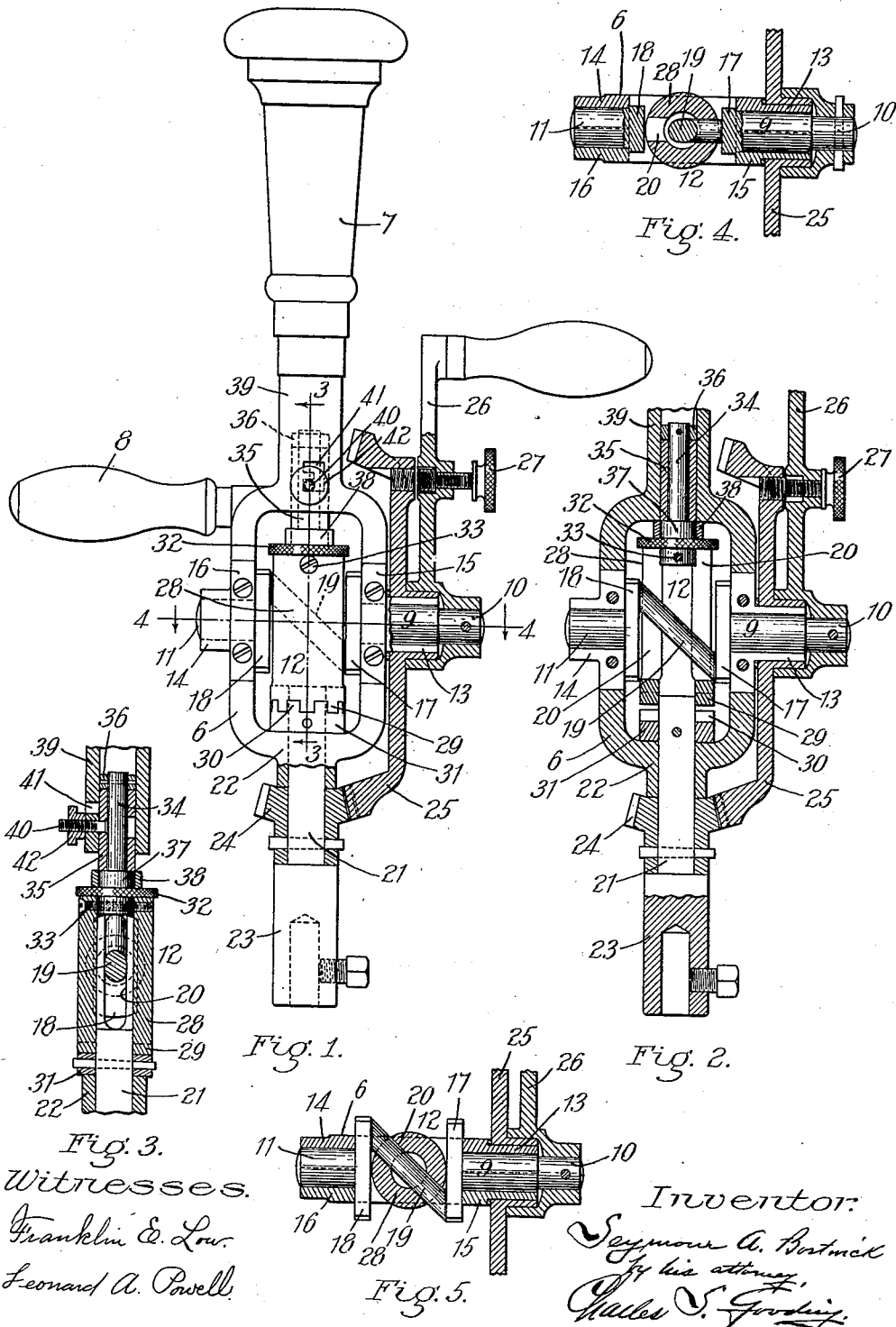


S. A. BOSTWICK.
DRIVING MECHANISM.
APPLICATION FILED JUNE 14, 1912.

1,064,437.

Patented June 10, 1913.



UNITED STATES PATENT OFFICE.

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DRIVING MECHANISM.

1,064,437.

Specification of Letters Patent.

Patented June 10, 1913.

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To all whom it may concern:

Be it known that I, SEYMOUR A. BOSTWICK, a citizen of the United States, residing at Roxbury, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Driving Mechanism, of which the following is a specification.

This invention relates to a device embodying two shafts at an angle to each other, one of said shafts, when rotated, adapted to impart to the other a rocking movement, said device also being so constructed that by certain adjustments the rotary movement of the driving shaft may be utilized to impart a rotary movement to the driven shaft. To attain the above results, one of said shafts is arranged at an angle to the other and has a crank-pin thereon extending into a slot in said other shaft, said crank-pin being located at an acute angle to the median axial lines of both of said shafts.

The device is particularly adapted to be used in connection with a breast drill which, by a slight change of the parts, can be converted into a valve grinder, the tool thus being adapted, by a rotary motion of a shaft provided with a handle, to impart to the driven shaft which carries the tool holder either a reciprocatory or a rotary motion as may be desired for valve grinding or for drilling.

The invention consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings: Figure 1 is a front elevation, partly in section, of my improved valve grinder, with the parts arranged in proper relation to impart a rocking motion to the driven shaft. Fig. 2 is a sectional elevation similar to Fig. 1, except that the parts are shown connected to impart a rotary motion to the driven shaft, some of said parts being broken away to save space. Fig. 3 is a sectional elevation taken on line 3—3 of Fig. 1, illustrating a portion of the driven shaft and the means of locking the same against longitudinal movement. Fig. 4 is a sectional plan taken on line 4—4 of Fig. 1. Fig. 5 is a sectional plan taken on line 4—4 of Fig. 1, with the driving shaft turned at right angles to the

position in which it is shown in Figs. 1 and 4.

Like numerals refer to like parts throughout the several views of the drawings.

In the drawings, 6 is a frame having a handle 7 at one end thereof and another handle 8 at one side thereof. 9 is a driving shaft consisting of two parts 10 and 11 on opposite sides, respectively, of a driven shaft 12. These parts are journaled in opposite sides of the frame 6 in bearings 13 and 14, respectively, said bearings being provided with caps 15 and 16 attached by screws to the frame 6.

The parts 10 and 11 of the shaft 9 are provided, respectively, with cranks 17 and 18 which are oppositely disposed diametrically relatively to said driving shaft and are connected together by an obliquely disposed crank-pin 19 which projects through a slot 20 located in and extending longitudinally of the driven shaft 12.

It will be seen that the two parts 10 and 11 of the driving shaft 9 are cylindrical and have the same median axial line and that the crank-pin 19 is interposed between the adjacent ends of said parts and connects them together, extending at an acute angle to said median axial line.

It will further be noted that the median axial lines of the driving and driven shafts and of the crank-pin lie in the same plane and intersect each other at the same point. It will further be noted that the crank-pin 19 extends at an acute angle to the median axial line of both the driving and the driven shafts.

The driven shaft 12 is preferably made in two parts, one of said parts being movable into and out of interlocking engagement with the other. Said parts consist, first, of a rotary shaft part 21 journaled in a bearing 22 in the frame 6 and terminating at its lower end in a tool holder 23. Said part 21 has a bevel gear 24 fast thereto and meshing into another bevel gear 25 which is journaled to rotate upon the exterior of the bearing 13 and is adapted to be fastened to a handle 26 by means of a screw 27. The handle 26 is fastened to the portion 10 of the shaft 9.

The other part 28 of the driven shaft 12 consists of a sleeve in which is located the

slot 20, one end of said sleeve being provided with teeth 29 which mesh into teeth 30 formed upon a collar 31 fast to the inner end of the part 21. Said sleeve has fastened
 5 to its upper end a collar 32 by means of a screw 33. Said collar has a shank 34 extending therefrom and projecting into a sleeve 35 in which it is rotatably mounted. The sleeve 35 is prevented from longitudinal
 10 movement upon the shank 34 by a collar 36 at one end thereof and by a shouldered portion 37 integral with the collar 32 at the other end thereof. A collar 38 upon the shouldered portion 37 constitutes a stop
 15 which abuts against the inner face of the frame 6 and limits the distance to which the movable portion 28 of the driven shaft can be moved longitudinally thereof.

The sleeve 35, it will be understood, is
 20 slidable longitudinally thereof in a bearing 39 on the frame 6 and is moved by means of a pin 40 fast thereto and projecting outwardly therefrom through a U-shaped slot 41. A clamp-nut 42 has screw-
 25 threaded engagement with the outer end of the pin 40 and is adapted to bear against the bearing 39, whereby the sleeve 35 and consequently the movable part 28 of the driven shaft 12, as a whole, may be moved
 30 longitudinally thereof and locked in position with the teeth 29 in engagement or out of engagement, as may be desired, with the teeth 30 upon the part 21 of the driven shaft.

The general operation of the device hereinbefore specifically described is as follows: Assuming that it is desired to impart a rocking motion to the shaft 12, whereby a tool,
 35 such, for instance, as a valve grinding tool, fastened to the lower part 21 may have a rocking motion imparted thereto for grinding valves, then the parts are connected together, as illustrated in Fig. 1, the movable
 40 part 28 being placed with its teeth in engagement with the teeth on the part 21, thus locking the two parts 28 and 21 together, with the pin 40 in the lower leg of the U-shaped slot 41 and with the clamp-nut set to hold the parts against relative
 45 movement longitudinally thereof.

The handle 26 is fast to the driving shaft part 10, but is disconnected from the bevel gear 25 when it is desired to impart a rocking movement to the driven shaft.

55 Assuming the parts, then, to be in the position illustrated in Fig. 1, if the handle 26 is rotated the shaft 9 will be rotated and the crank-pin 19 during this rotation will impart a rocking movement to the shaft 12
 60 through the longitudinally movable portion 28 and the rotatable portion 21. If it is desired, now, to use the tool for drilling or for any other movement in which a rotary motion of the driven shaft is desired, then
 65 the clamp-nut 42 is loosened, the pin 40 is

moved into the other leg of the U-shaped slot, thus lifting the slidable portion 28 of the driven shaft, together with the sleeve 35, out of connection with the rotatable part 21 of said driven shaft. The screw 27 is
 70 then turned to lock the handle 26 to the bevel gear 25; then upon moving the handle 26 to rotate the shaft 9, the bevel gear 25 and the bevel gear 24 into which it meshes will be rotated, thus imparting a rotary
 75 motion to the part 21 of the driven shaft 12 and to the holder 23 as well as to the drill or other tool held thereby.

While the device hereinbefore described is particularly adapted for a valve grinder
 80 and for a breast drill, I do not wish to be understood as limiting my invention to that particular class of mechanical device, as it is evident that the driving shaft provided
 85 with its obliquely disposed crank-pin projecting into a slot in the driven shaft, may be utilized for other devices or machines in which it is desired to impart a rocking motion to one shaft from another shaft to
 90 which a rotary motion is imparted.

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

1. A device of the character described having, in combination, a frame, a driven shaft
 95 and a driving shaft journaled therein, the median axial lines of said shafts extending at an angle to each other, said driven shaft being in two parts, one of said parts movable into and out of interlocking engagement with
 100 the other of said parts, a sleeve slidable in said frame longitudinally of said driven shaft and constituting a bearing for said movable part, means to lock said sleeve against longitudinal movement on said movable
 105 part while allowing the same to rotate therein, a pin fast to said sleeve and projecting outwardly therefrom through a U-shaped slot in said frame, a nut having screw-threaded engagement with the outer
 110 end of said pin and adapted to bear against said frame, whereby said movable part may be locked into and out of engagement with the other part of said driven shaft, a handle fast to said driving shaft, a gear fast to said
 115 driven shaft, another gear meshing into said first-named gear and means to lock said second-named gear to said driving shaft.

2. A device of the character described having, in combination, a frame, a driven
 120 shaft and a driving shaft journaled therein, the median axial lines of said shafts extending at an angle to each other, said driven shaft being in two parts, one of said parts movable into and out of interlocking engagement with the other of said parts, a
 125 sleeve slidable in said frame longitudinally of said driven shaft and constituting a bearing for said movable part while allowing the same to rotate therein, a pin fast to said
 130

sleeve and projecting outwardly therefrom through a U-shaped slot in said frame, a nut having screw-threaded engagement with the outer end of said pin and adapted to
5 bear against said frame, whereby said movable part may be locked into and out of engagement with the other part of said driven shaft, a handle fast to said driving shaft, a gear fast to said driven shaft, another
10 gear meshing into said first named gear and

journaled on said frame concentric with said driving shaft and a screw on said handle adapted to engage said last named gear.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses. 15

SEYMOUR A. BOSTWICK.

Witnesses:

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