(No Model.)

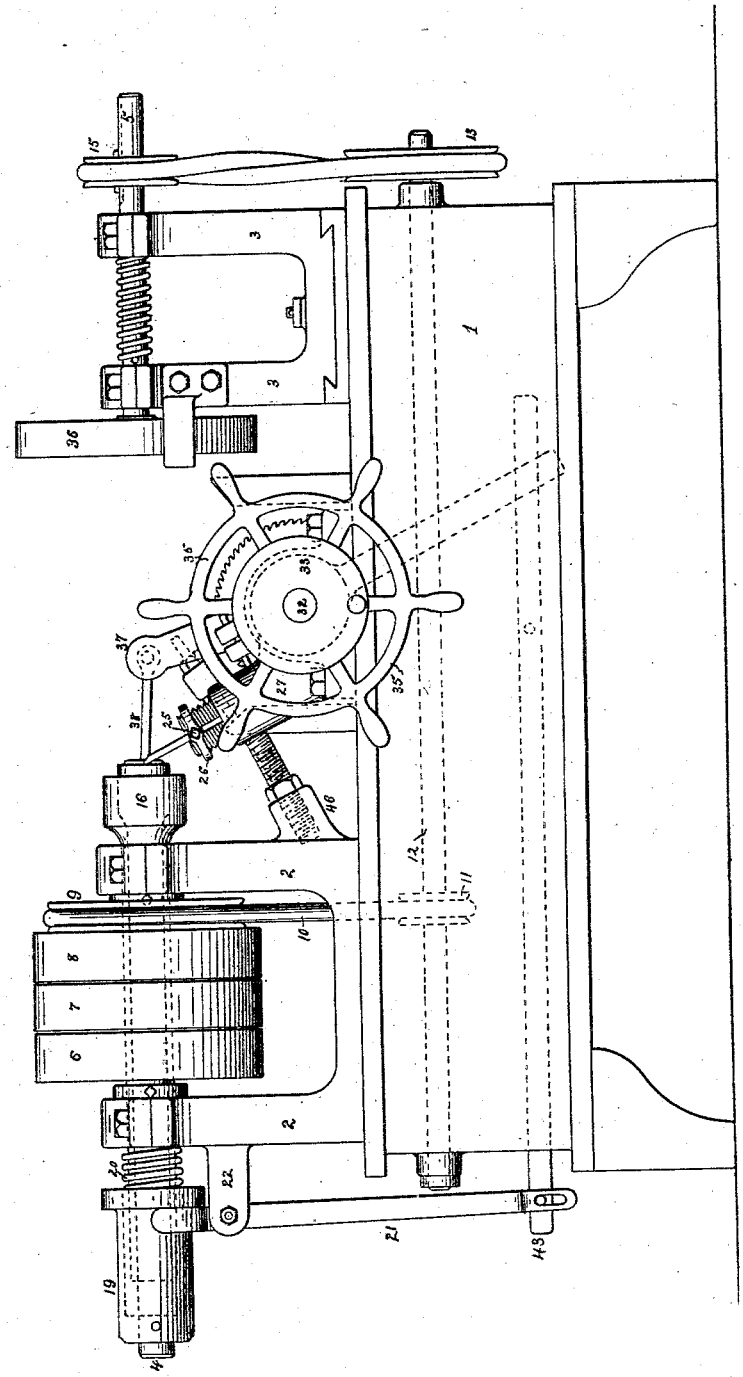
4 Sheets—Sheet 1.

# J. HENWOOD.

## BUTTON SHAPING MACHINE.

No. 556,748. Patented Mar. 24, 1896.

FIG. 1.



Witnesses:
F. D. Goodwin
Frank E. Bechtold

Inventor:
John Henwood
by his Attorneys
Howson & Howson

(No Model.)

4 Sheets—Sheet 2.

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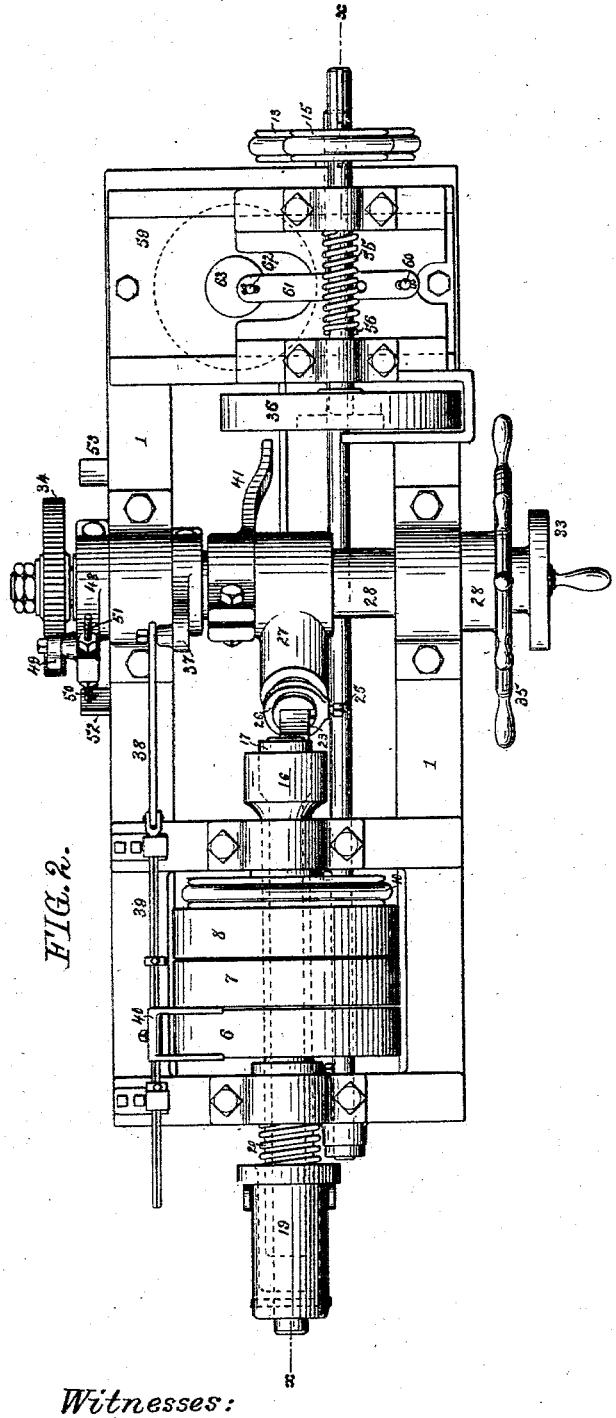

FIG. 2.

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(No Model.)

4 Sheets—Sheet 3.

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## BUTTON SHAPING MACHINE.

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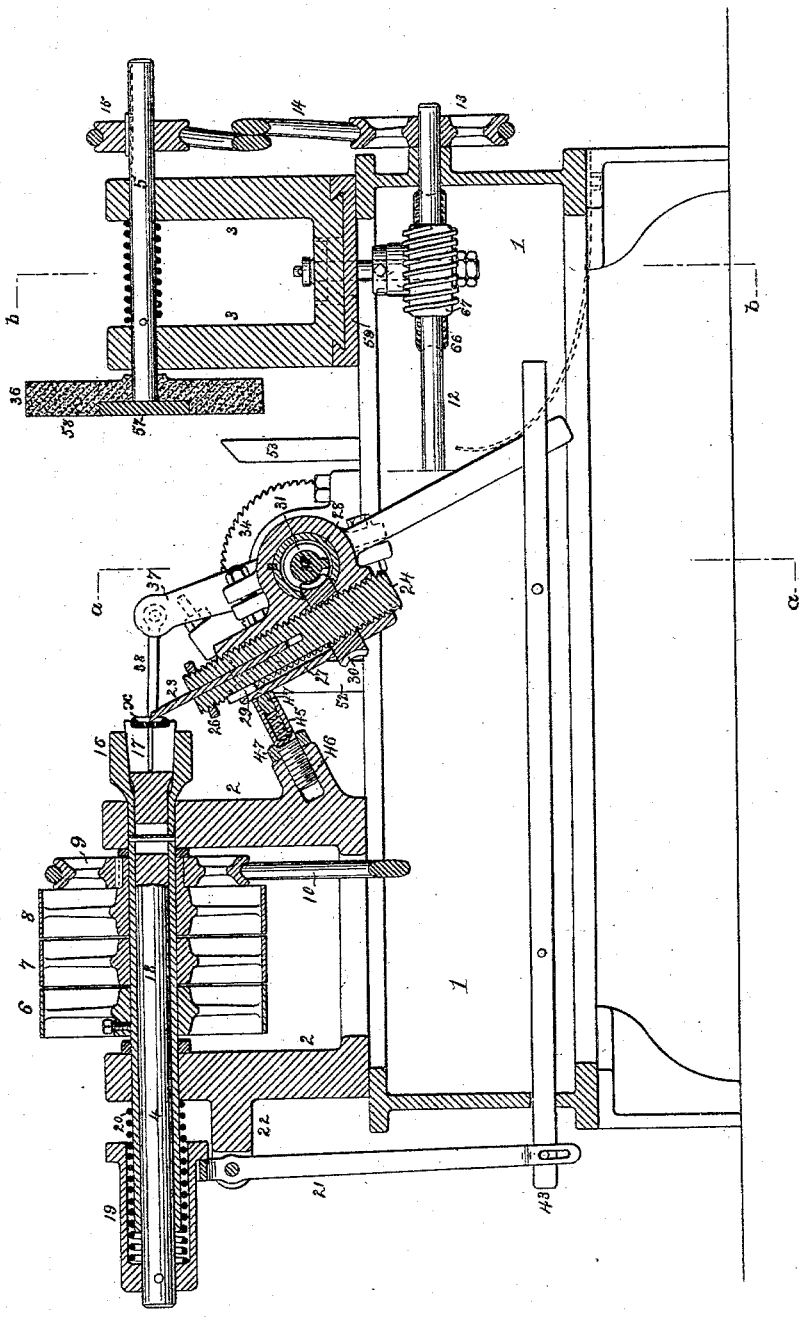

FIG. 3.

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(No Model.) 4 Sheets—Sheet 4.

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## BUTTON SHAPING MACHINE.

No. 556,748. Patented Mar. 24, 1896.

FIG. 5.

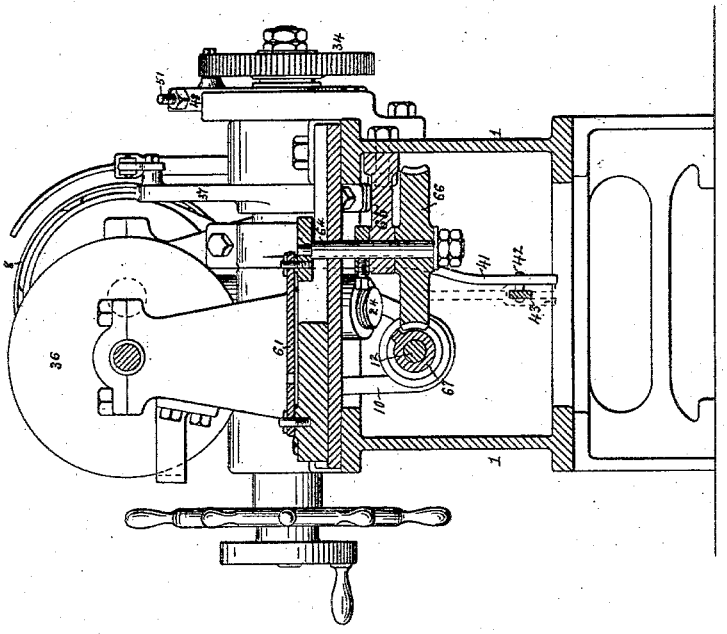
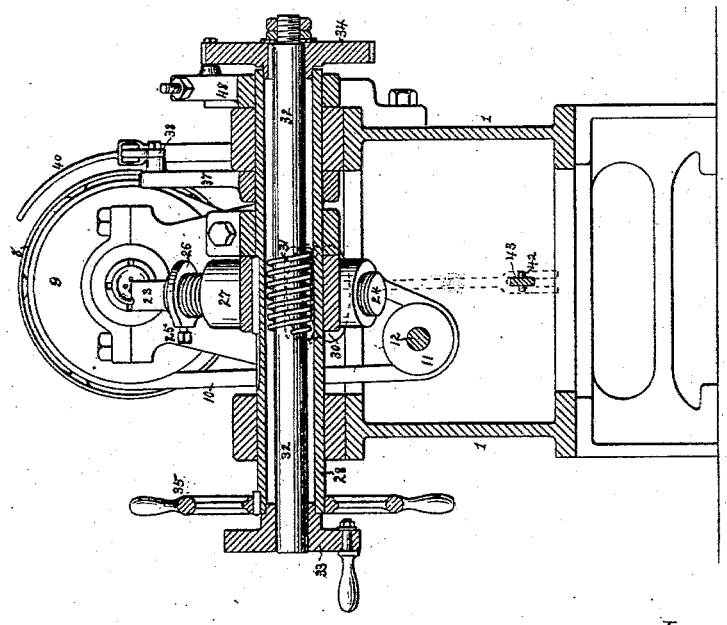


FIG. 4.



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# UNITED STATES PATENT OFFICE.

JOHN HENWOOD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JANE HENWOOD, OF SAME PLACE, AND JOHN C. MARTIN, OF PORTAGE, PENNSYLVANIA.

## BUTTON-SHAPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,748, dated March 24, 1896.

Application filed September 5, 1893. Serial No. 484,823. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HENWOOD, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Button-Shaping Machines, of which the following is a specification.

My invention consists of a machine in the nature of a turning-lathe in which the button-blank is held in a spring-jaw chuck and while being rapidly rotated is subjected to the action of a cutting-tool of such configuration as to properly shape the blank, my improvements comprising means whereby the cutting-tool can either be caused to act upon the button-blank or can be brought into contact with a sharpening wheel or disk; also, means for operating said wheel or disk for effecting the automatic feed of the cutting-tool and for causing the automatic release of the shaped button from the chuck preparatory to the insertion of a fresh blank therein, all as fully hereinafter set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a front elevation of a button-shaping machine constructed in accordance with my invention. Fig. 2 is a plan view of the same. Fig. 3 is a longitudinal section. Fig. 4 is a transverse section on the line *a a*, Fig. 3; and Fig. 5 is a transverse section on the line *b b*, Fig. 3.

The fixed frame or bed of the machine is represented at 1, and upon this fixed frame are mounted standards 2 and 3, said standards 2 having bearings for a shaft 4 and the standards 3 having bearings for the shaft 5. Upon the shaft 4 are mounted three pulleys 6, 7 and 8, the pulley 6 being secured to said shaft, but the pulleys 7 and 8 running loosely thereon. The pulley 8, however, is secured to a pulley 9, which receives a belt 10, the latter driving a pulley 11 upon a shaft 12, which is adapted to suitable bearings in the fixed frame 1 of the machine and has at one end a pulley 13 for the reception of a belt 14, which drives a pulley 15, secured to the shaft 5. When, therefore, the driving-belt is running upon the pulley 7, neither of the shafts 4 or 5 will be rotated, but when the belt is shifted onto the pulley 6 it will effect the rotation of the shaft 4, the shaft 5 still remaining stationary, while if the belt is shifted onto the pulley 8 the shaft 5 will be rotated and the shaft 4 will remain stationary. The shaft 4 terminates at the front end in a head 16 having a conical socket for the reception of the split conical chuck 17, the face of which is recessed for the reception of the button-blank *x*, and the stem 18 of the chuck extends through the shaft 4, which is made tubular for this purpose, and to the projecting end of the stem 18 is secured a tubular cap 19, which is acted upon by a coiled spring 20, tending to project the cap and draw the chuck 17 into the conical socket of the shaft-head 16, so as to clamp the button-blank between the jaws of the chuck. A flange upon the cap 19, however, is acted upon by the forked upper end of a lever 21 hung to a stud 22 on the standard 2, and this lever is actuated in the manner described hereinafter so as to thrust the cap 19 inward against the action of the spring 20 and thus loosen the chuck 17 in the conical socket and permit the discharge of a shaped button from the jaws of the chuck and the insertion of a fresh blank in place of the same.

The cutting-tool 23 is contained within a slot in a tool-post 24 and is retained in position therein by means of a set-screw 25, carried by a ring 26, which envelops the upper end of said tool-post, so that by slackening this set-screw the tool can be adjusted or fed forward as it becomes worn, and again secured in position after adjustment by tightening the set-screw.

In order to provide for the automatic feeding of the tool up to its work as it is gradually worn away the tool-post 24 is mounted so as to be free to slide in a swinging head 27, which is secured to a tubular shaft 28, adapted to suitable bearings upon the fixed frame 1 of the machine, a spline being formed in said tool-post for the reception of a feather 29 on the swinging head, so that said tool-post is prevented from turning in the head.

Fitted upon the tool-post is a worm-wheel 30 which is confined between bearings on the swinging head 27 and constitutes a nut for the tool-post 24, the turning of said nut in one direction or the other having the effect of feeding the tool-post up or down in the swinging head 27. With the worm-wheel 30

engages a worm 31, carried by a shaft 32, which passes through the hollow shaft 28 and has at one end a hand-wheel 33 and at the other end a ratchet-wheel 34. The hollow shaft 28 is provided with a capstan-wheel 35. Hence said shaft can be turned so as to vibrate the swinging head 27 in order to bring the cutting-tool 23 either into position for acting upon the button-blank in the chuck 17 or against the face of a sharpening wheel or disk 36, carried by the shaft 5, it being understood that the cutting-tool has to be frequently sharpened, owing to the hard and refractory character of the pearl of which the buttons are made. By mounting the tool in a swinging head, therefore, provision is afforded for applying the tool to the sharpening-disk as often as desired. For instance, it may be thrown over against the sharpening-disk after each cutting operation and while the shaped button is being removed from the chuck and a fresh blank is being applied thereto.

In order to automatically effect the shifting of the driving-belt so as to start the rotation of the shaft 4 and stop the rotation of the shaft 5 as the tool is moved toward the work and to stop the rotation of the shaft 4 and start the rotation of the shaft 5 as the tool is moved toward the sharpening-disk I provide the tubular shaft 28 with an arm 37, which is connected by means of a link 38 to the shipper-rod 39, which carries the belt-guide 40. When, therefore, the swinging head 27 occupies the mid-position, the belt will be directed to the central loose-pulley 7 and neither shaft will be rotated; but as the swinging head is moved to the left in order to bring the tool into action upon the work the belt will be shifted onto the pulley 6 and the shaft 4 will be rotated so as to rotate the chuck, while if the swinging head is moved to the right so as to carry the tool against the face of the sharpening-disk 36 the belt will be moved onto the pulley 8 and the shaft 5 will be rotated, the shaft 4 in this case being stopped so as to permit of the ready removal of the shaped button from the chuck and the insertion of a fresh blank therein.

In order to effect the automatic loosening of the chuck the shaft 28 is provided with a projecting arm 41, which is adapted to act upon a pin 42 projecting from a sliding bar 43 guided in the fixed frame 1 of the machine and engaging at the outer end with the long arm of the lever 21, so that as the swinging head 27 is moved to the right said lever 21 will be actuated in such manner as to move inward the cap 19 and chuck-stem 18, so as to loosen the chuck in the manner before set forth.

In order to limit the movement of the cutting-tool toward the button-blank and thus properly regulate the depth of cut formed in the latter I employ a stop-bolt 45, which is threaded externally for adaptation to an internally-threaded stud 46 on the standard 2, and is provided with a lock-nut 47, whereby it may be secured in position after adjustment, the motion of the swinging head being arrested by this stop-bolt when the cutting-tool is in proper position for the desired action upon the blank, and in order to prevent too quick an action of the cutter upon the blank I provide the stop-bolt with a spring-plug 47, which normally projects some distance beyond the end of the stop-bolt, and which is struck and depressed by the swinging head before the latter comes into contact with the end of the bolt, so that the movement of the swinging head is retarded as it approaches the limit of its swing to the left and an easy and gradual action of the cutting-tool upon the blank is thereby insured. A spring-stop, such as shown by dotted lines, may be used in place of the spring-plug, if desired.

The cutting-tool may be fed forward by rotating the hand-wheel 33 so as to compensate for the wear of the tool caused by the frequent sharpening of the same; but it may be advisable in some cases to provide for the automatic forward feed of the tool, and for this reason I provide the outer end of the hollow shaft 28 with an arm 48 frictionally mounted upon said shaft and carrying a pawl 49 for engagement with the teeth of the ratchet-wheel 34, which is secured to the end of the worm-shaft 32.

The arm 48 carries a pair of adjustable stop-screws 50 and 51, which by contact with the fixed stops 52 and 53 serve to govern the extent of vibration of the arm 48 and thus regulate the extent of movement imparted to the ratchet-wheel 34 on each vibration of the swinging head.

The shaft 5 which carries the sharpening-disk 36 is free to move longitudinally in its bearings, the disk being retained in its normal position by means of a spring 55 interposed between one of the shaft-bearings and a pin 56 or other suitable projections carried by the shaft.

In case of any undue pressure of the cutting-tool against the face of the sharpening-disk, however, the latter will yield and thus prevent on the one hand undue grinding away of the face of the cutting-tool, or, on the other hand, undue wear of the face of the disk.

The sharpening-disk is composed of two portions—namely, the central disk 57, consisting of a whetstone or like grinding-surface and an outer ring 58 of emery or the like surrounding the said whetstone-disk, either of these grinding-surfaces being brought into action by laterally shifting the standards 3 upon the transverse bed-plate 59, on which said standards are suitably guided, and which is bolted to the fixed frame 1.

In order to distribute the wear over the surface of the sharpening element which is in action I provide for a slow transverse movement of the sharpening-disk, which movement is effected by the following means: A

pin 60 on the base of the standard 3 is connected by a link 61 to a crank-pin 62 projecting from a disk 63, which is carried by a shaft 64 adapted to a bearing in the bed-plate 59 and in a bracket-arm 65 secured to and projecting inward from the fixed frame 1 of the machine, as shown in Fig. 5. The lower end of this shaft 64 is provided with a worm-wheel 66, with which engages a worm 67 upon the shaft 12. Hence whenever said shaft 12 is rotated rotation is imparted to the worm-wheel 66 and shaft 64, and the crank-pin of the disk 63 is caused to impart reciprocating motion to the standard 3.

The link 61 has two openings for the reception of the pin 60, the pin being adapted to the outermost of these openings when the whetstone surface of the sharpening-disk is in action and to the innermost opening when it is desired to use the emery or other grinding surface of the disk.

It will be evident that the disk may be so disposed as to present its periphery instead of its flat face to the tool, if desired.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. The combination of a chuck-shaft, a shaft for the sharpening-disk, and a swinging-tool carrier mounted on a fixed axis between the chuck and disk so that it can be swung so as to bring its tool either against a blank carried by the chuck or against the face of the sharpening-disk, substantially as specified.

2. The combination of a chuck-shaft, the shaft having a sharpening-disk, a swinging-tool carrier adapted to bring its tool either against the work in the chuck or against the sharpening-disk, two belt-pulleys, one driving the chuck-shaft and the other driving the shaft of the sharpening-disk, a belt-shifter, and a connection between the same and the swinging-tool carrier, whereby the chuck-shaft or the sharpener-shaft is caused to rotate on the movement of the tool toward the same, but is stopped on the movement of the tool away from the same, substantially as specified.

3. The combination of the chuck-shaft, the swinging-tool carrier, tool-feeding mechanism mounted upon and moving with said carrier, and an operative connection between said tool-feeding mechanism and the axial shaft of the tool-carrier, substantially as specified.

4. The combination of the chuck-shaft, the swinging-tool carrier, a nut mounted thereon, a threaded tool-post adapted to said nut, a shaft and worm-gearing whereby the nut may be rotated, substantially as specified.

5. The combination of the chuck-shaft, the swinging-tool carrier, a feed-shaft for adjusting the tool, a ratchet-wheel on said shaft, a pawl-carrier on the swinging-tool shaft and means for limiting the movement of said pawl-carrier, substantially as specified.

6. The combination of the chuck-shaft, the swinging-tool carrier, the sharpening-disk, a shaft for the latter yieldingly mounted in its bearings, and a spring for projecting said shaft and its disk, substantially as specified.

7. The combination of the chuck-shaft, the swinging-tool carrier, a shaft carrying the sharpening-disk, a carrier for said shaft, and means for laterally shifting said shaft-carrier, substantially as specified.

8. The combination of the chuck-shaft, the swinging-tool carrier, a shaft carrying the sharpening-disk, a carrier for said shaft, and means for laterally reciprocating said shaft-carrier, substantially as specified.

9. The combination of the chuck-shaft having a head with conical socket, the chuck adapted thereto, and having a stem passing through the chuck-shaft, the swinging-tool carrier, and means whereby the movement of said carrier is imparted to the chuck-stem so as to release the chuck as the tool is moved away from the work, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN HENWOOD.

Witnesses:

FRANK E. BECHTOLD,

JOSEPH H. KLEIN.