(No Model.) 4 Sheets—Sheet 1.

B. S. ATWOOD.

BOX NAILING MACHINE.

No. 515,393. Patented Feb. 27, 1894.

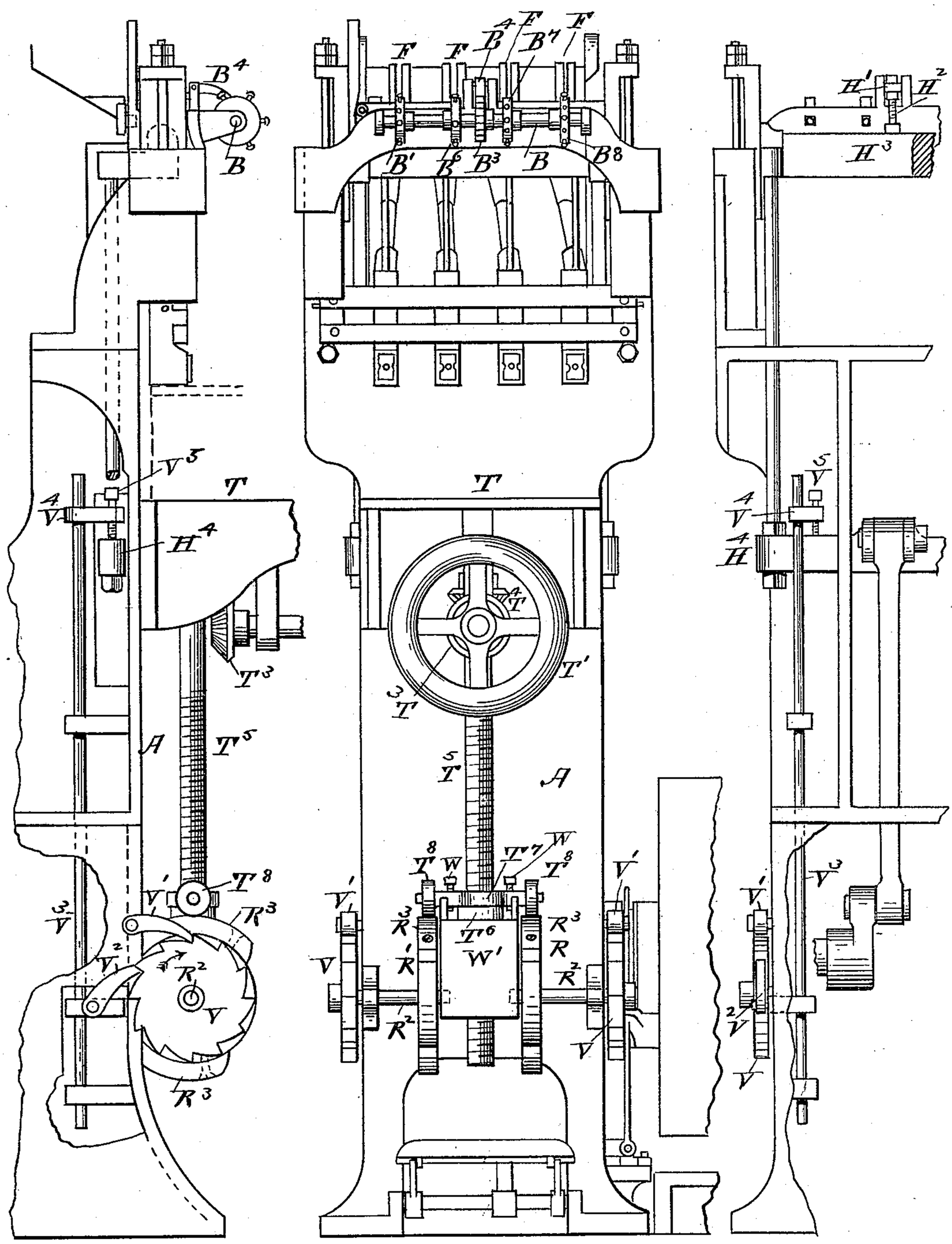

Fig. 3. Fig. 1. Fig. 2

WITNESSES

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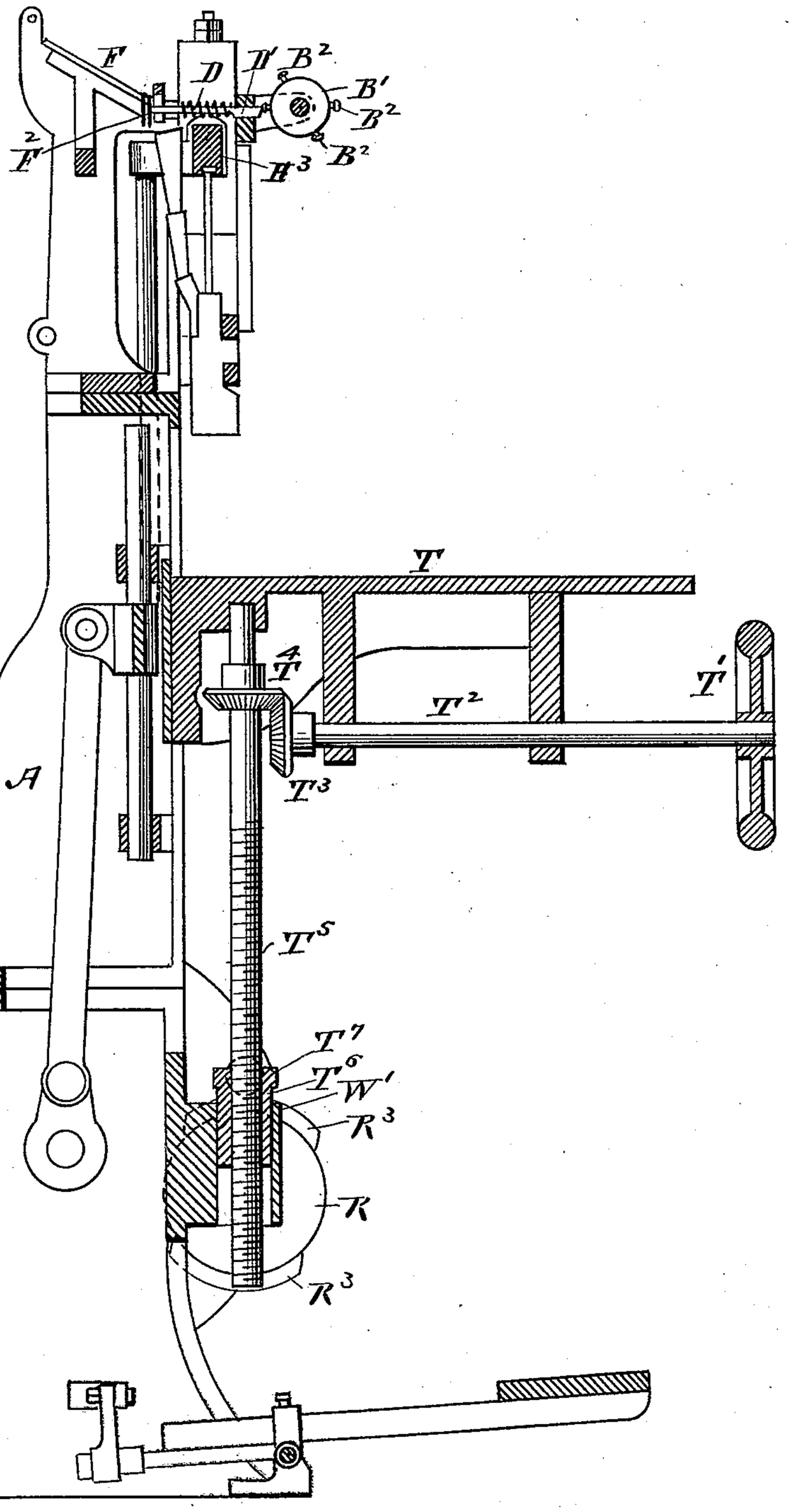

Fig. 4

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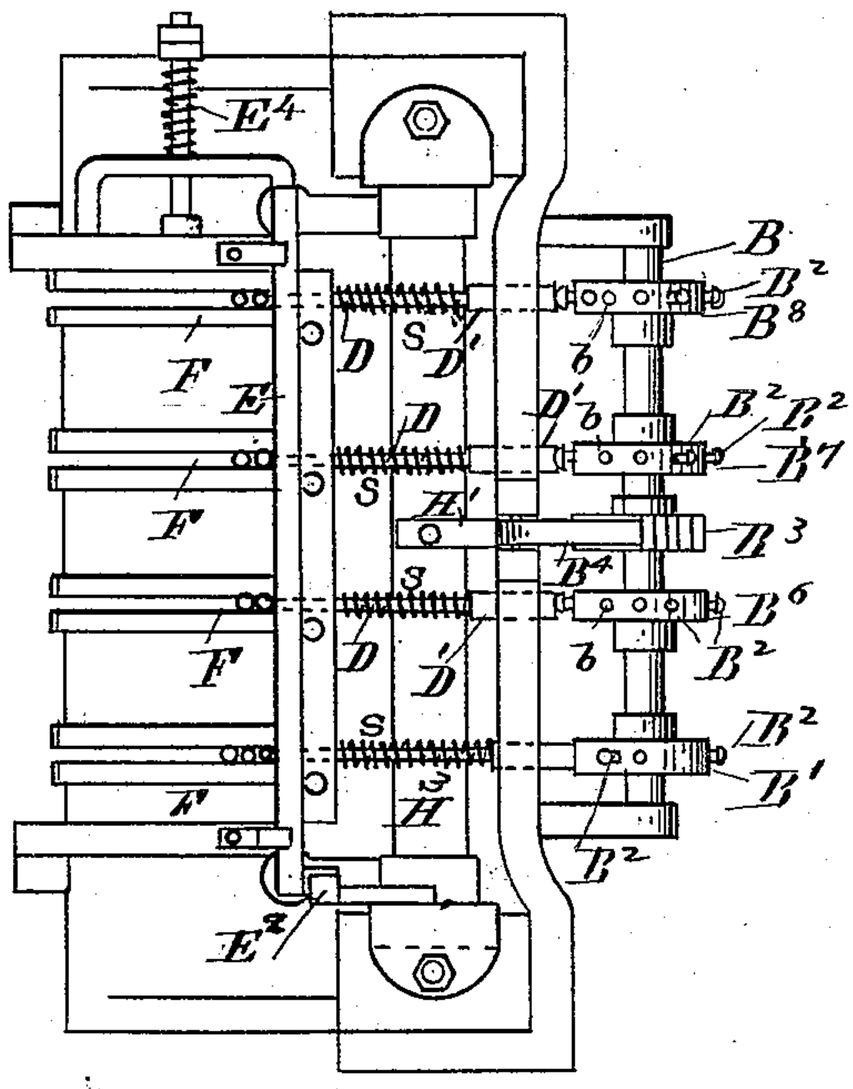

Fig. 5.

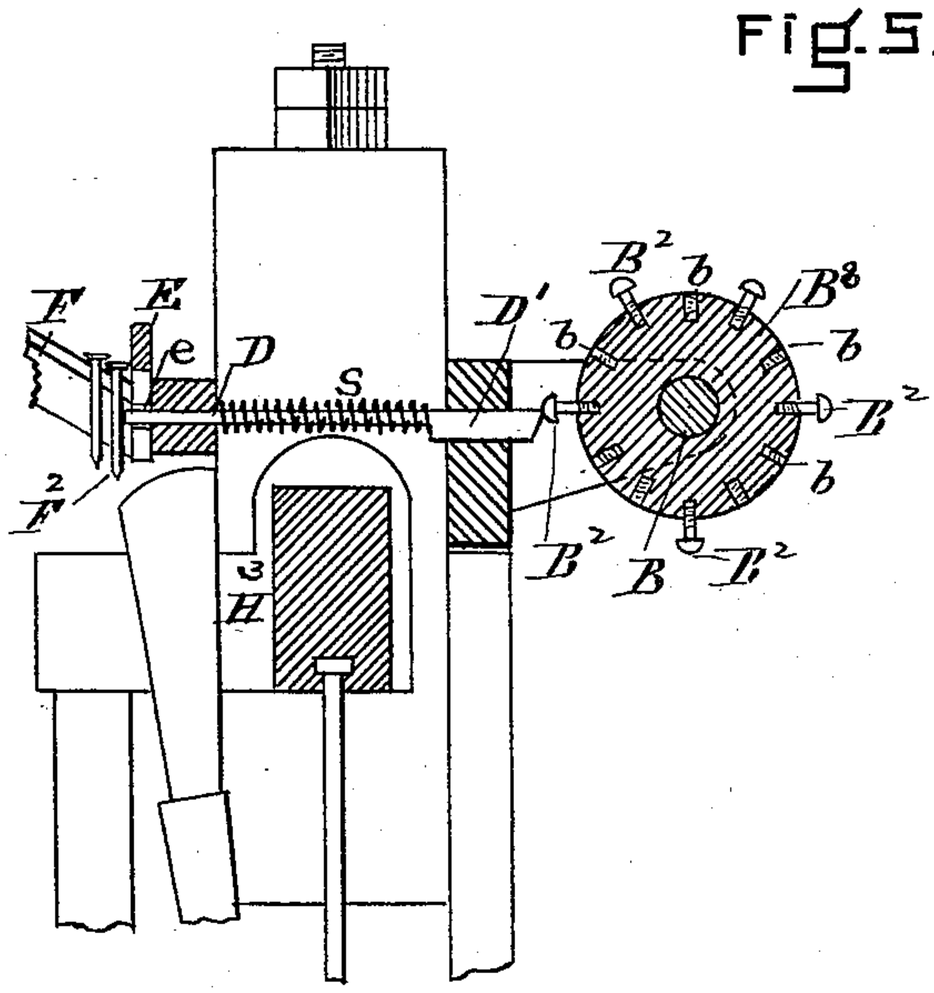

Fig. 6.

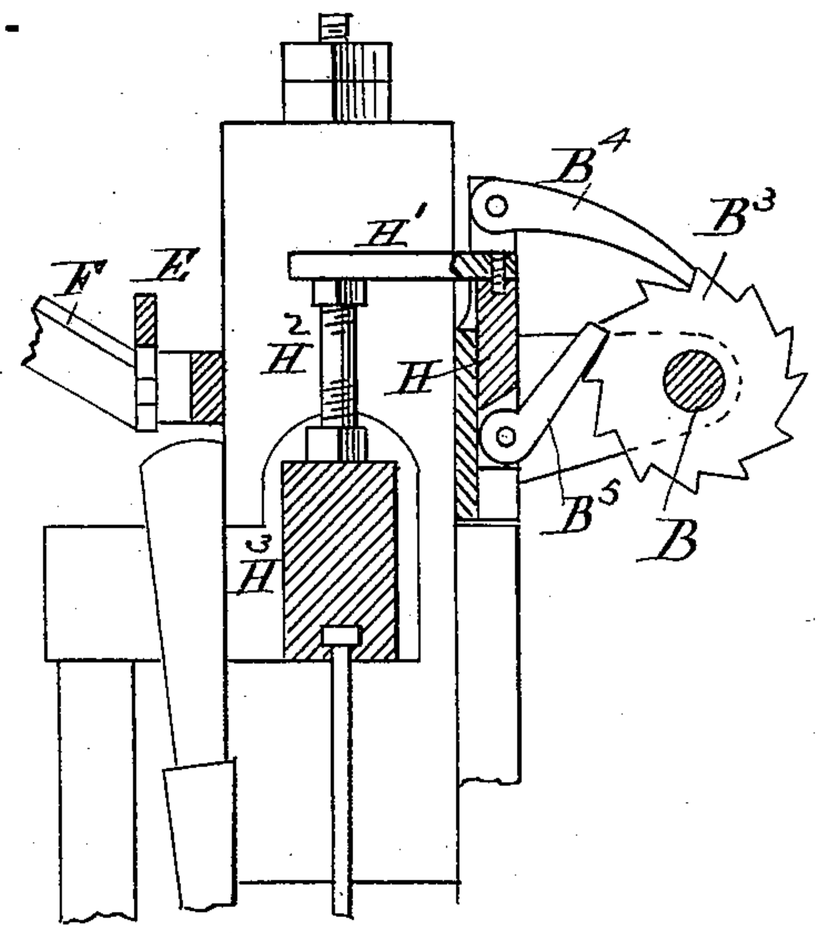

Fig. 7.

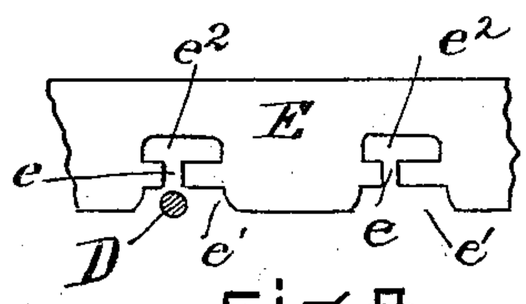

Fig. 8.

WITNESSES

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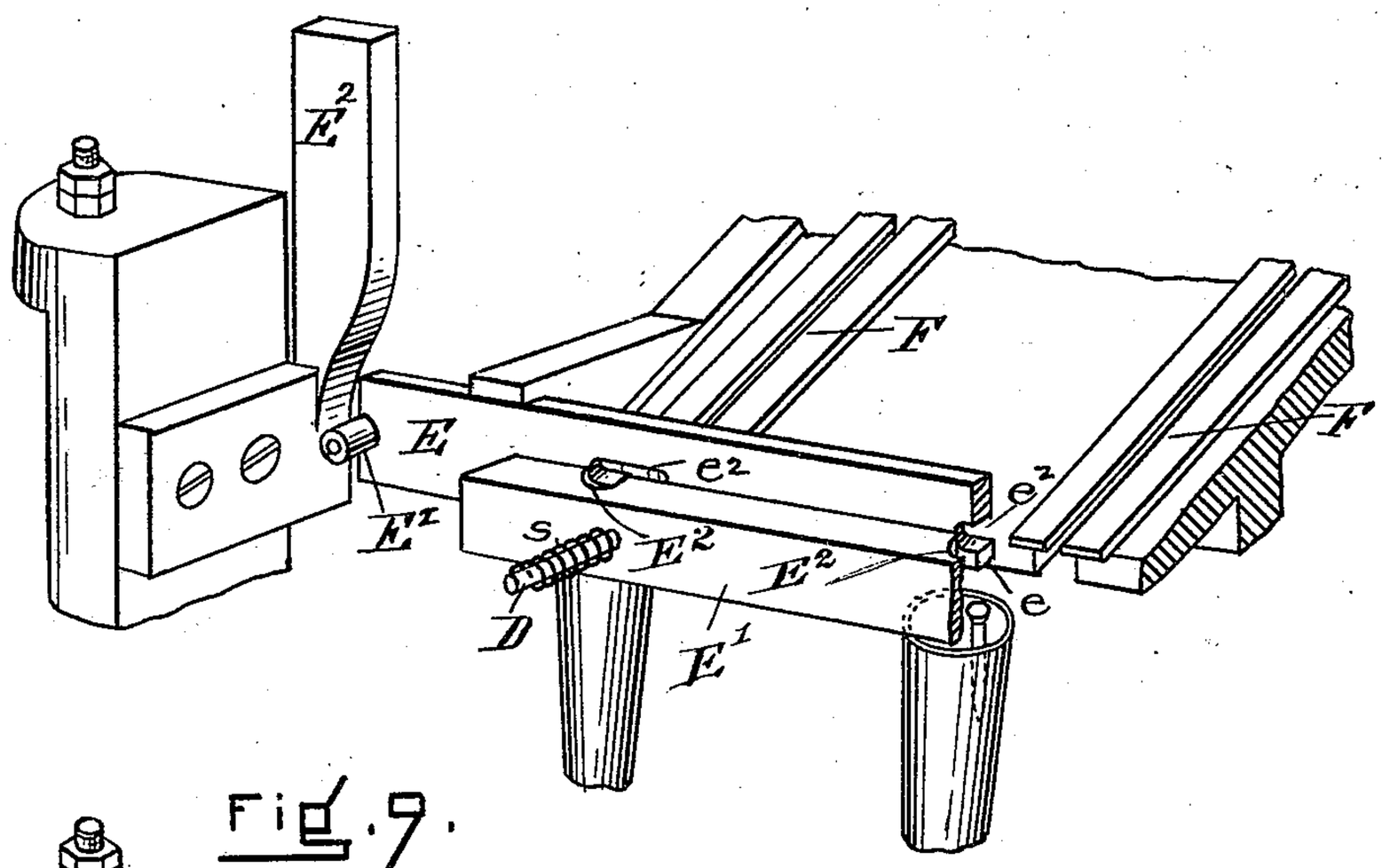

Fig. 9.

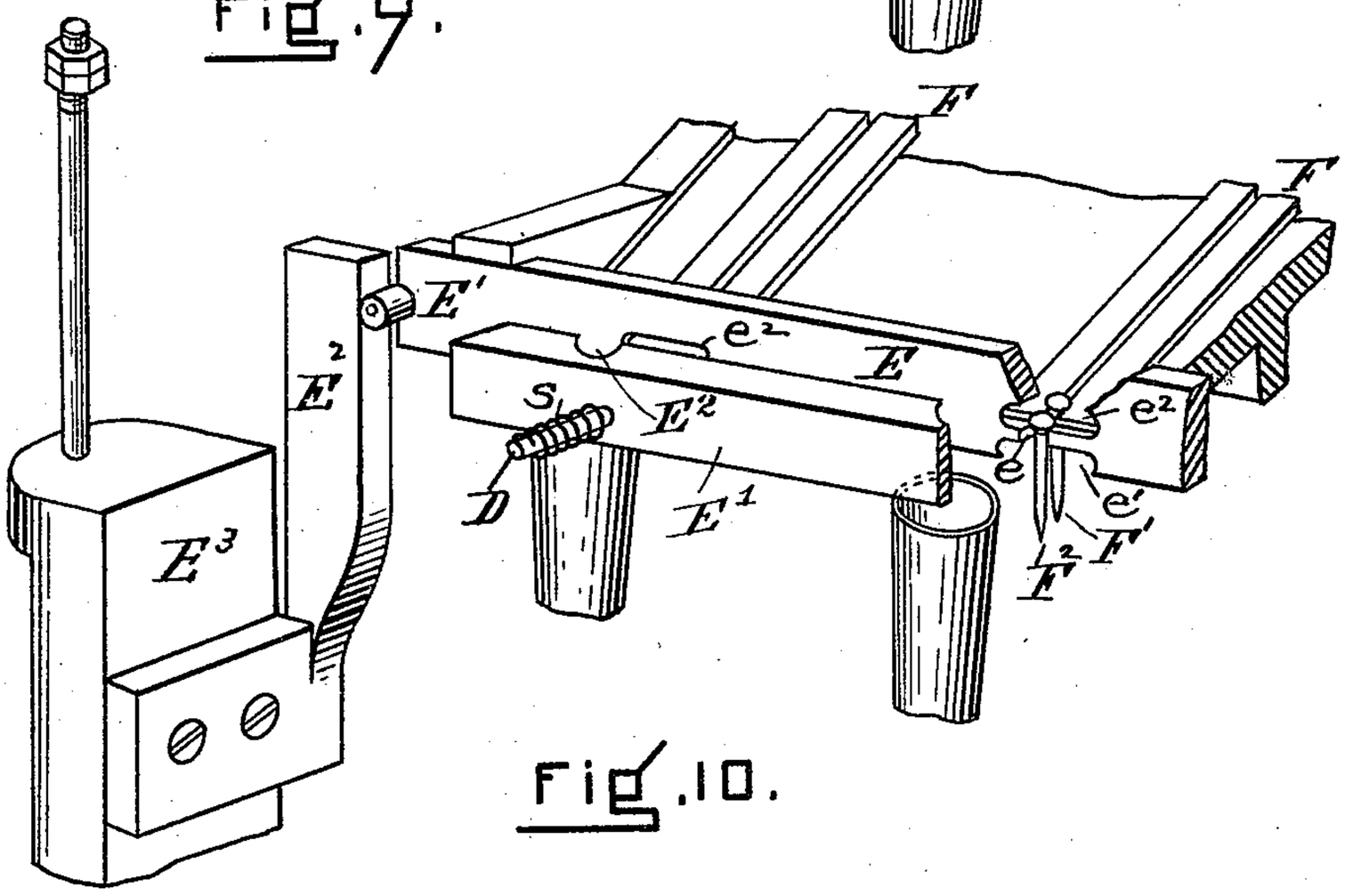

Fig. 10.

WITNESSES

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UNITED STATES PATENT OFFICE.

BENJAMIN S. ATWOOD, OF WHITMAN, MASSACHUSETTS.

BOX-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,393, dated February 27, 1894.

Application filed April 9, 1891. Serial No. 388,297. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN S. ATWOOD, of Whitman, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Box-Nailing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to so improve box nailing machines that the machine may drive successively groups of nails, the number of nails in a group and the succession of the groups once being determined by the operator, the machine will become automatic as to the number of nails driven in a group and as to the order of succession of the group. This object I attain by the mechanism shown in the accompanying drawings, in which—

Figure 1 is a front elevation of my machine. Fig. 2 is a rear elevation, showing a part of my machine. Fig. 3 is a side elevation, showing a part of my machine. Fig. 4 is a cross-vertical section of my machine. Fig. 5 is a plan of my machine. Fig. 6 is a cross-vertical section of the parts that relate particularly to the device by which the feeding of the nails is governed. Fig. 7 is a view similar to Fig. 6, showing other parts that relate to the nail feeding device. Fig. 8 shows in elevation a part of the picker bar. Figs. 9 and 10 are views in perspective to illustrate the construction and action of the nail feeding mechanism.

As my invention relates solely to a device for regulating and controlling the nail-feeding, and as said device as illustrated in the drawings is one that is adapted to be applied to the Casey box nailing machine, which is fully described in the specification of United States Patent No. 432,477, of July 15, 1890; it is not necessary for me to fully describe the entire box nailing machine, and I will therefore describe in detail only such parts as pertain to my invention, or are immediately connected with it.

The device for determining the number of nails to be fed to the drivers, at each operation of the machine, and for determining the succession of the groups of nails, driven at each operation of the machine consists of a shaft B and the connecting parts which I will now describe. The shaft B, located as shown on the drawings, has attached to it centrally a ratchet wheel B^3 (see Figs. 5 and 7) which is caused to make a partial rotation by the action of the pawl B^5; said pawl B^5 being attached to a slide H. This slide H being operated by the vertically operating nail driving frame H^3, which acts through the adjustable screw stud H^2 and the horizontal arm H′ (see Fig. 7) thus; as the nail driving frame H^3 moves downward the slide H is allowed to drop thus taking with it the pawl B^5, and as the ratchet B^3 is held in place by the retaining pawl B^4, the working pawl B^5 will fall into another tooth of the ratchet, and as the driving frame H^3 again rises, the pawl B^5 will be carried upward and the ratchet wheel B^3 will be made to rotate an amount which is governed by the distance apart of the teeth. The exact working position of the ratchet B^3, when resting, is determined by the position of the adjustable screw stud H^2; the position of the ratchet wheel B^3 obviously determines the position of the feed governing disks B′, B^6, B^7, B^8, attached to the shaft B (see Figs. 1 and 5). Each of these disks has at intervals corresponding with the teeth of the ratchet B^3 screw holes as indicated at *b*—*b* (see Figs. 6 and 7), adapted to receive screws or pins B^2—B^2. These screws or pins B^2—B^2 are so adjusted and arranged that, as the disks are rotated they come in contact with the sliding feed controllers D D′, and when in this position they, the pins B^2—B^2 will hold the sliding feed controllers D D′ in such a position that their inner ends will rest against the last nail F^2 in the feedway F, so that it cannot fall into the recess *e*, of the nail picker bar E. (See Figs. 6, 8, 9, and 10.)

The nail picker bar E is provided with a series of openings (see Figs. 8, 9 and 10), each of which has three members: first, the part *e*′ adapted to admit of the passage of the end D of one of the sliding feed controllers D D′ (so that the corresponding nail may be held back), long enough to allow the nail picker bar E to move sufficiently to take the nails from opposite the ends of the nail feedways to the drivers; second, a narrow part *e*, which is just wide enough to allow the passage of a nail and its head; third, a part *e*′ made long, as shown, and adapted to receive the projecting flange of the heads of the nails.

The nail picker bar E is caused to move forth and back longitudinally by means of a vertically operating wedge cam E^2 acting on the stud E′ (see Figs. 9 and 10), and a spring E^4 (Fig. 5) which acts to force the picker bar back against the cam. The cam wedge E^2 is attached to an upright slide E^3, which in turn is attached to the nail driving frame H^3 (Figs. 6 and 7), which moves up and down.

It will be noticed that the bar E′, Figs. 9 and 10, being immediately behind the nail picker bar E, prevents the nails from passing through the slot *e*, the slot being large enough to hold one at a time, from which slot the nail cannot escape until carried by the nail picker bar E to a position opposite one of the passageways E^2 in the bar E.

From the above description it will be seen that were there no screw pins B^2—B^2 in any of the disks B′, B^6, B^7, B^8, then all of the sliding feed controllers D D′ would be removed from the recesses *e′*—*e′* in the nail picker bar E, and all of the nails would be fed in and driven at every motion of the machine; and also that the number of nails fed at each operation of the machine will be determined by the number of the unpinned holes that are opposite the ends of the sliding feed controllers. That is, if there were but one pin in contact, then all of the nails but one would be driven, and if two pins were in contact, then all but two nails would be driven. It may also be seen that if we call the sets of unpinned holes *b*—*b* on the various disks B′, B^6, B^7, B^8, that are in line with each other, a group, then it will be possible to have as many groups as there are pin holes *b*—*b* in each disk, and that we may have as many nails driven at a time as there are unpinned holes in each group, and therefore that the groups may be varied in their succession at will, by simply inserting or removing pins from the holes *b*—*b*. Thus if we wish to drive four nails, at the first operation of the machine, and two the second, and three the third, then we would arrange the pins in the groups accordingly, that is, so as to have four unpinned holes in the first group (one in each disk) two in the second group, and three in the third group. Then this series of groups may be repeated or another series be inserted. As shown in the drawings, each of these disks has twelve pin holes, so that a great variety of groups and series of groups may be arranged as desired.

Before describing the automatically operating table T and its connected parts, I wish to state that, although I believe that it is new and of my invention, I do not claim it in this application, but reserve it for another application.

The automatically operating table T (Figs. 1, 3 and 4) is arranged to slide up and down in the usual manner on the frame A, and is adjusted, by means of the hand wheel T′, which acts through the shaft T^2, gears T^3, T^4 and screw rod T^5 (as shown in Fig. 4). This hand adjustment of the table is a common device and requires no particular description, but my automatic adjustment, which I believe to be new, I will now describe. The screw rod T^5 is held in a vertical nut T^6, said nut being attached to a cross-head T^7, the outer ends of which have friction rollers T^8, T^8, which rest upon two cam wheels R R′, attached to shafts R^2. Each of the cam wheels R R′, has attached to it removable cam pieces R^3, R^3. Each of the shafts R^2, to which these cam wheels are attached has at its end a ratchet wheel V, which is held in place by a holding pawl V′ and is made to rotate by a working pawl V^2, which is connected to a vertical sliding rod V^3 by a cross arm V^4, which has an adjusting screw V^5 adapted to be operated upon by the part H^4 of the nail driving frame H^3, so that as the nail driving frame moves upward it will cause the pawl V^2 to rotate the ratchet V one tooth in the direction of the arrow. The lengths of the detachable cam pieces R^3 must bear a certain relation to the number of teeth in the ratchet wheel; for instance, if the cam R^3 is intended to hold the box in a fixed position vertically, while four groups of nails are being driven, then the cam piece must subtend four teeth as the motion required for driving one group of nails will move the ratchet but one tooth. When the nail driving operation has been repeated a sufficient number of times to complete the nailing of one side of the box, then the cam pieces will pass out from under the cross head rollers T^8 and allow the table T to drop sufficiently to admit of placing the other side of the box in a position for nailing. The distance that the table T will drop when the cam pieces pass from under the cross head rollers T^8 is determined by the adjusting screws W. W. Fig. 1, in the cross head T^7, the lower end of these screws coming in contact with the fixed block W′.

I claim—

In a box nailing machine the combination of the sliding feed-controllers adapted to operate as described: with feed governing disks having receptacles adapted to receive the detachable holding pins adapted to operate upon the sliding feed controllers and mechanism for operating said disks, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 4th day of April, A. D. 1891.

BENJAMIN S. ATWOOD.

Witnesses:

FRANK G. PARKER,

MATTHEW M. BLUNT.