

(No Model.)

2 Sheets—Sheet 1.

C. A. WORDEN.
MACHINE FOR SHARPENING RAZORS.

No. 522,361.

Patented July 3, 1894.

Fig. 1.

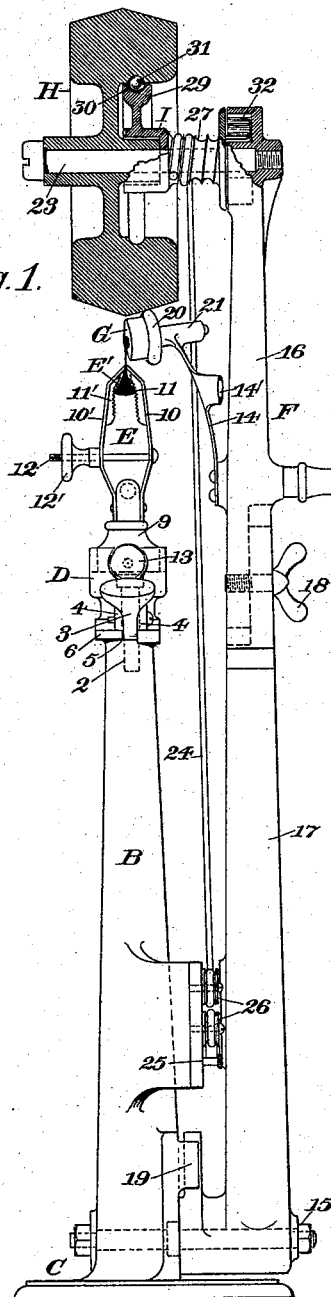
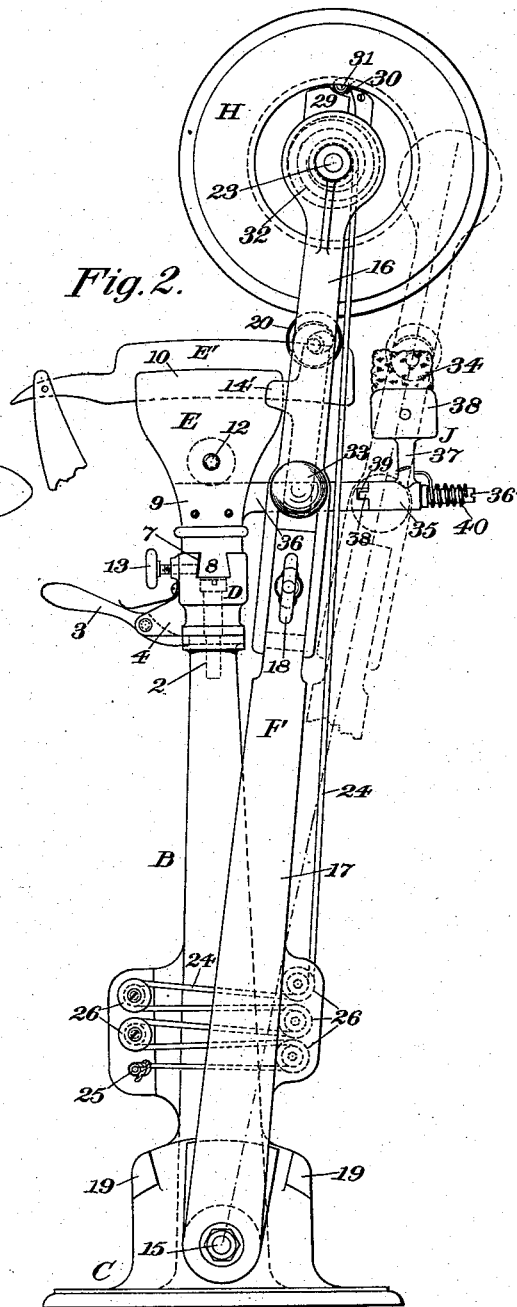


Fig. 2.



Witnesses:

J. L. Edwards Jr.
Fred. J. Dole.

Inventor:

Charles A. Worden.
By his Attorney

F. W. Richardson

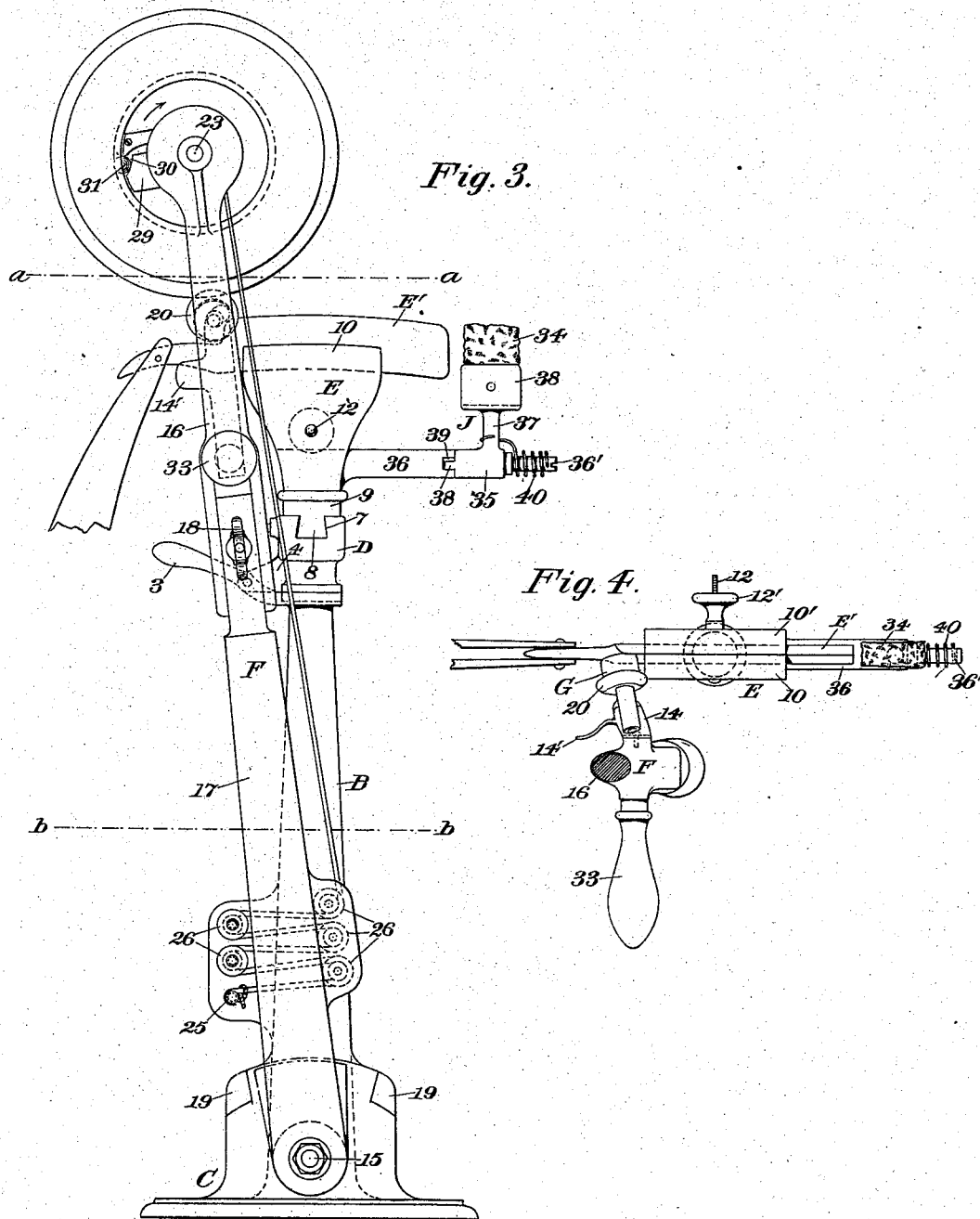
(No Model.)

2 Sheets—Sheet 2.

C. A. WORDEN.
MACHINE FOR SHARPENING RAZORS.

No. 522,361.

Patented July 3, 1894.



Witnesses:
H. L. Edwards Jr.
Fred. J. Dole.

Inventor:
Charles A. Worden.
By his Attorney,
F. H. Richards

UNITED STATES PATENT OFFICE.

CHARLES A. WORDEN, OF THE UNITED STATES ARMY, ASSIGNOR TO THE
WORDEN MACHINE COMPANY, OF OMAHA, NEBRASKA.

MACHINE FOR SHARPENING RAZORS.

SPECIFICATION forming part of Letters Patent No. 522,361, dated July 3, 1894.

Application filed April 11, 1894. Serial No. 507,172. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. WORDEN, of the United States Army, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Sharpening Razors, of which the following is a specification.

This invention relates to machines for grinding or sharpening razors and other cutlery; the object of the invention being to furnish a machine of the class specified which shall be simple, durable and effective, and by means of which the edge of a blade may be quickly ground as required, first upon one side, then reversed and ground upon the opposite side; and to do this by means of co-acting devices without the employment of tracks and gear-wheels for guiding and driving the grinding device.

My present invention is in the nature of an improvement upon the machine for sharpening razors shown and described in Letters Patent of the United States No. 487,140, dated November 29, 1892, and No. 516,146, dated March 6, 1894, heretofore granted to me, to which reference may be had.

In the drawings accompanying and forming a part of this specification, Figure 1 is a front elevation, partially in section, of a razor-grinding machine constructed and organized in accordance with my present invention, said figure showing a razor-blade in cross-section supported in position for being operated upon by the grinding-button. Fig. 2 is a side elevation of the razor-grinding machine as seen from a point at the right hand of Fig. 1, the carrier for the driving and grinding devices being shown in its extreme backward position in dotted lines. Fig. 3 is a side elevation, similar to that shown in Fig. 2, showing the carrier approximately in its extreme forward position. Fig. 4 is a sectional plan view of that portion of the machine located between the dotted lines *a-a* and *b-b* shown in Fig. 3.

Similar characters designate like parts in all of the figures.

In the patents hereinbefore referred to, the razor-grinding machine is shown as a duplex machine, it comprising a fixed chuck or blade-

holder, two revoluble grinding-buttons carried by a reciprocating carriage and adapted for operating upon the blade at both sides thereof simultaneously, a peripherally toothed revoluble driver carried by said reciprocating carriage, and operatively connected with the grinding-buttons through the medium of pinions, the driver being rotated by means of a pinion in meshing engagement with the teeth of a rack, which rack constitutes a guiding-track for guiding the carriage in its reciprocation.

In the embodiment of my present invention, herein shown and described, the grinding-machine comprises, in part, a blade-holding chuck revolubly-supported and adapted to be turned so as to successively present opposite sides of the blade to the action of the grinding-button, means for locking the chuck in its successive positions, a grinding-button removably-connected with an oscillating carrier, a revoluble driver carried upon said carrier and in frictional engagement with the grinding-button, or with a friction-wheel to which said button is secured, and means for rotating said driver, as will be hereinafter more fully described.

The framework of the machine may be of any suitable construction for carrying the operative details, it being herein shown as consisting of a standard, or upright, B, having a suitable base, C, adapted to be rigidly fixed to the floor, or to a table, as desired. This standard is provided at its upper end with a revoluble chuck-carrying head, D, the head being herein shown revoluble-connected with the standard by means of a stud, 2, extending through the head and journaled at its lower end in a bearing formed in the upper end of said standard, as will be understood by reference to Fig. 2 of the drawings. This revoluble head D is provided with a latch or locking-lever, 3, pivotally-supported between ears, 4, upon the head and adapted for engaging lock-notches, 5, formed in a flange, 6, at the upper end of the standard B, one of which notches is shown in the figure referred to. In the drawings I have shown the revoluble chuck-carrying head D as having a transverse slide-way, 7, formed in the upper face thereof, which slide-way is preferably dove-

tailed and is adapted to receive a dovetailed flange or tenon, 8, upon the body 9 of a chuck, designated in a general way by E. This chuck, in the form thereof herein shown, comprises
 5 a body-portion, 9, fitted for transverse adjustment in the revoluble head D, and two oppositely-disposed spring-jaws, 10 and 10', connected at their lower ends to the body-portion 9 and having serrated blade-engaging
 10 portions, 11 and 11', at the upper ends thereof, and a clamping-device consisting of a screw, 12, connected with one of said jaws, and a nut, 12', engaging the opposite end of said screw and bearing against the opposite jaw to clamp
 15 said jaws upon the blade held between them. The chuck is secured in its adjusted position with relation to the head D by means of a binding-screw, 13, extending through said head and engaging the chuck, as shown most
 20 clearly in Fig. 2 of the drawings.

The grinding-wheel, or button G is shown carried at the upper end of a resilient arm, 14, fixed at its lower end to a swinging arm, or carrier, F, pivoted at one side of the chuck E
 25 to the frame of the machine near the lower end thereof, as shown at 15 in the drawings. This swinging arm constitutes the carrier for the grinding-button G and the guiding mechanism therefor.

30 As herein shown the carrier F is made extensible, it being constructed in two pieces, 16 and 17, respectively, adjustably-secured together by means, preferably, of a clamping device, herein shown as a thumb-screw, 18,
 35 extending through an elongated slot formed in one member of the carrier and engaging the other member. The carrier F will have a limited swinging movement longitudinally of the chuck and the blade E' held thereby,
 40 it being limited in its movement by stops, or abutments, 19, projecting laterally from the base of the standard B, as clearly shown in Figs. 1, 2 and 3.

The grinding-button G is herein shown as
 45 secured to a friction-wheel, 20, the stem of which is journaled in a bearing, 21, formed at the upper end of the resilient arm 14, the friction-wheel usually having a flexible rim of leather, rubber, or other suitable material.

50 The driving-mechanism will usually consist of a revoluble driver, H, carried upon a stud, 23, secured to the upper end of the carrier F, as most clearly shown in Fig. 1, said driver having its rim in frictional-engagement with and being adapted for driving the
 55 friction-wheel 20 to which the grinding-button G is secured. This driver may be rotated by a crank (not shown) secured thereto, but will preferably be automatically actuated by
 60 means of a suitable driving-device working in connection with the carrier itself. One form of suitable driving-apparatus for this purpose is shown in the drawings, and consists of a cord, 24, connected to the frame-
 65 work at 25, and passing over a series of pulleys, 26, supported upon studs secured to the framework whereby the movement of the

cord is multiplied several times. The cord is shown extending upward over a drum, 27, loosely mounted upon the stud 23 at the side
 70 of the driving-wheel H, as shown in Fig. 1. This drum carries a ball-clutch, designated in a general way by I, in position and adapted for engaging and rotating the driver H, said
 75 ball-clutch being herein shown as comprising a laterally projecting arm, 29, having a ball-receiving socket, 30, at the upper end thereof contiguous to the inner face of the rim of the driver H, and a ball, 31, carried in said socket
 80 and adapted for frictionally engaging the inner face of the rim of the driver, as will be clearly understood by reference to Fig. 1 hereinbefore referred to.

The upper end of the carrier F is shown recessed to form a casing for clutch-retracting
 85 spring, 32, which may be connected at one end with the clutch I, and at its opposite end to the drum 27 in the usual well known manner of connecting springs for analogous pur-
 90 poses. This spring is adapted for retracting the clutch at each operation thereof. The manner of connecting springs of the form of spring 32, shown in dotted lines in Fig. 2 to
 95 two members for the purpose of retracting or advancing one member with relation to the other member being so well known in the art, a further illustration and description of this particular mechanism are deemed unne-
 100 cessary to a clear understanding of the operation thereof.

The carrier F is shown as provided with a handle, 33, by means of which said carrier may be conveniently operated, and the resili-
 105 ent carrier arm 14 is shown provided with a thumb-piece, 14', by means of which the arm may be drawn backward to carry the grinding-button away from the razor or blade being sharpened as described, as is sometimes necessary, and as shown in dotted lines in
 110 Fig. 2 of the drawings.

The driving-wheel is made excessively heavy relatively to the other parts of the machine so that when the carrier is moved forward, the wheel being set in motion by said forward movement, will have sufficient mo-
 115 mentum to continue its rotation during the backward movement of the carrier, so that notwithstanding the intermittent manner in which the driving-wheel is actuated, it will have a continuous revolution so long as the
 120 carrier is moved back and forth at regular intervals, which in practice may have a duration of five to fifteen seconds, or even longer.

The revoluble grinding-button is lubricated at one end of its movement by a sponge, 34,
 125 which is kept saturated with oil, water, or other lubricant, said sponge being herein shown secured in a holder, J, which consists, preferably, of a sleeve, 35, revolubly-supported upon a stud, 36', secured in the end
 130 of an arm, 36, and having a laterally projecting arm, 37, with spring-jaws, 38, at the end thereof, between which jaws the sponge is supported, the arm 36 being preferably se-

cured to or formed a part of the body-portion of the chuck E. Formed upon the end of the sponge-holder sleeve 35 is a projection, 38, adapted for engaging in a notch, 39, formed in the arm 36 which holds the sponge in an upright position and in position to be brought in contact with the grinding-wheel as the said wheel is carried over the end of the blade E'. This holder is adapted to be turned down out of the way when desired, a spiral spring, 40, secured to the end of the stud 36' and engaging the arm 37 retaining the holder in locked engagement, in its working-position, with relation to the arm 36, as will be understood by reference to Figs. 2 and 3 of the drawings.

I do not desire to limit myself to the employment of a spring arm 44, for supporting the grinding button, of the exact construction shown in the drawings, as any suitable arm adapted for adjustment laterally of the carrier F might be employed.

By constructing the carrier F in two parts, as herein described, the grinding-button and its driving mechanism may be raised and lowered with relation to the chuck which will adapt the machine to various kinds of work.

The general operation of the machine is as follows: Assuming the carrier of the machine to be in the position illustrated in Fig. 3, the movement of said carrier toward the right hand and toward the position shown in Fig. 2 will rotate the clutch-device I in the direction of the arrow in Fig. 3, carrying the driver therewith, and, owing to the frictional engagement of the driver with the friction wheel, will rotate the grinding-button. When the carrier has reached the position shown in Fig. 2, the ball of the clutch will be thrown out of engagement with the rim of the driver allowing the driver to rotate by its own momentum during the return movement of the carrier to the position shown in Fig. 3, thus continuously rotating the grinding-button. After one side of the blade E' has been properly ground, the latch 3 is thrown out of engagement with the lock-notch of the standard B, and the head D together with the chuck will then be swung to the right to bring the opposite side of the blade in position to be acted upon by the grinding-button, the chuck being locked in this position by engagement of the latch or lever 3 with another lock-notch (not shown) formed in the side of the standard B opposite the lock-notch 5.

Having thus described my invention, I claim—

1. In a grinding-machine, in combination, a blade-holder, or chuck, an oscillating carrier, a grinding-button movably secured to said carrier, and a revoluble driver carried by said carrier in driving-engagement with the grinding button, and means for rotating said driver, substantially as described and for the purpose set forth.

2. In a grinding-machine, in combination, a revoluble blade-holder, or chuck, a swinging

or oscillating carrier, a grinding-button carried by a spindle having a driven-wheel and revolubly carried by an arm movably secured to the carrier, a driver revolubly-supported on the carrier in peripheral engagement with the driven-wheel, and means for rotating said driver, substantially as described and for the purpose set forth.

3. In a grinding-machine, a blade-holding chuck revolubly-supported upon a standard or base, and adapted to be turned to successively present opposite sides of the blade to the action of the grinding-button, means for locking the chuck in its successive positions, in combination with a grinding-button movably connected with an oscillating carrier, and means for rotating said button, substantially as described.

4. In a machine of the class specified, in combination an oscillating carrier, a revoluble grinding-button yieldingly-connected with said carrier, a revoluble driver carried by said carrier in position and adapted for rotating the grinding-button, a clutch in connection with said driver, means for actuating said clutch, a revoluble blade-holder or chuck adapted to be turned to successively present opposite sides of the blade carried thereby to the action of the grinding-button, and means for locking said chuck in its successive working positions, substantially as described and for the purpose set forth.

5. In a machine of the class specified, the combination with the framework thereof, of a revoluble chuck-carrying head, means for locking said head in its adjusted positions, a blade-holder or chuck adjustably-carried by said head, a revoluble grinding-button shiftably-supported adjacent to said chuck, and means for rotating said button, substantially as described and for the purpose set forth.

6. In a machine of the class specified, the combination with the blade-holder or chuck of an oscillating carrier comprising two members adjustably connected together, a grinding-button connected with one of said members in position and adapted for operating upon a blade held by the chuck, and a revoluble driver carried by said member in position and adapted for rotating said grinding-button, substantially as described and for the purpose set forth.

7. In a machine of the class specified, a blade-holder or chuck adjustably-secured to a head revolubly carried by the framework of the machine, a grinding-button revolubly carried by a shiftable arm carried by an oscillating carrier at one side of said chuck, and means for rotating said grinding-button, substantially as described and for the purpose set forth.

8. In a machine of the class specified, the combination with a shiftable blade-holder, or chuck, and means for locking said chuck in its successive positions, of an extensible carrier, a grinding-button located at one side of the chuck and carried by a resilient arm se-

cured to said carrier, a revoluble driver connected with said carrier in position and adapted for rotating the grinding-button, a ball-clutch carried by said carrier and adapted
5 for engagement with the driver and carrying a drum, a driving-cord connected at one end to the frame of the machine and at its opposite end to said drum, and a retracting-spring connected with the carrier and engaging the
10 clutch, substantially as described and for the purpose set forth.

9. In a machine of the class specified, the combination with the standard B and with the blade-holder, or chuck, carried thereby, of an

oscillating carrier pivoted to said standard, a
15 grinding-button carried at the free end of a spring arm secured to the carrier, a driver carried by the carrier in position and adapted for rotating the grinding-button, clutch-mechanism for rotating the driver, and stops for
20 limiting the oscillating movement of the carrier, substantially as described and for the purpose set forth.

CHARLES A. WORDEN.

Witnesses:

F. C. AYRES,
LAVINIA JACKSON.