

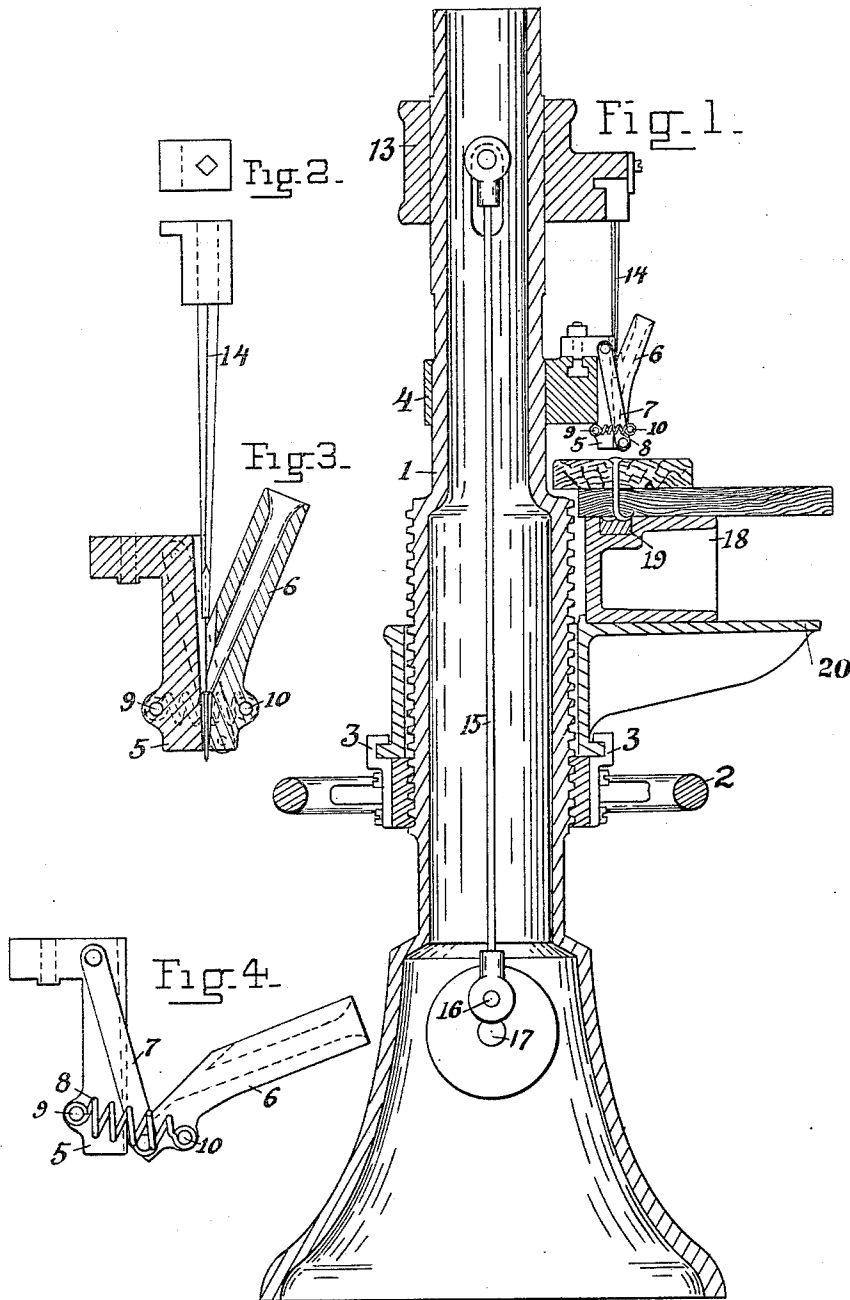
(No Model.)

2 Sheets—Sheet 1.

W. S. DOIG.
NAILING MACHINE.

No. 461,014.

Patented Oct. 13, 1891.



Witnesses=
Chas. A. Behrens.
Chas. B. Onderdonk.

Inventor,
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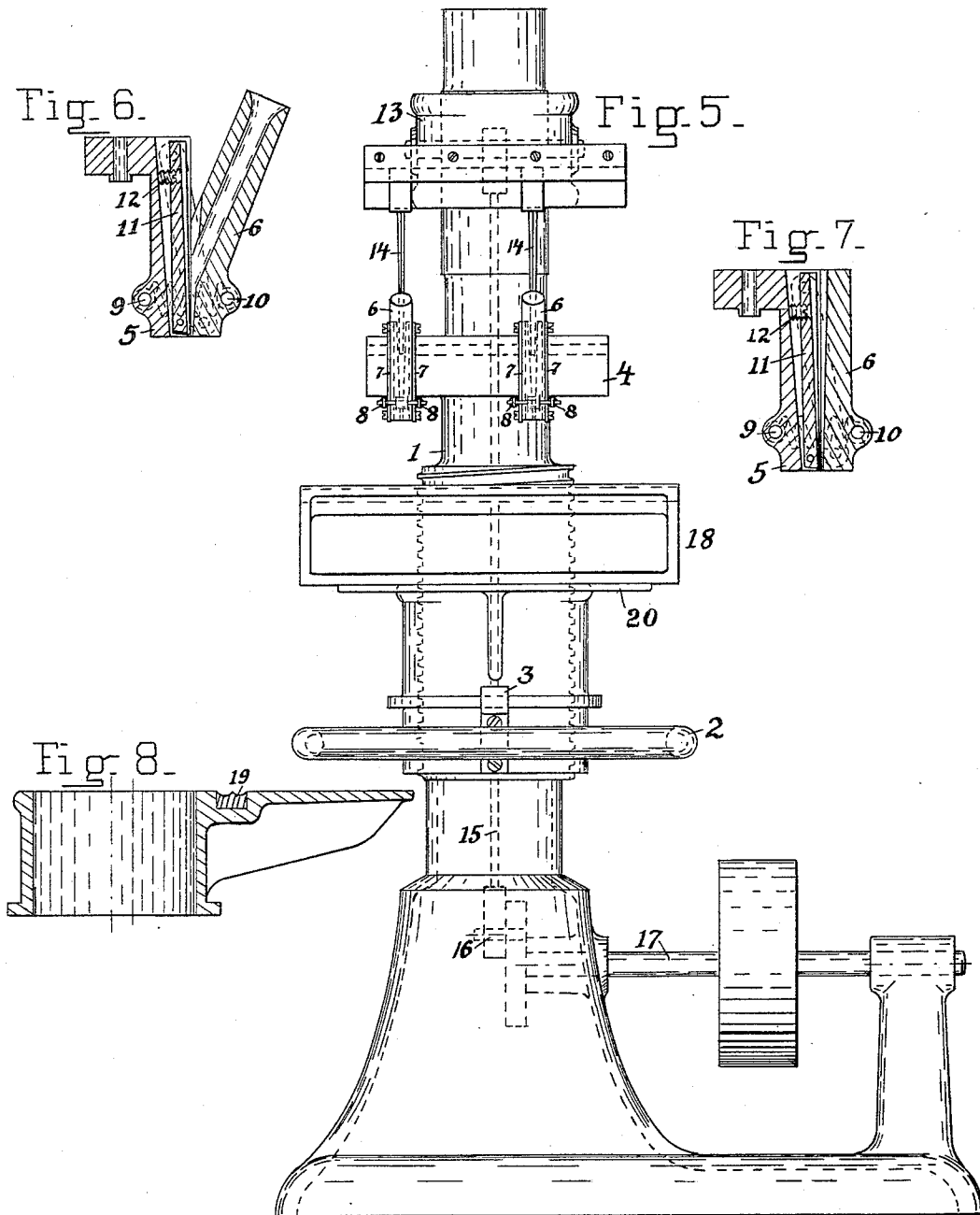
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UNITED STATES PATENT OFFICE.

WILLIAM S. DOIG, OF BROOKLYN, NEW YORK.

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 461,014, dated October 13, 1891.

Application filed July 18, 1890. Serial No. 359,183. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. DOIG, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented new and useful Improvements in Nailing-Machines, of which the following is a specification.

These improvements have been devised with special reference to their use in connection with nailing-machines embodying the improvements set forth in patents granted by the United States to Thomas L. Smith and Willaim S. Doig as joint inventors, and numbered and dated as follows: No. 265,166, September 26, 1882; Nos. 276,639 and 276,726, May 1, 1883, and Nos. 342,230 and 342,268, May 18, 1886. Several of the features now disclosed are, however, applicable with other types of nailing-machines.

Machines admitting of my improvements comprise as their essential features a platform for the support of the boxes or boards in which the nails are to be driven, one or more nail-boxes supported above the platform and each having a vertical channel to guide the nail into the wood, and above the nail-box a vertically-reciprocating head carrying punches that enter the channels in the nail-boxes and expel and drive the nails. My improvements in these elements relate to improved and simplified construction for the nail-box, the means by which the platform is elevated, in combination with the other elements of a nailing-machine carried from a column, and the means employed for clinching the nails, all as hereinafter described and claimed.

Referring to the two sheets of accompanying drawings, Figure 1 is a vertical section of the entire machine. Fig. 2 shows the head of the punch. Fig. 3 shows the punch and a section through the nail-box. Fig. 4 illustrates how the nail-box may be opened in order that access may be had for clearing obstructions. Fig. 5 is a front elevation of the machine. Fig. 6 shows a modification of the nail-box in which the inclination of one side of the channel guiding the nail is made adjustable. Fig. 7 is a modification of the nail-box dispensing with the oblique channel, and Fig. 8 shows a modification of the platform

in which the grooved bar for clinching nails is mounted.

In my drawings accompanying this application I have shown the several elements of my machine supported from a circular column 1. This column has a threaded portion carrying a hand-wheel 2. Above the hand-wheel is a platform 20, having a hub surrounding the column and free to slide vertically thereon. On the lower edge of this hub is a rim, over which clips 3 3, attached to the hand-wheel, engage and serve to carry the platform vertically when the hand-wheel is turned on the threaded column, thus affording adjustment between the platform and the nailing mechanism. Above the platform a nail-box frame 4, shrunk on the column, is provided with a horizontally-grooved cross-head, to which the nail-boxes are attached.

The nail-boxes are constructed as follows: A fixed jaw 5 is made fast to the cross-head of the nail-box frame. A movable jaw 6 is supported from this fixed jaw by links 7 7, hinged to the upper end of the fixed jaw and to the lower end of the movable jaw, so that by the yielding of these hinge-joints the movable jaw may be folded away from the fixed jaw either at the top for the purpose of inspection and cleaning of the nail-box, as shown in Fig. 4, or at the lower end to permit the passage of the nail-head when the nail is expelled. Springs 8, attached to pins 9 and 10 on the fixed and movable jaws, respectively, keep the two jaws normally closed together. These jaws taken together form the nail-box. A vertical channel lies partly in each jaw. It is open at its upper end for the entrance of the nail-punch, at the lower end for the expulsion of the nail, and serves as a guide for the latter as it enters the wood. This vertical channel is largest at its upper end and reduces with a uniform taper to the lower end, where it confines the nail near its point. By thus using a tapering channel the perfect centering of the nails and their uniform entrance into the wood are secured when the heads of the nails vary in size. In former designs of nail-boxes with jaws thus tapered both jaws have been held in place by springs, against which they yield for the passage of the head of the nail. In practice I have found

that the springs will not yield simultaneously, so that one jaw may as well be fixed, and that after the nail has entered the wood further guiding on the part of the nail-box is useless, as the wood then determines the course of the nail, and the machine will spring so as to permit the nail to take the course thus determined. I have found on experiment that nails can be driven with more precision with my new form of nail-box in which one jaw is fixed than with former designs.

In machines which I wish to adapt to a considerable range of work and drive nails having extra large or small heads an additional feature is introduced in the construction of the nail-box, as shown in Fig. 6. An adjustable block 11 is set in the fixed jaw and carries the unyielding portion of the vertical channel. This block is hinged near its lower end, and retained at the desired inclination by a screw 12 near the other end. For the insertion of the nail into the nail-box an oblique channel opening into the vertical channel is provided, as shown in Figs. 3 and 6. This channel, however, is not essential to a nail-box embodying the features above described and hereinafter claimed, and I have therefore shown in Fig. 7 a nail-box having the construction that I shall claim, but in which the oblique channel is omitted and in which the nail can be inserted only by entirely withdrawing the punch.

Above the nail-box frame is the punch-carrying frame 13, with its punch-carrying cross-head, to which the punches 14 14 are clamped. This frame can slide on the column and is reciprocated thereon. This reciprocation is effected mechanically through the connecting-rod 15, one end of which is attached to a bar in the punch-carrying frame, which passes through slots in the column, and the other end of the connecting-rod is carried by the crank-pin 16, which is revolved from the shaft 17. When the punch-carrying frame is in its highest position, the end of the punch lies in the vertical channel above the point where the oblique channel enters, so that a nail dropped in the oblique will reach the vertical channel and come under the punch. The punch is shown in this position in Fig. 3. When the form of nail-box illustrated in Fig. 7 is used, the punch is entirely withdrawn when the punch-carrying frame is in its highest position. When the punch-carrying frame descends, carrying the punch with it, the latter strikes the nail-head and drives the nail.

My nailing-machine is designed for two classes of work for which the requirements are different—that is, for the nailing of cleats onto boards and for the nailing together of boxes. In making boxes with cleats these are nailed to the sides which are to form the box before these sides are assembled, so in nailing on cleats the work does not stand as high above the platform as in the nailing together of boxes. In order to avoid the necessity of adjusting the platform closer to the nail-box

when changing from box-nailing to cleat-nailing, a cleat-nailing block 18 is placed on the platform. In this latter class of work, since the nails pass through the boards, it is desirable to turn and clinch the points. The natural way to effect this clinching of the nails is to have the points strike the side of a groove in a piece of metal on coming through the boards, so that the points will be deflected and turned back into the wood. As it is desirable in rapid work to place the boards over the groove before the nails are driven, and as variations in the grain of the wood render it uncertain just where the points of the nails are likely to emerge, either of two difficulties result. If the edge of the groove is too close to where the points of the nails are expected to emerge, some will strike the metal outside of the groove and fail to be clinched, or if the edge is sufficiently far away to insure that the points will come out over the groove some will come out so nearly over the center of the groove that they will not be properly deflected. I have avoided these difficulties by placing two grooves together, so that they join in a sharp ridge directly under the vertical channel of the nail-box. The nail, having a sharp point, will not be arrested by the sharp edge of the ridge, but will strike one side or the other and be deflected by the sides of the groove in which it strikes. These grooves are shown in a bar of steel 19, which may either be let into the cleat-nailing block, as shown in Figs. 1 and 5, or it may be let into the platform, as illustrated in Fig. 8.

I claim as new and desire to secure by Letters Patent—

1. In a nailing-machine, the combination, with a circular column threaded for a hand-wheel, of a hand-wheel encircling this column, so as to turn on its screw-thread, a platform having a hub surrounding and guided by said column and supported by the hub of said hand-wheel, a nail-box frame having a cross-head and supported from said column, a nail-box attached to said cross-head, a punch-carrying frame having a cross-head and guided by said column, so that it can be reciprocated thereon, and a punch carried from the cross-head of said punch-carrying frame and located above said nail-box, substantially as and for the purpose set forth.

2. A nail-box for a nailing-machine, consisting of a fixed and a movable jaw grooved on their adjoining faces, so as to form a channel for directing the nail, links hinged to the upper end of said fixed jaw and to the lower end of said movable jaw, and springs attached to both jaws, whereby they are drawn together, in combination with a punch for expelling and driving said nail from said channel, substantially as and for the purpose set forth.

3. A nail-box for a nailing-machine, consisting of a fixed and a movable jaw grooved on their adjoining faces, so as to form a channel largest at its upper end and reducing with a

uniform taper for guiding the nail, and
springs for drawing the jaws together, in
combination with a punch for expelling and
driving said nail from said channel, and a
5 supporting frame-work for the work and said
fixed jaw, substantially as and for the pur-
pose set forth.

4. A nail-box for a nailing-machine, consist-
ing of a fixed and a movable jaw, an adjust-
10 able block set in said fixed jaw and grooved
on its face opposite a corresponding groove
on the adjoining face of the movable jaw, so
as to form a channel for directing the nail,
and springs for drawing the jaws together, in
15 combination with a punch for expelling and
driving said nail from said channel, substan-
tially as and for the purpose set forth.

5. In a nailing-machine, a support for work,

having two grooves at right angles to which
they are adapted from their curved form and 20
size to turn and clinch the points of the
nails, as shown, and meeting in a ridge, in
combination with a nail-box located so as to
direct the nails through the boards to be
nailed together and in a line approximately 25
intersecting the ridge formed by said adjoin-
ing grooves, a punch for expelling and driv-
ing said nails from said nail-box, and a frame
carrying said support for work and said nail-
box, substantially as and for the purpose set 30
forth.

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Witnesses:

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