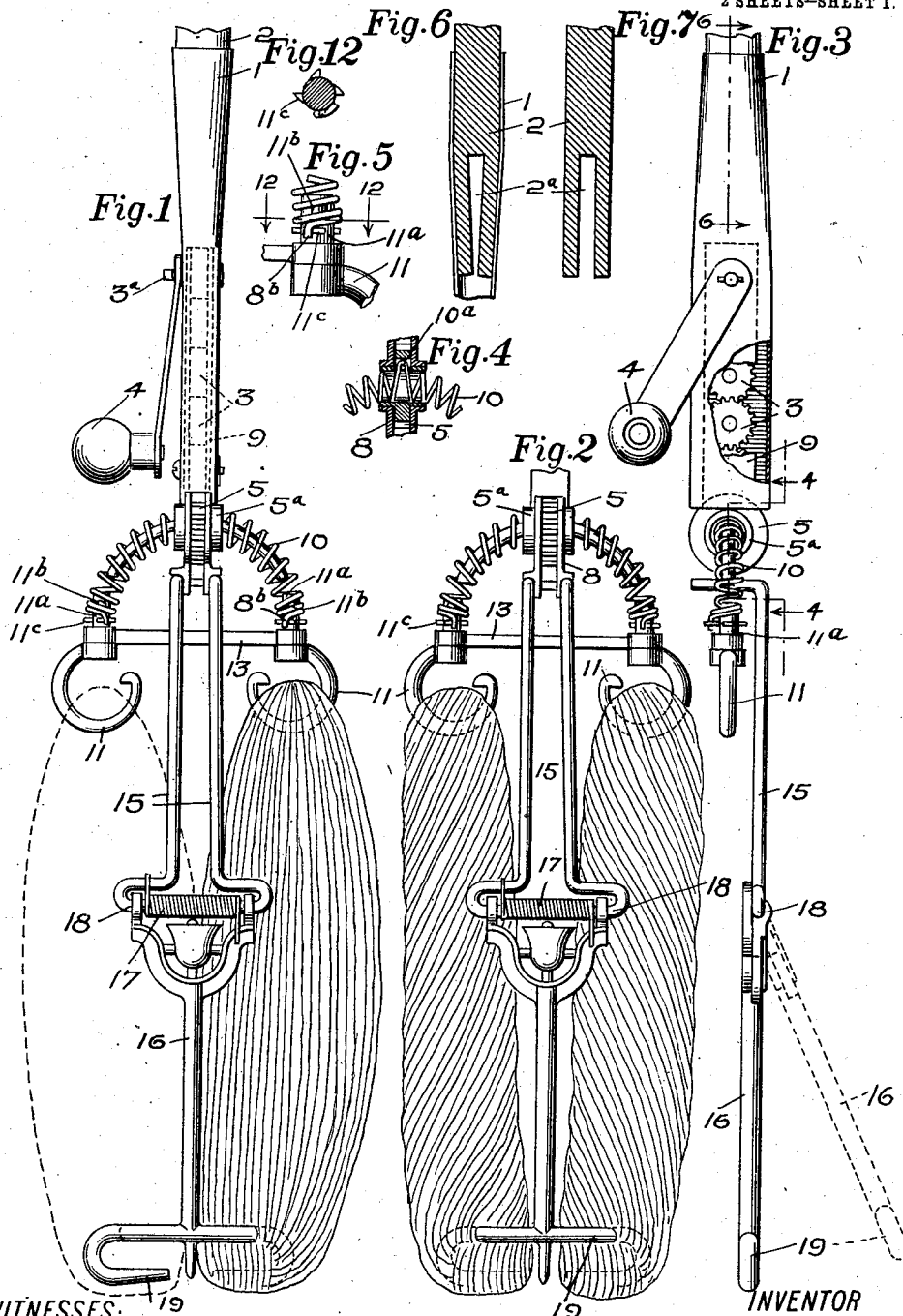


H. O. THOMAS.
MOP AND WRINGER.
APPLICATION FILED DEC. 30, 1909.

1,011,525.

Patented Dec. 12, 1911.

2 SHEETS-SHEET 1.



WITNESSES:
John M. Culver
C. J. Christoffel

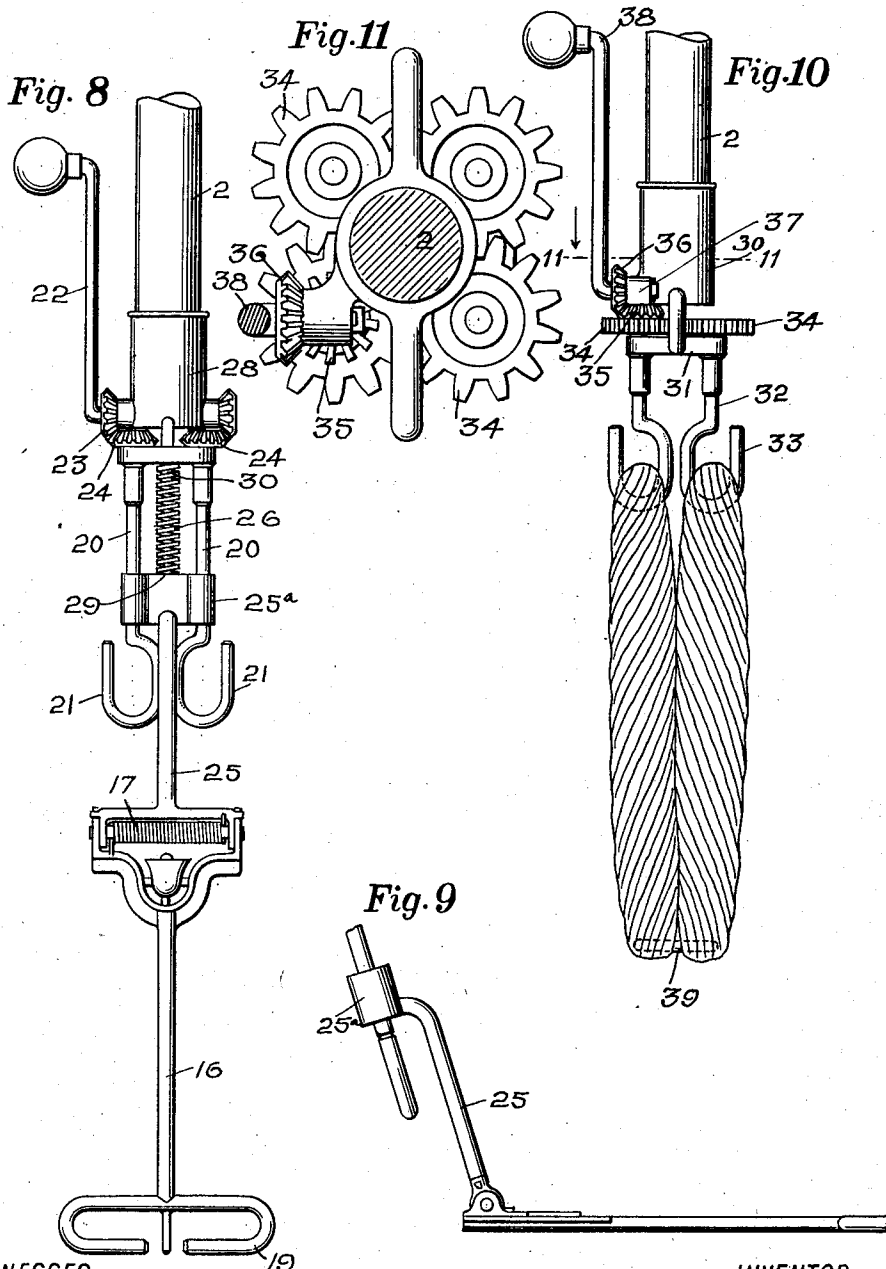
INVENTOR
Henry O. Thomas
by Byron T. Burton
his atty

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UNITED STATES PATENT OFFICE.

HENRY O. THOMAS, OF ST. LOUIS, MISSOURI.

MOP AND WRINGER.

1,011,525.

Specification of Letters Patent.

Patented Dec. 12, 1911.

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To all whom it may concern:

Be it known that I, HENRY O. THOMAS, a citizen of the United States, residing at Maplewood, St. Louis, State of Missouri, have invented new and useful Improvements in Mops and Wringers, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

10 The purpose of this invention is to provide a mop of improved construction, and adapted to be used wet or dry and adapted to be wrung.

15 It consists in the features of construction shown and described as indicated in the claims.

20 In the drawings:—Figure 1 is a front elevation of a mop embodying this invention, in normal condition for use. Fig. 2 is a similar view the handle being broken away,—showing the cloths as twisted in wringing. Fig. 3 is an edge elevation of the mop without the cloths, the handle socket piece being broken away to disclose the interior mechanism. Fig. 4 is a detail section at the line 4—4 on Fig. 3. Fig. 5 is a detail elevation of the flexible shaft connection with the cloth holder for wringing. Fig. 6 is a detail section at the line 6—6 on Fig. 3. Fig. 7 is an axial section of the end of the handle in normal condition before insertion of the handle and socket. Fig. 8 is a front elevation of a modified form of the device stripped of the cloths. Fig. 9 is a detail side elevation at the lower portion of the cloth holder or stretcher, of the form shown in Fig. 8. Fig. 10 is a similar view of a third modification showing the cloths twisted in wringing. Fig. 11 is a section at the line 11—11 on Fig. 10 on a larger scale than the latter figure.

45 In the form of this invention which is shown in Figs. 1, 2 and 3 and the detail figures relating thereto, it comprises a handle socket, 1, which is preferably made of cylindrical metal tubing flattened for the greater part of its length so as to make it oblong in cross section, and as a result, tapering from the unflattened portion toward the flattened end, narrowing in one direction and widening in the transverse direction, as may be understood by comparison of Figs. 1 and 3. This adapts the upper end of the socket tub-

ing to receive a wooden handle, 2, which is cleft at the end by a deep and wide saw-cut, 2^a, so as to make a spring fork which may be forced into the upper end of the socket, 1, with the cleft, 2^a, extending in the plane in which the socket tubing is widened by flattening, so that by the narrowing of the tubing in the transverse direction, the fork-ends may be pinched together as seen in Fig. 6, and by elastic reaction of said fork ends the handle may be held tightly in the socket. The flattened portion of the socket 1, serves as a gear casing for a train of gears, 3, the first of which has a crank handle, 4, fast on the protruding end of its axle, 3^a, and the last of which meshes with a gear, 5, which is journaled beyond the lower end of the socket in a bearing, 8, provided at the protruding end of a fitting, 9, which extends up within the socket, and affords bearings therein for the several gears, 4, being secured to the socket by the axles or shafts of said gears, which extend through them and through the side plates or fork arms of the fitting and through the socket walls. The gear, 5, has its hubs, 5^a, journaled in the bearing, 8, and axially hollow to receive the flexible shaft, 10, which is made of spring wire, coiled in opposite directions from the middle point at which it is folded upon itself forming a loop engaged by a pin, 10^a, set through the hub of the gear and holding the flexible shaft against rotation with respect to said gear, thereby causing it to be rotated with the gear.

To the opposite ends of the flexible shaft, 10, there are connected so as to be rotated by the shaft, the cloth-engaging hooks, 11, 11. For so connecting these hooks to the ends of the flexible shaft, they are each provided with stems or spindles, 11^a, adapted to extend within the coil of the shaft, each stem having a projecting tooth, 11^b, adapted to protrude between the coils so that the stem may be screwed into the coil from the end of the latter; and the stem has back from the tooth, 11^b, a series of radial ratchet teeth, 11^c, which are engaged by the forwardly bent end, 86, of the wire, which forms the flexible shaft; as the stem, 11, is screwed into the end of the coil; the distance between the tooth, 11^b, and the ratchet teeth, 11^c, is preferably sufficient to permit at least

two coils of the wire to be engaged between the tooth, 11^b, and the ratchet teeth, 11^c, as seen in Fig. 1.

Before the stems of the hooks are screwed into the opposite ends of the shaft as described, they are connected by a yoke, 13, in which their stems obtain bearings parallel to each other; and in order to screw them into the opposite ends of the flexible shaft the latter is bowed in a half circle, as seen in Fig. 1,—and the yoke holding the two stems of the hooks fixedly spaced apart and parallel, causes the flexible shaft to remain in bowed condition. In the form shown in Figs. 1, 2, 3 and 8, and the details relating thereto, there is provided for holding the mop cloths in addition to the hooks, 11, a stretcher which comprises two members, 15 and 16, hinged together and provided with a spring, 17, coiled about their pivot, 18, and re-acting upon them both, tending to hold them extended in line, as seen in Fig. 3, the construction of the hinged joint being such as to stop them upon each other when thus extended, for permitting the outer member, 16, to fold forward as indicated in dotted line, in Fig. 3, and as seen in Fig. 9. The specific character of the hinge and spring connection is slightly different in the two modifications, which are shown having this stretcher, but the details of the hinge are not a material part of this invention and require no more specific description.

The terminal element, 16, of the stretcher is preferably in the form of a double pronged C-shaped hook, 19, with each of whose prongs a separate mop cloth may be engaged, as seen in Figs. 1 and 2. The mop cloths extend from the hooks, 19, to the hooks, 11, on the back side of the hinge joint, so that when the stretcher is folded the mop cloths are folded about the joint. When the crank handle, 3, is rotated by the operator holding the handle, 1, the rotation is transmitted through the flexible shaft, 8, to the two hooks, 11, which being at opposite ends of the flexible shaft, whose said ends are turned parallel, are rotated in opposite directions, causing the mop cloths attached to the hooks, to be twisted in opposite directions; so that the torsional resistance of the wringing of the two cloths is counter-balanced, and results in no tendency to rotate the mop as a whole, the two cloths and the stretcher about the axis of the handle or stretcher; but on the contrary the two cloths tend to retain their position with respect to the handle during wringing, precisely as in their normal or untwisted condition.

In the modification shown in Figs. 8 and 9, there are employed instead of the flexible shaft, separate parallel shafts, 20, 20, terminating in hooks, 21, 21, corresponding to the hooks, 11, 11, of the first described form;

and said shafts are rotated by bevel gear connection with the crank handle, such crank handle, 22, having two bevel gears, 23, 23, which mesh with bevel gears, 24, 24, on the upper ends of the shafts, 20, 20, and positioned between the two bevel gears, 23, 23, so that they derive motion in opposite directions from said bevel gears, with the same result as that above described in respect to the first form, in that the torsion of the mop cloths in opposite direction is counterbalanced and prevents the tendency to rotate the mop as a whole about the handle axis.

The wringing of the mop cloths when held at both ends as in the forms thus far described, tends to shorten the cloths or draw their opposite ends together; and in order to wring the cloths to the best advantage, it is preferable that provision should be made for permitting the hooks which hold the cloths at the two ends, to approach during the wringing but against such yielding resistance as may facilitate the wringing. In the forms shown in Figs. 1, 2 and 3, this yielding resistance permitting the approach of the two ends, is afforded by the yielding character of the flexible shaft, 8. In the form shown in Figs. 8 and 9, a rigid shaft being employed, it is necessary to make different provision for the yielding resistance to the approach to the opposite ends, and this is effected by forming the upper member, 25, of the folding stretcher for sliding on the shafts, 20, 20, for which purpose it is provided with a cross head, 25^a, through which the two shafts extend, and in which they thus obtain bearing, a coil spring, 26, being interposed between said cross head and the bearing of the shaft, 20, in the handle socket, 28. The spring may be centered at its opposite ends by studs, 29, 30, projecting from the cross head and shaft bearings, respectively, when taken into the opposite ends of the spring.

A third modification of this invention shown in Figs. 10 and 11, consists in dispensing with the stretcher for holding the outer or lower ends of the mop cloths, and providing means for holding any desired number, preferably four, such cloths at the upper ends, and for wringing the same. For this purpose the handle socket, 30, is provided at its lower end with bearings, 31, for four parallel shafts grouped about the axis of the handle, and in these bearings there are mounted shafts, 32, terminating at the lower end in hooks, 33, and having at their upper ends intermeshing spur gears, 34. One of the shafts has also rigid with it above the spur gear, 34, a bevel gear, 35, which meshes with a bevel gear, 36, mounted on a horizontal crank shaft, which is journaled in a lug, 37, projecting from the handle socket. The operator, by rotating

the crank handle, 38, communicates rotary motion through the train of gears described, to the four hooks which revolve alternately in opposite directions, so that each two diagonally situated hooks of a group rotate in the same direction and the other two in the opposite direction. When four looped mop cloths are suspended from the four hooks, they may be connected at their opposite ends of the loops by a ring, 39, for retaining them grouped closely together. When thus suspended, the four cloths may be wrung quite tightly, notwithstanding their remote ends are not attached, except to each other by means of the ring, and their alternately opposite twist operated to prevent them from twisting together and also from doubling or folding intermediate their ends; and I find that it is practicable to wring four cloths in this suspended condition almost as tightly as if their remote ends are held by a stretcher, so effectively is their opposite torsion counterbalanced and made to operate for holding them extended.

I claim:

1. A mop or wiper comprising a handle, a flexible shaft journaled between its ends transversely to the handle, cloth-engaging devices at the opposite ends of such flexible shaft, means for rotating the flexible shaft, cloths connected at their upper ends with such engaging devices, and means for connecting the cloths together at their lower ends.

2. A mop or wiper comprising a handle, a flexible shaft journaled between its ends transversely of the handle, cloth-engaging devices at the opposite ends of such flexible shaft, means for rotating the flexible shaft, and means connected with the handle for engaging the lower ends of the cloths.

3. A mop or wiper comprising a handle, a flexible shaft journaled between its ends transversely of the handle, a yoke extending transversely of the handle; cloth-engaging devices having stems or spindles journaled in the yoke, the flexible shaft having its opposite end portions flexed from transverse to forwardly extending direction, and engaged with said spindles respectively for rotating the cloth-engaging devices, cloths engaged at their upper ends with said engaging devices, and means connecting their lower ends together.

4. A mop or wiper comprising a handle, a flexible shaft journaled between its ends transversely of the handle, a yoke extending transversely of the handle; cloth-engaging devices having stems or spindles journaled in the yoke, the flexible shaft having its opposite end portions flexed from transverse to forwardly extending direction, and engaged with said spindles respectively for rotating the cloth-engaging devices, a stretcher con-

nected to the handle and extending past the yoke, and means at the lower ends of the stretcher for engaging the cloths respectively.

5. A mop or wiper comprising a handle, an even number of cloth holders carried by the handle for engaging the upper ends of the cloths, such cloth holders being mounted for rotation half in one direction and half in the opposite direction, cloths connected at their upper ends to said cloth holders respectively, and means connecting the several cloths at their lower ends.

6. A mop or wiper comprising a handle, a gear wheel having a hollow hub journaled on the handle with its axis transverse thereto; power-communicating means for rotating the gear; a flexible shaft extending through the gear and connected thereto for rotation therewith, cloth-engaging devices on the opposite ends of said flexible shafts; cloths connected at their upper ends to said cloth-engaging devices, and means connecting the lower ends of the cloths.

7. In a mop or wiper, in combination with a tubular handle socket piece flattened throughout a portion of its length, a crank shaft journaled transversely in such socket piece at the flattened portion, a spur gear on said crank shaft within said flattened portion; a train of spur gears positioned in said flattened portion and having their axles or shafts journaled in the opposite walls thereof driven by the first mentioned spur gear; a spur gear journaled beyond the end of said socket piece driven by said train, having its hub exposed at the opposite ends of its bearings, a flexible shaft extending in both directions from said hub, and cloth-engaging devices at the flexible shaft ends.

8. In a mop or wiper, in combination with a handle, a flexible shaft journaled between its ends transversely of the handle, cloth-engaging devices at the opposite ends of such flexible shaft, and means for rotating the shaft, the flexible shaft being a coiled wire spring and the cloth-engaging devices having each a stem or spindle adapted to be inserted into the end of the coil and having a spur tooth for engaging between the coils, and a plurality of ratchet teeth back of the spur tooth, the end of the wire coil being flexed to form a tooth adapted to engage with the ratchet teeth as the spur tooth is screwed into the coil.

9. A mop or wiper comprising a handle, a flexible shaft journaled between its ends transversely of the handle, a yoke extending transversely of the handle, cloth-engaging devices having stems or spindles journaled in the yoke; the flexible shaft consisting of a coiled wire spring having its opposite end portions flexed from transverse to forwardly extending direction, and the ends of the wire

bent forwardly at an angle to the spiral
trend to form a tooth, the spindles having
each a spur tooth for screwing into the
spiral and ratchet teeth between the spur
5 teeth and the spindle bearing for engage-
ment with the end of the wire.

In testimony whereof, I have set my hand

at Chicago, Illinois, this 20th day of Decem-
ber 1909.

HENRY O. THOMAS.

Witnesses:

S. NICCOLLS,

JAMES HAYWARD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."