(No Model.)

S. D. SHEPPERD.

WATER MOTOR.

No. 504,283. Patented Aug. 29, 1893.

Fig. 1.

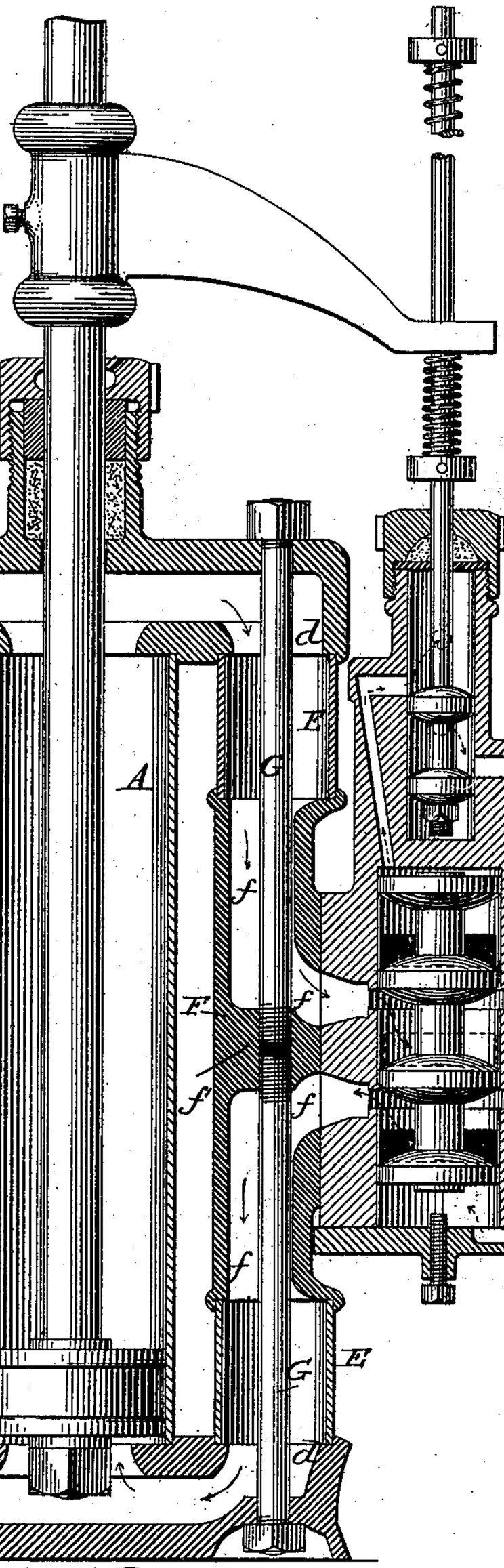
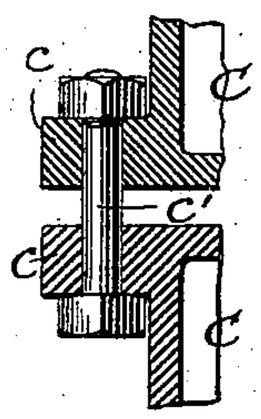


Fig. 2.



Witnesses,
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Inventor;
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by his attorneys,
Baldwin, Davidson & Wright

UNITED STATES PATENT OFFICE.

SYLVANUS D. SHEPPERD, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE BACKUS WATER MOTOR COMPANY, OF SAME PLACE.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 504,283, dated August 29, 1893.

Application filed February 7, 1893. Serial No. 461,352. (No model.)

To all whom it may concern:

Be it known that I, SYLVANUS D. SHEPPERD, a citizen of the United States, residing at Newark, in the county of Essex, State of New Jersey, have invented certain new and useful Improvements in Water-Motors, of which the following is a specification.

My invention relates to that class of piston water motors in which the tube forming the cylinder is clamped between end sections or heads each of which has a port opening into the end of the cylinder, and in which there are passages leading from said ports to the openings in a valve case seat. Such a construction in general outline is very old—and is also shown in my Patent No. 474,347. In that patent, however, the organization shown has a capacity or function not found in the prior state of the art, to wit: the capability of using cylinder tubes of different lengths, with the same heads or end pieces and valve case seat. I am thus enabled by unclamping the end pieces and substituting a shorter or longer cylinder tube, as the case may be, to produce a motor of any desired length of stroke. In the patent I accomplish this in the following manner: One of the end pieces has cast with, formed on, or secured to it, a valve case seat having the two required openings. A channel leads from one opening to the port in said end piece, and the other opening of the valve case seat is placed in communication with the port in the other end piece by a section of tubing bearing at one end on the valve case seat and at the other on the end piece. The end pieces with the interposed cylinder and section of tubing mentioned are clamped together by any suitable bolts or devices. Obviously, now, if it be desired to change the stroke of such a motor, it is only necessary to loosen or remove the clamping bolts or devices, remove the cylinder and section of tubing, substitute those of the required length and again clamp the heads or end pieces together. The utility and value of a water motor having such a capacity are obvious, since only one style or pattern of end pieces is required for the construction of motors having different lengths of stroke. The construction shown in the patent has a further utility, viz: the valve case seat being formed in a single piece, the face thereof may be ground readily and with accuracy, which is not the case in the ordinary construction where there is a seat for the valve case on each head or end piece. Nor in the construction shown in the patent is there any occasion to exactly align or properly bring together the two parts of a valve case seat, as is the case in the ordinary construction where a seat is formed on each head, and whereby the accurate alignment of the two seats requires a careful and nice adjustment of the two heads with reference to each other.

My present invention possesses all the advantages of construction above recited and constitutes an improvement upon the organization shown in my patent referred to. It is desirable that the columns of water, when the motor is in operation, or in other words the passage leading from each opening in the valve case seat to the ports opening into the ends of the cylinder, should be of equal length, as such an arrangement tends toward a smooth, even running of the motor. By my improved construction I am enabled to accomplish this regardless of the varying lengths of cylinders that may be employed. Aside from this, however, it is often necessary or convenient to be able to change the location of the valve case seat and bring it nearer to one or the other end of the cylinder at will to accommodate the motor to the space it has to occupy. This is a very desirable feature since the motors often have to be placed in contracted spaces, and by my invention I am enabled in some cases to place my motor in a space which a motor having no such adjustment could not be introduced into.

I accomplish these ends by making the valve case seat separate from both heads and connecting the heads and seat by interposed hollow or tubular connections. This may be conveniently done by placing between each head and the valve case seat a section of tubing that is clamped in place when the heads are drawn together to clamp the cylinder between them. Obviously by using sections of tubing of equal length, the valve case seat will be located midway between the ends of

the cylinder; or by using tubes of different length it may be brought nearer to either end of the cylinder, as may be desired.

In the accompanying drawings: Figure 1 is a longitudinal central section through my improved motor; and Fig. 2 a detail sectional view on the line 2, 2, of Fig. 1.

The cylinder A which may be an ordinary piece of tubing without flanges is seated in sockets or recesses in the hollow heads B B between which it is clamped. Each head is provided with a hollow leg or extension C, that projects from the head in line with the cylinder and constitutes an air chamber. It will be noted that these air chambers are not within the heads, but are arranged outside of them and parallel with the cylinder. The construction is that shown and described in my patent mentioned and a more detailed description is unnecessary. The adjacent ends of the legs are provided on each side with laterally projecting flanges *c* through which clamp bolts *c'*, that may of course be of various lengths pass. Each head, preferably at a point diametrically opposite the leg C, is formed with a seat surrounding an opening *d* that communicates with the end of the cylinder. Sections of tubing E are seated therein, and at their opposite ends are seated against the ends of the valve case seat F and in communication with the ports or passages *f f* therein. Screw clamping bolts G, may, as shown, pass through the heads, the openings *d* therein, the tube sections, and passages *f* and screw into the solid central portion *f'* of the valve case seat. In the construction shown these screw bolts, and the bolts *c'* constitute the only means of clamping the parts together. Of course, however, any suitable clamping devices, such for instance, as side rods extending from head to head may be used, but I prefer the construction shown. It is simple, inexpensive and efficient.

The valve case H is bolted to the seat F in the usual manner. The construction of valve shown is that illustrated and described in my patent and no detailed description is necessary here. All the joints may be ground true, or packed with washers, or both ground and packed if desired.

The construction, operation and capacities for adjustment or change are obvious. Cylinders of different length may be used, it only being necessary to employ tube sections and clamping bolts of suitable length, and the valve case seat may be adjusted to such location as desired.

I claim as my invention—

1. The combination of the chambered heads, the cylinder formed of a single tubular section interposed between the heads and having ports opening into the chambers thereof, the detachable valve case seat arranged at one side of the cylinder and adjustable longitudinally relatively to the axis of the cylinder, a valve case secured to the valve case seat and having ports registering therewith, a tubular connection interposed between each head, and each end of the valve case seat and detachable therefrom, and means for clamping the chambered head, the interposed cylinder, the valve case seat and the tubular sections together, substantially as described.

2. The combination of the cylinder formed of a single tubular section, the chambered heads, each having a flanged leg or extension and having ports opening into the cylinder, a clamping bolt passing through the flanges in the legs, the detachable valve case seat arranged at one side of the cylinder and adjustable longitudinally relatively to the axis of the cylinder, the valve case having ports registering with the ports in the valve case seat, a removable tubular connection between each chambered head and the opposite ends of the valve case seat, and a clamping bolt passing through the tubular connections and each head, and firmly clamping the tubular connections, the heads and the valve case seat together, substantially as described.

In testimony whereof I have hereunto subscribed my name.

SYLVANUS D. SHEPPERD.

Witnesses:
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