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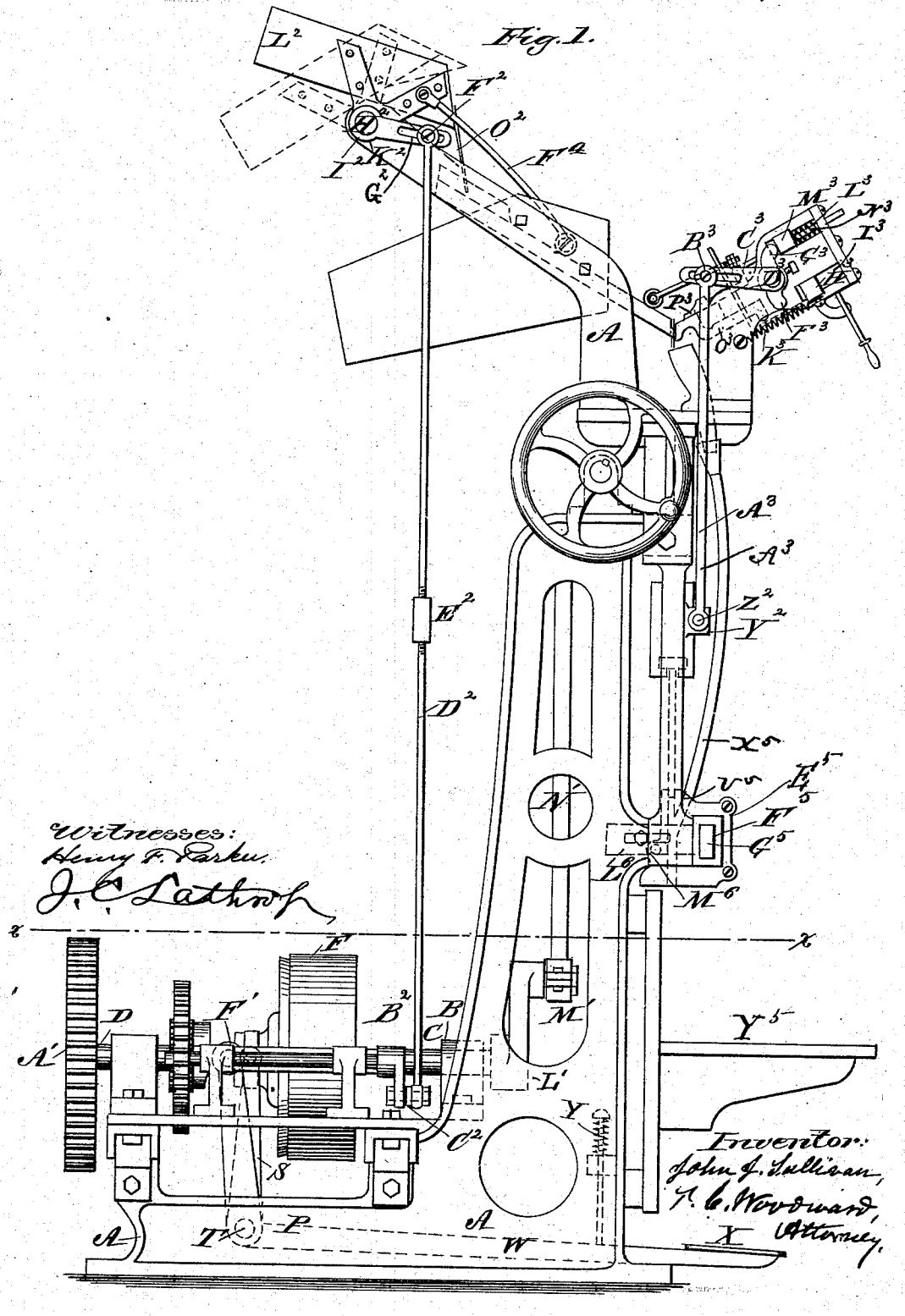
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J. J. SULLIVAN.

NAIL FEEDER AND NAILING MACHINE.

No. 289,360. Patented Nov. 27, 1883.

Fig. 1.



Witnesses:
Henry F. Parker.
J. C. Lathrop.

Inventor:
John J. Sullivan,
A. G. Woodward,
Attorney.

N. PETERS. Photo-Lithographer. Washington, D. C.

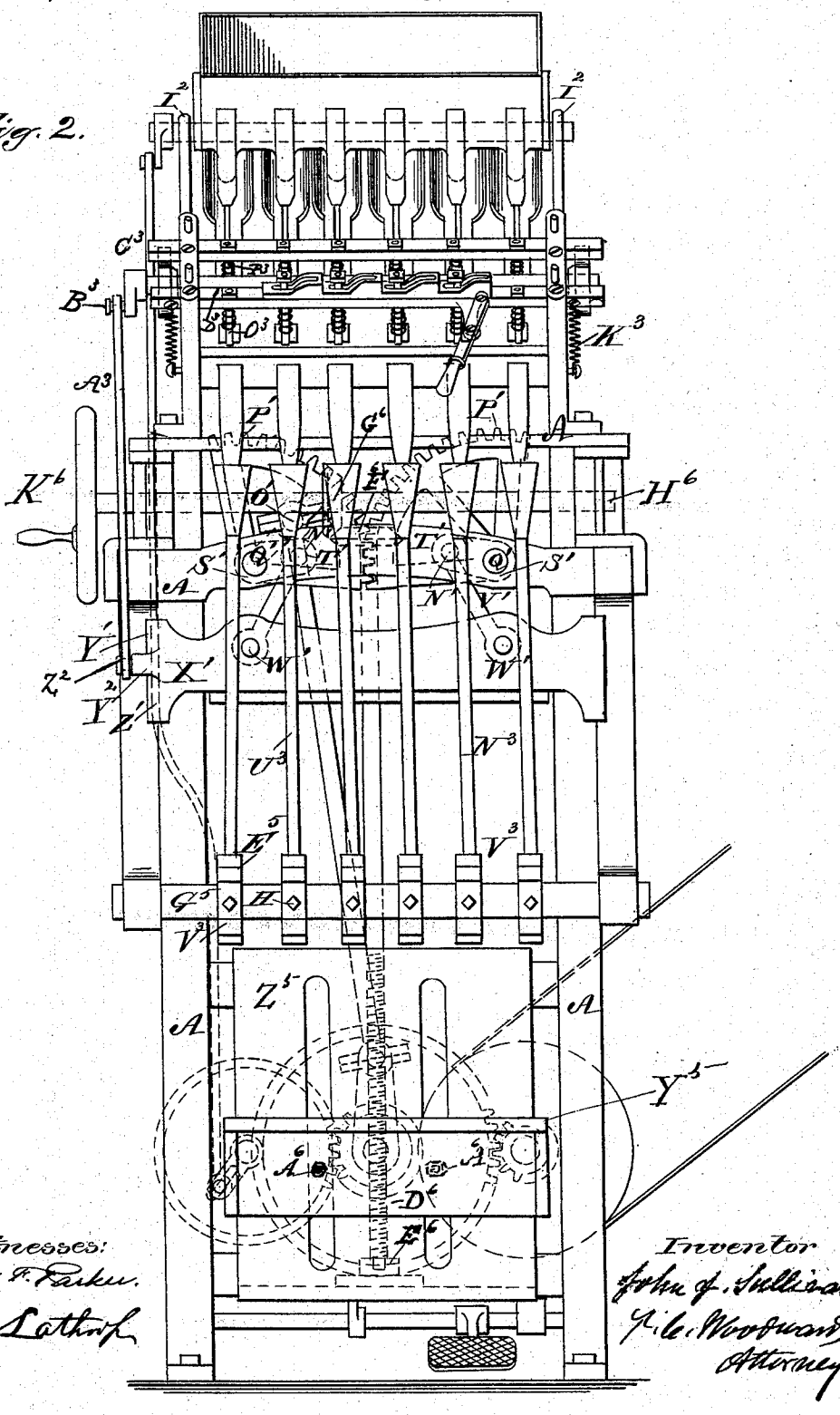
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Fig. 2.



Witnesses:
Henry F. Parker.
J. C. Lathrop

Inventor
John J. Sullivan,
by G. G. Woodward,
Attorney.

N. PETERS. Photo-Lithographer. Washington. D. C.

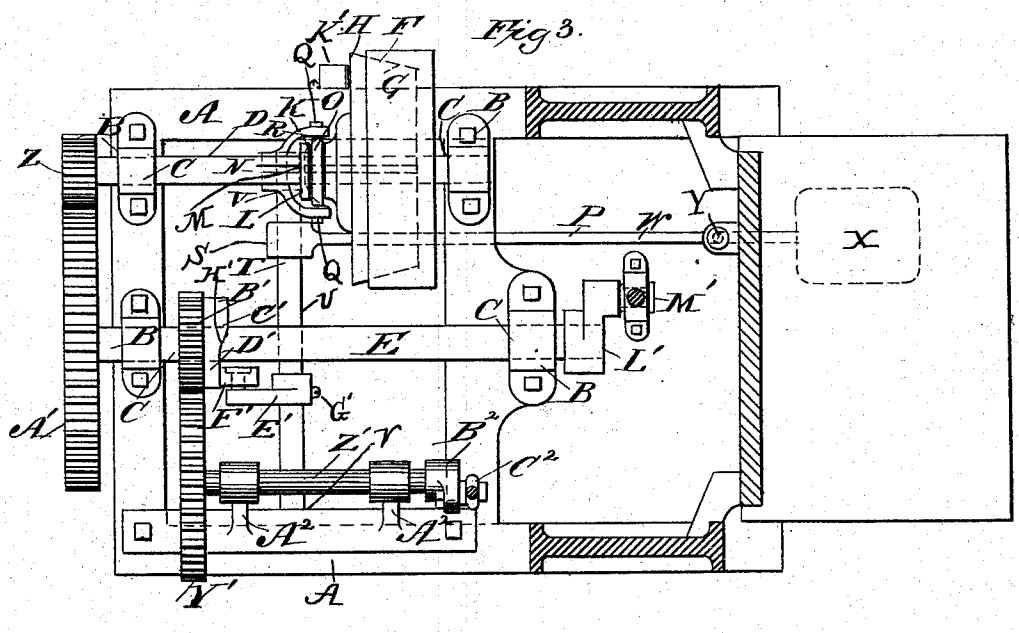
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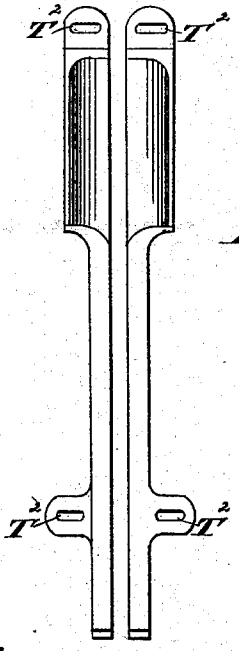
J. J. SULLIVAN.

NAIL FEEDER AND NAILING MACHINE.

No. 289,360. Patented Nov. 27, 1883.

Fig 3.





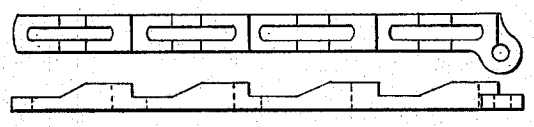
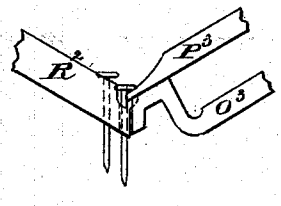
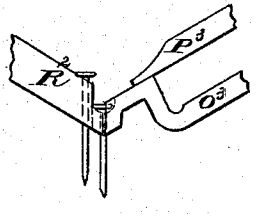
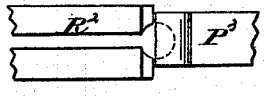


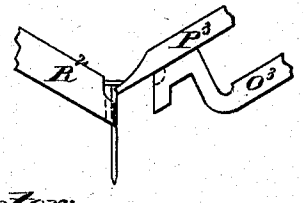
Fig. 5.

Fig. 4.









Witnesses:
Henry F. Parker.
J. C. Fairbank.

Inventor:
John J. Sullivan.
R. C. Woodward.
Attorney

N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 4 Sheets—Sheet 4.

J. J. SULLIVAN.

NAIL FEEDER AND NAILING MACHINE.

No. 289,360. Patented Nov. 27, 1883.

Fig. 6.

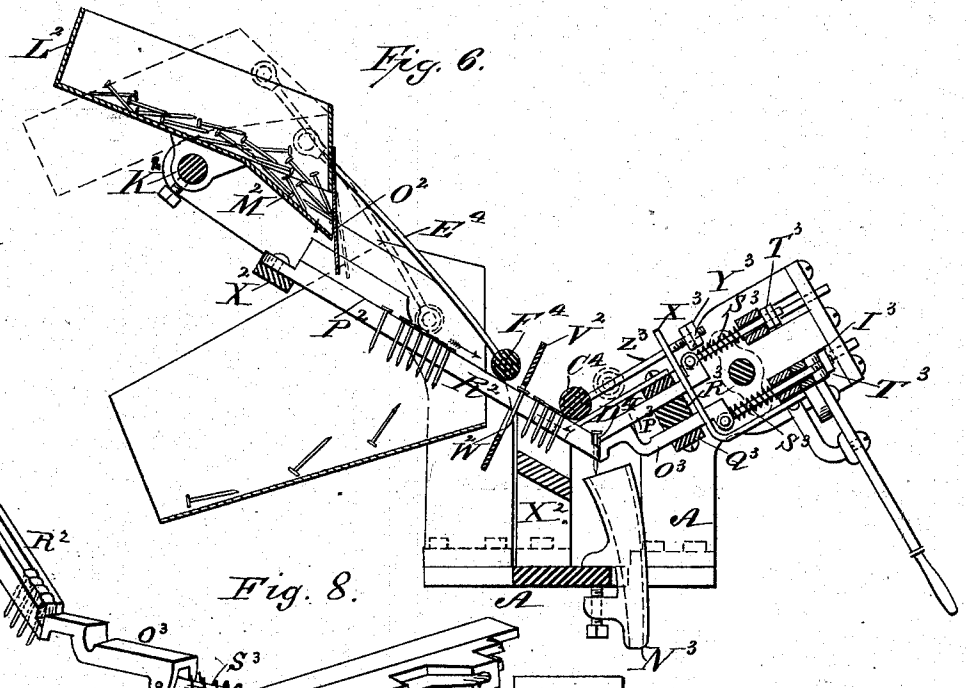
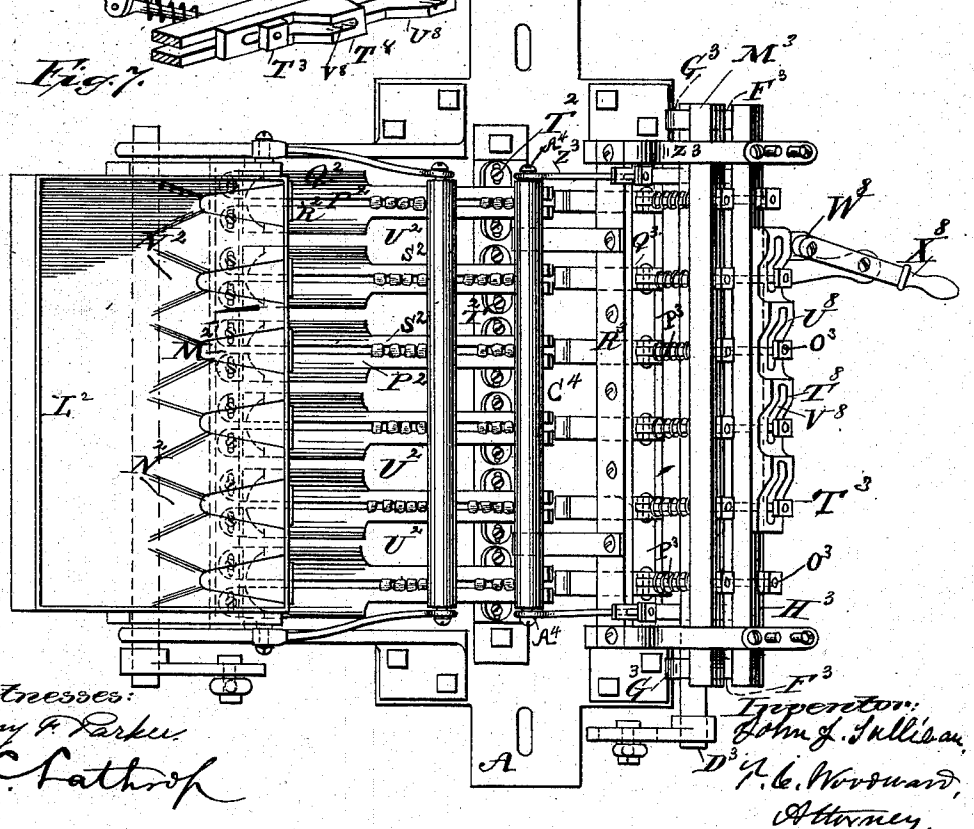


Fig. 8.

Fig. 7.



Witnesses:
Henry A. Parker
J. C. Fathrop

Inventor:
John J. Sullivan.
F. G. Woodward,
Attorney.

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN J. SULLIVAN, OF BROOKLYN, NEW YORK.

NAIL-FEEDER AND NAILING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 289,360, dated November 27, 1883.

Application filed July 24, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. SULLIVAN, of Brooklyn, New York, have invented certain new and useful Improvements in Box-Nailing Machines, set forth in this specification and the drawings thereof.

The invention consists of improvements relating to the hopper and the stops of the nail-feeder, and to the mechanism by which the nail-feeder is operated, and to the connection therewith of the stopping, starting, and nail-driving mechanism, whereby nails in bulk in the hopper will be placed in the nail-boxes singly and driven into the work.

Figure 1 is a side view of the machine. Fig. 2 is a front view of the same. Fig. 3 is a top view of the lower portion thereof with the upper part removed. Figs. 4, 5, and 8 are detail views of portions of the machine. Fig. 6 is a sectional view of the nail-feeder, and Fig. 7 is a top view of the same.

In the form of construction shown, on the frame A, Fig. 3, are four bearings, B, in which are supported the journals C of the shafts D E. On the shaft D is a driving-pulley, F, which is driven by a belt from suitable driving-power. The driving-pulley F is loose on the shaft D, and has a conical recess, G, into which is fitted a conical friction-pulley, H. The friction-pulley H has a neck, K, with a flange, L, and is loose on the shaft D, but is held from turning thereon by a groove, M, and feather N. The friction-pulley H is operated back and forth on the shaft D into and out of the conical recess G, to fasten or unfasten the pulley F to or from the shaft D, by a collar, O, on the neck K and an elbow-lever, P. The collar O is pivoted by bolts Q between the forks R of the short arm S of the elbow-lever P, which has for its fulcrum T a rock-shaft, U, supported in bearings V in the frame A. The long arm W of the elbow-lever P has a foot-piece, X, and a retracting-spring, Y. By applying pressure to the foot-piece X when the pulley F is in motion, the friction-pulley H is forced into the conical recess G in the pulley F, and by friction is locked therein and causes the shaft D to be driven. The pinion Z on the end of shaft D drives the cog-wheel A′ on the end of shaft E, and gives motion thereto. On shaft E is a pinion, B′, and a cam-wheel, C′. The cam-wheel C′ has a cam, D′, on its side. On the shaft U is an arm, E′, having at its upper end a roller, F′, which rolls against the cam D′ on the cam-wheel C′. The arm E′ is adjustable by set-screw G′. When the pressure is suddenly applied to the foot-piece X, the lever P depressed, the friction-pulley H engaged with the pulley F, and the shafts D E in motion, and the pressure suddenly removed from the foot-piece X, the roller F′ operates against the cam D′ on the side of the cam-wheel C′, and holds the friction-pulley H engaged with the pulley F until one revolution of the cam-wheel C′ is made, when the roller F′ drops into a notch, H′, at the end of the cam D′ and releases the friction-pulley H from the pulley F, which is then drawn back by the retracting-spring Y against the friction-brake K′ on the frame A, and the motion of shaft D is stopped.

The brake K′ is adjustable by set-screws in the frame A, and may press the edge or back of the friction-pulley H. As the motion of shaft D is intermittent, depending, as it does, upon the operation of the elbow-lever P, the friction-pulley H, the roller F′, and the cam D′, so the motion of shaft E is also intermittent. On the end of shaft E is a crank, L′, which has a wrist-connection, M′, with pitman N′, Fig. 1, to which it imparts intermittent motion. Pitman N′ is connected by a wrist, O′, Fig. 2, to the segments P′ and imparts intermittent motion to them. The segments P′ are fixed at their centers to the ends of short shafts Q′, having bearing S′ on the frame A and cranks T′ at their other ends. To the wrists N′ of cranks T′ are connected short pitmen V′, which are connected at their other ends by pivot-bolts W′ to the cross-head X′ and impart intermittent motion to it from the segments. The parts K^5 L^5 have channels V^5, which form nail-grooves U^5, into which enter nail-tubes X^5, Fig. 1. The nails descend through the nail-tubes X^5 and the nail-grooves U^5 into the nail-guides T^5 and onto the closed end W^5 thereof, and rest on their points until the nail-punches A^5 descend, strike the nails on their heads, and force open the slides or dies O^5, and drive the nails through the nail-

boxes E^5 into the work to be nailed to form the boxes. The work is placed on a table, Y^5, Fig. 2, under the nail-boxes E^5 and against a back plate, Z^5. The table Y^5 and the back plate, Z^5, are both adjustable to suit the work. The table Y^5 is adjustable by arms A^6, passing through slots B^6 in the back plate, Z^5, and connected with a block, C^6, through which passes an adjusting-screw, D^6, supported at its lower end in a socket, E^6, on the frame A, and having at its upper end a bevel-wheel, F^6, connecting with a bevel-wheel, G^6, on a shaft, H^6, having a hand-wheel, K^6, to operate the screw D^6 to raise or lower the work under the nail-boxes E^5. The pinion B′, Fig. 3, on shaft E imparts intermittent motion to a cog-wheel, Y′, on the end of a short shaft, Z′, supported in bearings A^2 on the frame A. The shaft Z′ has a crank, B^2, connected by a wrist, C^2, to pitman D^2, Fig. 1, to which it imparts intermittent motion. The pitman D^2 has a compensating-joint, E^2, and is connected at its upper end by slot and set-pivot F^2 to a crank, G^2, on the end of an axis, H^2, supported in bearings I^2 on the frame A.

On the axis H^2 is supported by lugs and set-screws K^2, Figs. 7 and 8, a hopper, L^2, to which intermittent motion is imparted by the pitman D^2. The hopper L^2 has at its front inside edge inclined chutes M^2 and conduits N^2, leading to them. The chutes M^2 are inclined forward, and in front of each chute M^2, on the front of the hopper L^2, are swinging guide-springs O^2. The chutes M^2 may be any number desired to suit the work. Five is a very convenient number. The swinging guide-springs close the front of the chutes M^2, and can be turned to one side to give access thereto. When nails are placed in the hopper L^2 in bulk, the intermittent tilting motion of the hopper L^2 forces the nails forward into the conduits N^2 and chutes M^2, and back of the spring-guides O^2 into the inclined channels P^2, formed by the V-bars Q^2, having inclined tracks R^2 between them. The nails drop point foremost into the tracks R^2, are held therein by their heads, and slide down the tracks in single file. The V-bars have extensions S^2 without the V, and are adjustable to vary the width of the track to suit different-sized nails by lugs and set-screws T^2. The nails that do not become suspended in the tracks and slide down therein drop through the spaces U^2. A guard, V^2, is placed around the tracks to stop the waste nails from coming forward; but it is provided with openings W^2, to permit the nails in the tracks to pass through it. The V-bars are supported on cross-pieces X^2 on the frame A. To a projection, Y^2, Figs. 1 and 2, on the cross-head X′ is pivoted by a pivot-bolt, Z^2, a pitman, A^3, which is connected at its upper end by a slot and pivot-bolt, B^3, to a crank, C^3, on rock-shaft D^3, supported in bearings in the frame A. On the rock-shaft D^3 are held by set-screws cams F^3 G^3. The cams F^3, Fig. 7, operate intermittently against a bar, H^3, supported in inclined slots I^3, Fig. 6, in the frame A, and move the bar H^3 backward in the slots I^3. The bar H^3 is drawn forward again in the slots I^3 by the retracting-springs K^3, Fig. 1. The cams G^3 and compression-springs L^3 operate the bar M^3 in the slots N^3 in a similar manner. Through openings in the bars H^3 and M^3, Fig. 7, are connected in a self-adjusting manner stops O^3 P^3, which pass through slots Q^3 in a supporting-bar, R^3, fastened to the frame A. The stops have compression-springs S^3 and nuts T^3, Fig. 6, to make them yielding and self-adjusting. The stops O^3 in one position are held by the retracting-springs K^3, Fig. 1, and the compression-springs S^3, Fig. 6, against the ends of the tracks R^2, and prevent the discharge of nails therefrom into the nail-tubes X^5, and thence into the nail-boxes E^5 under the nail-punches A^5, but when drawn back by the cams F^3 permit the nails to so descend. When the stops O^3 are drawn back, the stops P^3 are forced forward and permit but one nail from each track R^2 to descend.

To the bar H^3, Fig. 7, is connected arms X^3, to which are adjustably connected by screws and nuts Y^3, adjustable arms Z^3, having end bearings A^4, in which is supported a roller, C^4, working on guides D^4. As the bar H^3 moves forward, the roller C^4 presses against the nails in the tracks R^2 and suspends the movements of the nails downward, but as the bar H^3 is drawn back the roller C^4 is raised from the nails onto the guides D^4 and permits the nails to advance. To the side of the hopper L^2 are pivoted arms E^4, which in a like manner support and operate the roller F^4 to cause the nails to be evenly distributed in the track R^2. A plate, T^8, having offsets U^8 and slots V^8, is placed under the nuts T^3 of the middle stops O^3, the outer stops O^3 being left free. The plate T^8 is pivoted at W^8 to the lever X^8, by which it is operated to force the offsets U^8 under the nuts T^3 of the middle stops, O^3, to render them inoperative or operative, and thereby to stop or start the nails in the corresponding tracks, to vary the number of nails to be driven at once.

The operating and starting and stopping mechanism, as described, and the nail-feeding and nail-driving devices in their general features, as specified, are well known, and for them I make no claim, broadly.

The details of construction and operation may be varied within the scope of the improvements.

I claim as my invention—

1. The combination, in nail-driving mechanism, of inclined nail-tracks, self-adjusting nail-stops arranged in pairs one over the other, to alternately operate against the ends of the nail-tracks, and the slide having inclines to suspend the operation of the nail-stops, and adapted to be operated by a hand-lever and link, substantially as set forth.

2. The combination, in nail-driving mech-

anism, of a tilting hopper, nail tracks, and reciprocating distributing-rollers, substantially as set forth.

3. The combination, in a box-nailing machine, of operating and starting and stopping mechanism, substantially as specified, the supplemental shaft and gearing, adjustable pitman, a tilting hopper mounted on a rock-shaft, substantially as described, and nail-feeding and nail-driving mechanism, substantially as set forth.

4. The combination, in a box-nailing machine, of operating and starting and stopping mechanism, substantially as specified, nail-feeding and nail-driving mechanism, substantially as described, and intermediate alternatively-reciprocating nail-stops arranged one above another in pairs, and connected to the cross-head by a pitman and rock-shaft, substantially as set forth.

5. The combination, in a box-nailing machine, of operating and starting and stopping mechanism adapted to be started by the operator and to stop automatically at each complete operation of the machine, substantially as specified, a tilting hopper adapted to receive nails in bulk and drop them into nail-tracks, and connected by rock-shaft and pitman to supplemental gear, substantially as specified, alternately reciprocating nail-stops arranged one above another in pairs opposite the ends of the nail-tracks, and adapted to prevent but one nail at a time from dropping from each nail-track, and connected to the cross-head by a pitman and rock-shaft, substantially as indicated, and reciprocating nail-drivers to drive the nails into the work intermittently, substantially as set forth.

In testimony whereof I hereunto subscribe my signature, in the presence of two witnesses, in the city, county, and State of New York, February 6, 1883.

JOHN J. SULLIVAN. [L. S.]

Witnesses:

M. PARPART,

OTTO KOCH.