

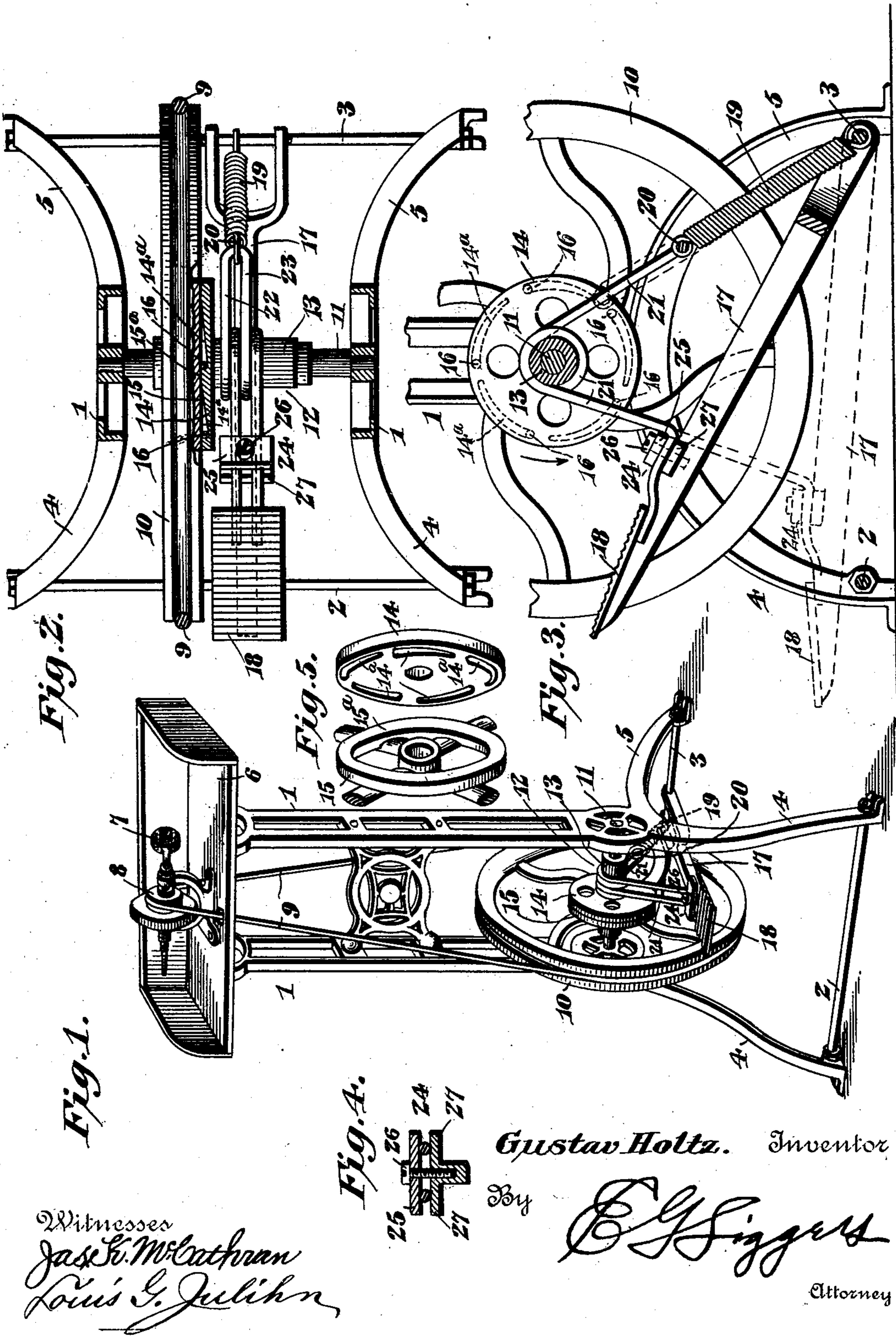
No. 699,171.

Patented May 6, 1902.

G. HOLTZ.
TREADLE MOTOR.

(Application filed Oct. 31, 1901.)

(No Model.)



Witnesses
Jas. E. McLaughlin
Louis S. Julian

Gustav Holtz.. Inventor

By

E. G. Siggers

Attorney

UNITED STATES PATENT OFFICE.

GUSTAV HOLTZ, OF JAMESBURG, NEW JERSEY.

TREADLE-MOTOR.

SPECIFICATION forming part of Letters Patent No. 699,171, dated May 6, 1902.

Application filed October 31, 1901. Serial No. 80,694. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV HOLTZ, a citizen of the United States, residing at Jamesburg, in the county of Middlesex and State of New Jersey, have invented a new and useful Treadle-Motor, of which the following is a specification.

My present invention relates to a novel manually-operated motor of that type known as "foot-power" machines or treadle-motors.

The object of the invention is to produce a simple and inexpensive treadle-power by means of which any form of light machinery—as, for instance, a polishing-lathe or the like—may be operated continuously at high speed by slight intermittent exertion on the part of the operator.

To the accomplishment of this object the invention consists in connecting the fly-wheel or other driven element of the machine with the driving element or the motor or foot-power through the medium of clutch mechanism which will compel the synchronous rotation of the driving and driven elements in one direction, but which will permit their independent movement in opposite directions, so that while the forward movement of the driving element under the impulse of the treadle will compel the rotation therewith of the driven element or fly-wheel the reverse movement of the driving element during the retraction of the treadle will be entirely independent of the driven element, which latter will therefore continue to rotate under its own momentum until again positively driven by the driving element as the treadle is depressed.

The invention consists, further and more particularly, in a novel form of connection between the treadle and the driving element, said connection comprehending a single flexible piece or strap doubled upon itself to form two strands, each of which is wound upon the drum or hub of the driven element and has its opposite ends connected to a retracting-spring and the treadle, respectively, these connections being preferably formed by passing the doubled portion of the piece through a loop at the end of the retracting-spring and by adjustably securing the ends of the strands to the treadle by means of a clamp.

To the accomplishment of the stated objects and others subordinate thereto the invention

also comprehends in its preferred embodiment certain other details of construction and arrangement, to be hereinafter more fully described, illustrated in the accompanying drawings, and succinctly defined in the appended claims.

In the accompanying drawings, Figure 1 is a perspective view of a dental lathe equipped with a treadle-motor constructed and arranged in accordance with my invention. Fig. 2 is a transverse section showing certain of the parts comprehended by my invention in plan. Fig. 3 is a sectional elevation of the subject-matter shown in Fig. 2, the depressed position of the treadle being indicated in dotted lines. Fig. 4 is a detail sectional view of the strap-clamp. Fig. 5 is a detail perspective view showing the two clutch members in juxtaposition.

Like numerals of reference are employed to designate corresponding parts throughout the several views.

The frame 1, having its opposite ends connected—as, for instance, by the tie-rods 2 and 3, extending between the front feet 4 and the rear feet 5—is surmounted by a table 6, carrying the tool to be operated, which in the present illustration is a polishing-lathe head 7. The construction and operation of the head 7 need not be explained in detail, as it constitutes no part of my present invention. It may be noted, however, that this head comprehends as an element thereof a small band-wheel 8, over which is passed a band 9, constituting the gearing between the head and the power or fly wheel 10, located at a point below the treadle. This fly-wheel 10 by reason of its relation to the motor will be hereinafter termed the "driven" element, and as a preferred construction said wheel is fixed upon a horizontal shaft 11, provided with suitable bearings at its opposite ends in the opposite side members of the frame 1 and at a point adjacent to the bottom thereof.

The driving element 12, constituting the motion-transmitting member of the foot-power or treadle-motor, comprises an elongated hub, sleeve, or drum 13, revolvably mounted on the shaft 11, and a clutch-disk 14, fixed to and preferably integral with one end of the sleeve 13 and opposed to a similar clutch-disk 15, constituting a part of the wheel 10. These

clutch-disks constitute the primary elements of a clutch mechanism, the disk 14 being provided in its face with tapering pockets 14^a, having inclined bottom walls, as shown, and
 5 designed for the reception of clutch-balls 16, which work against the plane flat face 15^a of the clutch member 15, as clearly shown in Figs. 2 and 5 of the drawings.

It will be obvious that when the clutch-disk
 10 14 is rotated in the direction of the arrow in Fig. 3 the balls will be wedged tightly between the two disks 14 and 15 by reason of the inclination of the bottom walls of the pockets, and an operative connection will therefore
 15 be effected between the driving element 12 and the wheel 10. It will be equally obvious that when the disk 14 is given a backward rotation in a manner to be hereinafter described the balls will seek the deep ends of the pock-
 20 ets and will therefore roll idly against the plane flat face 15^a of the clutch-disk 15, and the disconnection of the driving element 12 from the wheel 10 will therefore be effected.

As clearly shown in Fig. 2 of the drawings,
 25 the shaft 11 is disposed in a vertical plane midway between the tie-rods 2 and 3, this relation of the parts being admirably adapted to permit the rear tie-rod 3 to be utilized as the fulcrum of a treadle 17, disposed below
 30 the shaft and provided at a point in advance thereof with a terminal footpiece 18, upon which the foot of the operator is placed to effect the depression of the treadle. At its rear end the treadle 17 is forked or bifur-
 35 cated, and the ends of the bifurcations are apertured for the reception of the tie-rod 3, which, as already stated, supports the treadle for operation.

Secured to the rod 3 and preferably within
 40 the forked end of the treadle is a treadle-retracting spring 19, which in the present instance is of spiral form and is provided with a terminal ring or eye 20. The connection
 45 between the treadle and the driving element is effected by means of a single flexible piece or strap 21, which is passed through the ring 20 and doubled upon itself to define a pair of strands 22 and 23. These strands of the
 50 flexible piece or strap 21 are carried over and around the sleeve or drum 13 and are preferably wound thereon in an identical manner, so that the front and rear portions of the
 55 strands—that is to say, those portions lying in front and in rear of the sleeve—will be disposed in alternating arrangement. This winding of the strap upon the sleeve or drum of the driving member insures an operative
 60 frictional connection therewith. The ends of the strands 22 and 23 after being wound around the drum in the manner stated are adjustably connected to the treadle, preferably adjacent to the footpiece 18, by means
 65 of a clamp 24, comprising a plate 25, adjustably retained by a screw 26, passed through the center of the plate 25 and into the treadle, which latter may be provided, as shown, with a pair of oppositely-extending lugs 27, upon

which the strand ends are imposed and which in connection with the plate 25 constitute the
 70 strap-retaining clamp.

If now it is desired to operate the polish-
 ing-lathe head or any other light machinery at a high rate of speed, it is simply necessary to operate the treadle, the depression of which
 75 will effect the rotation of the driving member in the direction of the arrow in Fig. 3 by reason of the fact that the front ends of the strands will be unwound from the drum, while the rear ends thereof are wound upon the
 80 drum in opposition to the resistance of the retracting-spring 19. This depression of the treadle will consequently rotate the driving member of the motor in a direction to impart motion to the wheel 10, and thus drive the
 85 tool, and will be accompanied by a proportionate extension of the retracting-spring, which when the treadle is relieved of the pressure of the operator's foot will effect the retraction of the treadle. During this re-
 90 tractile movement the direction of the rotation of the driving member will of course be reversed, and the treadle will be retracted to its initial position; but as the relative move-
 95 ments of the driving and driven elements will now be in opposite directions the clutch mechanism will remain inactive, and the continued rotation of the wheel 10 under the im-
 100 petus gained will not be interfered with during the retraction of the treadle. Obviously, therefore, the equipment of light machinery with my novel foot-power or motor will en-
 105 able the former to be operated continuously in one direction and at a high rate of speed by comparatively slight exertion intermittently applied to effect the oscillation of the treadle.

It is thought that from the foregoing the construction and operation of my device will be clearly apparent; but while the present
 110 embodiment thereof is believed at this time to be preferable I wish to reserve the right to effect such changes, modifications, and variations of the illustrated structure as may be suggested by experience and experiment and embraced within the scope of the ap-
 115 pended claims.

What I claim is—

1. In a device of the character described, the combination with the driving and driven members, and intermediate clutch mechanism, of a treadle disposed below the driving member and fulcrumed at its rear end, a re-
 120 tracting-spring provided with an eye at one end, a single strand passed through the eye of the retracting-spring and doubled upon itself, the two strands thus formed being wound upon
 125 the driving member in the same direction, and a clamp mounted upon the treadle and adjustably retaining the extremities of said strand.

2. In a device of the character described, the combination with the driving and driven members, and intermediate clutch mechanism, of a treadle disposed below the driving
 130

member and fulcrumed at its rear end with its front end located in advance of the driving member, a retracting-spring secured directly beyond the rear end of the treadle and
5 provided with an eye at one end, a single strand passed through the eye of the retracting-spring and doubled upon itself, the two strands thus formed being wound upon the driving member in the same direction, and a
10 clamp mounted on the treadle in advance of the driving member and adjustably retaining the extremities of the flexible piece.

3. In a device of the character described, the combination with a frame comprehending
15 a transverse tie-rod, coaxial driving and driven members, and intermediate clutch mechanism, of a treadle disposed below the driving member and having a forked rear end fulcrumed upon the tie-rod, a retracting-
20 spring secured at one end to the tie-rod within the fork of the treadle and having an eye at its opposite end, a single flexible piece passed through the eye of the spring and doubled upon itself, the double strand being
25 wound upon the driving member, and a clamp carried by the treadle in advance of the driving member and adjustably retaining the extremities of the flexible piece.

4. In a device of the character described, the combination with a shaft, and a wheel 30 mounted thereon and provided with a clutch-disk having a flat annular side face, of a cylindrical driving member also mounted on the shaft and having at one end a clutch-disk opposed to the clutch-disk of the wheel, and 35 formed with a series of tapering pockets having inclined bottom walls, clutch-balls located within the pockets and disposed against the flat annular face of the first-named clutch-disk, a treadle disposed below the driven 40 member, a spring located at the rear end of the treadle, and a single flexible piece doubled upon itself and wound as a double strand upon the driving member, the doubled end of said piece being secured to the spring 45 and the extremities of said piece having attachment to the treadle adjacent to the front end thereof.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 50 the presence of two witnesses.

GUSTAV HOLTZ.

Witnesses:

O. ULBRICH,
J. GRANZ.