

R. B. GOODRICH.
OSCILLATORY MOTOR.
APPLICATION FILED DEC. 3, 1908.

1,044,042.

Patented Nov. 12, 1912.

Fig. 1.

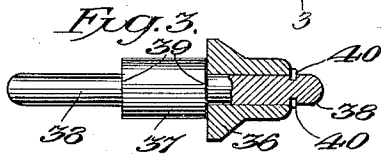
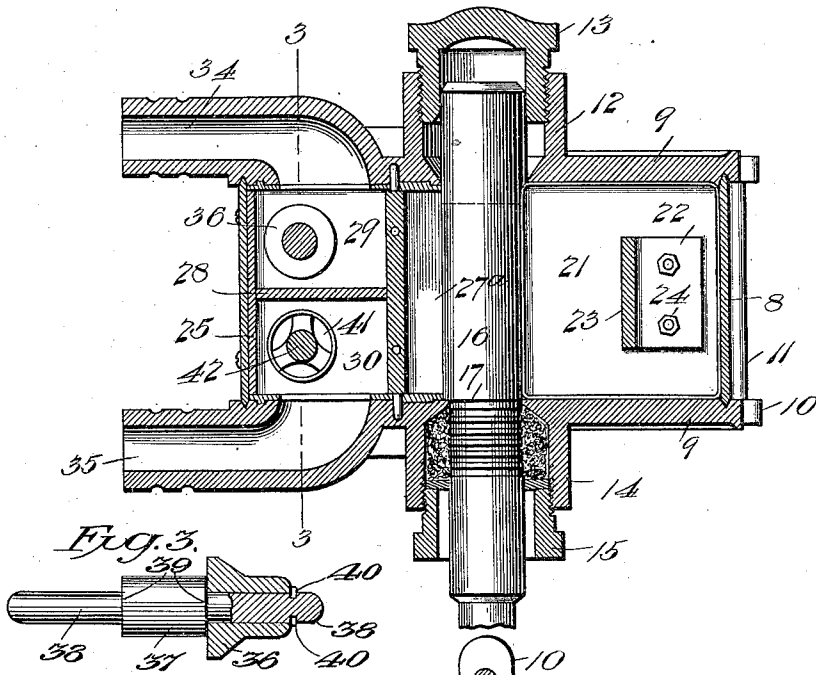
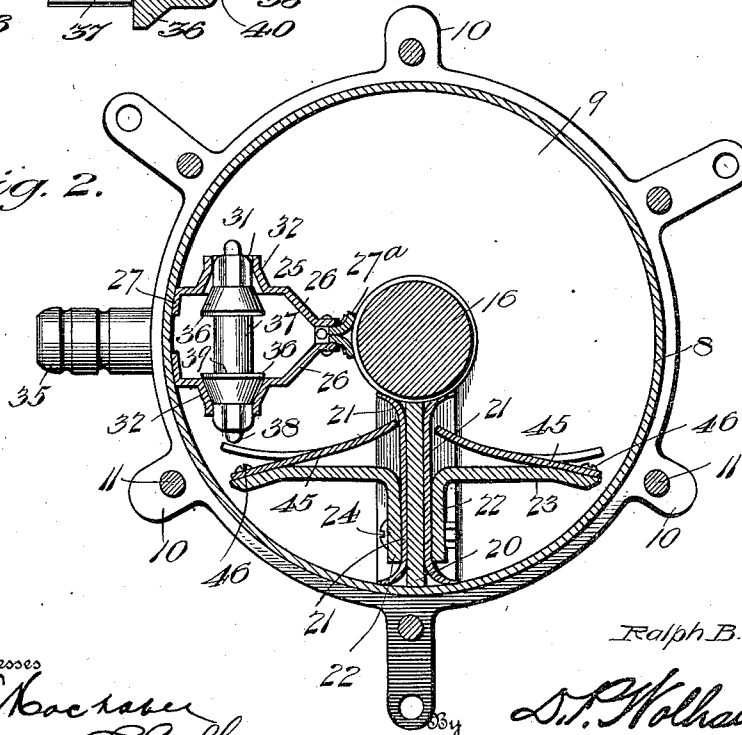


Fig. 2.



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UNITED STATES PATENT OFFICE.

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OSCILLATORY MOTOR.

1,044,042.

Specification of Letters Patent.

Patented Nov. 12, 1912.

Application filed December 3, 1908. Serial No. 465,839.

To all whom it may concern:

Be it known that I, RALPH B. GOODRICH, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Oscillatory Motors, of which the following is a specification.

This invention relates to motors, and more particularly those of the type disclosed in my Patent, No. 884,654, granted April 14, 1908, though there are features not necessarily limited thereto.

The primary object of this invention is to provide means for securing the valve heads in position on the valve stem, the securing means heretofore employed having proven ineffective and expensive. This is an important feature in the practical use of water motors of this general type because the present methods of securing the valve heads in position do not insure a reasonably long life of the motor, owing to the accidental displacement and dismemberment of the valve parts.

While the invention can be embodied in a number of different ways, the preferred form of construction is illustrated in the accompanying drawings, wherein:—

Figure 1 is a longitudinal sectional view through the motor, also cutting through the valve cage. Fig. 2 is a horizontal sectional view through the structure. Fig. 3 is a detail.

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

The improvements provided by the present invention are designed to be associated by an oscillating motor of the type disclosed in my former patent, hereinbefore referred to. However, for the purposes of illustration, the general features of such a motor may be referred to as follows: A cylinder member is employed, comprising a circular side wall 8 and end heads 9 detachably interlocked with the edges of the side wall. To this end, the margins of said side wall are tapered to produce substantial wedges, and the inner sides of the heads have grooves to receive the same. The heads are provided with suitable outstanding ears 10 through which are passed tie bolts 11 that serve to draw the heads toward each other, and thus effectively hold the elements of

the cylinder member in associated relation and prevent leakage through the joints. The upper head of the cylinder member is provided with a packing box, which includes an upstanding boss 12 into which is threaded a cap 13. The lower head is also provided with a boss 14, into which is threaded a collar 15, the said boss 14 and collar 15 consequently producing a lower packing box.

The motor shaft, which is designated generally by the reference numeral 16, extends through the lower packing box, through the cylinder member, and has its upper end journaled in the upper packing box, said upper end preferably extending into the cap 13. This shaft furthermore has the portion which extends through the lower box, reduced in diameter, thereby producing an annular shoulder 17 that rests upon the inner face of the lower head and forms a support for the shaft.

Secured to the portion of the shaft that is located within the cylinder member is the piston. This piston includes a body vane 20, suitably secured to the shaft and having cupped or dished packing sheets 21 arranged against its opposite face. The packing sheets are maintained in position by bracket plates, each bracket plate consisting of angularly disposed arms 22 and 23. The arms 22 rest against the said packing sheets, and are secured in place by suitable bolts 24, or other fasteners. The other arms 23 thus stand out at substantially right angles to the vane 20 and carry the valve actuators, as hereinafter described.

Arranged within the cylinder member and in the path of movement of the piston is the valve cage 25. This valve cage, as in the former construction, preferably consists of oppositely disposed sheet metal plates or walls 26, the outer portions of which are flanged, as shown at 27, and suitably secured to the side wall 8 of the motor. The inner margins of said walls are brought close together and have clamped between them packing strips 27^a that bear against the shaft. The interior of this cage is divided by a partition 28 into separate chambers 29 and 30, each having communication with the interior of the cylinder member through ports 31, formed in the opposite walls 26. These ports are surrounded by opposite valve seats 32 and 33, struck from the walls, as shown. The motive fluid is supplied to the chamber 29

through a coupling nipple 34, formed integral with the upper head of the cylinder member, and the exhaust is carried away from the motor and from the chamber 30 by means of a nipple 35, formed integral with the lower head. The supply and exhaust of such motive fluid is controlled by sets of oppositely disposed valves. For the supply a pair of oppositely disposed valve heads 36 is employed, located within the chamber 29 and carried by a stem 37. The manner of securing these heads upon the stem is important. Difficulty has heretofore been experienced with this feature. In every case, it has been impossible to fix the valves against loosening and detachment from the stems. It has been found that the present arrangement overcomes the difficulty. The structure is as follows:—The stem 37 has its end portions reduced, as shown at 38, thus producing opposite shoulders 39. The valve heads are fitted upon the reduced portions and abutted against said shoulders, after which outstanding retaining lugs 40 are pinched from the projecting ends of the stems, said lugs bearing against the outer ends or wings of the heads, and forcing them into binding engagement with the shoulders. The valves which control the exhaust ports, are set oppositely to the valves 36. They comprise heads 41 arranged upon the reduced terminal portions 42 of a stem, and are maintained thereupon by lugs pinched from the projecting portions of the stems in the manner above explained.

For the purpose of effecting the operation of the valves, actuating devices are employed that are secured to the outstanding arms 23 of the brackets. Each of these actuating devices consists of a spring body or plate 45 secured, as shown at 46 at its outer

end to the free end of the arm 23, which end is preferably offset slightly as shown.

From the foregoing description, it will be readily understood how the applicant has provided a serviceable and effective means for securing the valve heads to their stems.

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

1. In a motor of the character described, the combination with a cylinder member and a rotatable piston operating therein, of means for supplying motive fluid to and exhausting it from the cylinder member, said means including sets of oppositely disposed valves, each set including a stem having an abutment shoulder, and a head fitted on the end of the stem and abutted against the shoulder, said stem projecting beyond the head and having retaining lugs pinched therefrom and engaging the outer end of said head.

2. In a motor of the character described, the combination with a cylinder member and a rotatable piston operating therein, of means for supplying motive fluid to and exhausting it from the cylinder member, said means including sets of oppositely disposed valves operated by the piston, each set consisting of a stem having opposite abutment shoulders, and heads fitted on the end of the stem and abutted against the shoulders, said stems projecting beyond the heads and having retaining lugs pinched therefrom and engaging the outer ends of the heads.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

RALPH B. GOODRICH.

Witnesses:

O. C. DAUGHERTY,
E. M. GRUB.