

No. 724,819.

PATENTED APR. 7, 1903.

J. M. CROWLEY.
ROTARY MOTOR.

APPLICATION FILED SEPT. 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

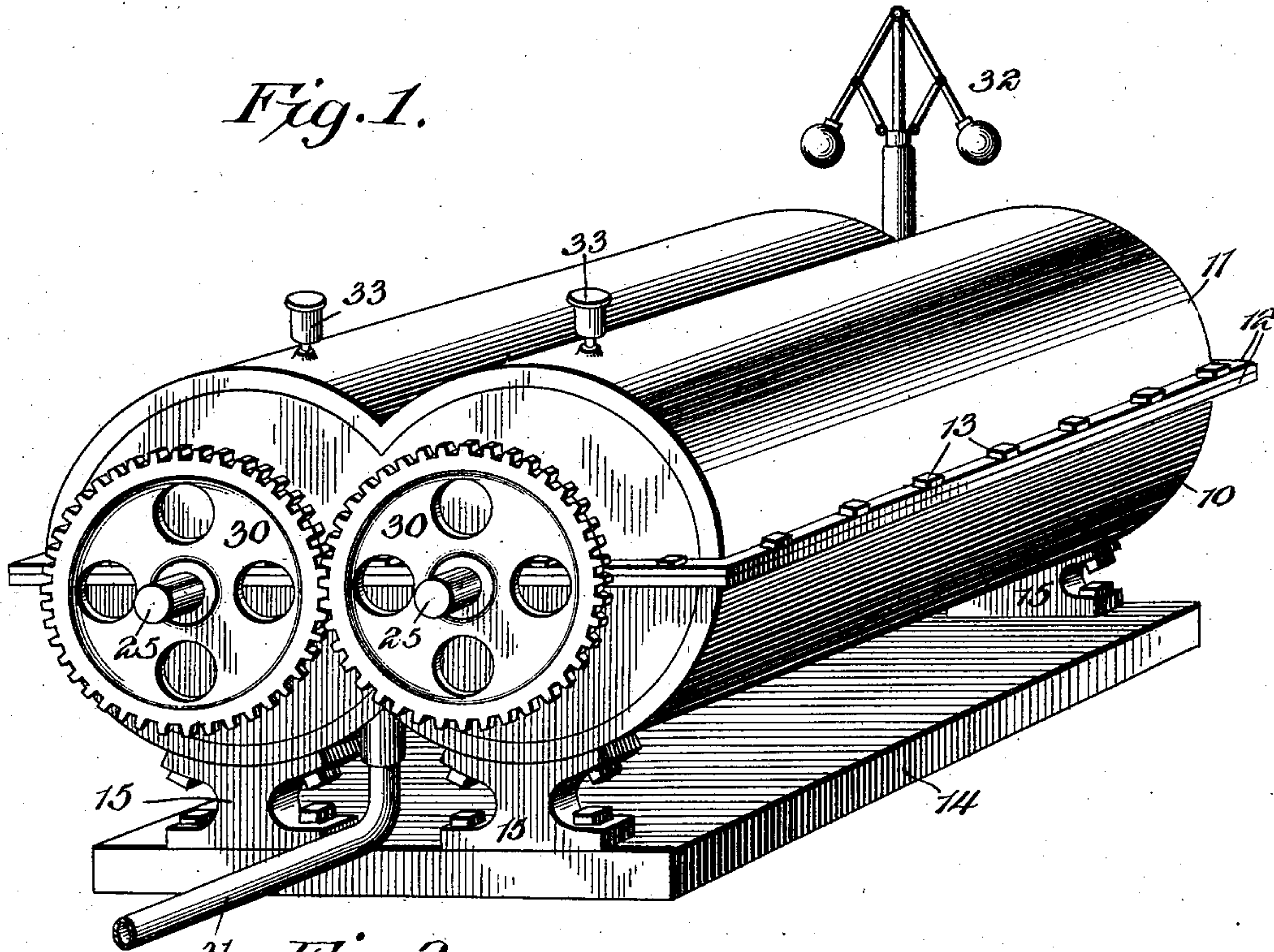
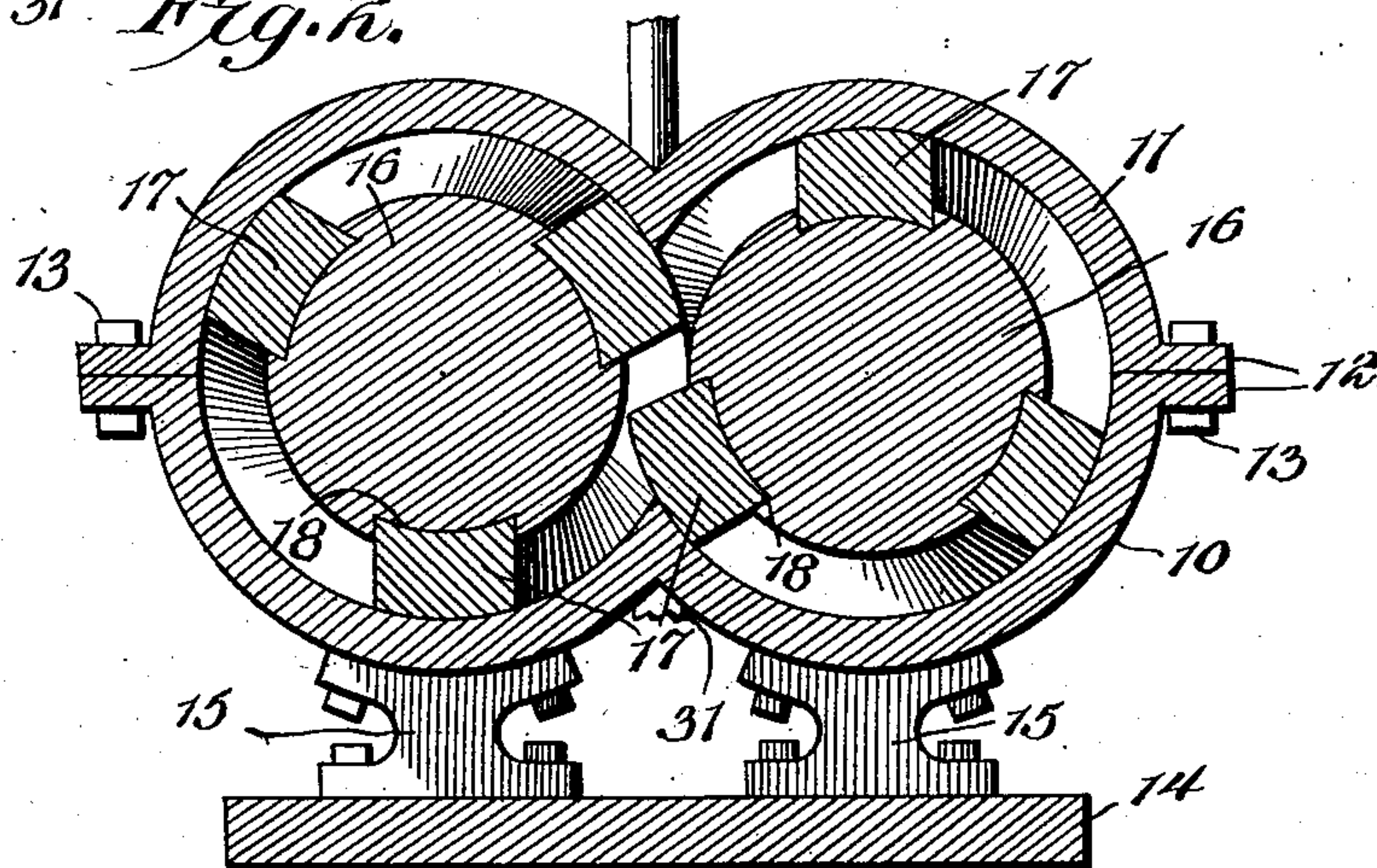


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

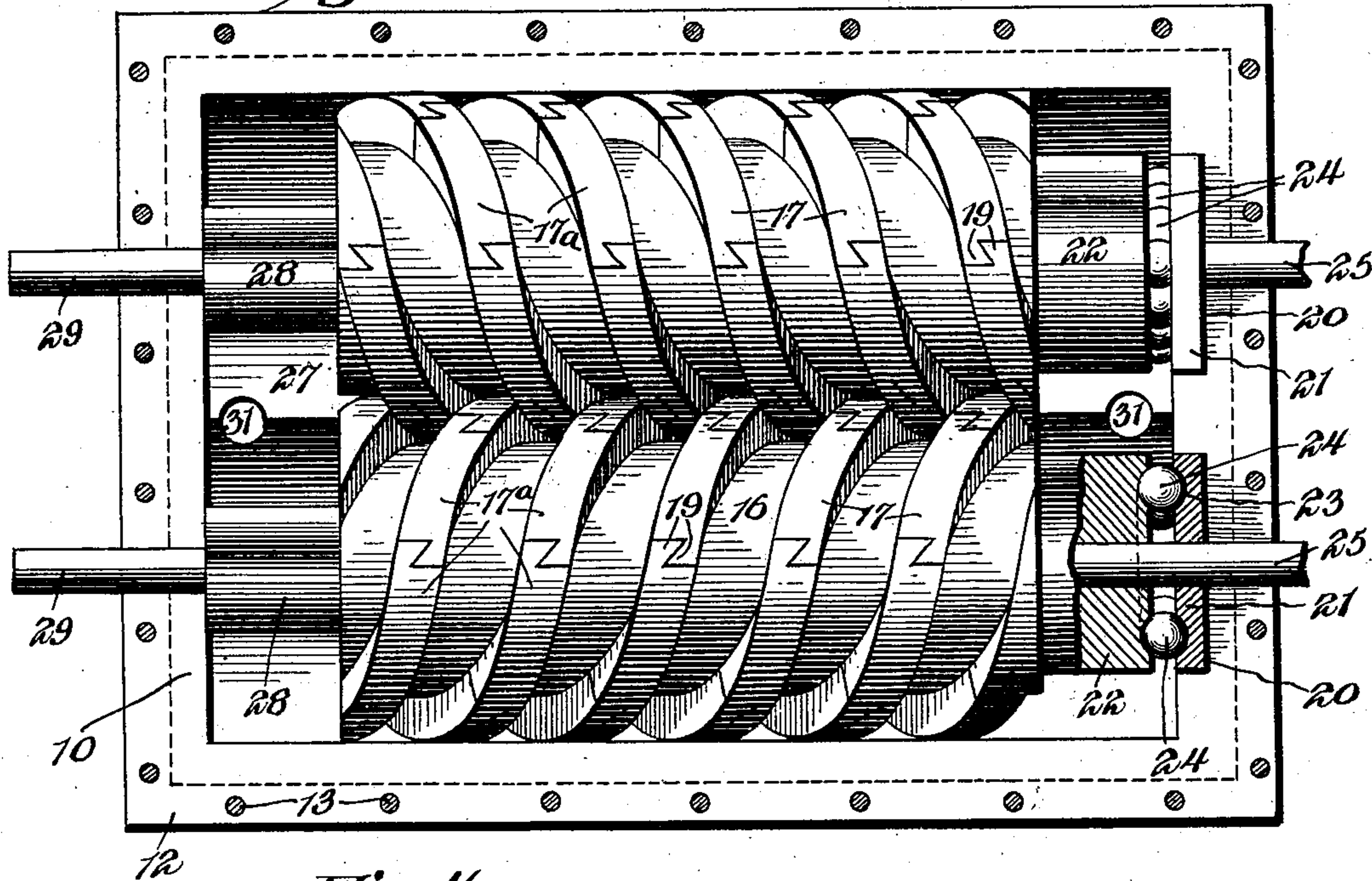
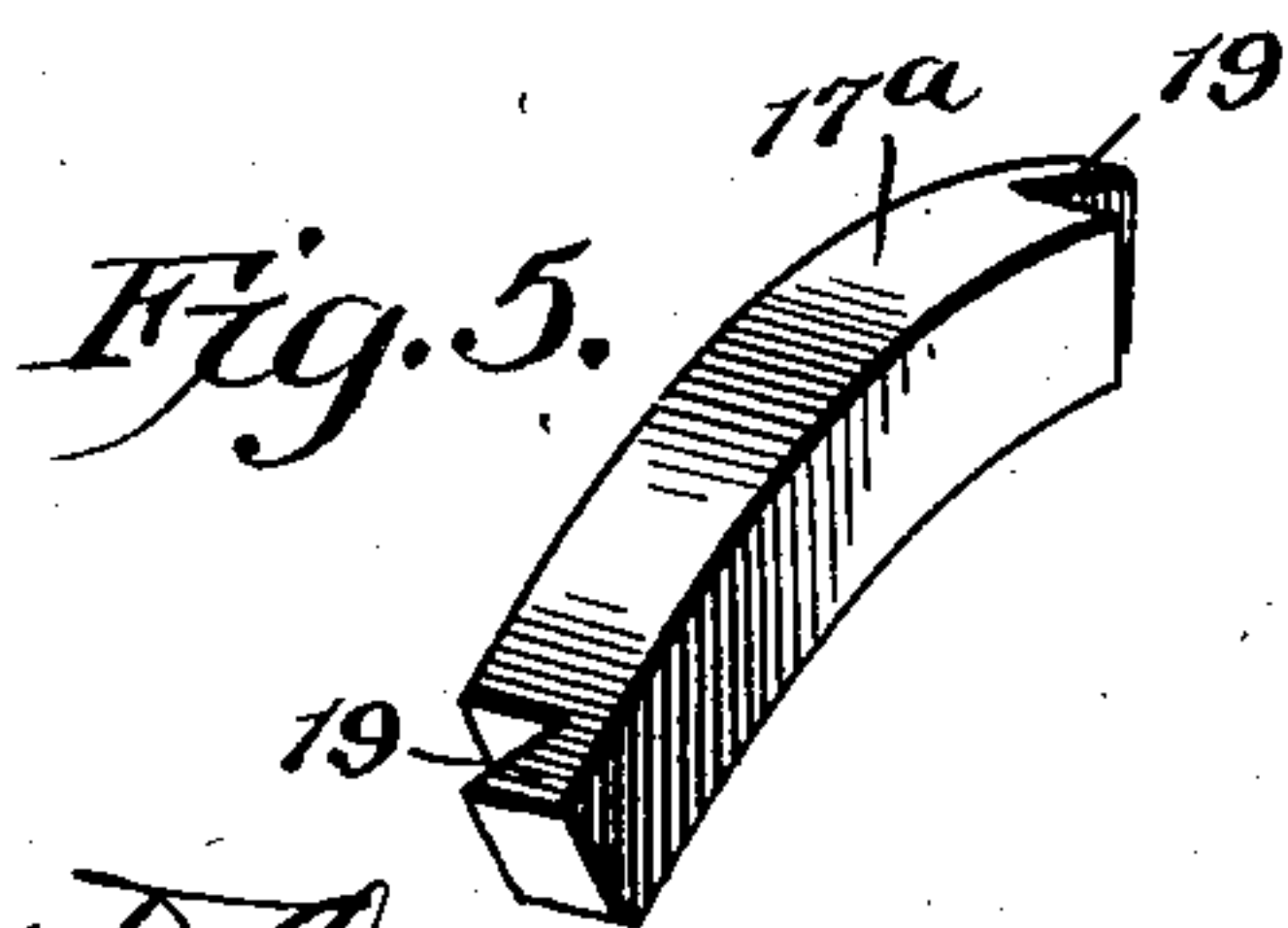
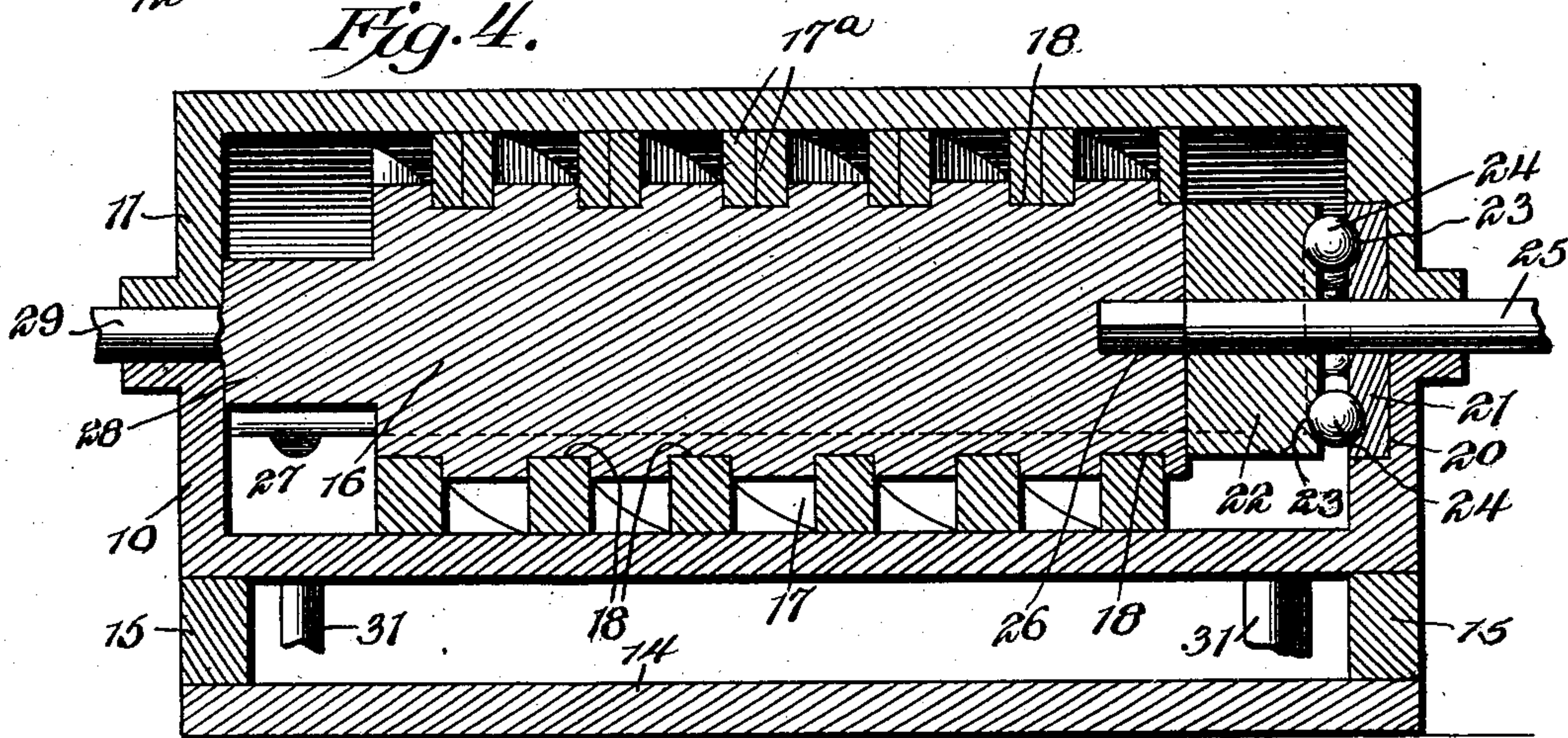


Fig. 4.



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UNITED STATES PATENT OFFICE.

JAMES M. CROWLEY, OF CARL JUNCTION, MISSOURI.

ROTARY MOTOR.

SPECIFICATION forming part of Letters Patent No. 724,819, dated April 7, 1903.

Application filed September 5, 1902. Serial No. 122,231. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. CROWLEY, a citizen of the United States, residing at Carl Junction, in the county of Jasper and State of Missouri, have invented a new and useful Rotary Motor, of which the following is a specification.

This invention relates to motors, and particularly rotary motors designed to be actuated by steam, water, or other fluid under pressure.

One of the primary objects of the invention is to provide a motor which will present a comparatively great and substantially continuous surface to the action of the steam or other fluid, thus providing a powerful and easy-running engine.

Another object is to provide a structure in which the parts subjected to the greatest wear can be readily removed and replaced by new ones should it become desirable or necessary.

Still another object is to provide a thrust-bearing that will reduce the friction to a minimum and which is removable for the purposes of repair or renewal.

The preferred form of construction is fully illustrated in the accompanying drawings and is described in the following specification.

In said drawings, Figure 1 is a perspective view of the motor. Fig. 2 is a vertical sectional view through the same. Fig. 3 is a top plan view with a portion of the cylinder removed. Fig. 4 is a vertical longitudinal sectional view. Fig. 5 is a detail perspective view of one of the abutment-sections.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention shown a cylinder is employed comprising upper and lower sections 10 and 11, having flanges 12 on their abutting edges, which flanges are secured together by means of bolts, as 13. The cylinder is supported upon a suitable base 14 by means of standards 15 and is formed into a pair of communicating chambers, as will be readily seen by reference to Fig. 2. Within these chambers are mounted rotary piston-bodies 16, one being located in each chamber, said bodies being disposed in parallel relation and spaced a slight distance apart. These

piston-bodies are provided with spiral intermeshing worm-abutments 17, each body being provided with a plurality of said abutments, which are spaced apart and between which those of the other piston engage. Three of the abutments are shown on each body, though it will be understood that more may be employed, if desired.

The abutments 17 are preferably detachably fastened to the bodies, and to this end each of said bodies is provided with a plurality of spiral grooves 18, in which the abutments fit snugly. Said abutments are preferably constructed of separate sections 17^a, each having dovetailed projections 19 at their opposite ends, which projections interlock with those of the adjacent sections, as seen in Fig. 3. Thrust-bearings are also employed for each piston and are constructed as follows: Angular seats 20 are constructed in one end of the cylinder, and in these seats are fitted wear-plates 21. Cylindrical wear-blocks 22 are attached to the adjacent ends of the pistons, and said blocks and plates are provided in their opposing faces with annular ball-races 23, while antifriction-balls 24 are interposed between said blocks and plates and are arranged in the races thereof. Suitable shafts 25 pass through the end of the cylinder, the wear-plates, and blocks and have their inner ends seated in sockets 26, formed in the ends of the piston-bodies, as illustrated in Fig. 4. The ends of the pistons opposite the thrust-bearings just described terminate short of the end of the cylinder to provide a steam-chamber 27, the bodies having reduced portions 28, from which project suitable shafts 29, that extend through the cylinder end. Suitable intermeshing gear-wheels 30 connect the shafts 25, while inlet and outlet steam-ports 31 are arranged at the ends of the cylinder and communicate with the inlet and exhaust chambers. A suitable governor, as 32, may be connected with the motor in the usual way, and lubricators 33 of any desirable type can likewise be employed.

When the engine is running, steam or other fluid is introduced into the chamber 27 through the port 31 and impacts against the intermeshing abutments of the two pistons, passing through the spaces between the same,

and finally exhausting through the rear outlet 31. By employing a plurality of the abutments on each cylinder the necessary pitch or inclination may be given to each, while a large amount of impact-surface is provided in the aggregate. Furthermore, the exhaust and discharge is almost continuous, each of the cylinders having three during each revolution. Thus a powerful engine is provided which is steady and uniform in action. As the abutments are subjected to considerable wear and are perhaps more liable to injury than the other elements, it will be seen that by having them constructed of detachable sections any part may be removed and replaced, as desired, though when they are together they are securely interlocked. The thrust-bearings also are extremely simple and may be readily reached for the purpose of repair.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a rotary motor, the combination with a cylinder, of a plurality of rotary piston-bodies arranged side by side within the cylinder, and spiral intermeshing worm-abutments arranged on the peripheral surfaces of the piston-bodies, each body being provided with a plurality of separate abutments between which those of the other piston engage.

2. In a rotary motor, a rotary piston-body, and a spiral worm-abutment detachably secured to the piston-body.

3. In a rotary motor, a rotary piston-body having a seat, and a spiral worm-abutment fitted in the seat thereof.

4. In a rotary motor, a rotary piston-body having a spiral groove in its peripheral face,

and a spiral worm-abutment detachably seated in the spiral groove.

5. In a rotary motor, a rotary piston-body, and a spiral worm-abutment detachably secured to the piston-body and comprising a plurality of sections.

6. In a rotary motor, a rotary piston-body, and a spiral worm-abutment detachably secured to the piston-body and comprising a plurality of sections, the ends of said sections being detachably interlocked.

7. In a rotary motor, a rotary piston-body, and a spiral worm-abutment detachably secured to the piston-body and comprising a plurality of sections, the ends of said sections being provided with interlocked dovetailed projections.

8. In a rotary motor, a rotary piston-body having a spiral groove in its peripheral face, and a spiral worm-abutment detachably seated in the spiral groove and comprising a plurality of sections, the ends of said sections being detachably interlocked.

9. In a rotary motor, the combination with a cylinder having a seat in one end, of a rotary piston arranged in the cylinder, a wear-plate fitted in the seat of the cylinder and being held thereby against rotation, a wear-block detachably secured to the adjacent end of the piston, said plate and block having annular ball-races in their opposing faces, and antifriction-balls located in the races.

10. In a rotary motor, the combination with a cylinder, of a rotary piston arranged in the cylinder and having a socket in one end that terminates short of the other end, a wear-plate located at one end of the cylinder, a wear-block attached to the end of the piston, balls interposed between the wear plate and block, and a shaft having its inner end seated in the socket of the piston, said shaft passing through the wear block and plate.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES M. CROWLEY.

Witnesses:

G. D. CHITWOOD,
C. F. SMITH.