

(No Model.)

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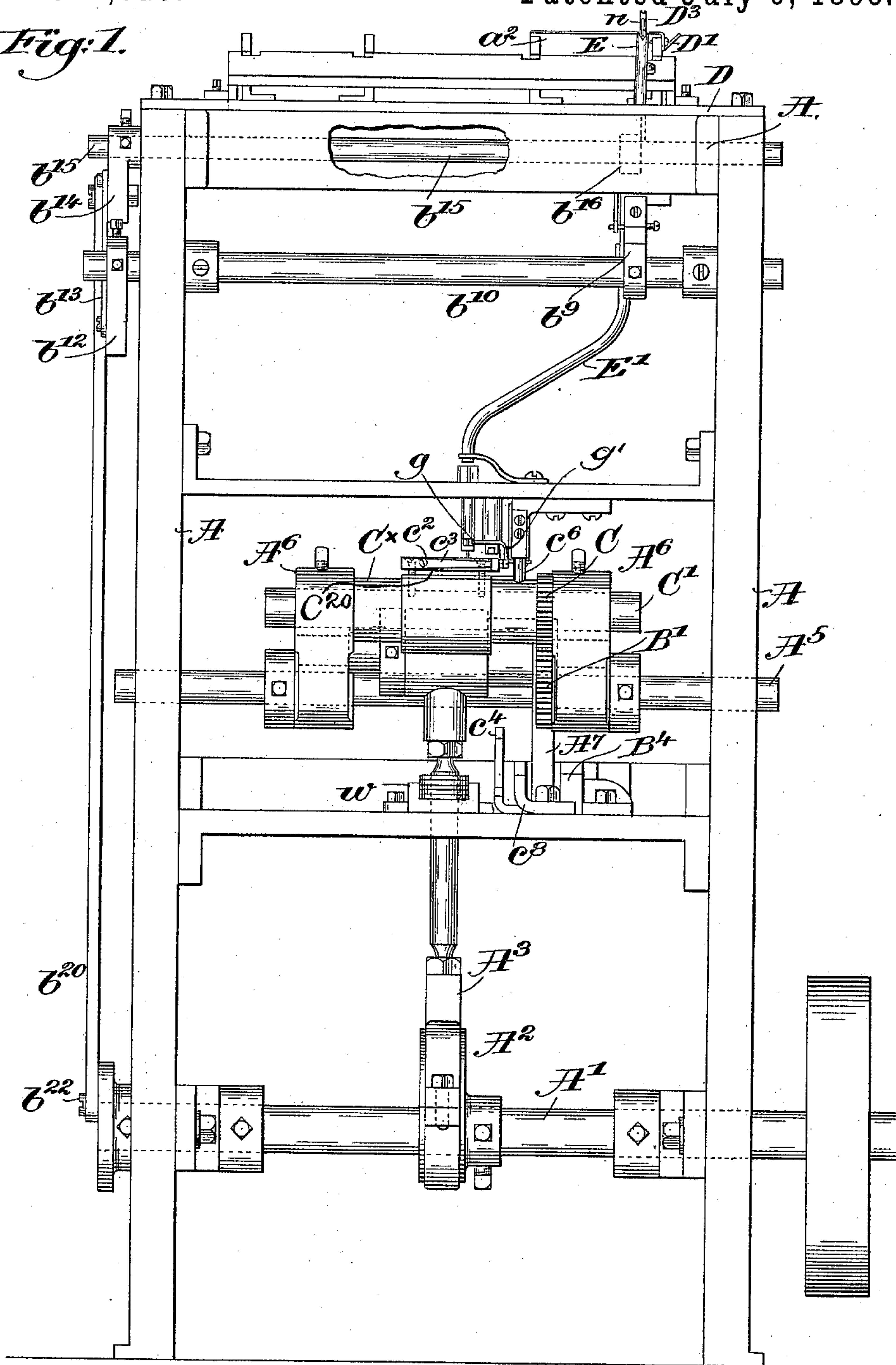
T. K. KEITH & G. H. CLARK.

NAIL ASSORTING AND DELIVERING MECHANISM.

No. 542,616.

Patented July 9, 1895.

Fig. 1.



Witnesses.

Thomas J. Drummond
Fred S. Grunleaf

Inventors.

Thomas K. Keith
George H. Clark
by Crosby & Gregory attys.

(No Model.)

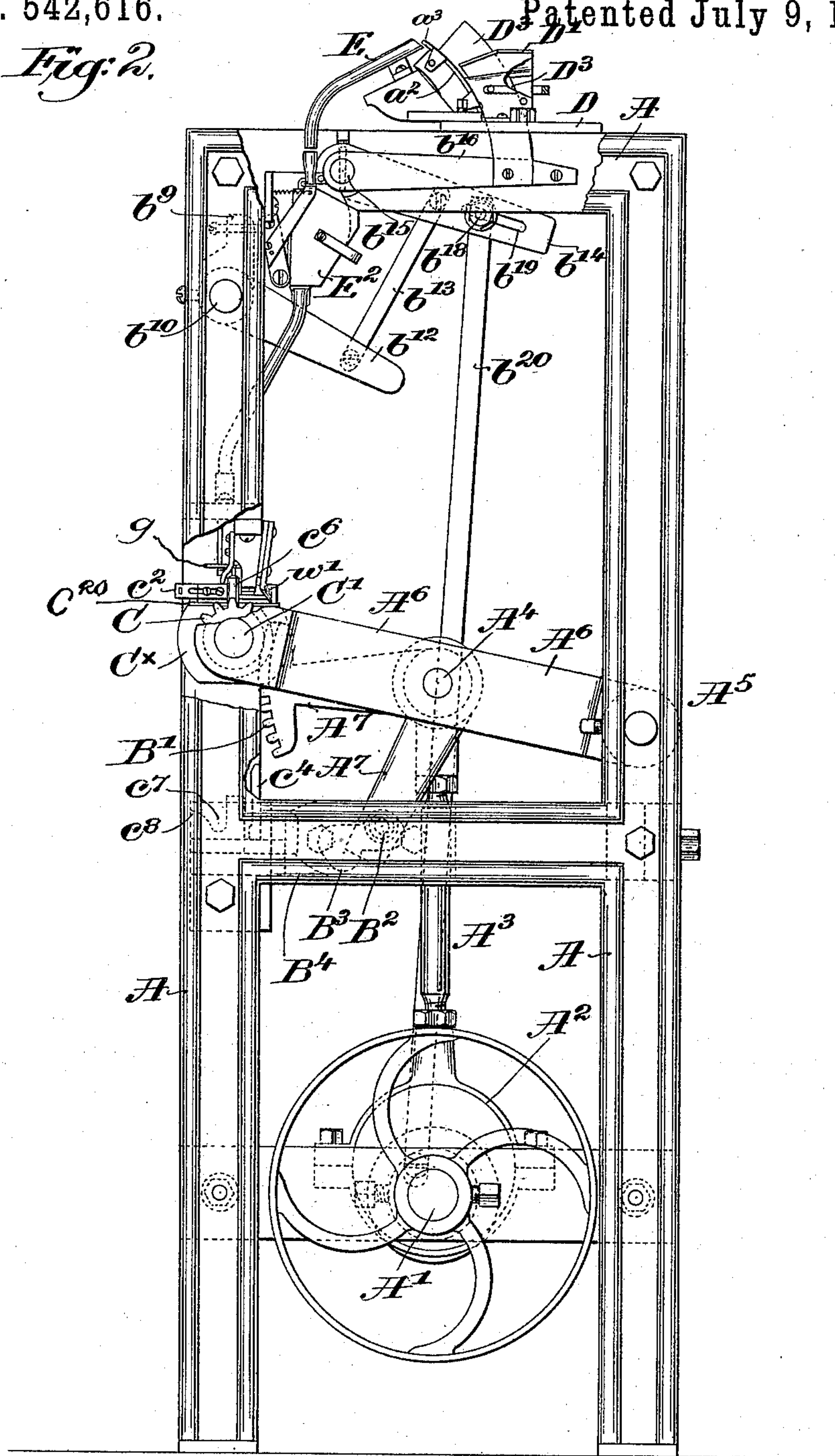
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Fig. 2.



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3 Sheets—Sheet 3.

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Fig. 3.

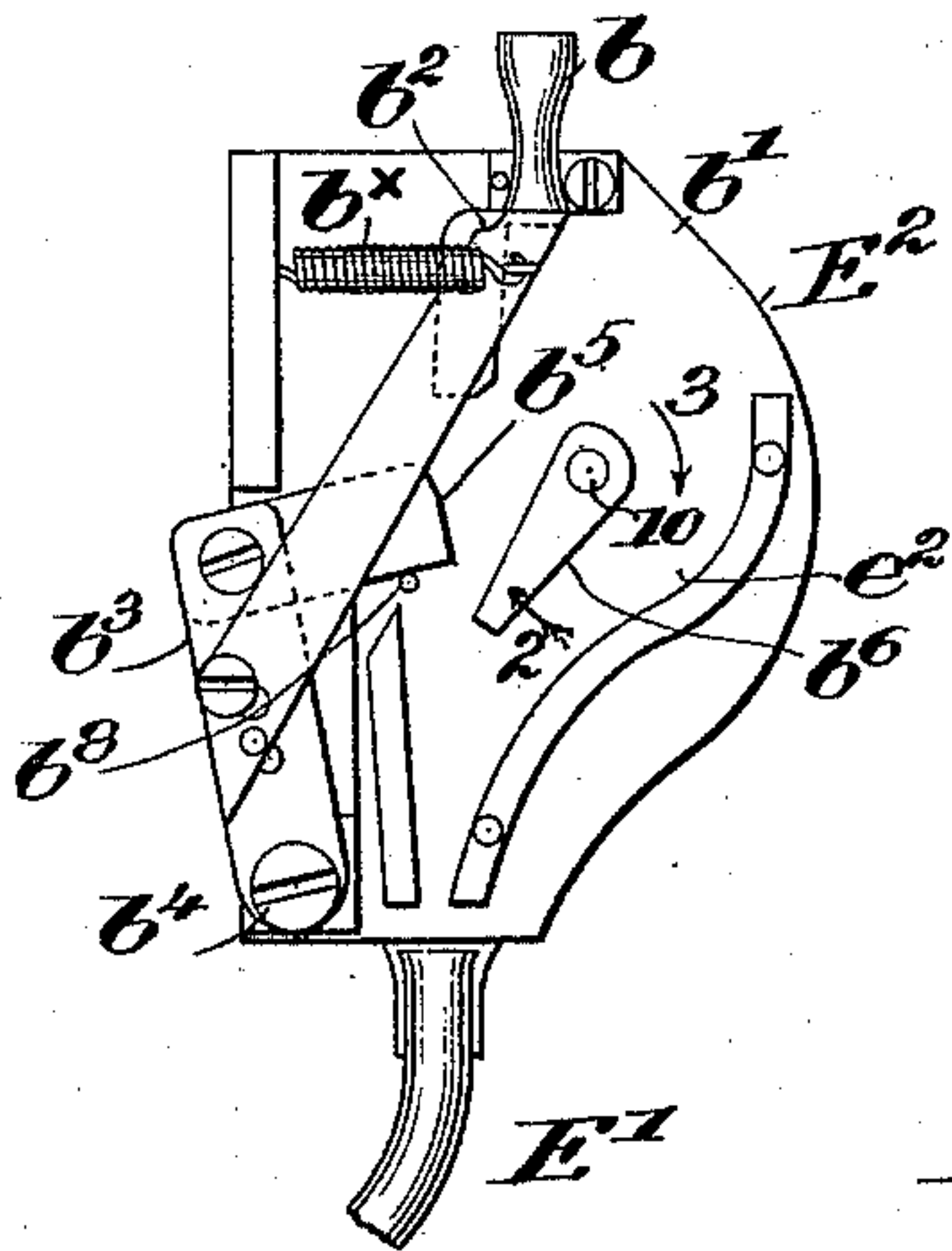


Fig. 4.

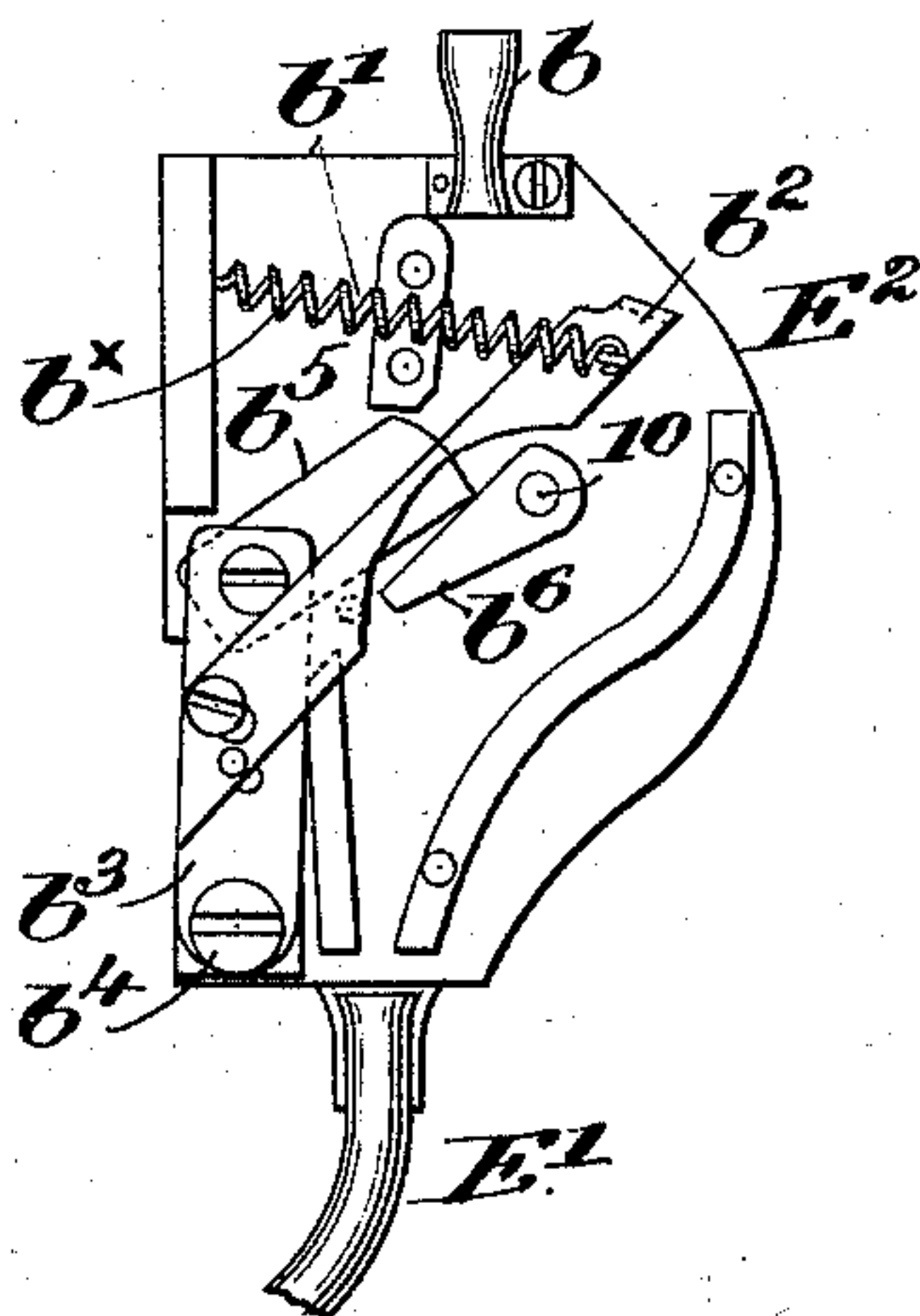


Fig. 5.

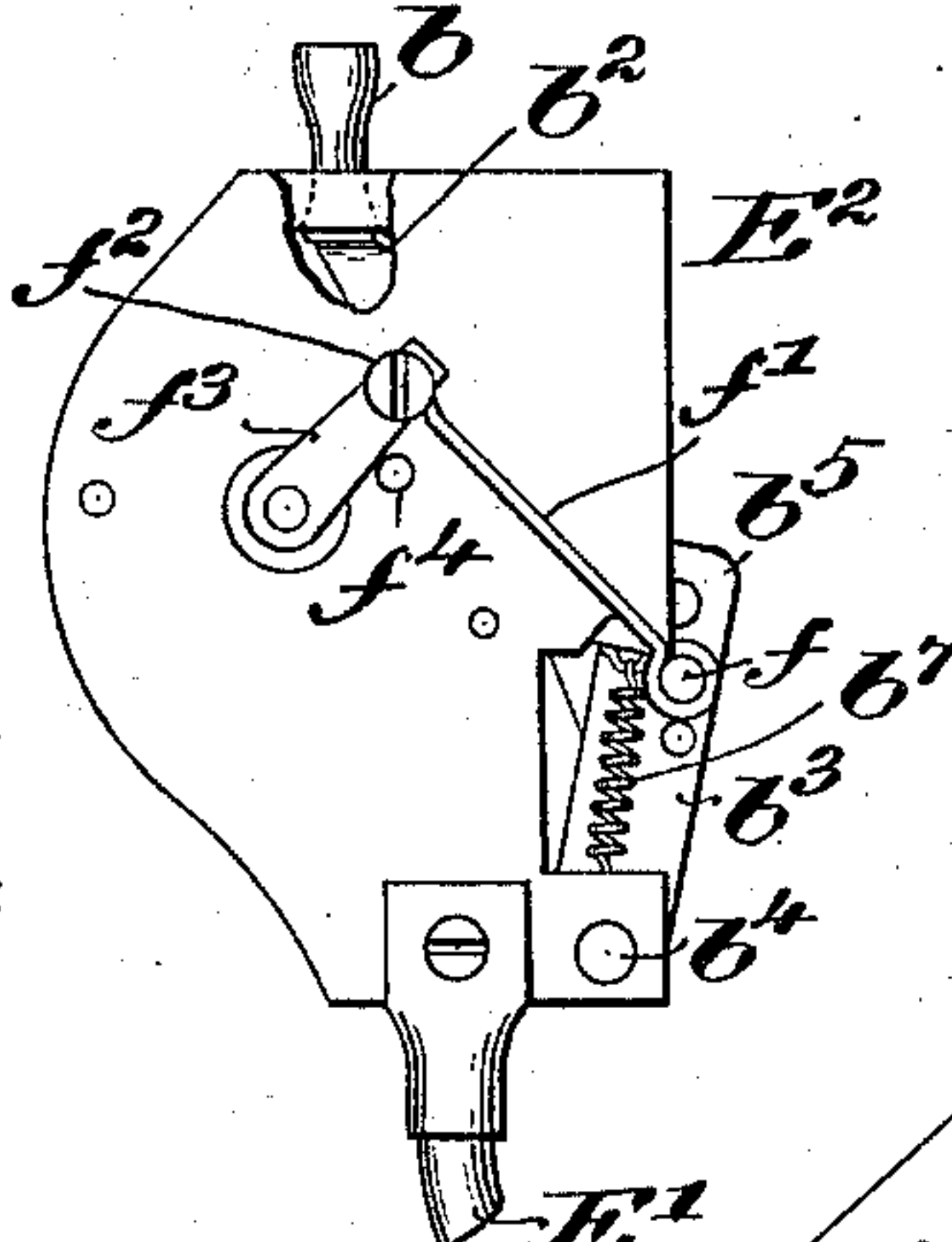


Fig. 6.

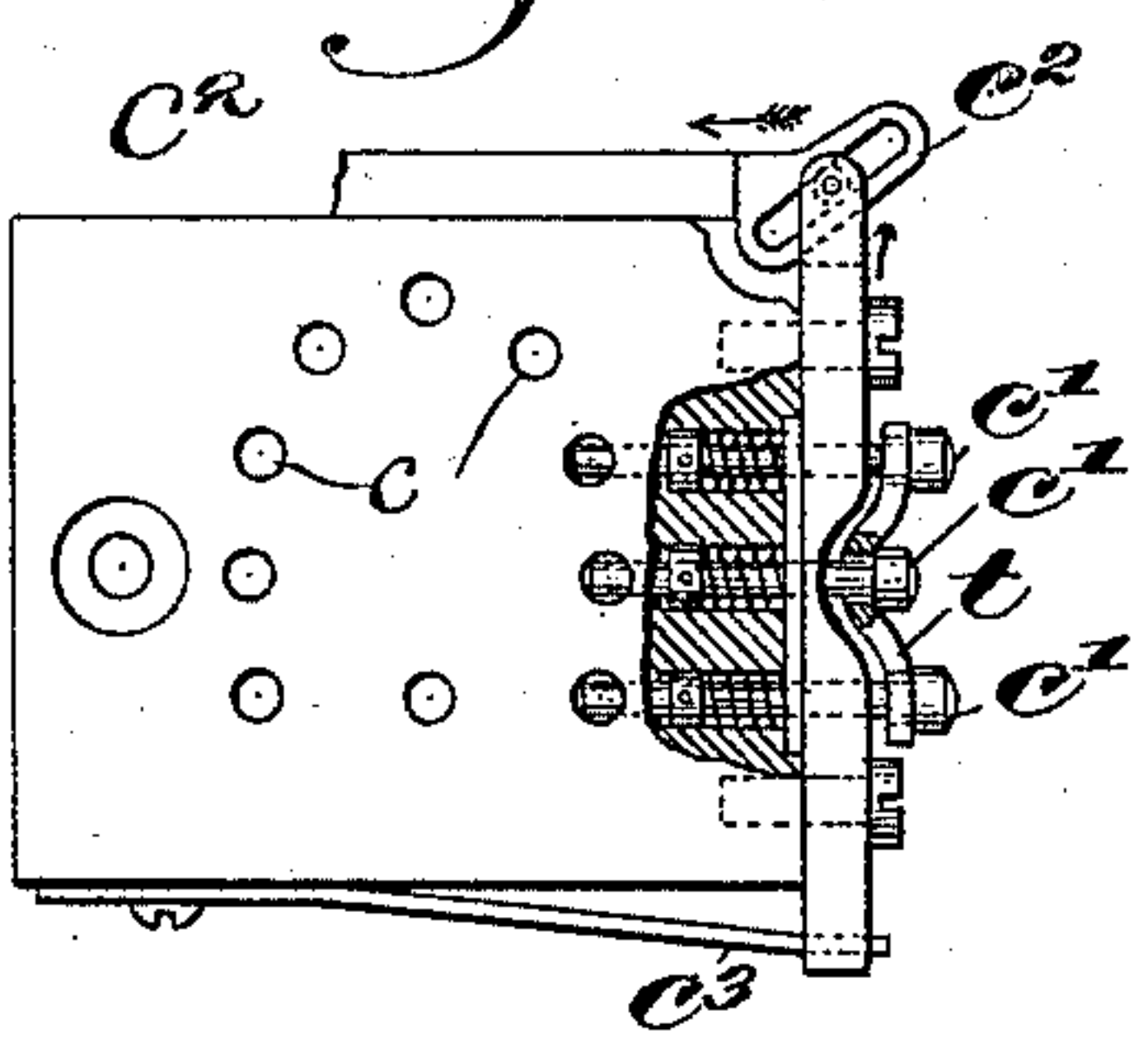


Fig. 7.

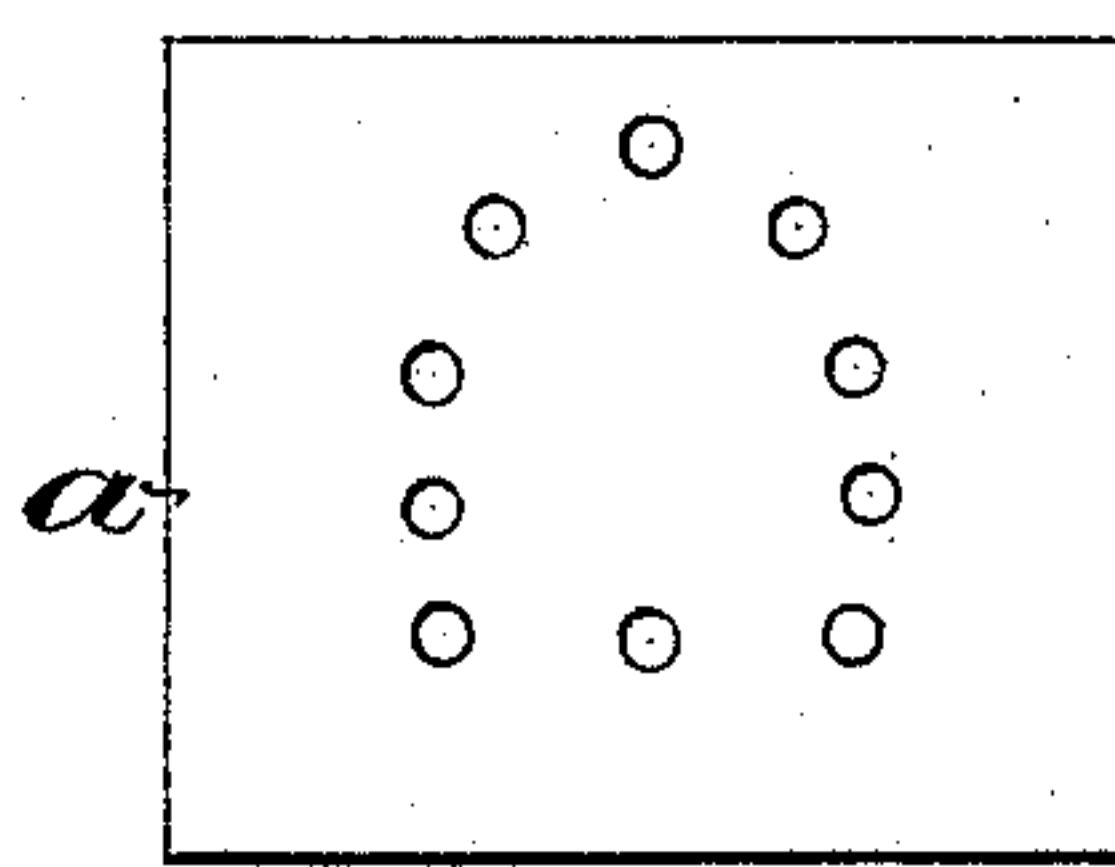


Fig. 8.

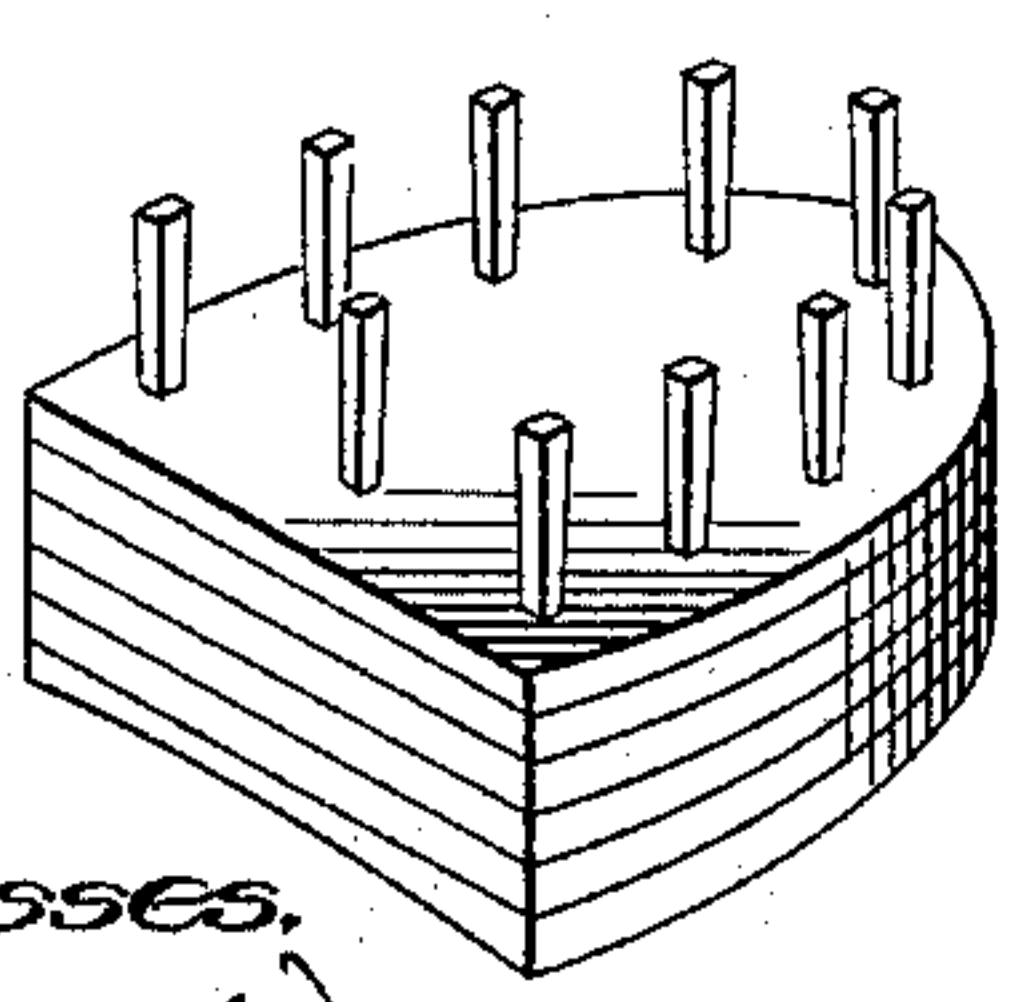
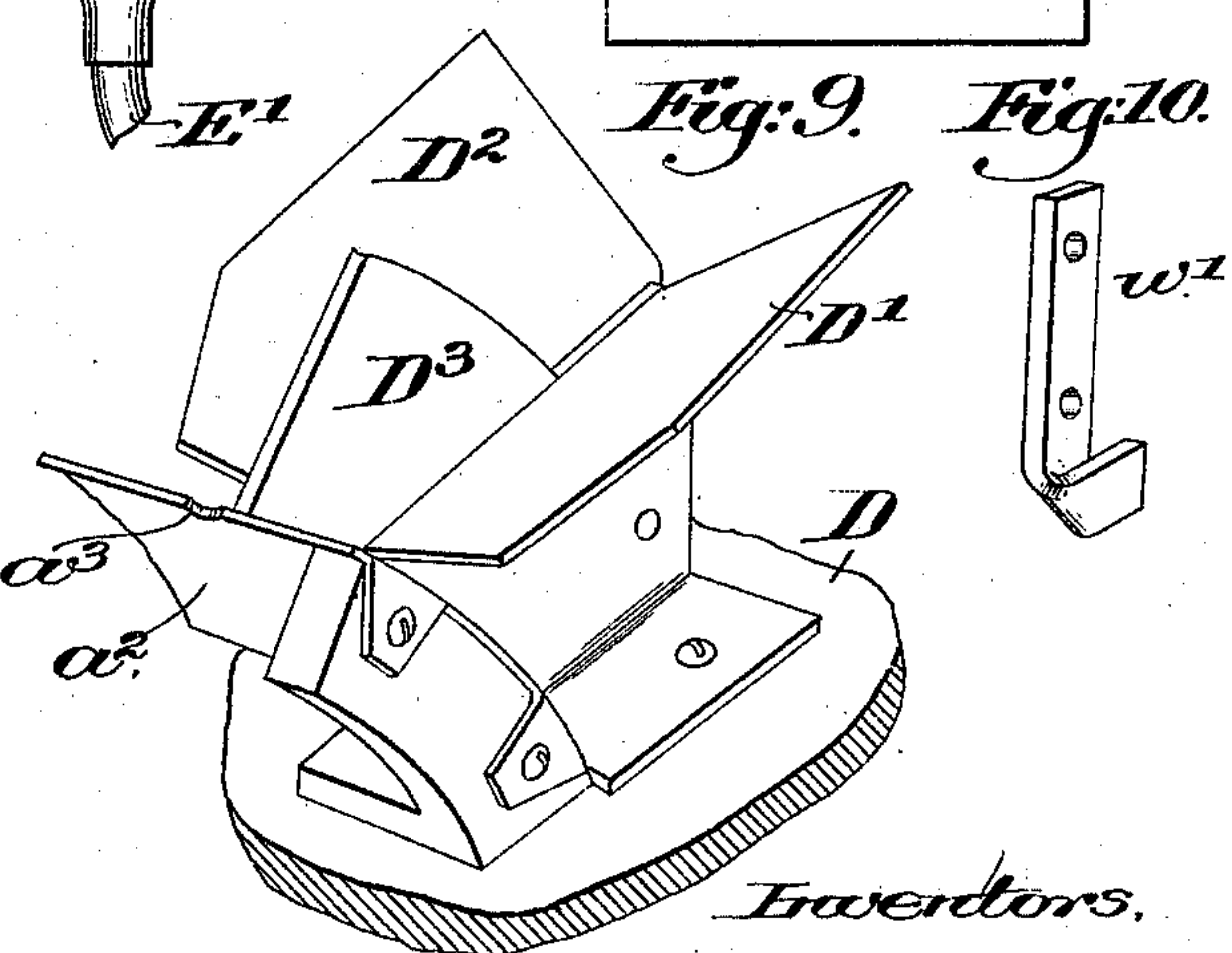


Fig. 9.

Fig. 10.



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UNITED STATES PATENT OFFICE.

THOMAS K. KEITH, OF BOSTON, AND GEORGE H. CLARK, OF ALLSTON,
ASSIGNORS TO JAMES W. BROOKS, TRUSTEE, OF PETERSHAM, MAS-
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NAIL ASSORTING AND DELIVERING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 542,616, dated July 9, 1895.

Application filed September 17, 1894. Serial No. 523,215. (No model.)

To all whom it may concern:

Be it known that we, THOMAS K. KEITH, of Boston, and GEORGE H. CLARK, of Allston, county of Suffolk, State of Massachusetts, have invented an Improvement in Nail Assorting and Delivering Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve that class of mechanism employed to assort tapering nails, such, for instance, as used in connection with heels of boots and shoes, and when desired to drive them.

In accordance with our invention, the nails are placed in bulk in a suitable hopper containing a pivoted vibrating lifter grooved for the reception longitudinally thereon of a nail to lift the nails singly and discharge them at the proper time into a chute or passage-way in communication with an assorting device adapted to arrest each nail separately and give to it a sliding movement on a support, the movement being in an upward direction, until the upper end of the nail projects over the end of the support, those nails with their heavier ends uppermost being tipped by gravity and turned over the support and thereby reversed, the nails having their heavier ends downward after having been acted upon and put through the sliding movement being permitted to pass along without being reversed. The nails having their heads all arranged downward or in one direction are fed by or through suitable distributing-tubes into a series of holes suitably arranged in a receiver or carrier mounted on an actuating device and provided with nail-holding devices, and from which the said series of nails, all arranged with their heads downward or in one direction, are driven or discharged either into a pricked heel-blank or into a nail-box or templet when the actuating device has moved the carrier away from the tubes, the carrier acting at such time as a driver for the nail.

One part of our invention in a nail-assorting mechanism consists in the combination, with a stationary hopper to receive nails in

bulk, and a pivoted vibrating lifter grooved for the reception longitudinally thereon of a nail, of a curved rest located between the hopper and the tube to receive the nails and forming one end of the hopper, and also a dent to retain the nail on the lifting device until it is to be discharged therefrom, substantially as will be described; also, in a hopper to receive nails, a nail-lifting device to lift nails therefrom, and a nail-distributing-tube system, combined with a nail-assorting mechanism comprising a shelf, a co-operating finger movable toward and away from it to arrest each nail separately, and means to move the finger along the shelf and slide each nail thereupon until its upper end projects over the end of the shelf, those nails having their head ends uppermost being tipped by gravity and turned over the edge of the shelf and discharged, substantially as will be described.

Other features of our invention will be hereinafter described, and pointed out in the claims.

Figure 1, in front elevation, represents a sufficient portion of a machine embodying our invention to enable the same to be understood. Fig. 2 is a right-hand side elevation, the parts at the left-hand side of the machine being shown partially by dotted lines. Fig. 3 is an enlarged detail of the preliminary nail-assorting mechanism, its outer side wall, shown in Fig. 2, being removed, the parts being shown in position to close the throat; Fig. 4, a view of the same parts, but in a different position; Fig. 5, a view of the parts shown in Fig. 3 from the rear side. Fig. 6, in plan view, shows the receiver or carrier detached; Fig. 7, the nail-box or templet α , in plan view, detached. Fig. 8 shows a heel-blank having the nails driven into it from the receiver or carrier. Fig. 9 shows the hopper detached and enlarged, and Fig. 10 is a detached view of one of the cam-stops to be referred to.

The framework A, of suitable shape to sustain the working parts, has a power-shaft A', provided, in this instance of our invention, with an eccentric A², which, by a suitable eccentric-strap A³, engages a stud A⁴, mounted, as herein shown, in a lever or actuating de-

vice A^6 , or movable frame or yoke, pivoted in suitable manner by or through a stud A^5 , suitably supported in the framework.

The stud A^4 receives upon it loosely a sector-lever A^7 , herein represented as a bell-crank, one arm of the crank being toothed, as at B' , while the other arm has, in this instance of our invention, (see dotted lines, Fig. 2,) a stud B^2 , which enters a cam slot B^3 , also shown by dotted lines as made in a stationary plate B^4 .

The teeth B' of the sector engage a pinion C , mounted upon a stud C' , herein represented as fixed in the lever A^6 , said pinion being operatively connected with a sleeve or hub C^x , mounted loosely on said stud, said sleeve constituting a bed to sustain a receiver or carrier C^2 , said receiver or carrier having in practice a series of holes c , (see Fig. 6,) which may be arranged in any suitable order according to the work to be done—as, for instance, if nails are to be assorted for a heel, the holes will be arranged as in the order represented in the drawings.

The holes c in the receiver or carrier are of sufficient depth to receive the heads and as much of the shanks of the nails as will be left exposed after the latter have been driven into a heel, the bottoms of the holes abutting against the heads of the nails and driving them into the heel when the receiver or carrier acts as a driver.

In Fig. 1 the receiver or carrier C^2 is shown as secured to the head by suitable screws, and a block c^{20} is shown as interposed between the head and the under side of the receiver or carrier, blocks of different thickness being in practice used in order to properly adjust the carrier to the thickness of the heel to be nailed.

The nails manipulated by the assorting mechanism, to be described, will be deposited in the holes c referred to, and in practice some suitable means may be employed to retain the nails in said holes frictionally, we having shown, in this present instance of our invention, one form of holding mechanism, the same consisting of inwardly-pressed spring-pins c' , which intersect the nail-holes c , the pins being retracted or pulled outwardly at the proper times from the holes c , as when the receiver or carrier is receiving nails and when the nails are to leave the said receiver or carrier. In this instance of our invention we have shown the pins as moved outwardly by a suitable sliding cam c^2 , one only being fully shown, said cam being double-acting or so made as to withdraw the pins when moved in either direction, it being retained in its normal position by a suitable spring and being slid in one or the other direction by contact with stops w' and c^4 , the stop w' being shown detached in Fig. 10. The one cam c^2 , shown acting on a yoke through which three of the spring-pins or holders pass, is adapted to operate said pins simultaneously.

While we have herein shown only one cam, as c^2 , to act on a yoke through which some of

the spring pins or holders pass, it is obvious that a series of similar cams may be disposed around the carrier to actuate yokes through which spring pins or holders for the remainder of the holes pass, suitable mechanism being provided to operate the cams and control the movement of the pins.

This invention is not, however, limited to the particular form of holding device shown, and instead we may use any other suitable well-known mechanism.

The use of the sector and pinion referred to is to put the receiver or carrier in position to have fed into it a series of nails from a series of nail-distributing tubes, and then to turn the nail-receiver containing the whole series over and place the nails opposite it just above a heel-blank w , preferably previously pricked and placed on a suitable support, (see Fig. 1,) or it may be over holes in a nail-box or templet a , (shown in Fig. 7,) such as commonly used in nailing-machines of the Glidden type, the ends of the nails protruding from the inverted receiver or carrier being driven into the heel-blank by the final downward movement of the said receiver.

It will be obvious from the foregoing description that the downward movement of the lever, with the receiver or carrier filled with nails, portions of which protrude therefrom, may be made to effect the driving of said nails directly into any material suitably supported underneath the said receiver or carrier, whether a heel-blank to be loaded or a heel laid upon a shoe supported on a suitable jack, or whatever may be the thing to be nailed. During the time that the lever A^6 is being depressed to put the projecting ends of the nails into the holes of the heel-blank or other thing the receiver or carrier should move in a straight line, so as not to tip the nails out of vertical position, and to insure this we have provided the sleeve or hub C^x with a finger c^6 , which enters a suitable guide-slot c^7 in a suitable stand c^8 attached to the framework.

In this present instance of our invention, to avoid making the drawings complicated, we have considered it necessary to show only one nail-distributing tube and a portion of another and the apparatus by which it is fed; but it will be understood in practice that the number of these nail-distributing tubes co-operating therewith may be limited only by the work to be done and the number of nails to be handled simultaneously.

The framework of the machine has a suitable plate D , upon which we have erected a hopper, herein represented as composed of like wings D' D^2 , having a slot between them, in which slot plays a nail-lifter D^3 to be described, said nail-lifter being made as a curved arm grooved at its free end or face, (see Fig. 1,) and working between the side walls of the hopper to receive a nail n , and, as the lifter rises, takes said nail out of the hopper, the curve of the arm and the inclination of its grooved nail-holding face being such as to

enable the nail to drop by gravity therefrom when the lifter has been raised into position opposite the upper end of the mouth or receiving end E of the nail-distributing-tube system, the other portion of the tube being marked E', the nail-assorting device giving to the nail its preliminary movement referred to, being located between them.

In this present instance of our invention we have arranged between the end of the tube E and the hopper a curved rest a^2 , which acts to prevent the accidental escape of nails not only from the inner end of the hopper, but also from the free end of the lifting device until the said nail has reached a position opposite the upper end of the tube E, we having, in this instance, shown such rest as provided with a notch a^3 opposite the upper end of the tube.

Referring now to Figs. 2 and 9, it will be seen that the wings D' D² are cut off somewhat, so as to leave open spaces between the hopper and the rest a^2 , these spaces being left to enable a nail which may be lying crosswise upon the lifter to drop off and out of the hopper and into a suitable receptacle, (not shown,) and thus not interfere with the working of the machine.

Referring now to Fig. 3, where the preliminary assorting device is represented on a larger scale, b represents a throat, forming practically a part of the nail-distributing-tube system, said throat being attached to a plate b' forming part of the nail-assorting mechanism. The nails entering the throat come against a gate b^2 , which is normally kept closed by a suitable spring b^x , as in Fig. 3, said gate, in the present instance of our invention, being attached to an arm b^3 mounted upon a fulcrum b^4 , said arm, in this instance of our invention, carrying one member b^5 of the preliminary assorting device, the other member being a movable shelf b^6 . The member b^5 is pivotally mounted upon the arm b^3 , and a suitable spring, as b^7 , (see Fig. 5,) connected to said arm and to said member b^5 , normally acts to keep said member against a stop b^8 . The member b^5 is moved positively by a suitable finger b^9 , attached to a rock-shaft b^{10} , having proper bearings in the framework, said rock-shaft having at one end an arm b^{12} , connected by a link b^{13} with an arm b^{14} , fast on a rock-shaft b^{15} , having attached to it an arm b^{16} , to which in turn is secured the nail-lifter D³, said arm b^{14} having adjustably connected with it by a stud b^{18} in a slot b^{19} a link b^{20} , which, as shown, is attached to a crank-pin b^{22} carried by the main shaft. When the rock-shaft b^{10} is moved, the arm b^9 thereon will act on arm b^3 to thus open the gate and let a nail fall from the throat b upon the shelf b^6 , and at the same time the member b^5 of the assorting device will be moved forward and engage said nail as it strikes the shelf b^6 , the latter being somewhat elevated or turned in the direction of the arrow 2, Fig. 3, by or through the shaft 10 on which it is

fixed, as will be described, during the time that the gate is opening the throat.

Fig. 3 shows the gate closed and the assorting mechanism in its normal condition. Fig. 4 shows the same parts in the positions they will occupy after the gate has been moved to open the throat and the nail has dropped on the shelf and been pushed somewhat up the shelf.

Now, in the further movement of the assorting device the member b^5 will travel upwardly along the shelf, and at the same time the shelf will have its movement continued in the direction of the arrow, so that in case a nail has been dropped upon the shelf with its large or heavier end uppermost the said nail will be lifted far enough to place its center of gravity above the top of the shelf, when the nail will be tipped over the shelf in the direction of the arrow 3, and will, in this instance of our invention, travel down the passage-way e^2 , emerging therefrom into the lower portion E' of the nail-distributing tube. In case, however, the head end of the nail be down, the movement of the nail along the shelf will not enable its upper end to preponderate in weight, and as the member b^5 is retracted by the spring b^x a space will be left between the members b^5 and b^6 to let the nail continue its travel from the lower end of said shelf down into the nail-distributing tube E'.

To operate the shelf, we have shown the arm b^3 as provided with a suitable pin or projection f , connected by link f' with a stud f^2 on an arm f^3 , connected to the shaft 10, carrying said shelf, a suitable stop f^4 limiting the backward movement of the shelf.

Prior to our invention we are not aware that a nail on its passage between a hopper and a nail receiver or carrier has ever been subjected to the action of a preliminary or assorting movement by an assorting device which will stop the nail and partially lift it, and therefore this invention is not limited to the exact mechanism shown for actuating the same, so long as each nail has imparted to it a movement such as described, as it will be obvious that the same may be modified in various ways by simply the skill of a mechanic and without the exercise of invention.

From the foregoing it will be understood that the nails will come into the portion E' of the tube under like conditions, and, reaching the lower extremity or lower end of the tube E', they may be arrested for a longer or shorter period by a stop g , herein represented as a lever, entering a slot in a portion of the tube nearer its extremity, said lever having an arm, which may be of any suitable or usual construction, which, when the lever A⁶ is lifted to put the receiver or carrier uppermost, as in Figs. 1 and 2, will be struck by the pin c^6 on the hub C^x to thus move the arresting device to release the nail and permit it to drop readily from the tube into a hole in said receiver or carrier.

The nail receiver or carrier moves vertically

up to and so as to meet substantially the delivery end of the distributing-tube, so that there is no space between them through which nails may escape.

5 The arresting device herein shown is normally kept closed by a suitable spring g' .

It will be seen, Fig. 2, that the free end of the lifter D is beveled or inclined in such manner with relation to its center of motion,
10 the shaft b^{15} , that when in its lowest position in the hopper it will be substantially horizontal; but when lifted, as in Fig. 2, the nail, owing to the inclined position of the end of the lifter, may slide off therefrom endwise by
15 gravity into the tube E.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A stationary hopper to receive nails in
20 bulk, and a pivoted vibrating lifter grooved for the reception longitudinally thereon of a nail, combined with a curved rest located between the hopper and the tube to receive the nails, and forming one end of the hopper and
25 also a detent to retain the nail on the lifting device until it is to be discharged therefrom, substantially as described.

2. A nail-receiving hopper, and a rest located at or near one end thereof, a portion of
30 the hopper being cut away to leave a space between itself and the rest, combined with a lifting device to receive longitudinally and lift nails from the hopper, the space permitting the escape therethrough, of nails lying
35 crosswise to and which may be lifted by the lifting device, substantially as described.

3. A hopper to receive nails, a nail-lifting device to lift the nails therefrom, and a nail-distributing tube system, combined with a
40 nail-assorting mechanism comprising a shelf, and a co-operating finger movable toward and away from it, to arrest each nail separately, and means to move the finger along the shelf and slide each nail thereupon until its upper
45 end projects over the end of the shelf, those nails having their head ends uppermost being tipped by gravity and turned over the end of the shelf and discharged, substantially as described.

50 4. In a nail-assorting mechanism, a shelf to receive each nail thereon, and a co-operating finger b^5 movable at times into contact with and to slide on said shelf, the end of the finger when in contact with the shelf
55 forming a temporary stop for each nail, sep-

aration of said finger and shelf forming a passage therebetween through which a nail remaining on the shelf may freely pass, substantially as described.

5. In a nail-assorting mechanism, a throat, 60 and a gate to close it intermittently, combined with an independent assorting device to arrest and lift each nail after its release from the throat, to operate, substantially as described. 65

6. The combination with a nail tube or tubes to contain nails, of a receiver or carrier having a hole to receive a nail, and means to move said receiver or carrier bodily toward and from said nail tube vertically, to receive 70 nails from the tube and thereafter to deliver said nails substantially as described.

7. A nail distributor having one or more tubes, and a nail-receiver or carrier to receive nails therefrom, combined with means 75 to reverse said receiver or carrier and also move it vertically when reversed, substantially as described.

8. A nail-assorting mechanism, a system of tubes in which the nails are assorted provided 80 with nail-holding devices, a nail-receiver or carrier and an actuating device upon which it is mounted, combined with means to raise and lower said actuating device and with it the receiver or carrier, whereby the latter 85 when in one position may receive a series of nails and when in another position may act as a driver to force the points of the nails contained in it directly into a heel or other article, substantially as described. 90

9. A nail-receiver or carrier provided with a series of nail-receiving holes and adapted when in its uppermost position to receive simultaneously a series of nails, combined with independent holding devices for the nails, 95 and means connected to and to positively withdraw the holding devices from engagement with the nails whereby the latter may be discharged in unison from the receiver when in its reverse position, substantially as 100 described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

THOMAS K. KEITH.
GEORGE H. CLARK.

Witnesses:

GEO. W. GREGORY,
M. J. SHERIDAN.