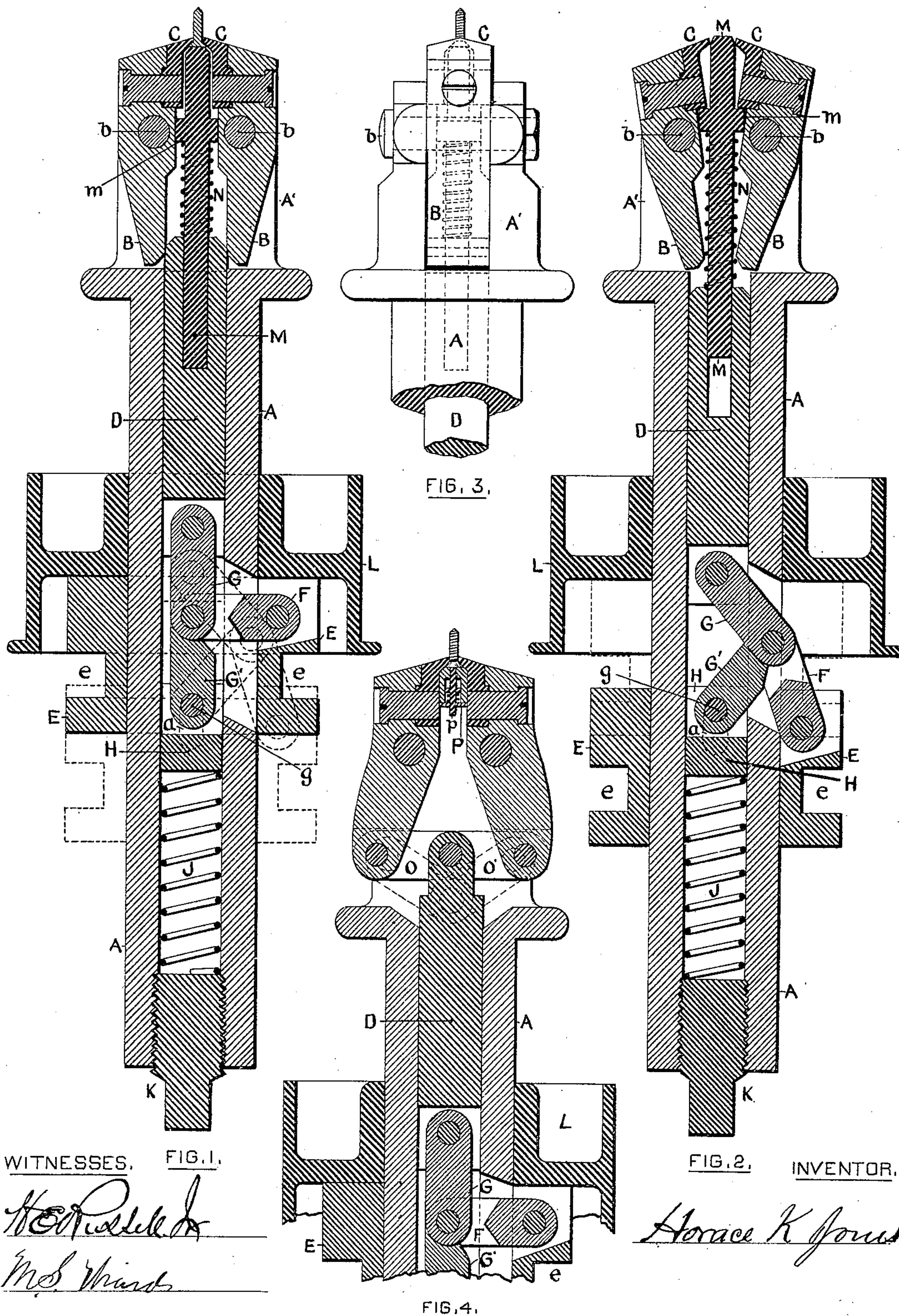


(No Model.)

H. K. JONES.
CHUCK FOR SCREW MACHINES.

No. 252,948.

Patented Jan. 31, 1882.



UNITED STATES PATENT OFFICE.

HORACE K. JONES, OF HARTFORD, CONNECTICUT.

CHUCK FOR SCREW-MACHINES.

SPECIFICATION forming part of Letters Patent No. 252,948, dated January 31, 1882.

Application filed June 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, HORACE K. JONES, of the city and county of Hartford, and State of Connecticut, have invented a new and useful
5 Improvement in Chucks for Screw-Machines; and I do hereby declare that the following specification, taken in connection with the accompanying drawings, forming a part of the same, is a full, clear, and exact description thereof. *

10 My invention relates to that portion of a screw-machine known as the "jaw-spindle"—that is, the spindle provided with jaws for holding the screw-blanks while they are being threaded, pointed, or otherwise operated upon.

15 My improvement consists in the combination of a sliding block having a wedge-shaped end or equivalent device for causing the gripping-jaws to close to gripe the blanks, a toggle-jointed lever connected with said block, and
20 which, when extended, will cause the block to be projected forward to its farthest extent of movement, and a link pivoted at one end to the knuckle-joint of such toggle-lever and at the other end to a sliding sleeve mounted on
25 the jaw-spindle, whereby, when the sleeve is moved by suitable mechanism to cause the jaws to close upon the blank, a powerful gripe will be effected by a very small movement of the sliding sleeve.

30 It also consists in the combination, with the said block, of a supplemental sliding piece, which is made capable of performing two functions, one of which is to form a seat for the head of the screw-blank and to assist in holding the blank in the jaws by exerting a positive pressure against the head. The other function which it is made capable of performing is
35 that of opening the jaws when the sliding wedge-block which closes them is removed and ejecting the blank from the jaws.

40 Referring to the drawings, Figure 1 represents in longitudinal section a spindle embodying my improvement with the jaws holding a blank. Fig. 2 shows the same with the parts
45 in the positions they assume when the blanks are released and ejected. Fig. 3 represents a view of the jaw end of the spindle, and Fig. 4 shows in longitudinal section another means of connecting the jaws with their operating
50 mechanism.

A is the annular portion of the spindle, and

A' the head thereof, which is slotted to receive the jaws B B, mounted therein on pivots *b b*. These jaws are provided with steel bushings C C, the faces of which are fitted to receive
55 and hold the blanks in a well-known way. The rear ends of the jaws are preferably beveled or rounded, in order that they may easily be moved from an open to a closed position by a sliding block, D, having a wedge-shaped end.
60 This block is located in the forward portion of the hollow spindle, and is arranged to slide longitudinally therein. Its forward movement closes the jaws, which are held closed so long as the opposite sides of the block engage the
65 inner faces of the rear ends of said jaws, as shown in Fig. 1, and its rearward movement allows the jaws to open, as illustrated at Fig. 2.

Forward and backward movements are imparted to the block D by a lever or shipping-
70 rod having a forked end, which occupies a score or groove, *e*, in a sleeve, E, arranged to slide upon the exterior of the spindle. To this sleeve is pivoted a link, F, which is connected to the pin of the knuckle-joint of a toggle-lever composed of two members, G G'. One end of the
75 member G is pivoted in the slotted rear end of the block D, and the outer end of the member G' is pivoted to a block, H, by a pin, *g*, which passes outward through the walls of the spindle A. Thus it will be seen that a forward-and-backward movement of the sleeve E will work
80 the toggle and produce a forward-and-backward movement of the block D, and consequently alternately close the jaws and allow
85 them to be opened.

In lever-acting jaw-spindles as heretofore constructed the jaws have been opened and closed by means of links which coupled the
90 jaws to a sliding rod, as shown in Fig. 4, and said sliding rod has heretofore been reciprocated through two sets of toggle-levers, each set corresponding with the toggle-levers G and G', (shown in Figs. 1, 2, and 4,) and the same
95 were operated by a sliding sleeve corresponding to my sleeve E; but instead of said sleeve being connected to said levers by means of a link, F, pivoted to said sleeve at one end and to the pintle of the levers at the other, as by
100 me, the prior levers, each corresponding to lever G', were extended outwardly beyond the periphery of the spindle, and thence through

slots or openings in the sliding sleeve, so that as the sleeve was moved to and fro it caused the levers to swing in and out, and thereby to operate the toggles. My combination of these
 5 triple toggle-levers with a sliding sleeve and a sliding rod for operating clamping-jaws is of value, in that my sleeve will perform its duties with an exceedingly short range of movement, can be readily contracted so as to require
 10 a spindle of small diameter, be easily and smoothly operated, and possesses a powerful clamping capacity.

Were it not that larger blanks than are intended to be regularly supplied to a definite
 15 spindle are liable to be accidentally inserted in the jaws, the block H could be secured in a permanent position by the pin *g*. Since such blanks are liable to be introduced into the jaws, however, a provision is made for the accommodation of the parts to such blanks, in
 20 order that the mechanism may not be injured. This is secured by having the pin *g* occupy slots *a* in the opposite sides of the spindle, one of said slots being shown by dotted lines in
 25 Figs. 1 and 2, and seating the block H upon a powerful spring, J, the rear end of which bears upon a plug, K, screwed into the rear end of the spindle, the said spring holding the pin *g* in engagement with the forward ends of the
 30 slots *a*. When the jaws close upon a blank of undue size the rear ends of said jaws will be nearer together than if the blank were of the size intended to be regularly supplied to the spindle. The block D therefore cannot enter
 35 between said ends to the extent shown in Fig. 1. The sleeve E, however, will have its full movement and force the block into engagement with the jaw ends; but when the toggles are straightened the block H will move rear-
 40 ward, the pin *g* sliding in the slots *a*, and the blank will be held by the force of the spring J, which force can be varied to the desired extent by adjusting the plug K. If the spindle is intended to be rotated, it is supplied with a
 45 pulley, L, secured thereto.

As thus far described the spindle may be of that class whose jaws hold the blank by gripping the shank or inclosing the head. I prefer to employ, however, especially for short-length
 50 screws, jaws having faces adapted to bear against the under or beveled side of the head of a blank, and a sliding block which forms a seat for the head of the blank, and which exerts pressure upon the head when the jaws are
 55 closed and clamps the blank between itself and the under faces of the jaws.

Referring to Figs. 1 and 2, M is a supplemental sliding block, whose rear portion occupies a cavity in the forward end of the wedge-
 60 block D, the said block M occupying such a relation to the gripping-jaws and block D that when the holding-faces C C close upon the under or beveled side of the head of the blank the rear end of the block M will take bearing
 65 upon the bottom of the cavity in the block D and the forward end of the block M will form a seat for the head of the blank, as shown in

Fig. 1, and by positive pressure upon the top of the head clamp the blank in the jaws.

I prefer in practice that the spring J should
 70 be made to exert a pressure upon the head of the blank through the medium of the block H, the toggle G G', and the blocks D and M. Consequently the parts composing the spindle
 75 are so constructed and proportioned that when screw-blanks of the usual and proper sizes as they ordinarily run are taken into the holding-jaws the movement of the sleeve E in straight-
 80 ening the toggle-links G G', and thereby causing pressure to be exerted by the block M upon the head of the blank, will, in consequence of the block M bringing up hard against the head of the blank before the links G G' are straight-
 85 ened, cause the compensating-spring J to be slightly compressed, and thus a practically-uniform clamping pressure is brought against the top surface of the head of the blank.

A yielding abutment for a pair of toggle-levers, each corresponding to my lever G', has heretofore been employed in jaw-spindles,
 90 and I therefore lay no claim thereto, except in combination with the supplemental block M, which is thereby forced against the head of the screw, thus supplementing the lateral clamping effect of the jaws by the clamping effect in-
 95 cident to a powerful direct thrust on the head of the blank.

In order to facilitate the ejection of the blank from the jaws after the operation of threading or of pointing has been performed upon it, the
 100 block M is provided with a collar, *m*, and surrounding the block, between said collar and the end of the wedge-block D, is a coiled spring, N, which is compressed, when the blanks are inserted in the jaws, by the feeding-fingers.
 105 This spring N, when the block D moves rearward and the jaws are free to open, reacts and causes the block M to be projected to pry open the jaws and eject the blank, as illustrated at Fig. 2.

Heretofore in jaws which closed upon a
 110 nicked screw-blank for centering it, and co-operating with a turn-screw operating after the manner of a screw-driver by engaging in the nick of the blank for rotating it with the jaws,
 115 said turn-screw has been provided with a spring which caused it to engage in the nick of the blank, and also contributed to the ejection of the threaded screw from the jaws; but in said
 120 prior combination the turn-screw and its spring did not perform the additional function performed by my supplemental block M and its spring—viz., to pry open the jaws for the reception of another blank—because in said prior
 125 combination the jaws were opened by the same mechanism which closed them.

I am also aware that spring ejectors have heretofore been employed in screw-threading machines for forcing a threaded screw from
 130 clamping-jaws; but I am the first to mount an ejector upon a wedge-block which closes the jaws and co-operates therewith for clamping the screw, and also for opening said jaws.

The operation of the device is as follows:

The blanks are supplied to the jaws by the usual feeding mechanism, the block M being retreated to the position shown in Fig. 1, by the engagement of the blank-head with the forward end of the block during the insertion of the blank. The sleeve E is now moved forward, thereby bringing the members G G' of the toggle into alignment. This forces the front end of the wedge-block D between the rear ends of the jaws, causing the steel bushings C C to press against the beveled side of the head, and at the same time brings the bottom of the cavity in said wedge-block in contact with the rear end of the block M and causes direct pressure to be exerted against the head of the blank to clamp the same, and this pressure is made yielding through the combination with the spring J, above described. After a blank has been operated upon, the sleeve E is moved rearward, thereby removing the wedge-block D from engagement with the rear ends of the jaws, and the spring N moves the block M forward to open the jaws and eject the blank, the parts assuming the positions shown in Fig. 2. The operations are then repeated for succeeding blanks.

In Fig. 4 the block D is moved by the improved toggle-link connection with the sleeve E, hereinbefore described; but in place of the wedge-block D and the supplemental pressure-seat M, the jaws are connected by links O O' to the sliding block D, and the blank is held in the jaws and subsequently ejected therefrom by the ejecting devices P p, substantially in the manner described in Letters Patent No. 210,221, issued jointly to E. Parker and myself November 26, 1878.

What I claim as my invention, and desire to secure by Letters Patent as an improvement in the jaw-spindles of screw-machines, is—

1. The combination, substantially as described, of lever-acting jaws adapted to hold

a screw-blank, a sliding wedge-block or equivalent means for causing the jaws to close upon the blank, a toggle-jointed lever for giving a to-and-fro movement to said block, and a link pivoted at one end to the knuckle of the toggle-lever and at the other end to a sliding sleeve on the jaw-spindle, whereby a powerful gripe can be given to the blanks by a small movement of the sliding sleeve, as specified.

2. The combination, substantially as described, of clamping-jaws, a sliding wedge-block or equivalent means for causing the jaws to close upon and gripe the blank, and a supplemental sliding block carried upon the wedge-block and operated by the movement thereof to clamp against the head of the blank after the closing of the jaws, whereby a positive pressure is applied to the head of the screw-blank to clamp it in the jaws.

3. The combination, substantially as described, of clamping-jaws, a sliding wedge-block or equivalent means for causing the jaws to close upon the blank, suitable mechanism for working the said wedge-block, a yielding seat, H J, for the same, and a supplemental sliding block, M, operated by the movement of the wedge-block, whereby a direct but yielding pressure can be exerted on the head of the blank to clamp it in the jaws.

4. The combination, substantially as specified, of the lever-acting clamping-jaws, the sliding wedge-block for closing said jaws, and the spring-acting supplemental sliding block mounted in and moving with said wedge-block, whereby said supplemental block serves with the jaws as a clamping device, as an ejector of the finished screw, and also to open the jaws for the reception of a blank.

HORACE K. JONES.

Witnesses:

H. E. RUSSELL, Jr.,
M. S. WIARD.