate ends, so as to provide a long path, through which the gas must flow before being finally exhausted, and it is also obvious that other minor details may be changed without departing from the spirit of our invention.

We claim as our invention—

1. The combination in an exhaust-muffler of a series of concentric chambers formed of a series of concentric shells of different diameters, openings longitudinally disposed upon alternate sides of adjacent shells, an inlet for the smaller chamber, an outlet for the larger leading into a series of concentric chambers similar to the first series, and an outlet for

the latter series, substantially as and for the purpose set forth.

2. In an exhaust-muffler, the combination of a series of concentric chambers, formed
5 by a series of concentric shells of different diameters, perforations longitudinally disposed upon alternate sides of the adjacent shells, an inlet for the smaller chamber; an outlet for the larger chamber leading into a
10 series of concentric chambers, similar to the

first series provided with similar openings, and a final exhaust-opening from the smaller chamber of the last series, substantially as and for the purpose set forth.

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Witnesses:

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