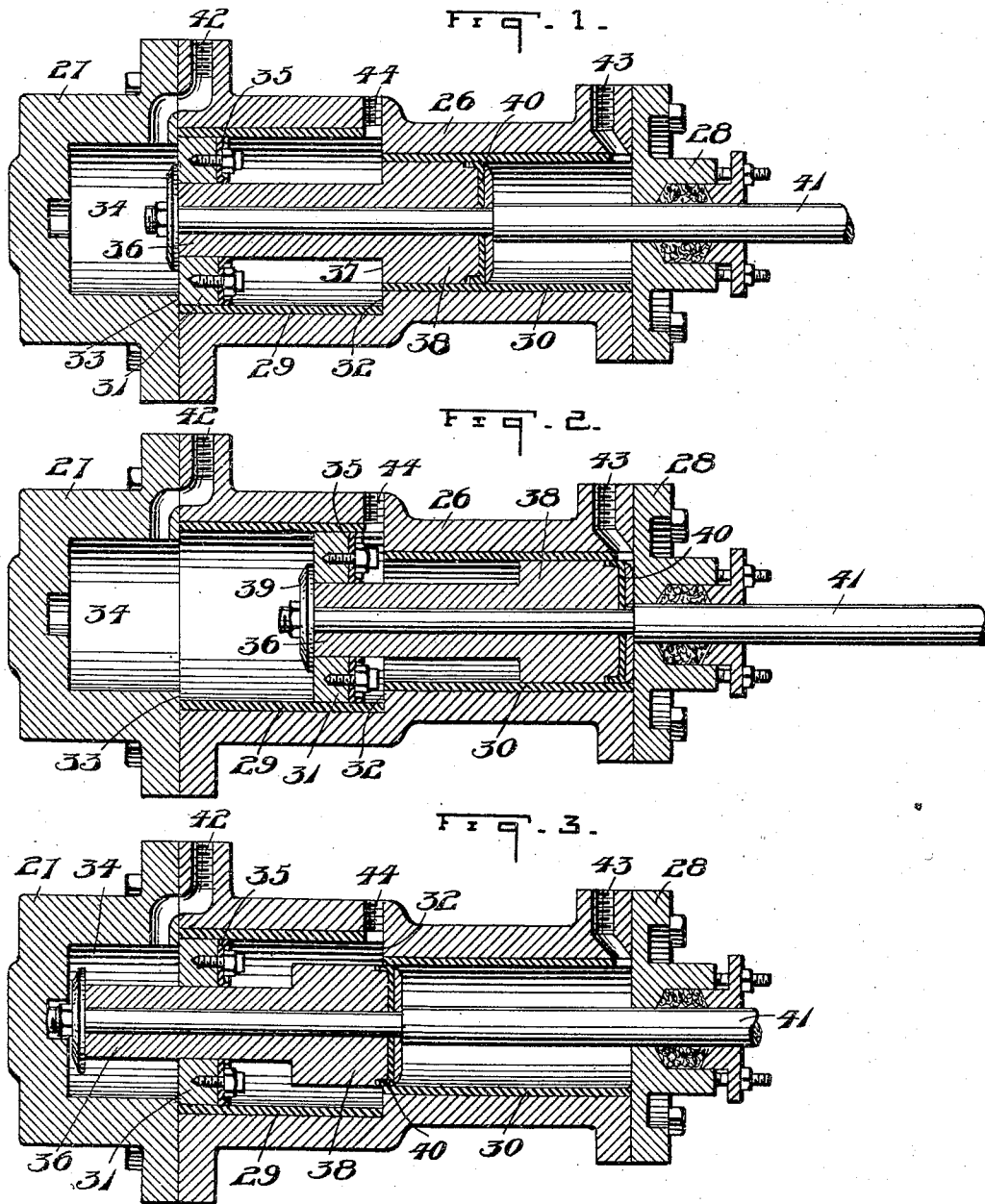


No. 787,480.

PATENTED APR. 18, 1905.

J. R. TANNER.
CENTERING MOTOR.
APPLICATION FILED MAR. 1, 1904.



WITNESSES:

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JULIUS R. TANNER, OF PITTSBURG, PENNSYLVANIA.

CENTERING-MOTOR.

SPECIFICATION forming part of Letters Patent No. 787,480, dated April 18, 1905.

Application filed March 1, 1904. Serial No. 196,033.

To all whom it may concern:

Be it known that I, JULIUS R. TANNER, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Centering-Motors, of which the following is a specification.

My invention relates to centering-motors particularly designed for operating motor-valves having three positions, but is in no wise limited to such mechanism.

It is the object of my invention to provide a centering-motor having but few movable parts which normally occupy a central or inactive position, but which may by similar simple operations be returned without fail and held securely in such central position.

Referring to the drawings, Figure 1 is a longitudinal section of one form of my motor, showing the operating parts in their central position. Fig. 2 is a similar view showing the movable parts of the motor at their right-hand extreme position. Fig. 3 is a similar view showing said movable parts at their left-hand extreme position.

Referring now to Figs. 1, 2, and 3, 26 represents the casing of my motor, having the end caps 27 and 28. The casing has a longitudinal opening closed at its ends by said caps, the opening having two cylindrical linings 29 and 30, the former having a greater diameter than the latter and their inner ends lying in the same transverse plane.

Slidable in the cylinder or lining 29 is a ring or piston 31, which has travel between the shoulder 32, which connects the two diameters of said longitudinal opening and the shoulder 33 of the cap 27, the said shoulder being formed by providing the cap 27 with an opening or socket 34 smaller in diameter than the lining 29. The inner end of the ring 31 is provided with a packing-ring 35, having a U-shaped cross-section, its outer flange bearing against the inner surface of the cylinder 29 and its inner annular flange forming a packing for the reduced portion 36 of the piston 37, its enlarged end 38 being slidable in the smaller lining 30. The outer end of the reduced portion 36 is provided with a disk

39, which when the piston is in its extreme right-hand position, as shown in Fig. 2, bears against the outer end of the ring 31. The outer end of the portion 38 is provided with a packing-disk 40, which bears against the inner surface of the lining 30. A valve-rod passes through the center of the cap 28 and through the axis of the piston 37 and is rigidly secured therein, so as to cause the rod 41 to travel with the piston. The rod 41 will in practice be connected to some device which my motor is adapted to operate—for example, to the slide-valve of a hydraulic or other motor. When the parts are in a central position, as shown in Fig. 1, the slide-valve will occupy a central position, causing the hydraulic or other motor to remain inactive. When the parts take the position shown in Fig. 2, the slide-valve will be shifted so as to operate the hydraulic or other motor in a certain direction, and when the parts are shifted as shown in Fig. 3 the hydraulic or other motor will be operated in the other direction. A passage 42 leads through the casing 26 and the cap 27 into the opening or socket 34, and a passage 43 leads through the casing and the lining 30 at the outer end of the opening in the casing next to the cap 28. A third passage 44 leads through the casing and the lining 29 next to the shoulder 32.

Fig. 1 represents the normal position of the pistons, in which position the outer ends of the pistons are not under pressure. In all positions of the pistons there is a constant pressure of fluid through the passage 44. When there is no pressure through the passages 42 and 43, the pressure through the passage 44 pushes the ring 31 against the shoulder 33, and at the same time it will push the piston 37, so that the disk 39 will engage the ring 31. The pressure on the large portion 38 of the piston 37 will not move the ring from the shoulder 33, because the area of pressure is greater on the ring than on the said portion 38.

When pressure is supplied through the passage 42, the ring and piston are forced to the right, as shown in Fig. 2. This movement will take place even if the pressures through the passages 42 and 44 are equal, since the

area subjected to right - hand pressure is largely in excess of the area subjected to left-hand pressure. When the pressure through the passage 42 is exhausted, the constant central pressure will obviously restore the parts to the position shown in Fig. 1.

When pressure is admitted to the passage 43, the motor-piston will move to the left, as shown in Fig. 3, and when the said pressure is exhausted the piston will again resume its central position. (Shown in Fig. 1.)

I do not limit the above-described invention to use with mechanism of any particular type, since it is adapted to any device to which it is attached having a central position or a position on either side of the central position.

I do not limit myself to the precise details shown and described above, but claim such changes as may fairly come within the scope of my invention.

Having described my invention, I claim—

1. In a centering-motor, a casing having a longitudinal opening consisting of two sections of different diameters and a third section, a lining in each of the first two sections, an internal shoulder at the junction of the first two sections, a ring slidable in the larger of the first two sections, a piston slidable in the smaller of the first two sections and having a reduced portion slidable in the said ring, a rod secured to the piston to transmit the movement of the piston to a suitable point, a packing-ring seated on the outer end of the larger portion of said piston and bearing against the smaller lining, and a packing on the said ring bearing against the larger lining and the reduced portion of the piston, and means involving the third section for supplying fluid - pressure to and exhausting it

from the outer end of the ring, means for supplying pressure to and exhausting it from the enlarged portion of the piston and for supplying continuous pressure to the inner ends of the ring and the enlarged portion of the piston, whereby said piston may be caused to occupy a central position or a position either side thereof and means for limiting the outward movement of the ring.

2. In a centering-motor, a casing having a longitudinal opening consisting of two sections of different diameters and a third section, a lining in each of the first two sections, an internal shoulder at the junction of the first two sections, a central supply-passage at the junction of the larger of the first two sections and said shoulder for supplying continuous pressure, a ring slidable in the said larger section, a piston slidable in the smaller of the first two sections and having a reduced portion slidable in the said ring, a rod secured to the piston to transmit the movement of the piston to a suitable point, a packing-ring seated on the outer end of the larger portion of said piston and bearing against the smaller lining, and a packing on the said ring bearing against the larger lining and the reduced portion of the piston, means for supplying fluid-pressure to and exhausting it from the outer sections of the said opening in the casing, whereby the said piston may be caused to occupy a central position or a position on either side thereof and means for limiting the outward movement of the ring.

Signed at Pittsburg this 27th day of February, 1904.

JULIUS R. TANNER.

Witnesses:

F. N. BARBER,
A. M. STEEN.