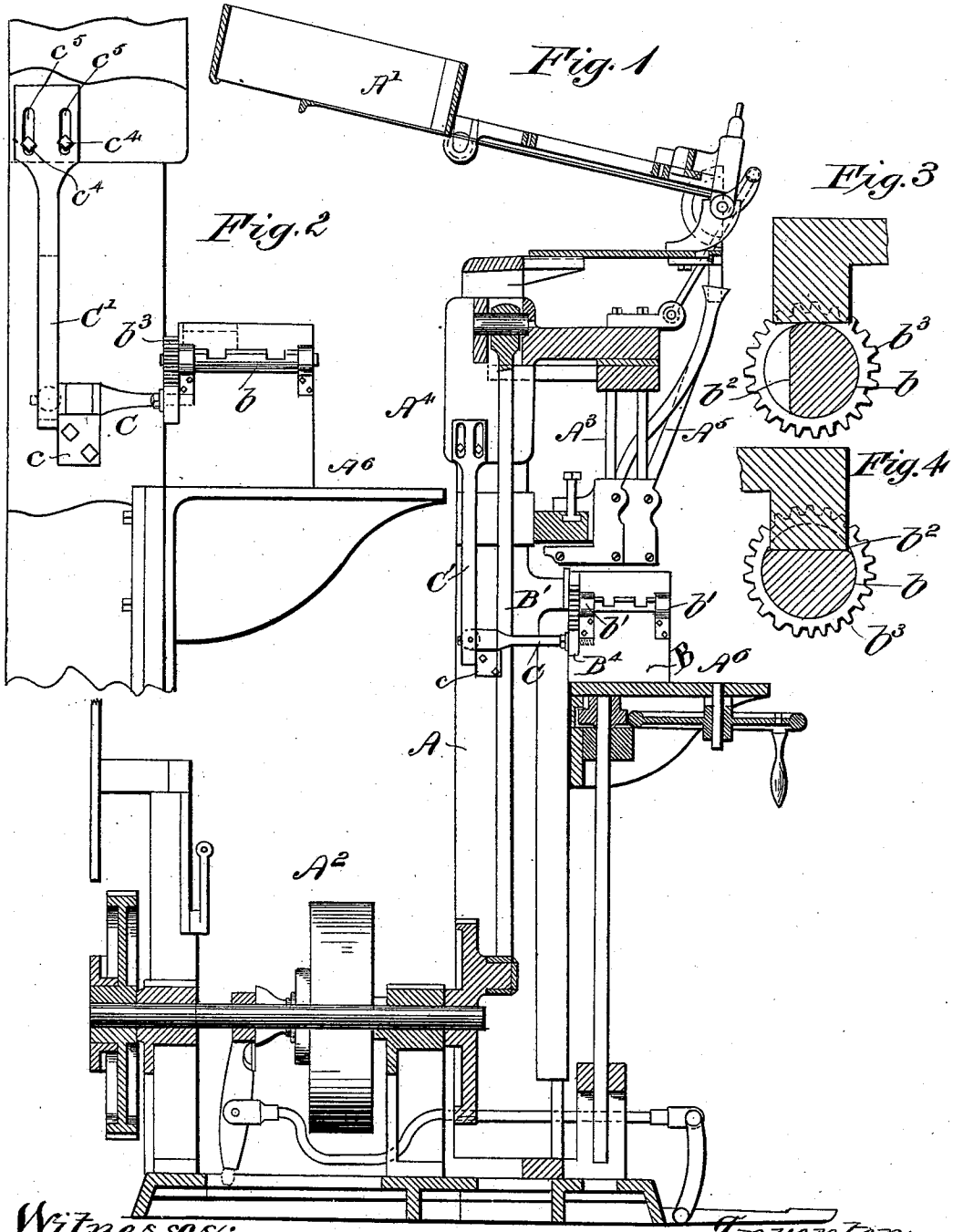
(No Model.) 2 Sheets—Sheet 1.

W. S. DOIG.

BOX NAILING MACHINE.

No. 536,192. Patented Mar. 26, 1895.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5

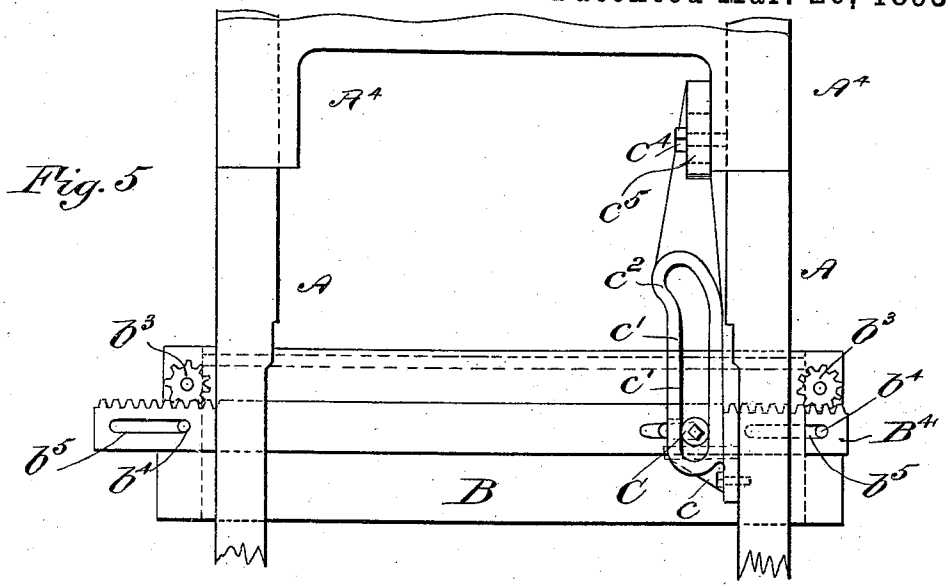


Fig. 6

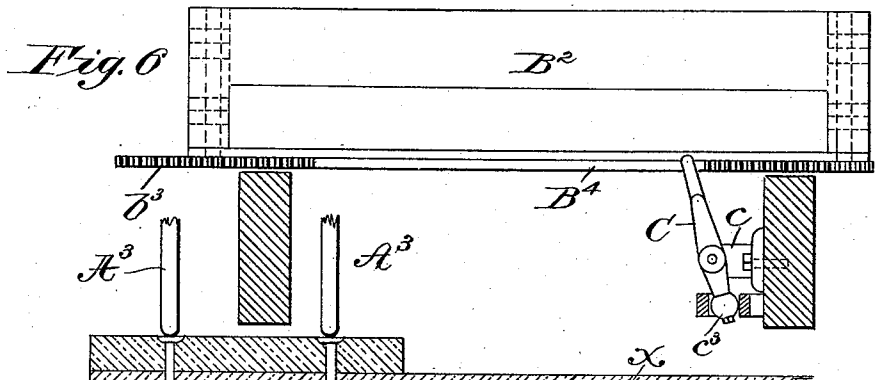


Fig. 7

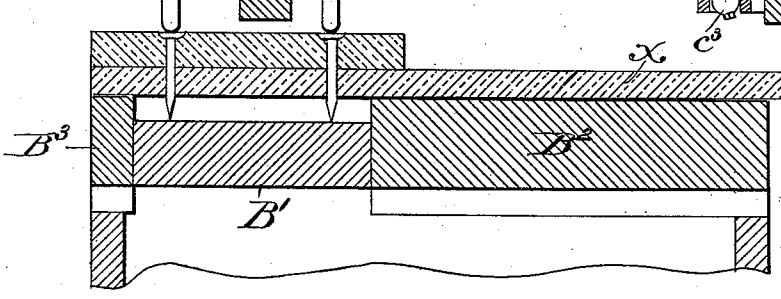
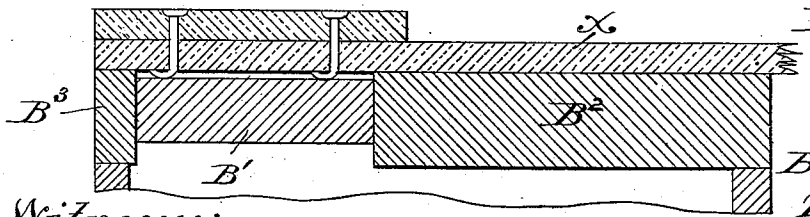


Fig. 8



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UNITED STATES PATENT OFFICE.

WILLIAM S. DOIG, OF BROOKLYN, NEW YORK.

BOX-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 536,192, dated March 26, 1895.

Application filed April 14, 1894. Serial No. 507,521. (No model.)

To all whom it may concern:

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

This invention relates more particularly to a nail clinching attachment for a box nailing machine, and it consists in the construction and novel arrangement of parts as hereinafter specified and particularly pointed out in the appended claims.

In the accompanying drawings Figure 1. is a partial elevation and partial vertical section of a box nailing machine, embodying my improvement. Fig. 2. is a side elevation on an enlarged scale more particularly showing the clinching mechanism. Figs. 3. and 4. are sectional views showing the two positions of the cams for raising and lowering the clinching anvil. Fig. 5. is a front elevation of the anvil and its operating mechanism. Fig. 6. is a partial plan and partial section thereof, and Figs. 7. and 8. are sectional details showing the position of the anvil before and after clinching the nails.

Referring by letter to the drawings A. designates the frame of the box nailing machine; A′, the nail pan; A^2, the driving mechanism; A^3, the nail punches carried by the vertically reciprocating crosshead A^4.

A^5 indicates the nail chutes, and A^6 the table.

The parts above enumerated are all clearly shown and fully described in Patent No. 342,268, dated May 18, 1886, granted to Thomas L. Smith and myself, and therefore need no further description here either as to construction or operation.

I will now describe the mechanism embodied in my present improvement.

B. designates a bed plate, preferably of cast iron, designed to rest upon the table A^6, and support the clinching anvil and certain of its appurtenances.

B′, is the riveting anvil, consisting preferably of a bar of steel or other hardened metal, extending across the bed plate B.

B^2, B^3, indicate the side portions of a box material supporting frame surrounding the riveting anvil B′ and supported on the base B.

There is a relative vertical movement between the frame portions B^2, B^3, and the clinching anvils B′, so that the ends of the driven nails may be brought in contact with the anvil whereby the nails will be clinched upon a continued movement of the nails. In this instance the anvil is shown as stationary and the parts B^2 B^3, movable relatively thereto. The mechanism for causing this relative movement consists of rocking cam shafts *b*. having journal bearings in boxes *b′* on the ends of the bed plate B. These cam shafts are shown as having a rounded side and a flat side b^2 and at their inner ends the shafts are provided with pinions b^3, engaging with a horizontally movable rack bar B^4, supported in a rabbet or upon a flange of the bed plate B. and guided by means of pins b^4, extended from the bed plate through longitudinal slots b^5 in the rack bar.

A reciprocating horizontal movement is imparted to the rack bar by means of a lever C, pivoted between its ends to a bracket *c* secured to a fixed portion of the box nailing machine. The inner end of the lever C. engages with the rack bar and the outer end engages with a cam plate C′, secured to and moved vertically by the cross head A^4. This cam plate C′ has perpendicular walls *c′* in its main portion and laterally inclined walls c^3 at the upper end of the perpendicular walls. The lever C. is shown as having a rotary spherical head c^3 which engages between these walls and allows for a certain universal movement with a minimum of friction.

The cam plate C′, is shown as secured to the cross-head A^4 by means of bolts c^4 passing through longitudinal slots c^5 in the cam plate so that said cam plate may be adjusted vertically to cause an earlier or a later movement of the parts which it operates.

During the vertical movement of the cross-head A^4 and while the walls *c′* of the cam plate are in engagement with the lever C. there will be no movement of the lever and consequently no movement of the parts B^2, B^3, but when the walls c^2 engage with the lever C. the rack bar will be moved horizontally thus rotating the pinions b^3 to rock the cam

shafts *b*, either to raise or lower the parts B^2 B^3 according to the direction of movement of the cross head.

The operation is as follows: A batten end of a box X being placed upon the supports B^2 B^3 the machine is set in operation in the usual manner to drop the nails through the chutes A^5 and to force them into the box material by the punches A^3 carried by the cross head A^4. When the nails shall have been forced through the box material a continued downward movement of the cross-head will cause the cam plate C′ to operate and lower the parts B^2 B^3 with the box, so that the ends of the nails will contact with the anvil B′ and clinch or turn them up as indicated in Fig. 8. It will be understood that when the clinching device is in use the table A^6 will remain stationary. The nail is driven through the material and projects the distance required to form the clinch before being operated on by the anvil. This insures a perfect clinch as the nail is protected by the material from bending or clinching at any other place than at the point of contact with the anvil.

Having described my invention, what I claim is—

1. The combination with a box nailing machine, of a clinching device supported on the table thereof comprising an anvil bar and a box material support, cam shafts for causing a relative movement between said bar and support, a rack bar engaging with pinions on said shafts, a fulcrumed lever engaging at one end with said rack bar and a cam plate carried by the cross-head of the machine and engaging with the other end of said lever, substantially as specified.

2. The combination with a box nailing machine of the clinching anvil, the box material support, the cam shafts, the pinions thereon, the reciprocating rack bar, the oscillating lever and the vertically adjustable cam plate carried by the cross-head of the machine, substantially as specified.

3. The combination with a box nailing machine comprising nail punches of an anvil, a box material support and mechanism for causing a relative vertical movement between the support and anvil timed with the continuous downward movement of the nail punches after a nail shall have been forced into position and projected through the box material by a punch, substantially as specified.

Signed at New York, in the county of New York and State of New York, this 13th day of April, A. D. 1894.

WILLIAM S. DOIG.

Witnesses:
W. L. ISAACS,
R. M. CRAWFORD.