(No Model.)

2 Sheets—Sheet 1.

G. H. PERKINS.

NAILING MACHINE.

No. 254,566.

Patented Mar. 7, 1882.

FIG. 5.

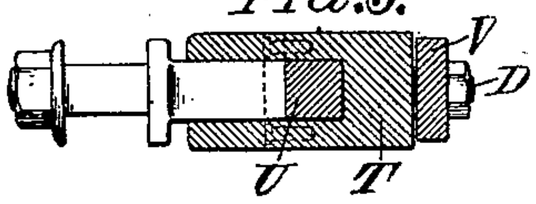


FIG. 8.

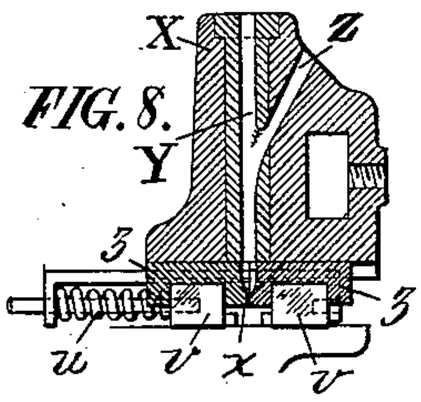


FIG. 1.

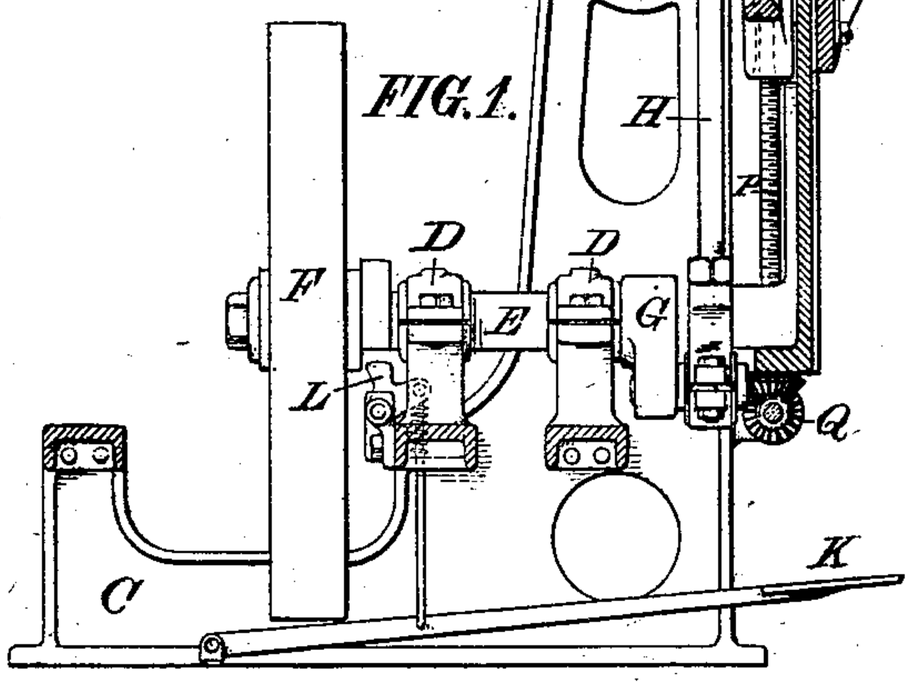


FIG. 2.

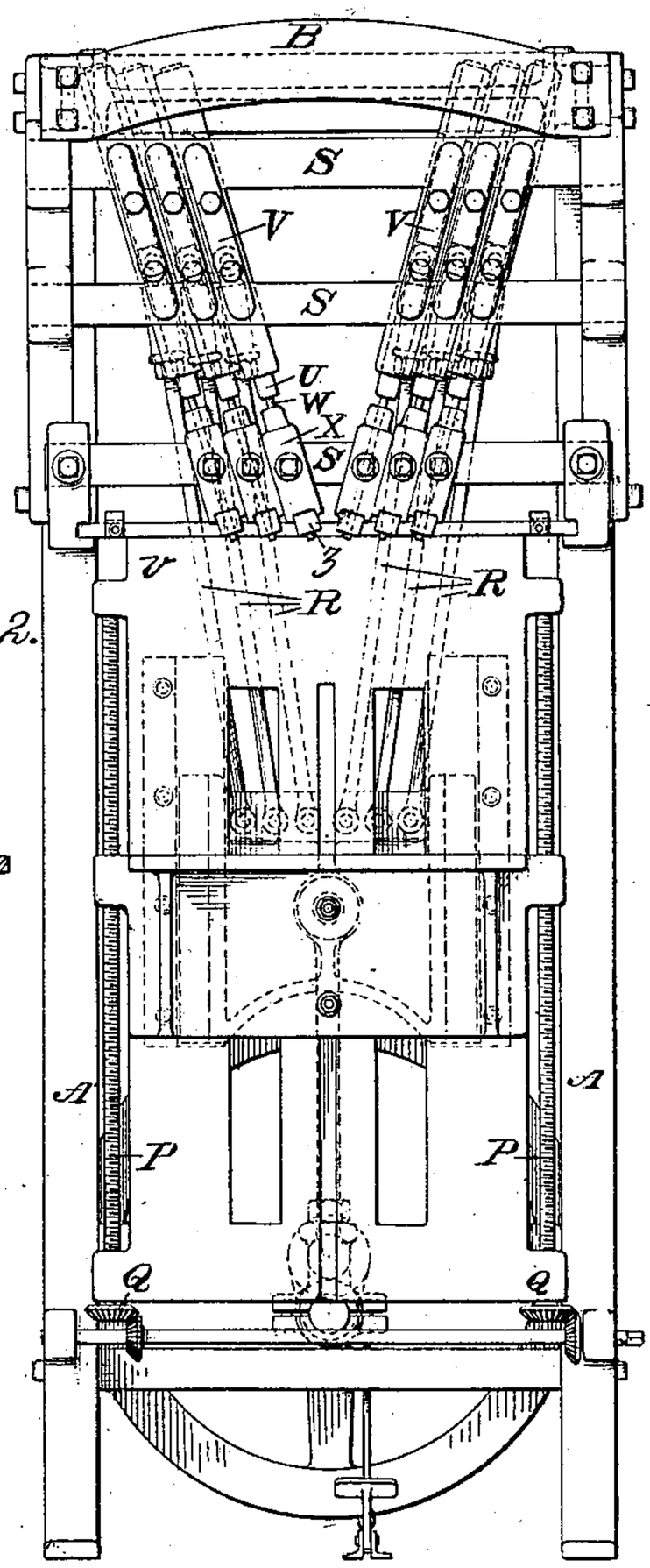
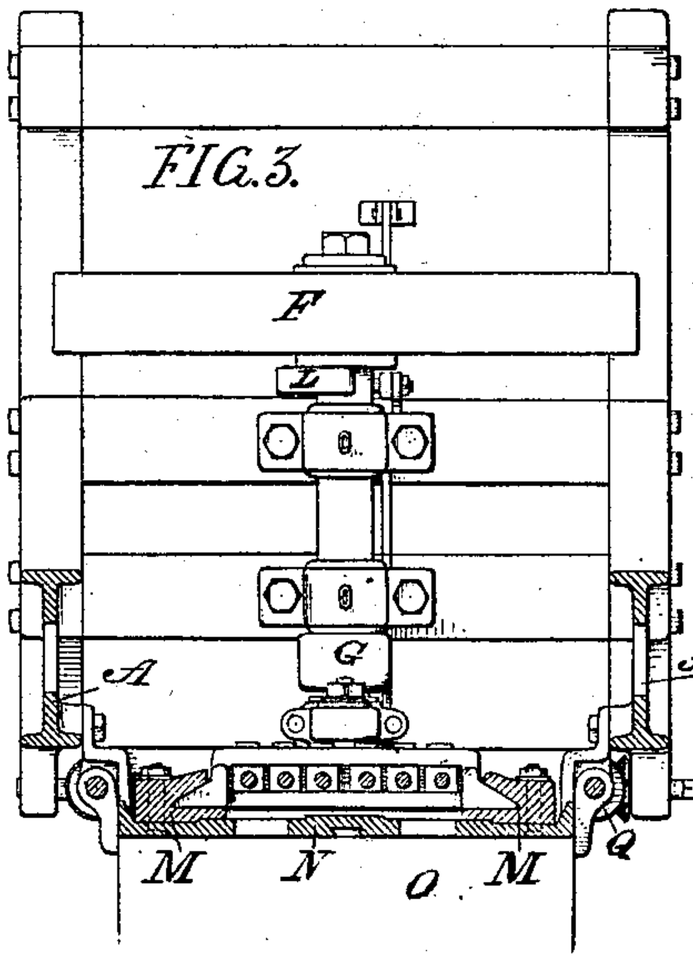


FIG. 3.



Attest,

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(No Model.) 2 Sheets—Sheet 2.

G. H. PERKINS.

NAILING MACHINE.

No. 254,566. Patented Mar. 7, 1882.

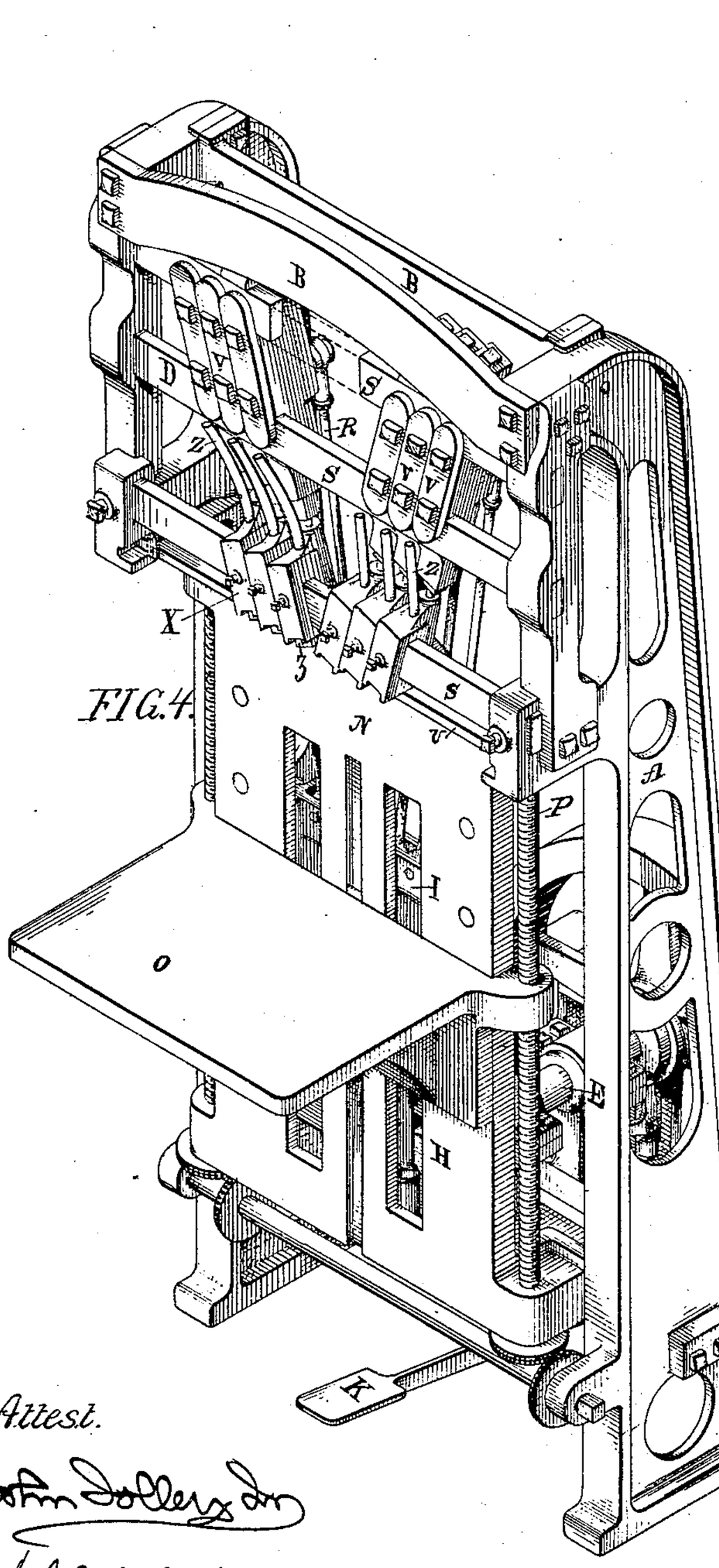

FIG. 4.

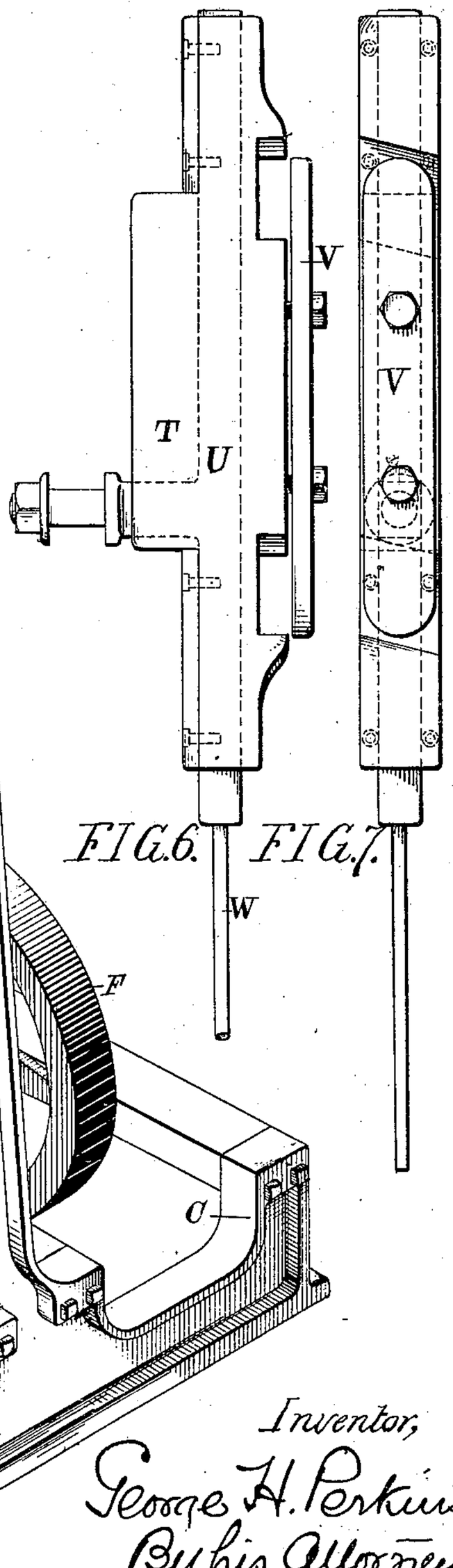

FIG. 6.

FIG. 7.

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UNITED STATES PATENT OFFICE.

GEORGE H. PERKINS, OF PHILADELPHIA, PENNSYLVANIA.

NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 254,566, dated March 7, 1882.

Application filed June 21, 1880. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. PERKINS, of Philadelphia, Pennsylvania, have invented an Improvement in Box-Nailing Machines, of which the following is a specification.

My invention relates to the class of machinery employed for automatically nailing boxes and other articles; and it consists, broadly stated, in the combination with a series of separate nail-driving plungers, each independently of every other capable of any desired lateral angular adjustment, and all conjointly operative for the driving of nails, whatever their respective adjusted positions may be, of a series of independent separable-jaw nail-holders, (best of a specific construction invented by me and hereinafter described,) each separately from every other capable of any desired lateral angular adjustment correspondent to that of the plungers aforesaid, and all conjointly operative for the holding of nails and the presentation of the same to the driving action of the plungers, in whatever adjusted position the said holders may have been placed.

The nail-driving mechanism, of which the plungers above named are a part, which I employ in my present invention, and which is hereinafter briefly described, is of my invention, and was patented to me in and by Letters Patent No. 240,332, dated April 19, 1881, but filed June 21, 1880, contemporaneously with this application.

It is to be understood that the above named nail-driving mechanism is susceptible of operation in connection with any nail-holder devices each of which is inherently capable of being placed and of operating after being placed at an angle corresponding with the angle at which a given nail-driving plunger of the said mechanism is placed, or in connection with any known form of nail-holder devices (many nail-holders, as such, being in existence) each of which, while retaining the construction which gives its principle of operation effect, can yet be adapted by the exercise of invention to be set at varying angles.

The nail-holders which, in combination with the nail-driving plungers of the above nail-driving mechanism, constitute broadly the subject-matter of this invention belong to that type of holder which is known as the "separable-jaw" holder, and in which separable jaws constitute the nail-emerging orifice, examples of such constructions being found in the following Letters Patent, viz: No. 9,112, granted July 13, 1852, to S. P. Carpenter; No. 38,924, granted June 16, 1863, to G. Wicke; No. 157,568, granted December 8, 1874, to E. Beard; No. 169,661, granted November 9, 1875, to F. M. Shaw, and No. 179,135, granted June 27, 1876, to F. Rochow.

Heretofore nail-holders of the above type have been of such construction as to be operative only for the vertical driving of nails, have in certain instances been separately inoperative and only operative in series, and have also in certain instances been dependent for operativeness upon mechanism intermediate between and connective of the jaws and the plunger-operating instrumentalities.

I have designed to make a holder which, while embodying separable jaws to constitute the nail-emerging orifice, shall yet be not only separately operative, but also wholly self-operative, or operative *per se* and independently of extrinsic operating devices, and shall also be capable of separate lateral angular adjustment.

In the carrying out of the above design I have devised the holder hereinafter described, which, while operative vertically, is especially designed for use in angular positions, although only capable of such latter use in combination with the angular-driving nailing mechanism patented as such to me and hereinbefore referred to, or with any kindred mechanism, being an improvement thereupon and embracing the vital capacity thereof or that of the simultaneous driving of separate nails at angles either opposite, varying, or coincident.

In the accompanying drawings, Figure 1 represents in central sectional side elevation my patented nail-driving mechanism with my improved nail-holder embodied therewith. Fig. 2 is a front elevation of the same. Fig. 3 is a top plan view sectioned on the line 1 2 of Fig. 1. Fig. 4 is a perspective view. Fig. 5 is a top sectional view taken on the line 3 4 of Fig. 1. Fig. 6 is a side elevation of a nail-driving plunger. Fig. 7 is a front elevation of the same, and Fig. 8 a transverse sectional elevation of my nail-holder.

Similar letters of reference indicate corresponding parts wherever used.

The following is a brief description of my

apparatus, independent of the nail-holders, as conveniently embodied in the forms shown in the drawings, and as made the subject of my patent referred to.

In the above apparatus a reciprocating cross-head, operated from a driving crank-shaft, has connected with it a series of connecting-rods, which are each secured to a wrist-pin connected with a separate plunger-carrier—each connecting-rod being separate from every other, and being adapted to operate its individual plunger-carrier in whatever position or inclination the latter may have been placed.

In the above construction the apparatus differs essentially from any previous box-nailing machine, in that said construction enables the driving of nails at angles either opposite, varying, or coincident.

In the drawings, A A are vertical standards, constituting the sides of the frame-work of the machine and united together above in a transverse head-bar, B; below they spread out to form a base, C, of suitable configuration to support in bearings D a driving-axle, E, operated by a driving-pulley, F, and provided with a crank, G, to the wrist-pin of which is secured a pitman, H, passing vertically upward to a cross-head, I, to which it is secured by a pivot-pin, J. It is obvious that the revolution of the axle will cause the reciprocation of the cross-head.

K is a treadle in the base of the frame-work, connected with a clutch device, L, known as the "Bliss Clutch," of such familiar construction to all mechanics as not to require explanation here. The operation of the clutch is to throw the driving-pulley into and out of gear, alternately at the beginning and end of each reciprocation of the plunger, its action being regulated by the treadle.

M are ways secured to the face-plate N of the machine, in which the cross-head plays.

In front of the face-plate is the table O, upon which the box to be nailed is supported, adapted to be raised or lowered to the proper adjustment by means of screw-shafts P, to which it is threaded and by which it is supported, said shafts being operated by a bevel-gear, Q, in the base of the frame-work.

R are connecting-rods, a series of which corresponding in number to the number of nail-holders is employed. They are each separately pivoted to the cross-head. These connecting-rods extend upward and attach to wrist-pins projecting from the plunger-carrier of each nail-holder, and are adapted to be adjusted with any lateral adjustment of the nail-holders, or with any inclination of the same, so that they act invariably, upon the reciprocation of the cross-head, to operate the plungers in whatever position the latter may have been placed.

S are three cross-bars in the upper frame-work of the machine, to which are secured at the desired inclinations the nail-driving mechanisms, of which T is the carrier-guide, within which plays the plunger-carrier U.

V is a plate whereby the guide is secured to the two uppermost cross-bars S S, the adjustment being to the desired angle, so that in the operation of the machine the plunger shall be driven at the desired angle.

W is the plunger extending down and entering the nail-holder block X. In the drawings six plungers are represented. It will be understood, however, that a greater or a less number may be employed.

X represents the blocks of my nail-holders, of which holders a number corresponding to that of the plungers is employed. Each holder-block is well made when of the form shown in the drawings, and each is separate and entirely disconnected from every other. These blocks are supported upon the lowermost cross-bar S of the frame-work, which bar, as a convenient construction, passes through a mortise in the front of each block. The mortises, which most conveniently serve to effect attachment, are each of sufficient vertical depth to permit of the adjustment of the blocks at lateral angles in either direction, while in horizontal extent they are of such size as to closely embrace the cross-bar and secure the proper horizontal "set" to the block. The blocks are secured in any position upon the cross-bar by means of tightening-bolts or thumb-screw devices threaded through the front face of the block and accessible to the operative.

In lieu of tightening-bolts or thumb-screw devices, clamps, set-screws, or other suitable fastenings may be substituted as a means for connecting or adjusting the blocks upon the cross-bar, as a skilled mechanic will at once recognize.

Each block is traversed in the direction of its vertical depth by a plunger passage-way, Y, into which the nail-feeding tube Z enters and discharges the nails one by one, into which, also, the driving extremity of the plunger of the holder in question is entered in such manner that its reciprocation in the action of the machine takes place without the withdrawing of the plunger from said passage-way.

It is obvious that the above disposition of the plunger with respect to its nail-holder insures the alignment of the plunger passage-way with the plunger at whatever angular position the latter may be placed, and that in adjusting the angle of the plunger-carrier the nail-holder, through the connecting instrumentality of the plunger, is caused to assume the same angle.

Each holder-block is also provided at its base with a pair of expanding plates, *z z*, provided between them with a nail-emerging orifice; the plates are supported upon two short cross-bars, *v v*, suitably connected with the holder, and ordinarily held together by a spring, *u*, or the like, so that they are adapted to be forced apart, compressing the spring, as the nail is driven through the orifice in the expanding plates. Each nail-holder is thus complete within itself and provided with all such devices as are necessary to render it self adjustable and operative.

While in point of effect each nail-holder is a part of the nail-driving mechanism connected with it, yet such unification is due simply to the location of the plunger within the plunger passage-way, and each nail-holder is in fact a separate and completely operative whole, independent of every other holder which may be employed, and operated as to its retention and discharge of nails wholly by the driving action of the plunger.

In Fig. 8 of the drawings I have shown in detail what I regard as an advantageous construction of nail-holder, and one in which, as will be seen, the spring controlling the members constituting the nail-emerging orifice is hung upon a removable pin, so that springs of varying tensions may be employed.

I do not of course limit myself to the exact form and mechanical arrangement shown, as other equivalent constructions may be resorted to without departing from such essential features as render each holder separately self-adjustable and separately self-operative.

Such being the construction of my machine, it is obvious that when the box is placed upon the bed or table, the machine thrown into action, and the plungers thereby caused to advance, the nails, one of which has been fed into each nail-holder, will be driven into the material to be united, at whatever inclination the nail-plungers and nail-holders, as hereinbefore set forth, may have been previously set; and as each plunger and its nail-holder may have been together disposed at an angle different from the angle of every other plunger and holder, it is obvious that the fastening of the box by variedly inclined driven nails will be extremely secure.

Having thus described my invention, I claim—

1. In a machine for nailing boxes, in combination with a series of separately and angularly adjustable nail-driving plungers adapted to be simultaneously operated in whatever positions they have been placed, a corresponding series of separately and angularly adjustable nail-holders, each provided with separable jaws, constituting their nail-emerging orifices, and each adapted to assume and to be operative when they have assumed angles correspondent with those of the plungers, substantially as set forth.

2. In a machine for nailing boxes, a series of independent and angularly adjustable nail-holders, each provided with a pair of separable jaws to constitute the nail-emerging orifice, substantially as described.

3. In a machine for nailing boxes, the combination of a fixed cross-bar or kindred supporting device in the frame-work, a series of separate and angularly adjustable nail-holders, and means, substantially as set forth, for connecting and adjusting said holders upon said bar.

In testimony whereof I have hereunto signed my name this 1st day of May, A. D. 1880.

GEORGE H. PERKINS.

In the presence of—

C. B. TAYLOR,

J. BONSALL TAYLOR.