G. A. CARLSON.

WORK HOLDING DEVICE.

APPLICATION FILED AUG. 19, 1920.

1,430,625.

Patented Oct. 3, 1922.

2 SHEETS—SHEET 1.

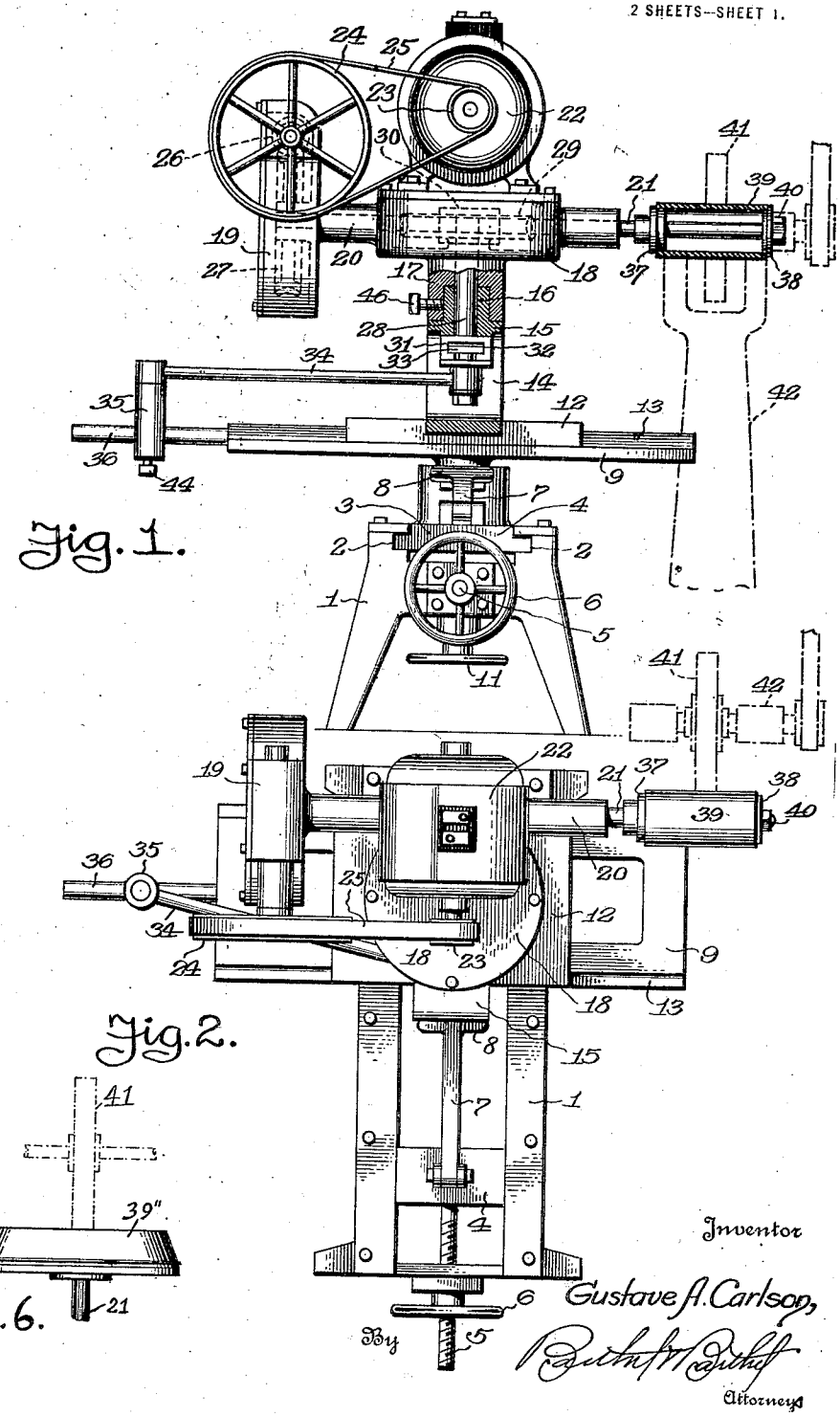


Fig. 1.

Fig. 2.

Fig. 6.

Inventor

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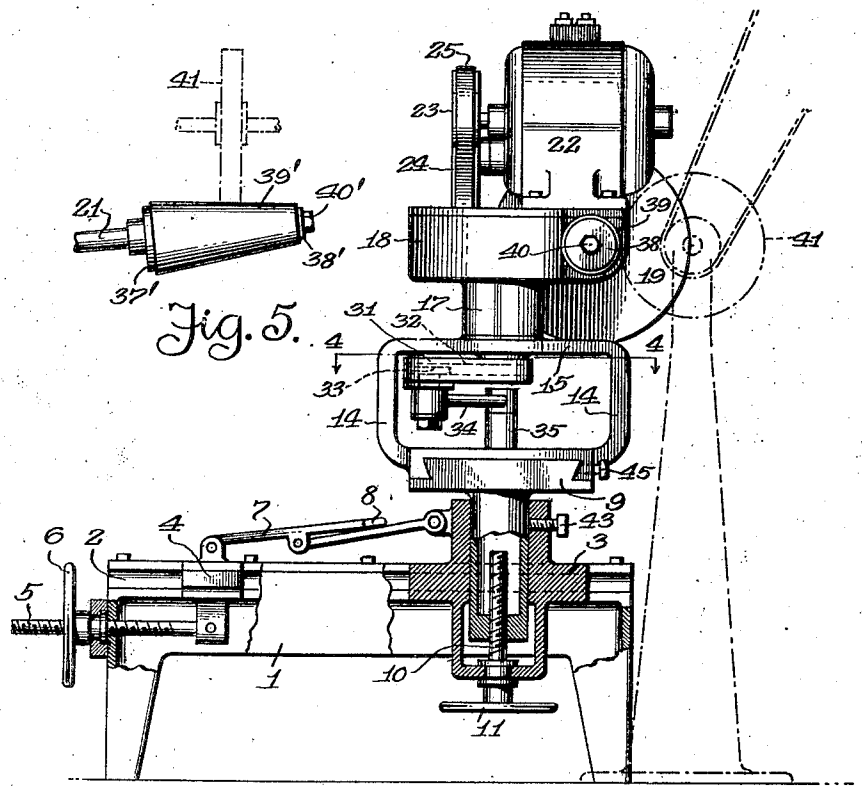


Fig. 5.

Fig. 3.

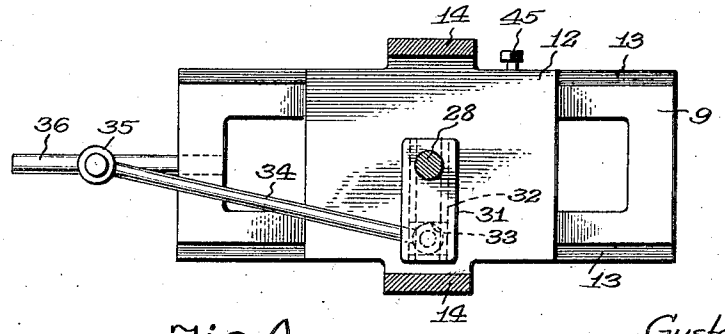


Fig. 4.

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UNITED STATES PATENT OFFICE.

GUSTAVE A. CARLSON, OF DETROIT, MICHIGAN.

WORK-HOLDING DEVICE.

Application filed August 19, 1920. Serial No. 404,649.

To all whom it may concern:

Be it known that I, GUSTAVE A. CARLSON, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Work-Holding Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to work holding devices for polishing machines, and has for its object the provision of means by which articles of circular cross section may be polished or buffed, whether cylindrical or tapering, even of considerable length, or disks of considerable width.

In the operation of the present device, the work is rotated and reciprocated while in contact with a regular polishing or buffing wheel of any suitable or well known type. Means are provided for adjusting the work with relation to the polishing device and for limiting the extent of movement as well as the location of the limits of the movement while in contact with the polishing means, so that a limited band of any desired width may be polished at any point along cylindrical or tapered work or on the face of a disk, while of course the entire surface may be polished.

The machine may also be used for small work which may be polished by simple rotation without reciprocation and it is thus adapted for a considerable range of work.

With this device, one workman may oversee the operation of a group of machines, since after the work has been placed in position and the work holder adjusted, the polishing operation is continued automatically.

In the drawings:

Figure 1 is an end elevation of my improved machine;

Fig. 2 is a plan view;

Fig. 3 is a side elevation partly in section;

Fig. 4 is a plan view, partly in section, on the line 4—4 of Fig. 3;

Fig. 5 is a fragmentary plan view, showing the relation of the shaft and chuck to the buffing wheel for tapering work; and Fig. 6 is a similar view of the same parts when disk-like articles are being polished.

I provide a suitable base 1 having ways 2 in which a support 3 is mounted for sliding movement. A block 4 also slidable in ways 2 may be adjusted longitudinally of the base by means of a screw 5 and hand wheel 6. This block 4 is connected to the support 3 by a toggle 7 having a handle member 8. With the toggle in the position shown in Fig. 3, adjustment of the block 4 by the screw and hand wheel causes the simultaneous adjustment of the support 3 longitudinally of the base 1.

A bed 9 is mounted in the support 3 for vertical adjustment by means of the screw 10 and wheel 11. A sliding table 12, mounted for reciprocation in ways 13 on the bed 9, has bracket arms 14, 14, extending upward and connected by a transverse plate 15 on which is formed a vertical bearing or cylindrical stud 16.

On the stud 16, is a head comprising a standard 17, gear casings 18 and 19, and a bearing 20 for the shaft 21. An electric motor 22 mounted on the gear casing 18, drives the shaft 21 by means of the pulleys 23, 24, belt 25, worm 26, and worm gear 27. A shaft 28 journaled in the standard 17 and stud 16, has at its upper end a worm gear 29 meshing with a worm 30 mounted on the shaft 21, and at its lower end is provided with a slotted arm 31. In the slot 32 of the arm 31 is slidably mounted a crank pin 33. A pitman 34 is pivoted at one end on the crank pin 33 and at its other end on the pivot member 35, which is adjustable along the bar 36 secured to the bed 9.

A suitable chuck, shown as comprising clamping heads 37, 38, mounted on the shaft 21, is used to hold the work 39 securely in place with its axis coinciding with that of the shaft 21, and any suitable securing means, as nut 40, may be used to hold the clamping means in position.

Any ordinary or well known form of polishing wheel or buffing means 41 is mounted on the support 42, with its axis of revolution substantially parallel with the path of movement of the reciprocating carriage or table 12.

The operation of this device will be evident from the description. When the work is mounted on the shaft 21 by means of the chuck members 37, 38, it may be adjusted in a plane parallel to that in which lies the axis of rotation of the polishing wheel 41 by the hand wheel 11, and in a plane at right angles to the former plane by the hand wheel 6, these two adjustments making pos-

sible the location of the work in the most advantageous position. When the bed 9 is adjusted vertically by the wheel 11, it may be secured at any point by the set screw 43. The horizontal adjustment of the bed toward and from the buffing means is made by the hand wheel 6 acting through screw 5 and block 4 on the toggle 7 to move the bed along the ways 2, on its support 3. After the adjustment is made, the toggle may be operated by the handle 8 to withdraw the work quickly from the buffing wheel and to return the next piece of work to the adjusted position by a rapid movement, without disturbing the adjustment.

When the motor is started, it drives the shaft 21, rotating the work in contact with the buffing wheel. At the same time, the vertical shaft 28 is rotated by its gear 29 in mesh with the worm 30, and the crank arm 31 is driven by the shaft 28. The crank arm 31 is pivoted to the pitman 34, which is pivoted to the member 35 secured to the bar 36. The rotation of the crank arm pivoted to a pitman which is pivoted at its other end to a fixed pivot results in the reciprocation of the carriage 12 on the ways 13, which are set parallel with the shaft on which the buffing wheel is mounted. The work moves longitudinally while rotating in contact with the buffing wheel, and the extent of this longitudinal movement is determined by the adjustment of the crank pin 33 along the crank arm 31 with respect to the axis of the shaft 28, while the location of the limits of the reciprocating movement may be adjusted by sliding the member 35 along the bar 36 and securing it in adjusted position by means of the set screw 44. Thus, a limited band of any desired width may be polished at any point along the work, it being understood that the entire length may be buffed.

When a tapering piece of work 39′ (Fig. 5), is mounted on the shaft 21 by the clamping heads 37′, 38′, and nut 40′, the standard 17 is adjusted angularly on the stud 16 to bring the surface of the work parallel with the shaft on which the buffing wheel 41 is mounted. The set screw 46 holds the head in the adjusted position, and the table 12 reciprocates parallel to the shaft on which the buffing wheel is mounted, and parallel to the face of the work as it rotates.

For small work, where longitudinal reciprocation is not necessary, the crank pin may be set in line with the shaft 28, or the pitman may be disconnected and the table 12 held in place by a set screw 45.

After a piece of work is polished, the support 3 is slid back along the ways 2 by pulling up on the handle 8 of the toggle, and the removal of the polished piece and the placing of the next in position in the chuck is done at a distance from the buffer.

A disk such as 39″ in Fig. 6, is mounted with the shaft 21 at right angles to the shaft of the wheel 41 and reciprocated across the face of the wheel to polish the entire surface or a band of any width desired. Any suitable chuck may be used.

I claim:

1. A work holder for a polishing machine comprising a bed, a carriage mounted for reciprocation on the bed, a head mounted on the carriage, a shaft rotatably mounted in the head, a work-holding chuck on the shaft, and means carried by the head for rotating the shaft and for reciprocating the carriage.

2. A structure as defined in claim 1, having means permitting adjustment of the shaft angularly with respect to the path of reciprocation of the carriage.

3. A work holder for a polishing machine comprising a base, a support adjustable longitudinally of the base, a bed carried by the support, a carriage mounted for reciprocation on the bed, a head on the carriage, a motor on the head, a work-supporting shaft driven by the motor, and means driven by the motor for reciprocating the carriage.

4. A structure as defined in claim 3, having a toggle by which the support may be moved to and from its adjusted position.

5. A structure as defined in claim 3, having means permitting angular adjustment of the head with respect to the path of movement of the reciprocating carriage.

6. A work holder for a polishing machine comprising a bed, a carriage mounted for reciprocation on the bed, a head on the carriage, a motor on the head, a shaft having a work-holding chuck, and a shaft having a crank arm, each journaled in the head and rotated by the motor, and a pitman pivoted at one end to the crank arm and at its other end to a pivot member mounted on the bed.

7. A structure as defined in claim 6, having means permitting adjustment of the shaft having the work-holding chuck angularly with respect to the path of reciprocation of the carriage.

8. A structure as defined in claim 6, having means permitting adjustment of the pivot member longitudinally of the path of movement of the carriage, whereby the limits of the reciprocating movement of the work-holding chuck may be adjusted.

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

GUSTAVE A. CARLSON.

Witnesses:
ARTHUR MINNICK,
H. C. UNDERWOOD.