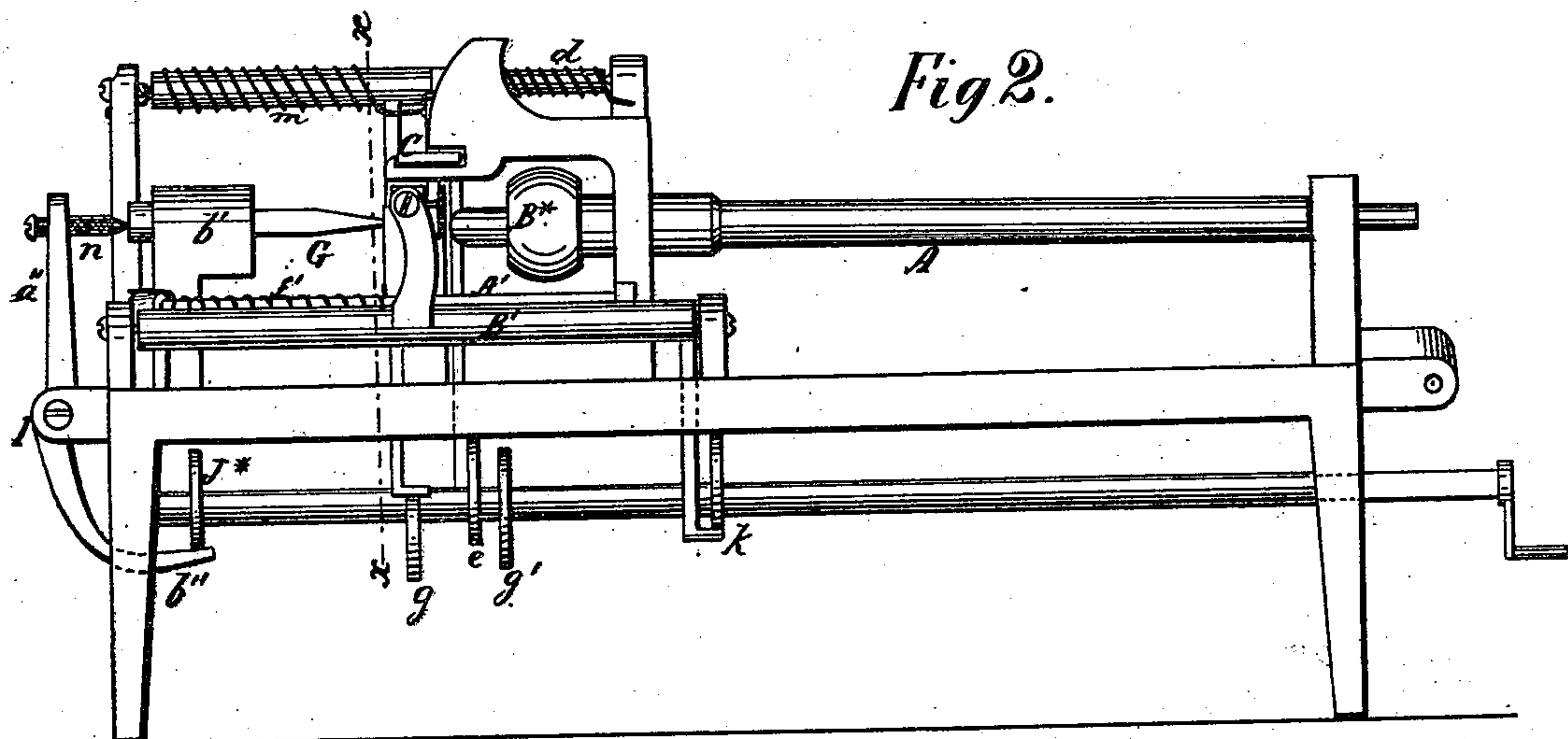
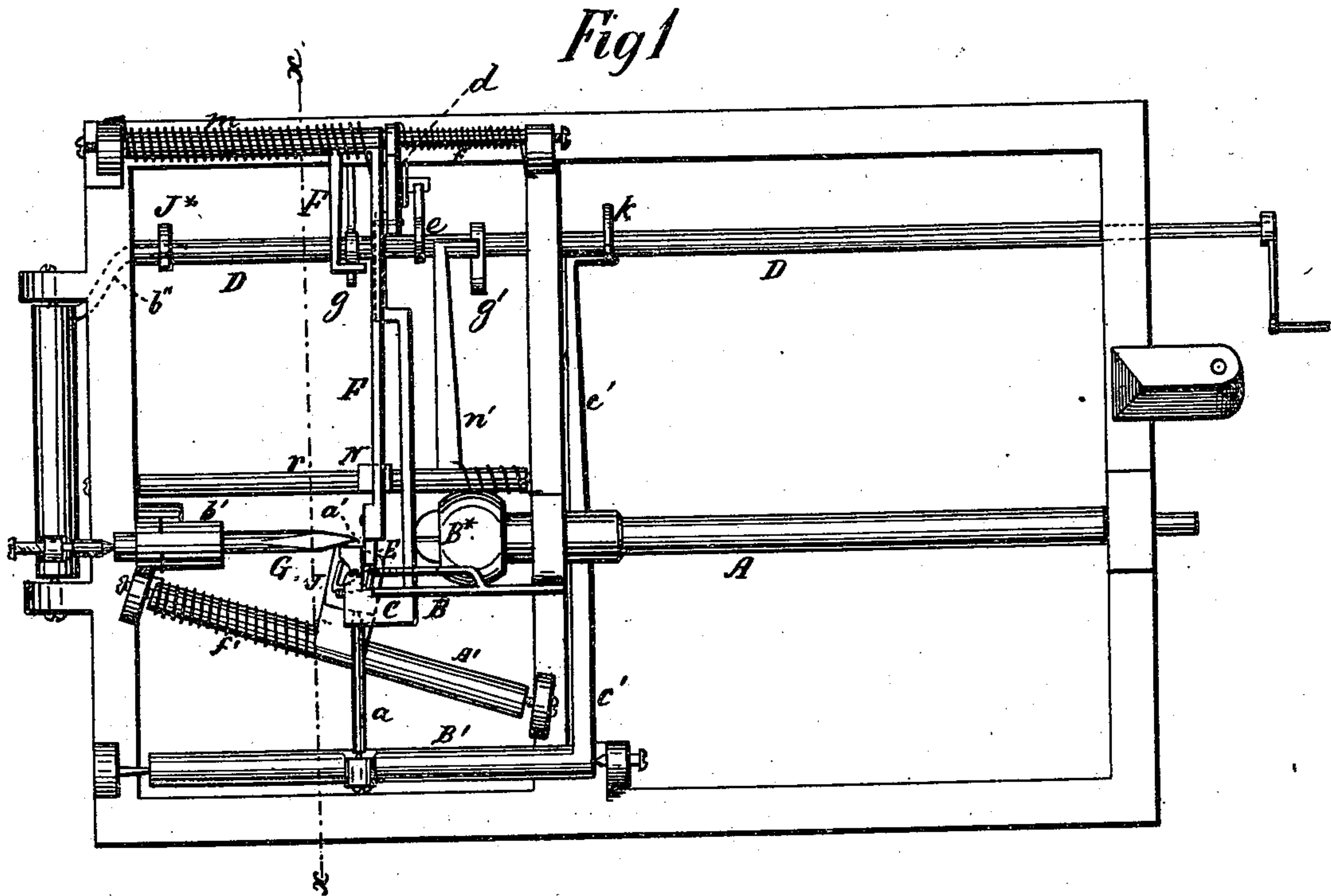


T. J. SLOAN.
MACHINE FOR MANUFACTURING WOOD-SCREWS.
No. 172,350. Patented Jan. 18, 1876.



Witnesses

Wm. Edwards
James R. Fitzgibbon

Inventor

Thomas J. Sloan
per James A. Whitney
Atty.

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Fig 3.

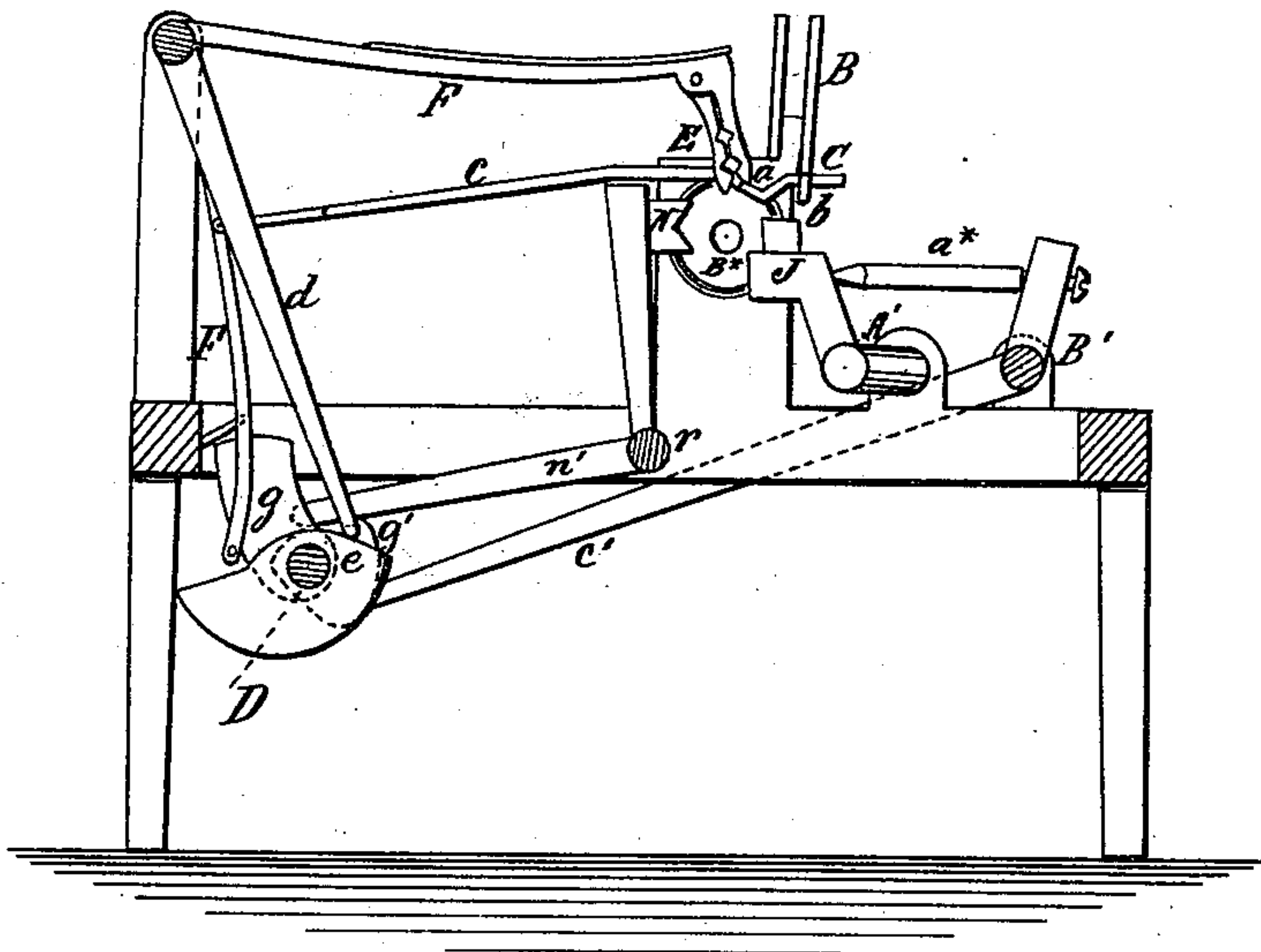


Fig 4.

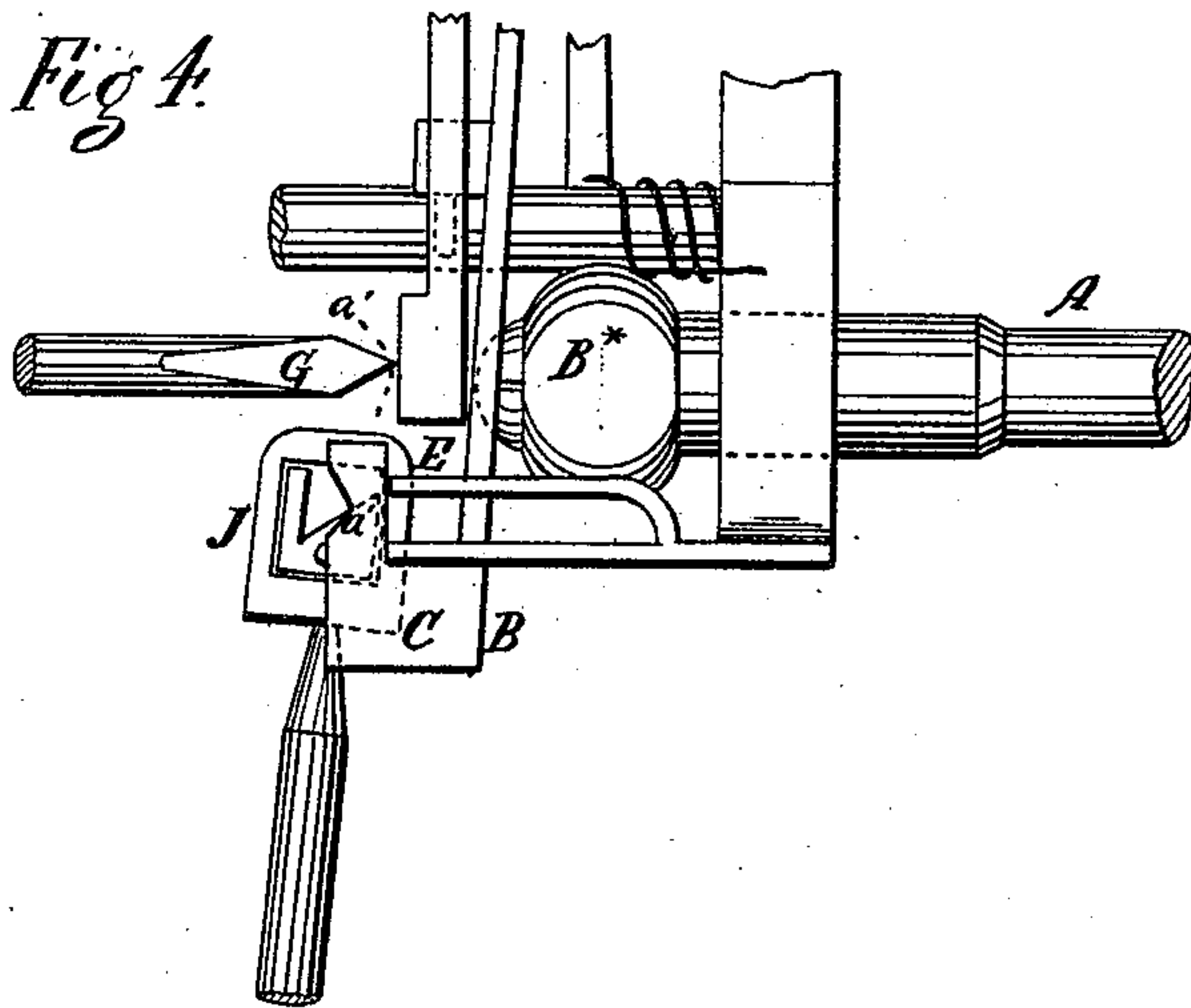
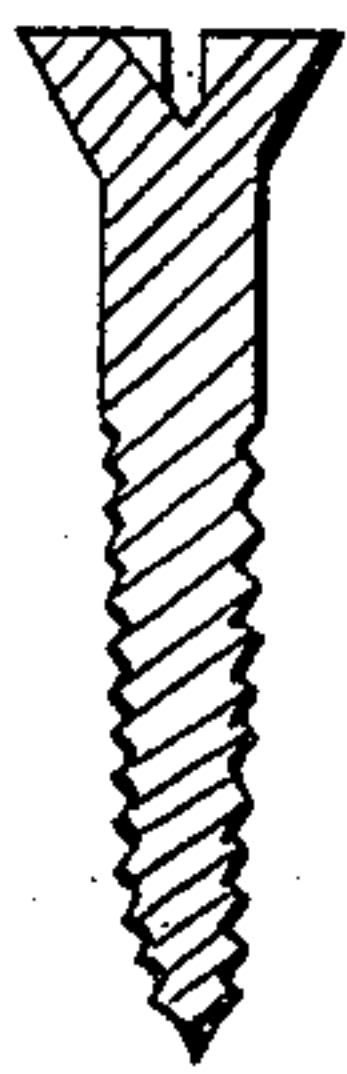


Fig 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

THOMAS J. SLOAN, OF NEW YORK, N. Y.

IMPROVEMENT IN MACHINES FOR MANUFACTURING WOOD-SCREWS.

Specification forming part of Letters Patent No. **172,350**, dated January 18, 1876; application filed May 25, 1875.

CASE B.

To all whom it may concern:

Be it known that I, THOMAS J. SLOAN, of the city, county, and State of New York, have invented certain Improvements in Machinery for the Manufacture of Wood-Screws, of which the following is a specification:

This invention is designed for use in the production of that variety of wood-screws in which the head of the screw is formed with a cavity, recess, or indentation, traversed by the usual nick or groove, so that, by the use of a specially-constructed driver, the screw may be turned or driven with far less liability of the slipping of the driver and of injury to the screw, and much less need of care in the adjustment of the driver than is required in the use of the common screw.

My present invention is intended for forming the hereinbefore-mentioned recess, cavity, or indentation in the head of the screw-blank after the formation of the latter by any of the usual or by any suitable means. To this end the invention consists in a novel combination of feeding mechanism, holding-jaws, and drill, whereby the blanks, passing automatically from the feeding mechanism to the holding-jaws, are firmly held by the latter while subjected to the action of the drill for forming the recesses in the heads, the blanks being thus passed, in succession, to the action of the drill, and the required recessing of the head being rapidly, cheaply, and effectually performed.

The invention also comprises the combination of a shaving-cutter with the drill, the jaws, and the feeding mechanism, whereby the operation of shaving the heads of the blanks may be performed in connection with the recessing of the said heads, thereby enabling the heads of my improved wood-screw, hereinbefore mentioned, to be shaped and finished at a cost only infinitesimally greater than that of the common wood-screws.

The invention also comprises a novel combination of a drill, constructed and arranged to have a longitudinal movement additional to its normal feed, with the carrying-fingers of a blank-feeding mechanism and the jaws, whereby the drill is made to serve the double function of forcing the blank through the said

fingers into the jaws, and of drilling the required recess in the head of the blank when the latter is held by the said jaws.

Figure 1 is a plan view of an apparatus made according to my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse sectional view in the line *x x* of Figs. 1 and 2. Fig. 4 is a detached view, on a larger scale, of certain parts of the machine; and Fig. 5 is a central longitudinal view of the screw in the manufacture of which my present invention is to be used.

A is a spindle, and B* a pair of holding-jaws attached thereto. These jaws may be made and operated in a manner identical with the jaws employed in the machines in common use for shaving the heads of screw-blanks; and such jaws being thus well known in the manufacture of wood-screws, no specific or detailed description of them is considered necessary in this connection. B is a channel or passage-way, through which the screw-blanks pass downward, in a horizontal position, to a carrier, C, in which is a transverse groove, *a*, of such size and proportions as to receive a blank from the channel B when brought coincident with the open lower end thereof. The carrier rests upon a guide, *b*, which sustains it in proper relation with the channel, and receives a longitudinal movement through a rod, *c*, from a pendulum-arm, *d*, which is swung in one direction by the action of a cam, *e*, on a driving-shaft, D, and in the other by a spring, *f*, applied at its upper end or point of suspension. The carrier is notched or slotted at its front edge, as shown at *a'* in Fig. 1, the said notch or slot *a'* crossing the groove *a*. E are spring-fingers, projecting downward from the upper arm of an elbow-lever, F, the lower arm of which receives a vibrating motion from a cam, *g*, on the driving-shaft, a spring, *m*, applied to the elbow-lever at its pivot or point of suspension, keeping the aforesaid lower arm thereof in due and proper contact with the cam *g*.

The channel B is supplied from a hopper in a manner well understood in the manufacture of wood-screws, the channel B, carrier C, and spring-fingers E being devices well known and applied in screw manufacture for con

ducting screw-blanks in succession to holding-jaws in the operations of nicking and shaving the heads of the blanks, and also in apparatus for threading the screws.

The operation of the devices is substantially as follows: The outward movement of the carrier C brings its groove *a* under the open bottom of the channel B, whereupon a blank from the latter drops into the said groove, and the reverse movement of the carrier brings it beneath the spring-fingers E, which then descend and grasp it. Meanwhile the jaws B* have been opened by suitable and well-known accessory mechanism. The spring-fingers E then bring the blank immediately in front of the jaws, and the forward movement (hereinafter described) of the drill G slides the blank through the fingers into or between the jaws, with the head of the blank projecting a requisite distance beyond the front of the said jaws, and the fingers E then retiring to their original position. The jaws are then automatically closed to gripe and hold the blank with its head projecting, as aforesaid.

The feeding mechanism just described is efficient, and as such may be used as one of the essential elements of my novel combinations; but any other usual or suitable devices for feeding the blanks in succession to the holding-jaws may be used in lieu thereof.

It is to be understood that the spindle A, and, consequently, the jaws B*, is capable of rotation by means of a belt and pulley or other suitable appliances applied to the shaft, and moving in due unison with the feeding mechanism, to receive the blanks in succession from the latter.

G is a drill, arranged in the axial line of the jaws B*, incapable of rotation, but capable of rectilinear movement in its bearings *b'*, which is provided upon the adjacent portion of the supporting-frame of the machine. The longitudinal movement of the drill is received from an upwardly-projecting arm, *a''*, of a rock-shaft, I, a lower arm, *b''*, of which is actuated by a cam, J*, on the driving-shaft; the said cam J* being of such configuration that, after having caused the arm *b''* to actuate the drill in forcing the screws or blanks to the jaws, as hereinafter fully set forth, it further causes the arm to give a normal feed to the drill, to drill the desired cavities in the heads of said screws or blanks while they are held in the jaws. The arm *a''* is connected with the outer end of the drill by a connecting-rod, *n*.

The blank having been gripped by the jaws B*, as hereinbefore explained, and the said jaws being rotated as in the ordinary shaving of the heads, the further inward movement or normal "feed" of the drill (the cutting end of which latter of course corresponds in size and shape to the recess or cavity to be formed in the head of the blank) causes the said drill to come in cutting or drilling contact with the flat outer surface of the head of the blank at the center thereof, and to drill therein the re-

cess, cavity, or indentation required, the drill then receding to its former position.

The blank is subsequently discharged from the jaws in the manner familiar in the operation of such jaws in shaving, nicking, and threading machines.

J is the shaving-cutter, arranged as in the usual relation with the jaws that hold the blanks, and with the feeding mechanism that conducts the blanks to the said jaws, and also in such relation to the drill G that while the latter is drilling the recess in the center of the head the cutter is engaged in shaving the remaining portions of the same, the movement of the drill being so controlled that the drill recedes slightly just as the cutter approaches the edge of the recess formed by the drill, by which means the head is shaved clear to the said recess.

The shaving-cutter is of the usual kind and configuration, and is carried on an arm of a rock-shaft, A', connected by a rod, *a**, with an arm of a second rock-shaft, B', a long arm, *c'*, of which extends to an actuating-cam, *k*, on the driving-shaft *f'*, being a spiral spring on the rock-shaft A', arranged to cause, by its tension, the outward movement of the shaving-cutter after the completion of shaving operation herein just described.

N is the usual back-rest, provided to support the blank against the pressure of the cutter, and actuated by a cam, *g'*, on the driving-shaft, the said cam acting on an arm, *n'*, of the rock-shaft *r*, which carries the said back-rest.

It will be seen that, the formation of the recess or cavity in the head of the blank being simultaneous with the shaving of said head, no appreciable increase of expense and no loss of time are involved in the production of my improved screw, hereinbefore referred to, as compared with the manufacture of the common wood-screw.

It should be understood that, if it be desired to only form the recesses in the heads of the blanks irrespective of the shaving of the said heads, the shaving-cutter may be dispensed with, and also that, so far as concerns the formation of the aforesaid recesses in the heads of the blanks, the same result would be achieved by the use, as equivalents of the construction hereinbefore described, of non-rotative jaws and rotating drill, and that, if desired, the parts may be so made and arranged that, instead of moving the drill to and from the blank, the latter may be moved to and from the drill.

What I claim as my invention is—

1. In a machine for recessing the heads of screw-blanks, the combination of a feeding mechanism, holding-jaws and drill, substantially as and for the purpose set forth.

2. The combination of a shaving-cutter with a feeding mechanism, holding-jaws, and drill, substantially as and for the purpose set forth.

3. In a machine for recessing the heads of screw-blanks, the drill constructed and ar-

ranged to have a longitudinal movement irrespective of its normal feed, in combination with the fingers E of the blank-feeding mechanism and the jaws B*, whereby the said drill is made to serve the double purpose of forcing the blank through the fingers to the jaws and recessing the head of the blank when the

said blank is held by the jaws, substantially as herein set forth.

THOS. J. SLOAN.

Witnesses:

W. M. EDWARDS,
JAMES A. WHITNEY.