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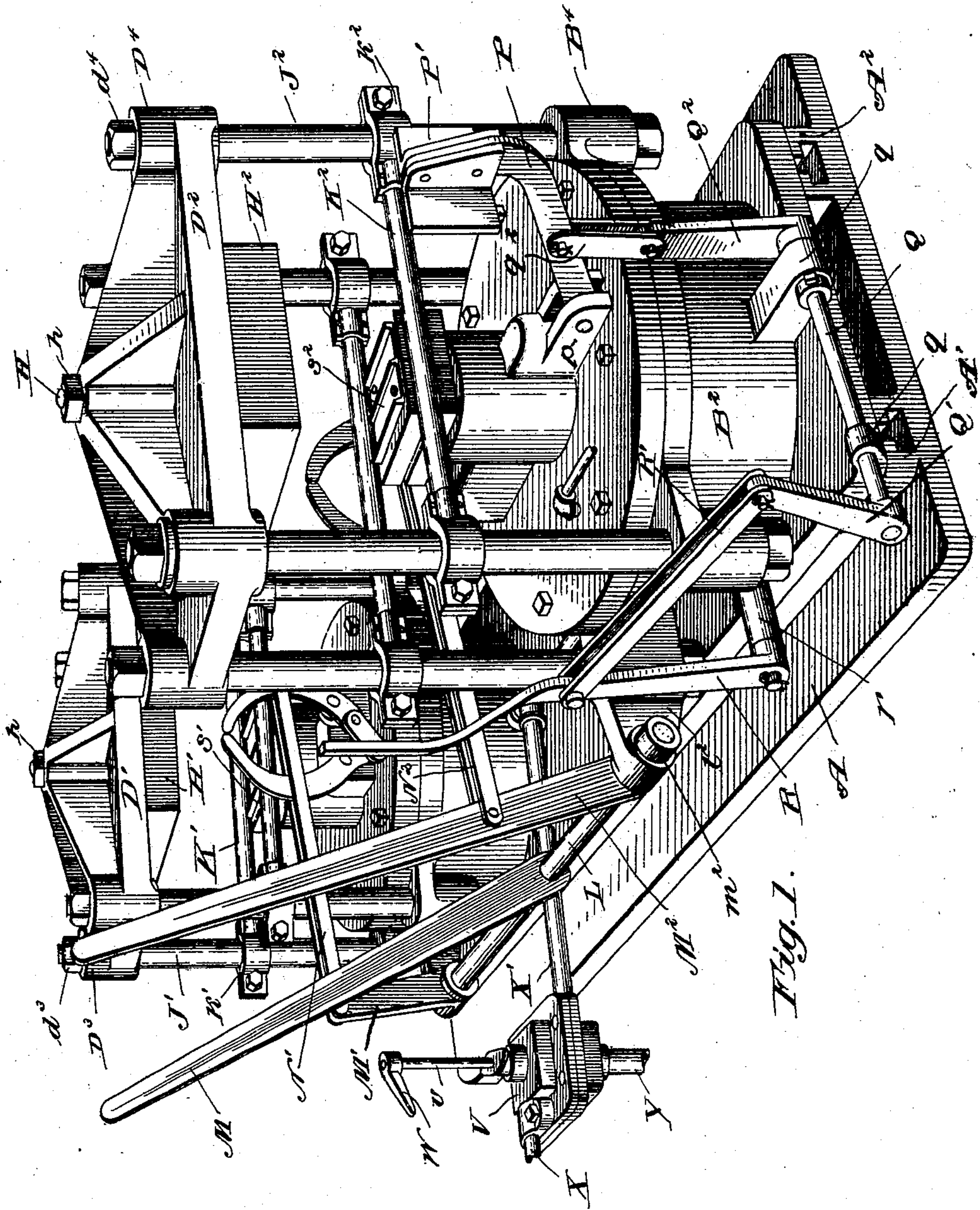
Patented Oct. 28, 1902.

F. W. WOOD.
TIE PLATE MACHINE.

(Application filed Aug. 14, 1901.)

(No Model.)

3 Sheets—Sheet I.



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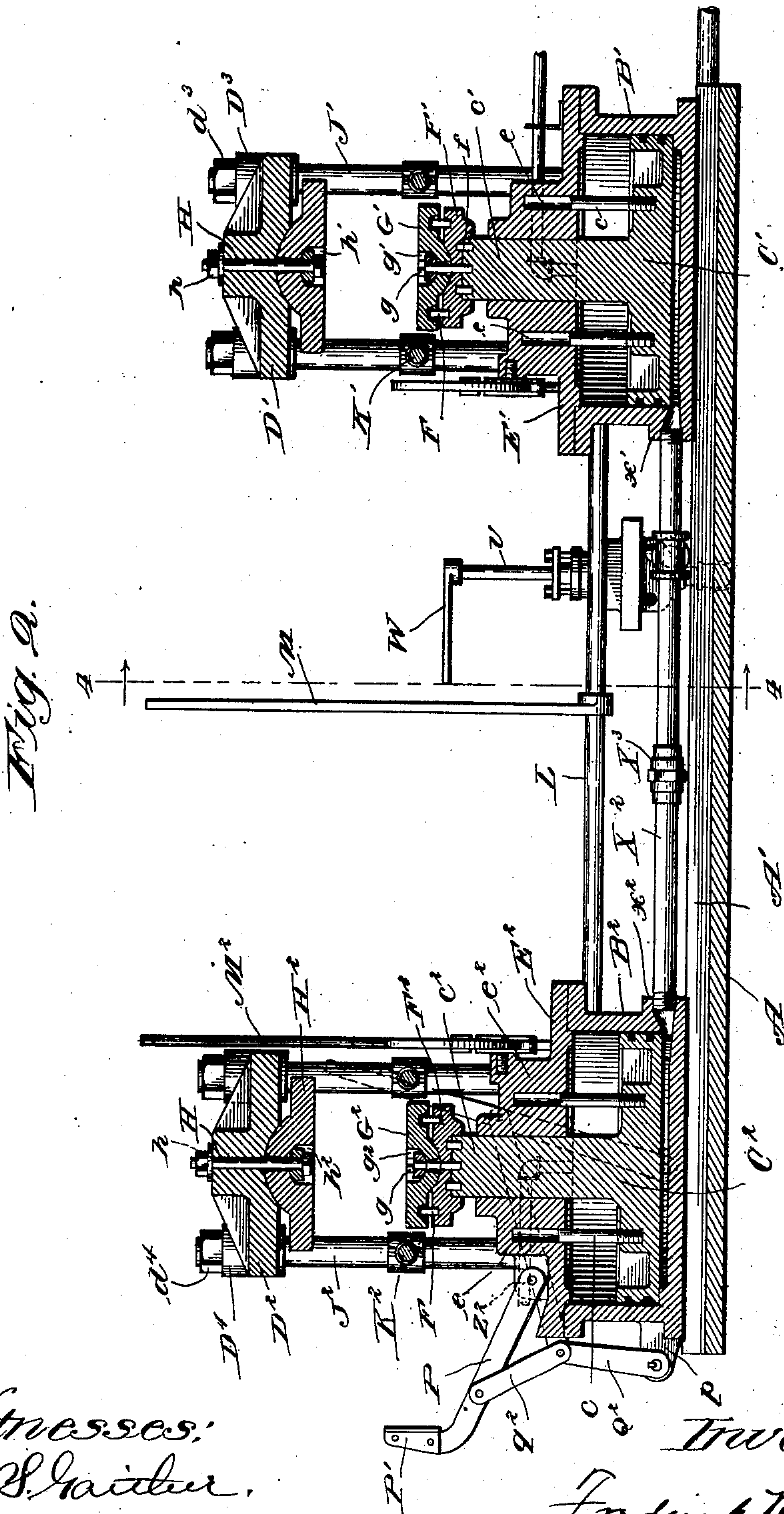
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

Fig. 1.

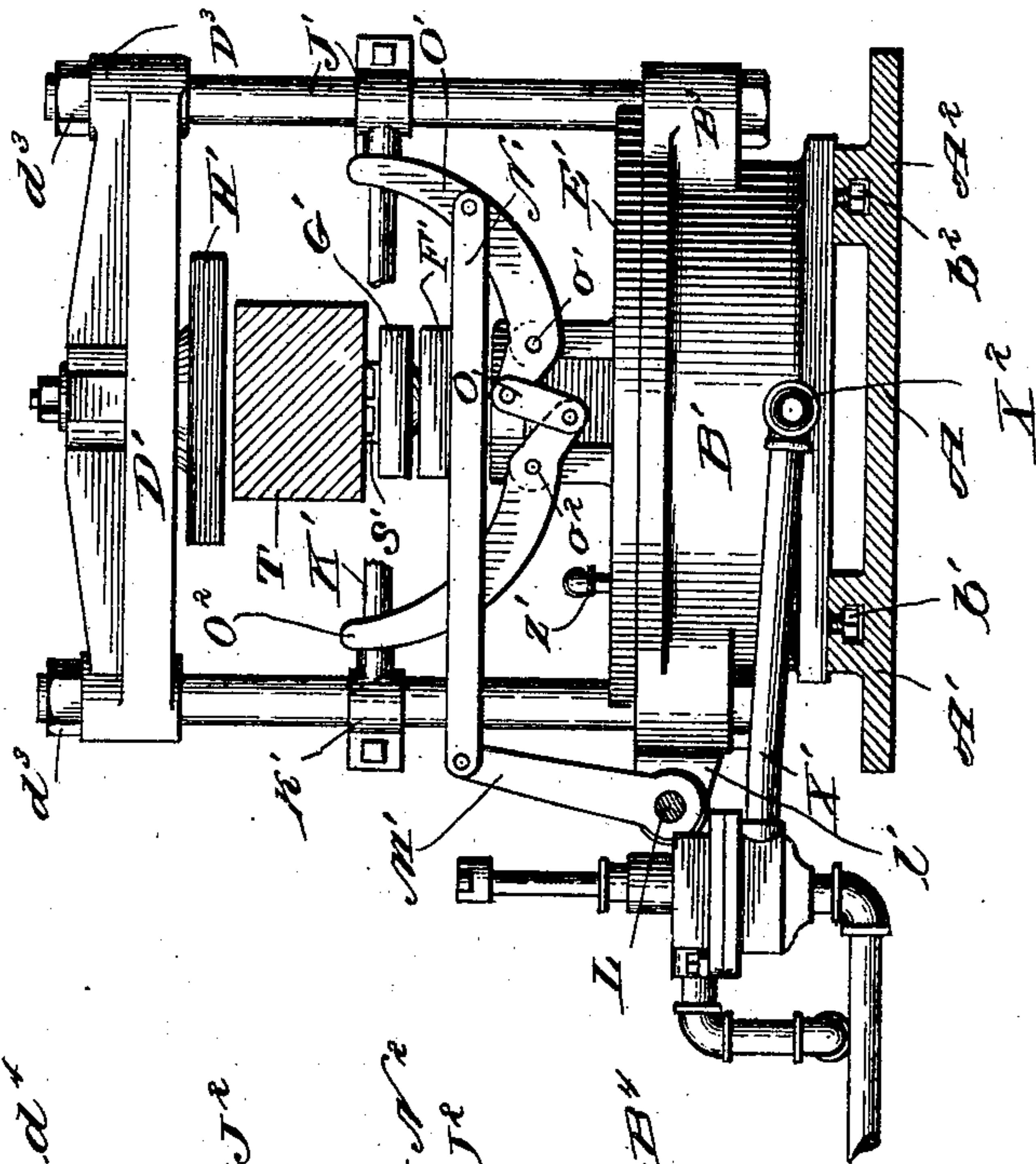
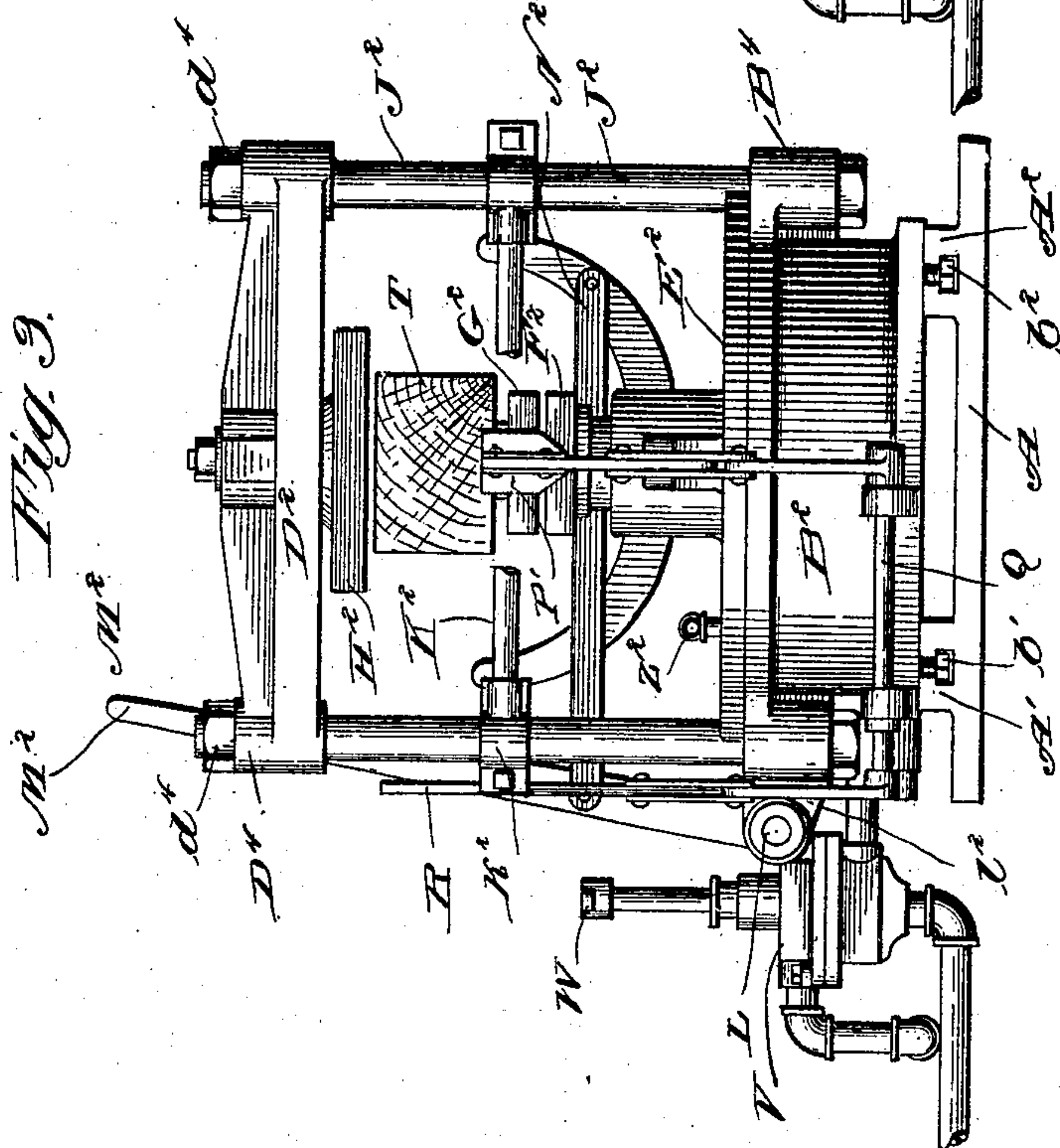


Fig. 2.



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UNITED STATES PATENT OFFICE.

FREDERICK W. WOOD, OF BALTIMORE, MARYLAND, ASSIGNOR TO RAILROAD SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

TIE-PLATE MACHINE.

SPECIFICATION forming part of Letters Patent No. 712,167, dated October 28, 1902.

Application filed August 14, 1901. Serial No. 72,037. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK W. WOOD, a citizen of the United States, residing in the city of Baltimore, State of Maryland, have invented a certain new and useful Improvement in Tie-Plate Machines; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates generally to a machine for applying tie-plates to railroad-ties, and more particularly to a machine for this purpose which will simultaneously secure the tie-plates to a tie at a predetermined distance apart to conform to the gage of the railroad.

In the construction of railroads the tie-plates are ordinarily secured to a tie separately, which necessitates the applying of one plate to the tie and then the location of the second plate by accurately measuring the distance from the first, in order that the rails when fastened to the plates may be spaced apart the requisite distance.

The object of my invention is to provide a machine which will perform at one operation the several steps incident to properly applying the tie-plates to a tie.

A further object of my invention is to provide a machine of the character referred to which will simultaneously apply the tie-plates to a tie at the desired distance apart, which will properly position the tie with respect to the tie-plates, and which will also securely hold the tie, and thereby prevent its displacement while the plates are being applied thereto.

The invention will be more fully described hereinafter, with reference to the accompanying drawings, in which the same is illustrated as embodied in a convenient and practical form, and in which—

Figure 1 is a perspective view of the complete machine; Fig. 2, a longitudinal sectional view through the center of the machine; Fig. 3, an end elevational view of the machine looking from the right in Fig. 1 and from the left in Fig. 2; and Fig. 4, a cross-sectional

view taken on line 4 4, Fig. 2, looking in the direction of the arrows.

The same reference characters are used to indicate the same parts in the several figures of the drawings.

My invention is illustrated as embodied in a machine consisting, essentially, in a bed-plate upon which are adjustably secured cylinders the pistons within which are actuated by fluid-pressure, and thereby simultaneously move abutments upon which the tie-plates and tie are placed, the latter being forced into engagement with fixed abutments, whereby the tie-plates and ties are subjected to a compression in order to apply the plates to the ties at the desired distance apart. The tie is properly positioned relative to the tie-plates and is prevented from lateral displacement while the tie-plates are being secured thereto.

Referring more particularly to the drawings, reference-letter A indicates a base-plate, which may be located upon a railroad-car or upon any other desired or suitable support. Guides A' and A² are provided upon the upper surface of the bed-plate and are arranged parallel at any desired distance apart. Fluid-pressure cylinders B' and B² are supported upon bed-plate A and are provided with projections b' and b², which engage the parallel guides A' and A², whereby the positions of the cylinders may be adjusted. Within the cylinders B' and B² are pistons C' and C², respectively, which are provided with piston-rods c' and c², extending through the cylinder-heads E' and E². The pistons are provided with packing and are also provided with projecting pins c, which engage corresponding-shaped recesses e in the cylinder-heads E' and E². The cylinder-heads are secured to the cylinders in any desired manner—as, for instance, by bolts extending through the heads and through outwardly-projecting flanges on the upper ends of the cylinders, as shown, for instance, in Fig. 1.

The cylinders B' and B² are provided with outwardly-projecting lugs B³ and B⁴, respectively, through which pass posts J' and J², these posts being preferably four in number, projecting from each of the cylinders. The

upper ends of the posts support cross-heads D' and D^2 , respectively, by means of circular flanges D^3 and D^4 , located at the corners of and formed integrally with the cross-heads, the upper ends of the posts J' and J^2 passing through the openings in D^3 and D^4 and being secured by suitable means—such, for instance, as nuts d^3 and d^4 . Depending from the cross-heads are platens H' and H^2 , which are secured to the cross-heads in any suitable manner, preferably, however, so as to have a slight oscillatory movement relative to the cross-heads. Bolts H , provided with nuts h , are shown as passing through the platens H' and H^2 and also through the centers of the cross-heads D' and D^2 . The heads of the bolts are located in recesses formed in the platens, which they engage through interposed washers. The openings through the platens are slightly larger in diameter than the bolts H , and the points of contact between the platens and the cross-heads are spherical, whereby the slight oscillatory movement above referred to is permitted.

The ends of the piston-rods c' and c^2 are provided with heads F' and F^2 , secured thereto by any suitable means—such, for instance, as dowel-pins f . Platens G' and G^2 are secured to the heads, respectively, by suitable means, which preferably consist in universal joints formed by a spherical engaging surface through which pass bolts g , the heads of which are seated in recesses g' and g^2 , formed in the surface of the platens G' and G^2 . Washers may be interposed between the heads of the bolts g and the recesses in which they are located. The openings through the platens G' and G^2 through which the bolts g pass are slightly larger in diameter than the bolts, thereby permitting universal oscillation of the platen, such oscillation, however, being limited by pins F , projecting from the upper faces of the heads F' and F^2 and entering the recesses formed in the under surface of the platens G' and G^2 .

The cylinders B' and B^2 are provided with projecting lugs l' and l^2 , within which is journaled a shaft L . A crank M' and lever M^2 project upwardly from the opposite ends of the shaft L , to which are secured pairs of links N' and N^2 , respectively, the opposite ends of such links being secured to one of a pair of levers O' and O^2 , the latter being operatively connected at their adjacent ends by a link O . The links O' and O^2 are arranged in two pairs and are pivotally supported at points o' and o^2 , respectively, upon portions projecting from each of the cylinder-heads E' and E^2 . A lever M is rigidly secured to the shaft L and serves as a means for rotating such shaft, and with it the crank M' , rigidly secured thereto. The lever M^2 is loosely supported upon the shaft L through the collar m^2 , surrounding said shaft, and is extended beyond its point of connection with the links N^2 to afford means for operating the pair of

levers O' and O^2 , pivoted upon the cylinder-head E' through the intervening pair of links N^2 , connected to the lever O' .

The cylinder B^2 is provided with projections q , within which is journaled a shaft Q . The opposite ends of such shaft Q are provided with crank-arms Q' and Q^2 , the former of which is connected by a pair of links R' with a hand-lever R , the lower end of which is supported upon a projection r , extending from the base of the cylinder B^2 . The crank-arm Q^2 is connected by means of a pair of links q^2 with a lever P , the end of which is pivotally secured between lugs p , projecting from the cylinder-head E^2 . The end of the lever P opposite to its pivotal support is preferably bent at substantially a right angle and is provided with lateral projecting portions P' .

Parallel rods K^2 extend between the posts J^2 , being suitably secured thereto—as, for instance, by split collars k^2 . Similar parallel rods K' extend between pairs of the posts J' , to which they are secured at their ends by suitable means—as, for instance, split collars k' .

The cylinders B' and B^2 are provided with openings, preferably screw-threaded, x' and x^2 , within which are secured the opposite ends of a pipe X^2 , the latter being connected by a suitable coupling with a pipe X' , which communicates with the interior of a valve-chamber V . The valve-chamber is provided with an exhaust-conduit Y and with a supply-conduit X , which communicates with any desired source of pressure—as, for instance, a steam-boiler. Within the valve-casing is a valve of any desired construction for controlling the communication of the pipe X' with either the supply-conduit X or the exhaust-conduit Y . This controlling-valve may be operated by connecting a stem v , which projects above the casing, with a handle W . To permit the relative adjustment of the cylinders B' and B^2 , the pipe X^2 , which is connected at x' and x^2 to the cylinders, may be flexible or may be rendered adjustable in length by means of an extended coupling-sleeve X^3 , thereby allowing the pipe X^2 to be lengthened or shortened to correspond to the adjusted distance between the cylinders B' and B^2 . In order to permit the escape of the air above the pistons when they are moved by the admission of fluid-pressure to the cylinders, ports Z' and Z^2 are provided.

The operation of my invention is as follows: The tie-plates s' and s^2 are placed upon the platens G' and G^2 with their flanges, which are adapted to be forced into the tie, extending upwardly. The tie T is then placed above the tie-plates, it being supported at its opposite ends by the pairs of bars K' and K^2 , respectively. The hand-lever R is then swung upon its pivot and through the connecting-links R' and the crank-arm Q' oscillates the crank Q , which in turn swings the lever P on its pivotal point through the

intervening connecting-links q^2 and crank-arm Q^2 . The lateral projections P' on the end of the lever P are brought into contact with the adjacent end of the tie, thereby forcing the latter lengthwise to the position desired relative to the tie-plates. The levers M and M^2 are then oscillated. The former rotates the shaft L , and with it the crank-arm M' . The pairs of links N' and N^2 , connected, respectively, to the crank-arm M' and the lever M^2 , swing the levers O' of each of the pairs of clutch-levers about their pivotal points o' , the second levers O^2 of each pair being simultaneously swung about their pivots o^2 by means of the interposed links O , one of which connects the adjacent ends of the clutch-levers forming each pair thereof, as clearly indicated in Fig. 4. The pairs of clutch-levers O' and O^2 are consequently brought into contact with the opposite sides of the tie at points adjacent to the tie-plates, and thereby retain the tie in any desired position and prevent its displacement during the subsequent operation of the machine.

By providing separate operating means for each pair of clutch-levers O' and O^2 the tie, although of irregular width, will be securely held in place, as the clutch-levers accommodate themselves to the width of the tie at the points of their engagement therewith. The controlling-valve is then operated by means of the handle W and valve-stem v , so as to connect the supply-conduit X with the pipe X' , whereby fluid-pressure is admitted to the cylinders B' and B^2 through the intervening pipe X^2 and its connections with the pipe X' and with the openings x' and x^2 in the cylinders, as clearly shown in Fig. 2. The pistons C' and C^2 are forced upwardly by the admission of the fluid-pressure to the cylinders. The pistons carry with them the platens G' and G^2 , upon which the tie-plates s' and s^2 have been placed, and when the tie-plates come into contact with the tie the latter is also carried upwardly into contact with the platens H' and H^2 , which are supported by the cross-heads D' and D^2 . The tie-plates and tie are thereby subjected to a compression which forces the projecting flanges on the tie-plates into the tie. The pistons C' and C^2 are prevented from rotating by the engagement of pins c with the recesses e in the cylinder-heads, thereby preventing the tie-plates from being rotated during their upward movement when carried by the platens G' and G^2 . The universal or oscillatory connections between the movable platens G' and G^2 and the heads F' and F^2 on the ends of the piston-rods, and also the universal or oscillatory connections between the fixed platens or abutments H' and H^2 and the cross-heads D' and D^2 , permit sufficient movement of the platens to accommodate any inequalities or irregularity in the thickness of the ties. When the upward movement of the pistons in the cylinders has effected the appli-

cation of the tie-plates to the ties, the controlling-valve is operated so as to disconnect the pipe X' from the supply-conduit X and connect the former with the exhaust-conduit Y , thereby permitting the escape of the fluid-pressure from the cylinders, and consequently allowing the pistons to return to their normal position, as shown in Fig. 2, for instance.

It should be noted that in my machine the position of the cylinders upon the bed-plate may be adjusted, thereby changing the distance between the platens upon which the tie-plates are supported. The machine therefore is capable of fixing the tie-plates to a tie at any desired distance apart to conform to the gage of the railroad. It should also be noted that the distance of the tie-plate from one end of the tie is regulated by the operation of the lever P , as above described, and also that the tie during the operation of applying the tie-plates thereto is retained in the desired position with respect to the tie-plates by means of the pairs of clutch-levers O' and O^2 .

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form, the proportion of parts, and the substitution of equivalents, as circumstances may suggest or render expedient, without departing from the spirit of my invention.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for applying tie-plates to a railroad-tie, the combination with movable abutments located at a predetermined distance apart, of abutments toward which said movable abutments approach, and means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression at the points of engagement between the tie-plates and tie, substantially as described.

2. In a machine for applying tie-plates to ties, the combination with movable abutments adjustably located at a predetermined distance apart, of abutments toward which said movable abutments approach, and means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression, and means adapted to engage one end of the tie to properly position the same with respect to the tie-plates, substantially as described.

3. In a machine for applying tie-plates to ties, the combination with a bed-plate, of movable abutments, supports for said abutments adjustably secured to said bed-plate, abutments toward which said movable abutments approach, means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression, and a lever piv-

oted to one of said adjustable supports and adapted to swing longitudinally into engagement with an end of the tie to properly position the same with respect to tie-plates, substantially as described.

4. In a machine for applying tie-plates to a tie, the combination with a bed-plate of movable abutments, supports for said abutments adjustably secured to said bed-plate, posts fixed to said supports, abutments rigidly secured to said posts toward which said movable abutments approach, means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression, and a lever pivoted to said adjustable support and adapted to swing longitudinally into engagement with an end of the tie, substantially as described.

5. In a machine for applying tie-plates to a railroad-tie, the combination with movable abutments located at a predetermined distance apart, of abutments toward which said movable abutments approach, means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression, and means for retaining the tie in proper position with respect to the tie-plates while the latter are being inserted, substantially as described.

6. In a machine for applying tie-plates to a railroad-tie, the combination with movable abutments adjustably located at a predetermined distance apart, of abutments toward which said movable abutments approach, means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression, means adapted to engage an end of the tie to properly position the same with respect to the tie-plates, and means for retaining the tie in the desired position relative to the plates while the latter are being applied, substantially as described.

7. In a machine for applying tie-plates to ties, the combination with a bed-plate, of movable abutments, supports for said abutments adjustably secured to said bed-plate, abutments toward which said movable abutments approach, means for actuating said movable abutments whereby the tie-plates and tie interposed between said abutments are subjected to compression, a lever pivoted to one of said adjustable supports adapted to swing longitudinally into engagement with an end of the tie, and a pair of levers pivoted to each of said adjustable supports adapted to engage the opposite sides of the tie adjacent to the tie-plates, substantially as described.

8. In a machine for applying tie-plates to a tie, the combination with a bed-plate, of movable abutments, supports for said abutments adjustably secured to said bed-plate, posts fixed to said supports, abutments rigidly secured to said posts toward which said mov-

able abutments approach, parallel horizontal bars extending transversely across the machine and supported by said posts, a lever pivoted to one of said supports adapted to swing longitudinally, a pair of transversely-swinging levers pivoted to each of said supports, and means for actuating said movable abutments and said levers whereby the tie-plates and tie interposed between said abutments are subjected to compression and the tie is properly positioned with respect to the tie-plates during such compression, substantially as described.

9. In a machine for applying tie-plates to a railroad-tie, the combination of movable abutments, of fixed abutments, platens secured to said abutments by universal joints, and means for actuating said movable abutments whereby the tie-plates and tie interposed between said platens are subjected to compression, substantially as described.

10. In a machine for applying tie-plates to a railroad-tie, the combination with cylinders located at a predetermined distance apart, of pistons therein, of fixed abutments toward which such pistons are adapted to move, and means for controlling the admission of fluid-pressure to said cylinders whereby the tie-plates and tie interposed between said pistons and abutment are subjected to compression at the points of engagement between said plates and tie, substantially as described.

11. In a machine for inserting tie-plates in a railroad-tie, the combination of a bed-plate, of cylinders adjustably supported upon said bed-plate, pistons in said cylinders, and fixed abutments toward which said pistons are adapted to move, levers pivoted to said cylinders, means for controlling the admission of fluid-pressure to said cylinders whereby the tie-plates and tie interposed between said pistons and abutments are subjected to compression at the points of engagement between said plates and tie, and means for swinging said levers into contact with the tie to properly position the same with respect to tie-plates, substantially as described.

12. In a machine for applying tie-plates to a railroad-tie, the combination of the bed-plate, of cylinders adjustably supported upon said bed-plate, pistons in said cylinders, posts fixed to said cylinders, abutments rigidly secured to said posts toward which said pistons are adapted to move, a pair of transversely-swinging levers pivoted to each of said cylinders, a lever pivoted to swing longitudinally, means for controlling the admission of fluid-pressure to said cylinders, whereby the tie-plates and tie interposed between said pistons and abutments are subjected to compression, means for swinging said pairs of levers into contact with the opposite sides of the tie, and means for actuating said longitudinal swinging lever to engage an end of the tie whereby the tie is properly positioned in relation to the tie-plates and prevented from displacement dur-

ing the application of the plates thereto, substantially as described.

13. In a machine of the described character, the combination with the bed, of a device whereby the inward movement of the tie is limited, and means for centering and holding the tie centered to the work.

14. In a tie-plating machine, the combination with the bed, of the centering-plates for the tie, and of means for operating said plates

to center the tie and hold same locked during the operation of applying the tie-plates thereto.

In testimony whereof I sign this specification in the presence of two witnesses.

FREDERICK W. WOOD.

Witnesses:

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WM. V. HUMMEL.