

(No Model.)

3 Sheets—Sheet 1.

F. F. RAYMOND, 2d.
HEEL NAILING MACHINE.

No. 599,012.

Patented Feb. 15, 1898.

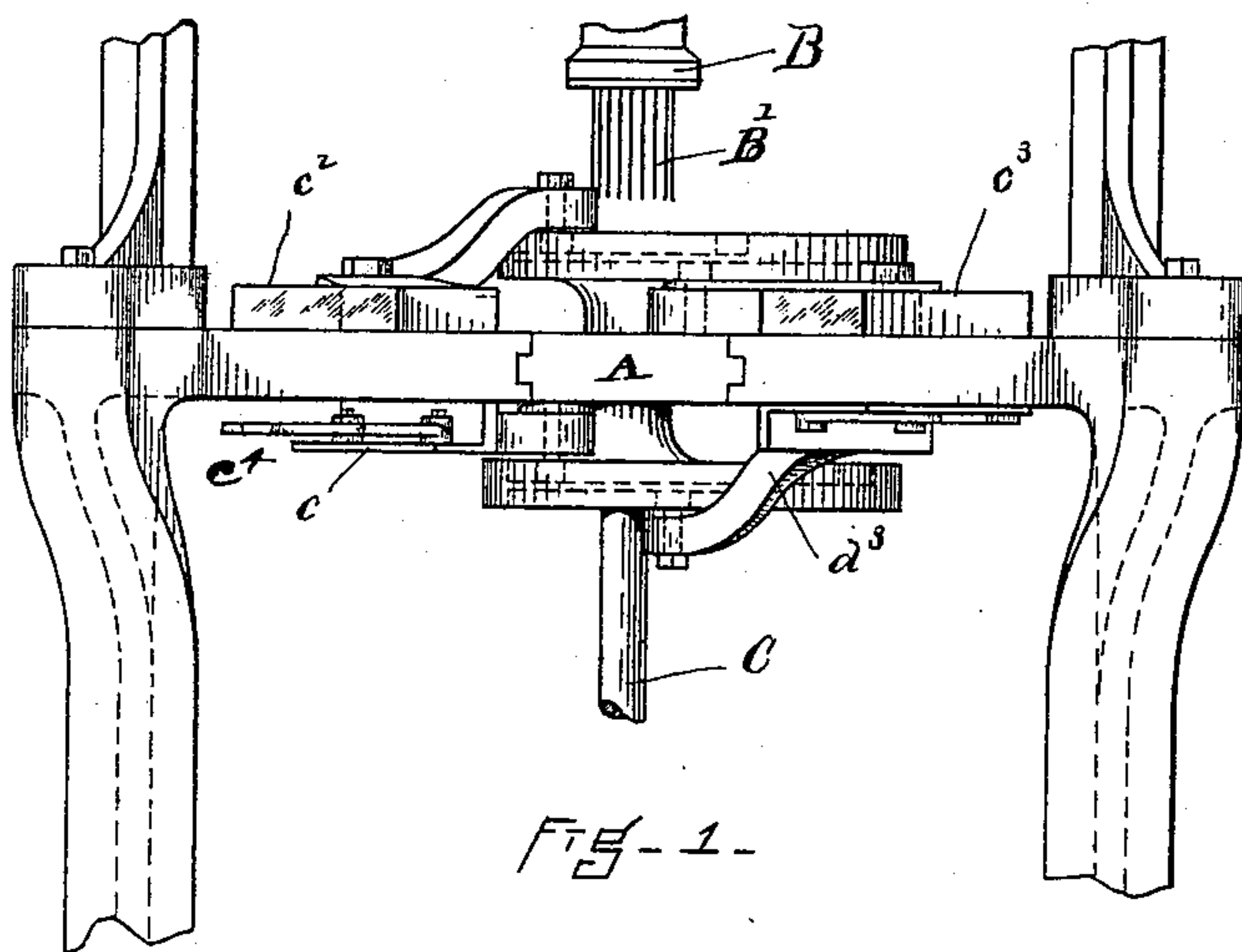


Fig-1-

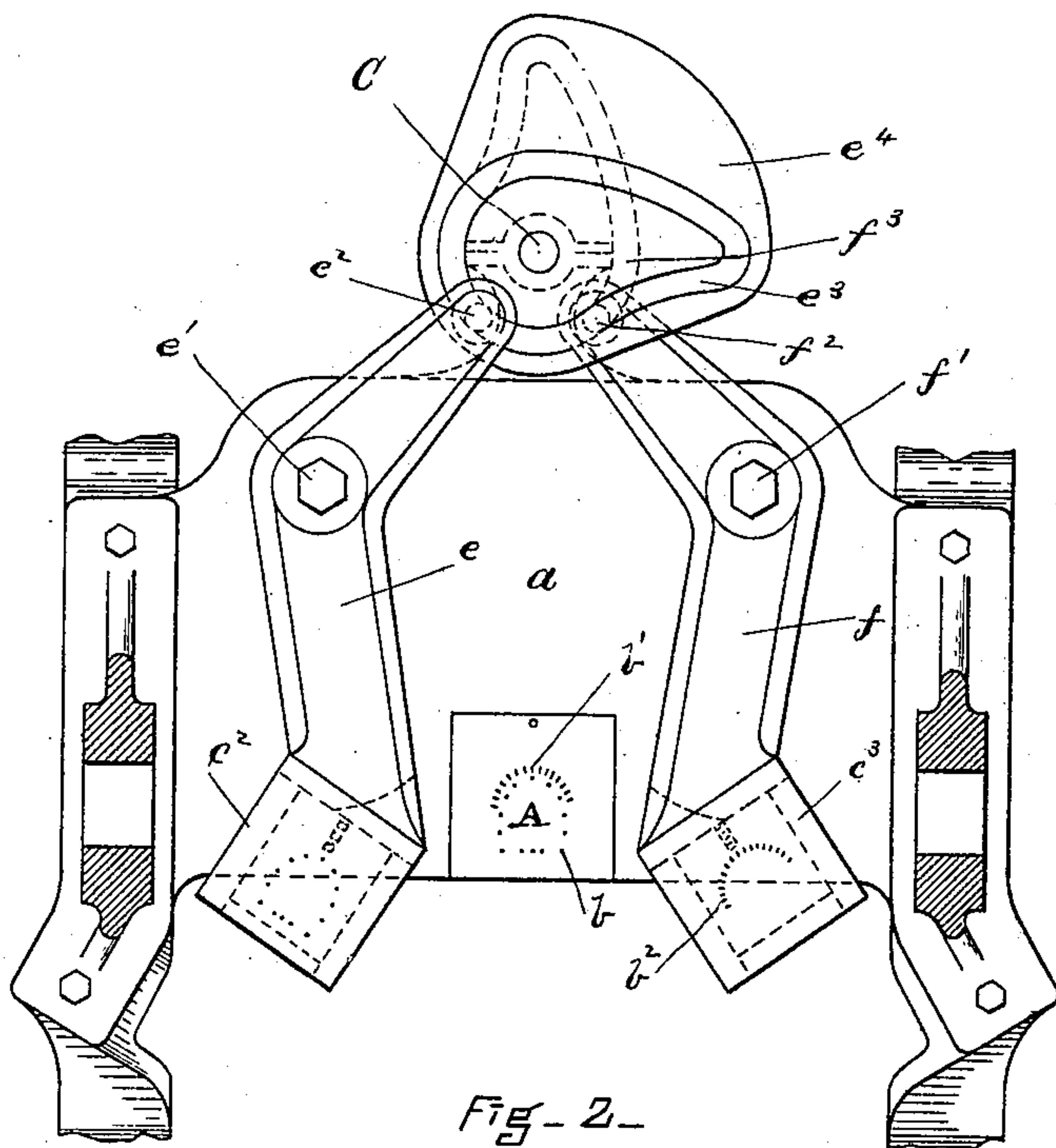


Fig-2-

WITNESSES—
a. P. Porter,
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INVENTOR—
Frederick F. Raymond

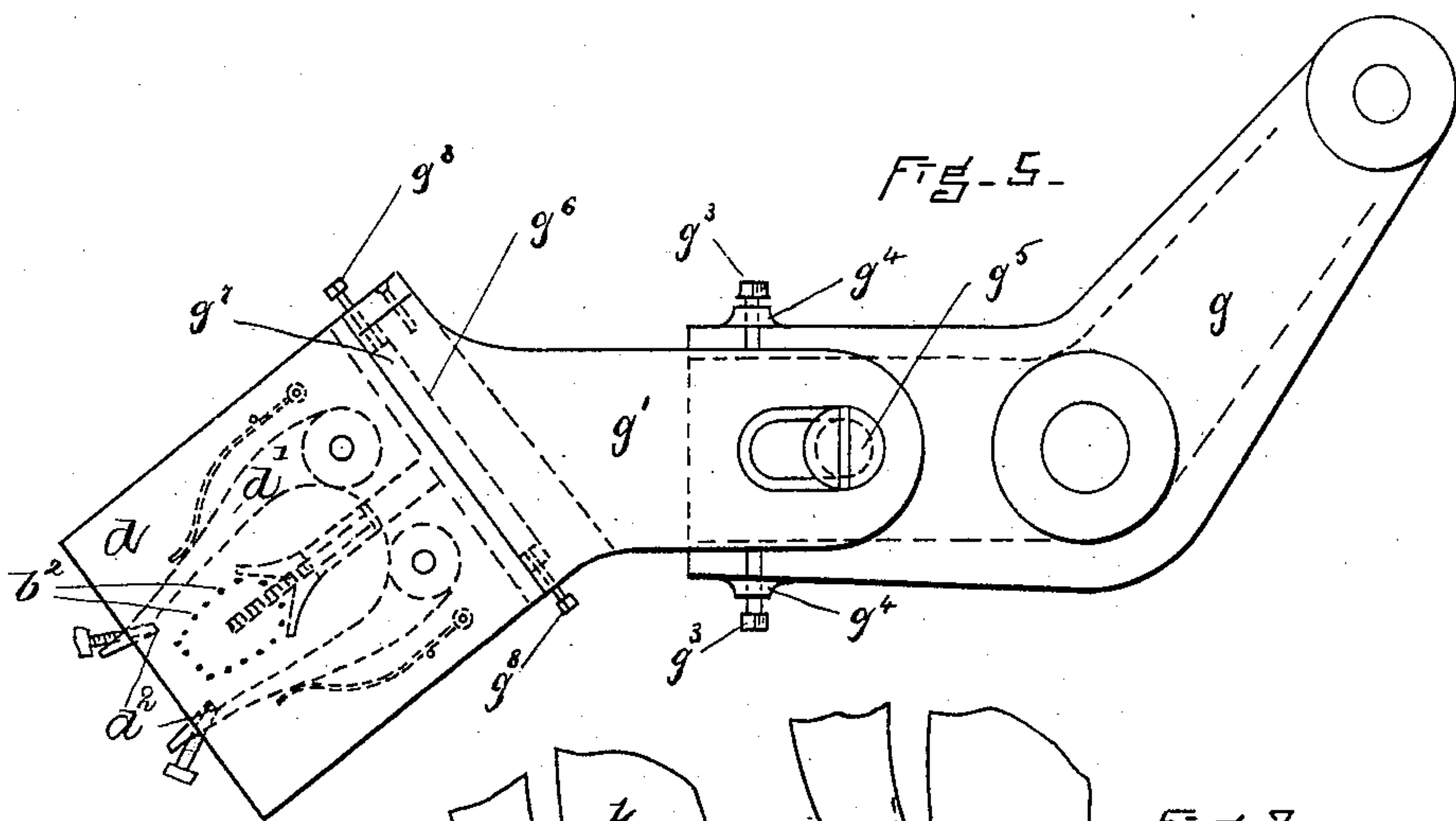
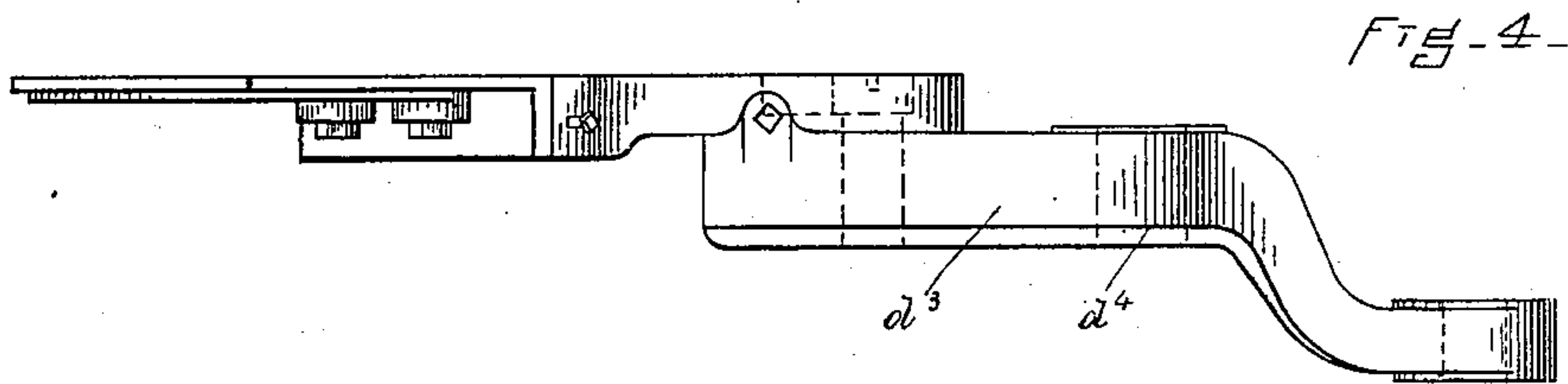
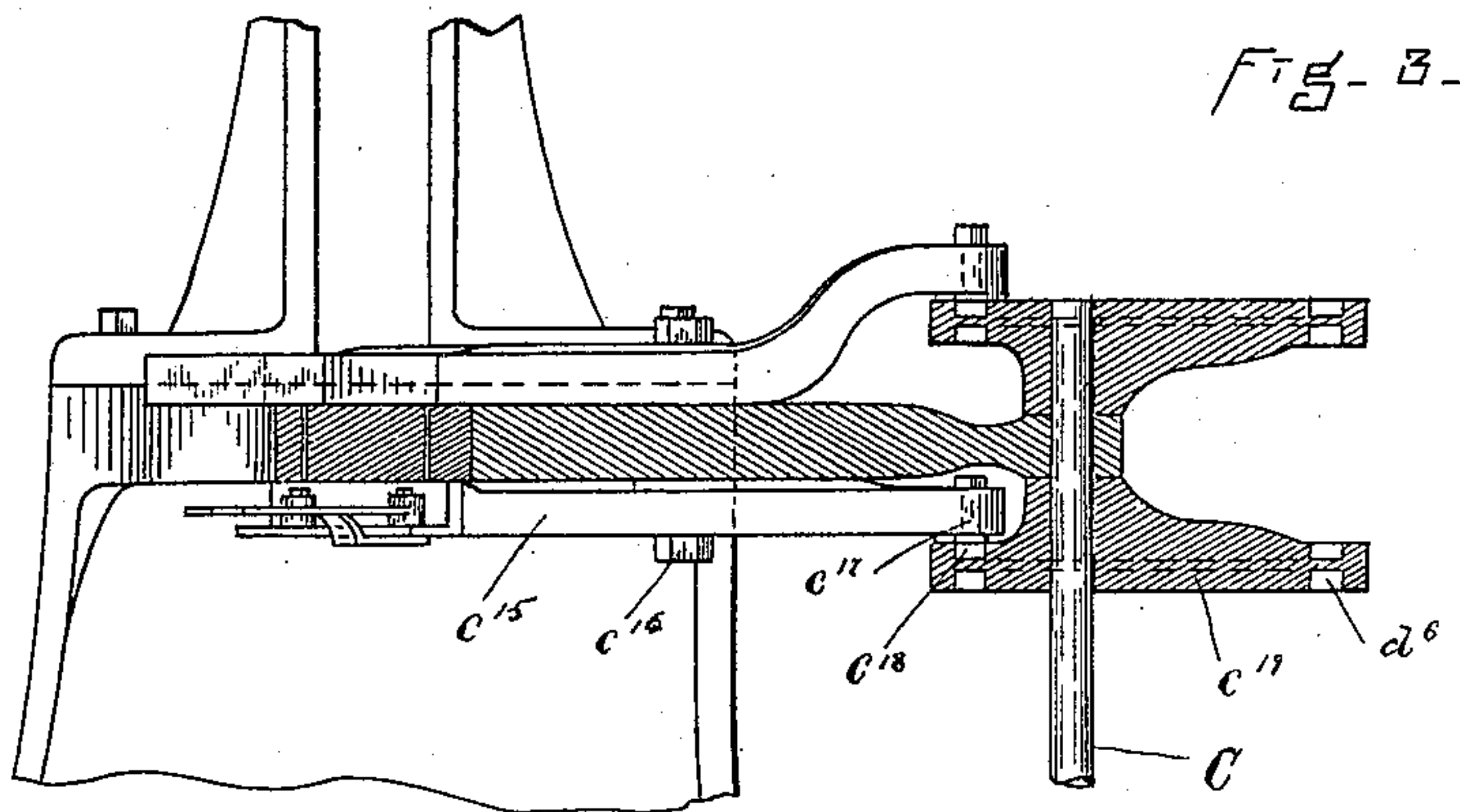
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3 Sheets—Sheet 2.

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WITNESSES.
A. P. Porter,
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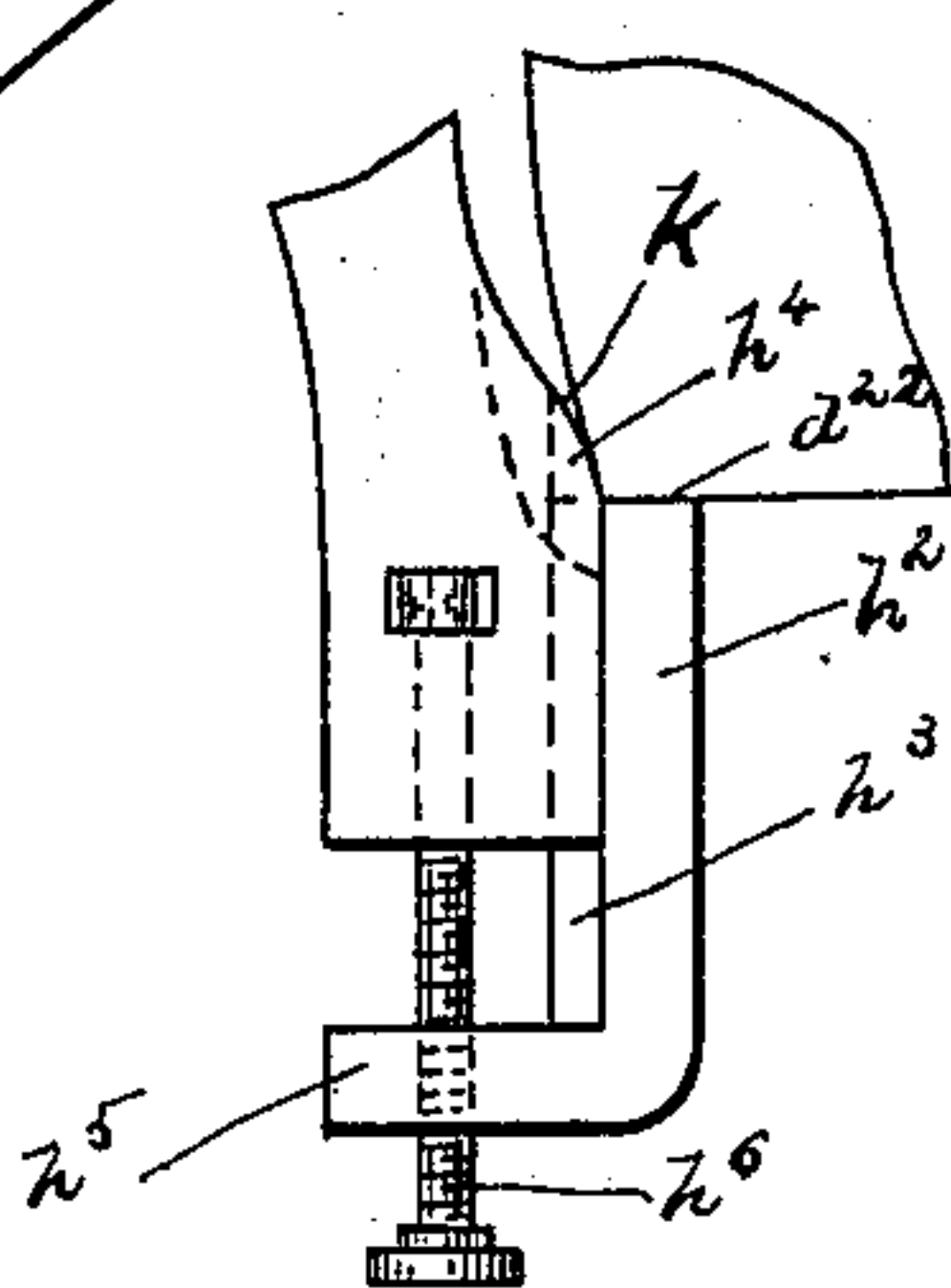
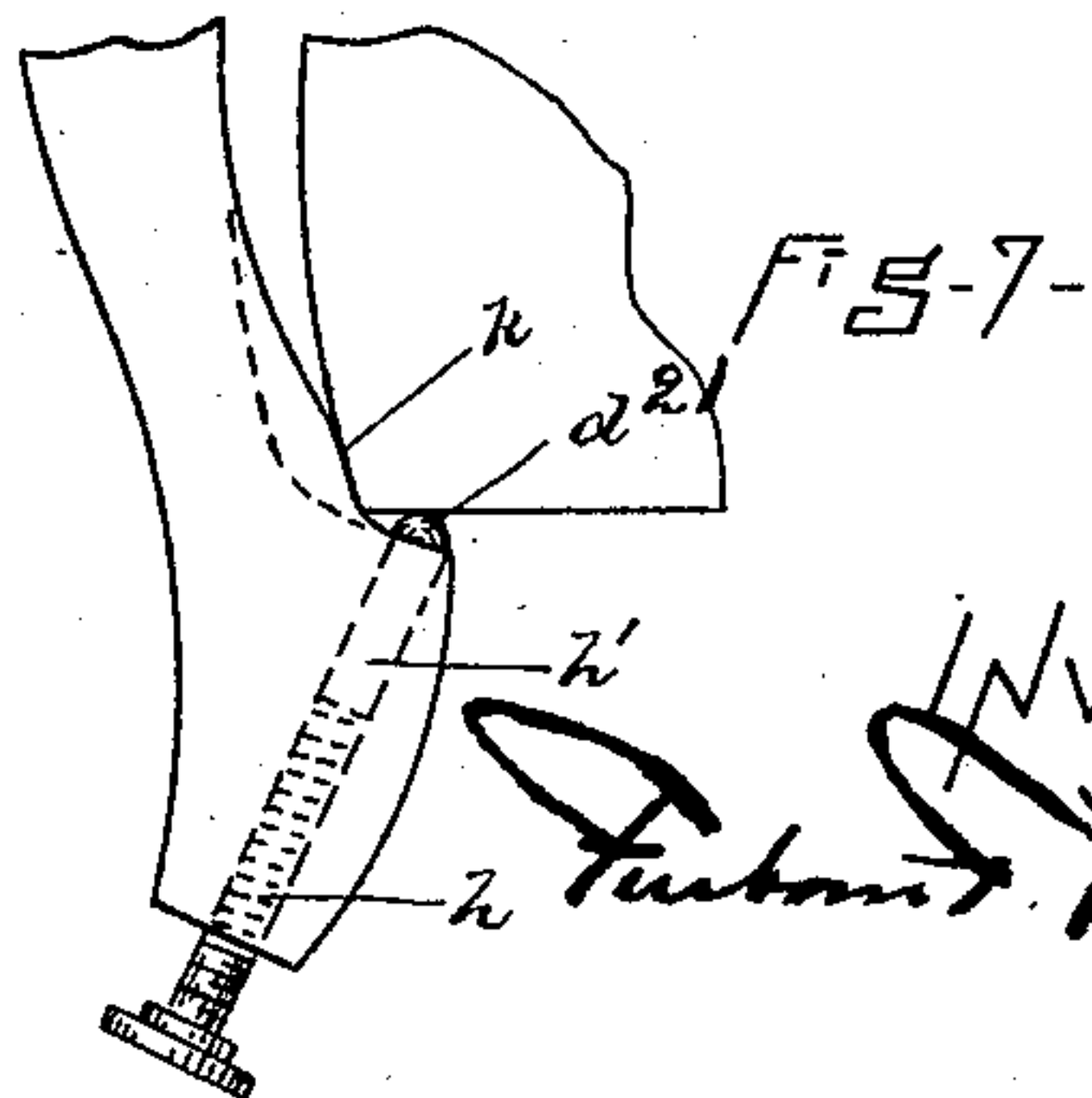


Fig-6-



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(No Model.)

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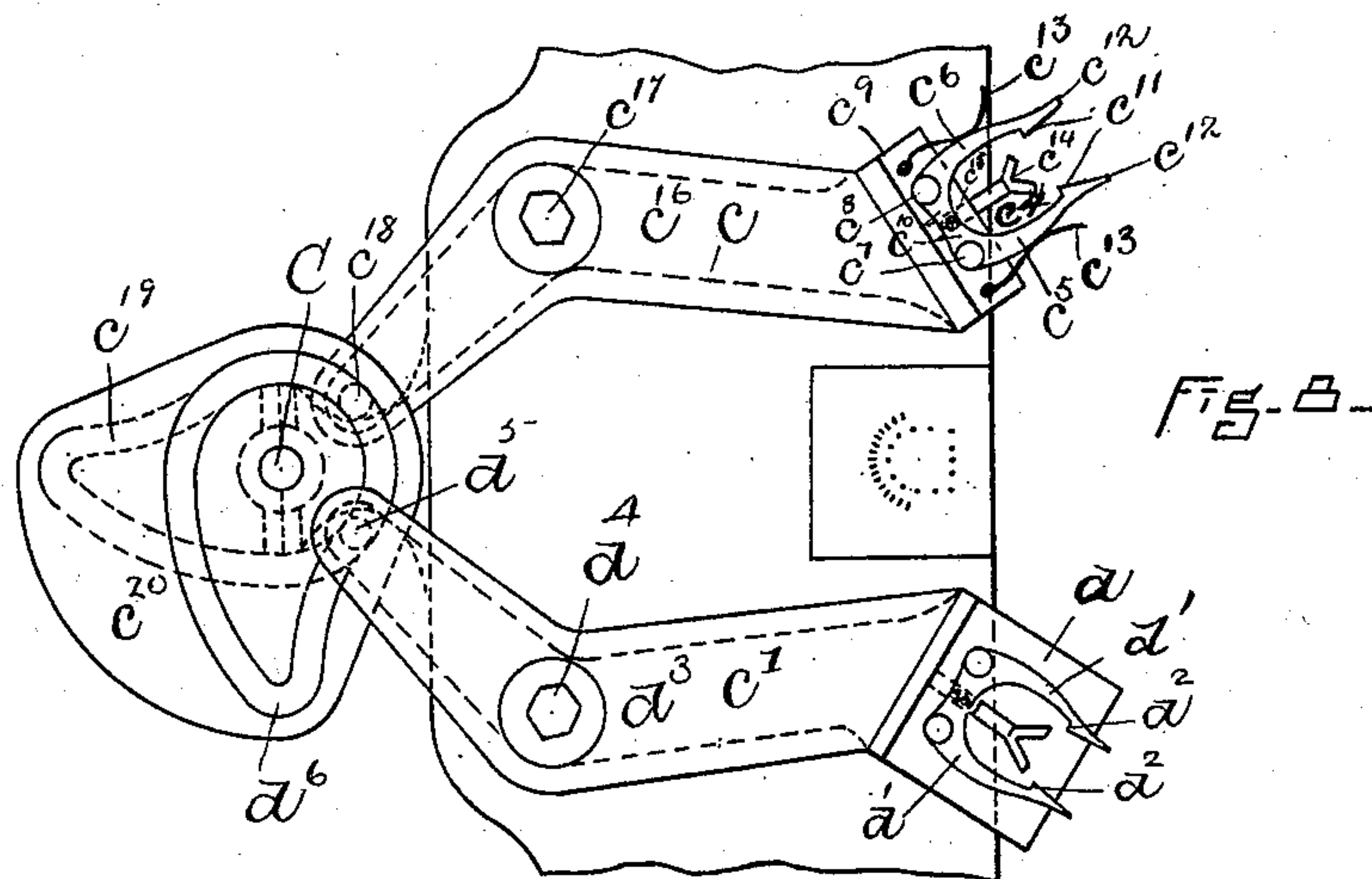


FIG. 8-

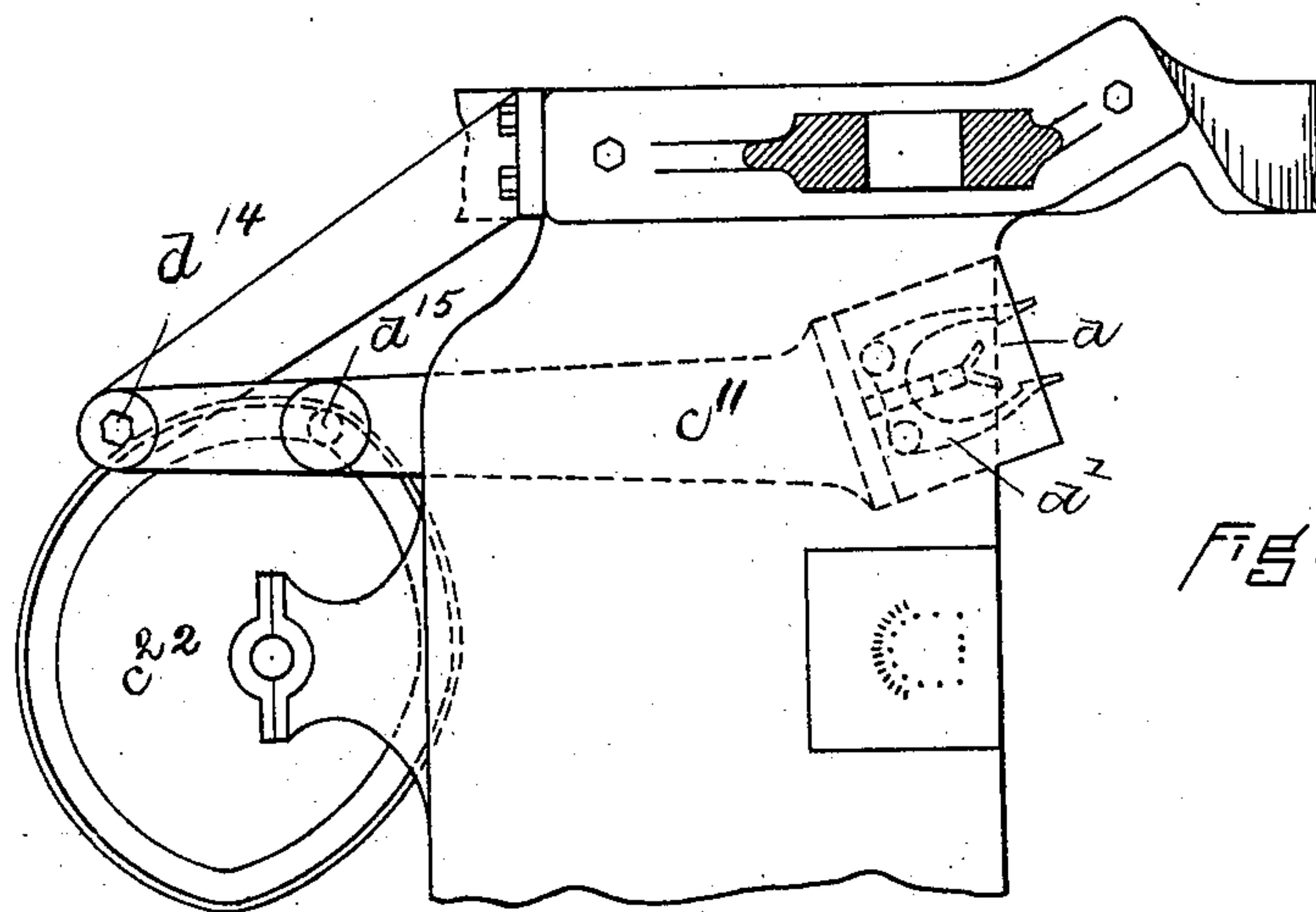


FIG. 9-

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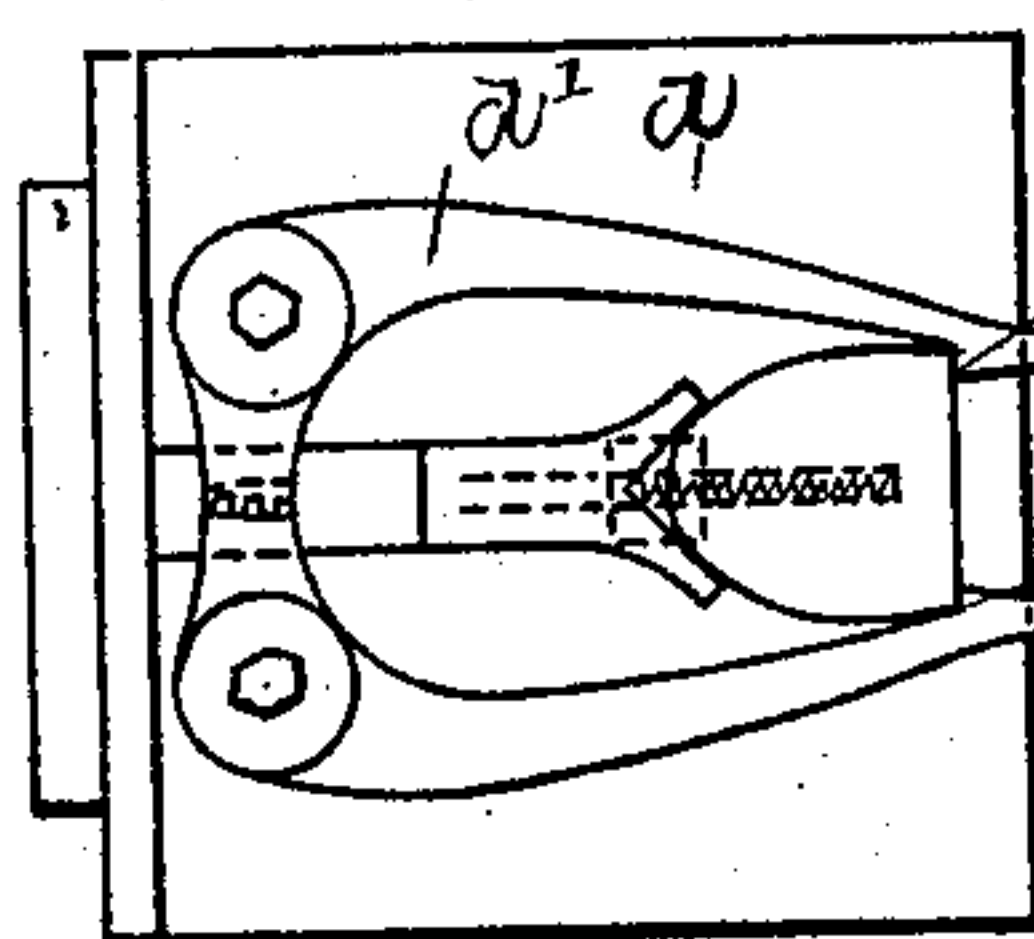


FIG. 10-

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UNITED STATES PATENT OFFICE.

FREEBORN F. RAYMOND, 2D, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO
JAMES W. BROOKS, OF PETERSHAM, AND JOHN BROOKS, OF CAMBRIDGE,
MASSACHUSETTS, TRUSTEES.

HEEL-NAILING MACHINE.

SPECIFICATION forming part of Letters Patent No. 599,012, dated February 15, 1898.

Application filed August 17, 1889. Serial No. 321,157. (No model.)

To all whom it may concern:

Be it known that I, FREEBORN F. RAYMOND, 2d, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Heel-Nailing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a heel-nailing machine having novel delivery mechanisms or devices for feeding heel-blanks, top lifts, and nails into operative position. It is desirable in certain organizations of machines to place the top lift, heel-blank, and nails in their respective holding devices at the front of the machine at one side of the operator or point at which the heel-blank, top lift, and nails are used in the attachment of the top lift and heel-blank to the boot or shoe, and I shall herein describe means for carrying these movements into effect.

Referring to the drawings, Figure 1 is a view in front elevation of the central portions of a nailing-machine having the features of my invention. Fig. 2 is a view, principally in plan, of the principal parts of the mechanism shown in Fig. 1. Fig. 3 is a view in vertical central section thereof. Figs. 4, 5, 6, and 7 are detail views, enlarged, to which reference is hereinafter made. Fig. 8 is a view of the heel-blank and top-lift carriers inverted. Fig. 9 is a detail view illustrating a slight modification, and Fig. 10 is a view showing the top-lift holder and spanker.

The invention is represented as applied to the machines having the organization shown and described in my Patent No. 377,577, dated February 7, 1888, in which the templet is preferably stationary and the last or work-support is mounted upon a spindle forming a part of the jack and provided with vertical movement by means of a pressure-head and cam, the various nailing devices being carried by a revolving head mounted upon the cross-head and preferably automatically operated.

In the drawings, A represents the templet. It is supported by the upper table α and is detachable therefrom.

B, Fig. 1, represents one of the arms of the revolving head, and B' the gang of drivers carried thereby.

C is a vertical shaft at the rear of the machine to connect with the driving-shaft. (Not shown.) Upon it are mounted various operative cams to operate or move the heel-blank carrier c , the top-lift carrier c' , and the nail-carriers c^2 c^3 . The heel-blank carrier c has any suitable form of heel-holding device c^4 . I prefer the form represented in Fig. 8, comprising the two arms c^5 c^6 , pivoted, respectively, at c^7 c^8 to a support c^9 , the inner ends of which arms are formed with segment-gears c^{10} , which mesh with each other, and the outer ends of which arms are provided with inward-extending shoulders c^{11} and flaring ends c^{12} , one or more springs c^{13} to hold said arms closed, and a V-shaped slide-plate c^{14} , carried by said support c^9 , arranged to slide therein and held in operative position by a spring c^{15} , the spring acting to continuously press the V-guide toward the shoulders c^{11} . This causes the heel-blank to be held with its breast in contact with the shoulders c^{11} by the pressure of the V-piece upon the rear of the heel. It enables heels of any length and width to be taken. It also permits them to be moved horizontally into place.

The plate c^9 , to which the arms c^5 c^6 are attached, is secured or formed upon the front end of the heel-blank carrier, and the carrier comprises, in addition to this holding-plate and the heel-holder, a long plate or arm c^{16} , pivoted at c^{17} on one side of the machine and having at its rear end a cam-pin c^{18} , which enters a cam-groove c^{19} in the cam-disk c^{20} upon the vertical shaft C. The top-lift carrier c' comprises a steel plate d and a top-lift holder d' , and I prefer the form of holder represented in Figs. 5, 6, and 7, which is practically like the heel-holder in construction, with the exception that the shoulders d^2 , the equivalent of the shoulders c^{11} of the heel-holder, are represented as movable lengthwise their supporting-fingers, so that their position may be varied sufficiently to provide for the endwise adjustment of the top lift in relation to the holes or pricking of the templet. It is quite desirable in order that the same templet

may be used for two or more sizes of heels that the top-lift holder have this provision for adjustment of the top lift back and forth or from breast to rear to change the relation or position of the top lift in regard to the holes or pricking of the templet, as by such adjustment the same templet and nailing devices may be used for attaching heel-blanks varying quite materially in size and the top lifts be varied as to size to correspond. This top-lift plate d is formed upon or attached to the arm or lever d^3 , which extends backward, is pivoted at d^4 to the under surface of the table a , and has at its rear end a cam-pin d^5 , which enters the cam-groove d^6 in the cam-disk c^{20} .

The nail-carrier c^2 is detachable from its holding plate or lever e . This plate or lever extends backward and is pivoted at e' to the upper surface of the table a and carries at its end a cam-pin e^2 , which enters the cam-groove e^3 in the cam-disk e^4 on the vertical shaft C . The nail-carrier c^3 is also detachable from its nail-carrying plate or lever f . This plate or lever extends backward, is pivoted at f' to the upper surface of the table a , and has at its rear end a cam-pin f^2 , which enters the cam-groove f^3 in the under surface of the cam e^4 . The two nail-carriers c^2 c^3 are used when it is desirable to provide the templet A with two sets of nails, either attaching-nails and slugs or sole-nails and slugs, or two gangs of attaching-nails or two gangs of slugs, as the case may be. It will be observed that the heel-blank carrier, top-lift carrier, and nail-carriers are connected directly with their operative cams and that these devices or delivery mechanisms are moved upon arcs of circles outward and forward from the templet A to a position upon each side of the templet and also so that they are inclined away from the templet and are favorably situated for the placing of the heel-blank and top lift and the loading of the nail-carriers either automatically or by hand. The cams preferably are timed to move the carriers as follows: First, the cams for operating the heel-blank carrier and nail-carrier c^2 to move the heel-blank into operative position beneath the templet A , and at the same time or immediately following the nail-carrier c^2 into position over the templet A , and then to simultaneously return the heel-blank carrier and nail-carrier to their original position, and to hold them in such position during the continued operation of the machine; second, the cam for operating the top-lift carrier is timed to hold the carrier out of position during the attaching of the heel-blank, and to then move it into position beneath the templet, and to hold it there during the spanking of the top lift to the attached heel, and to then return it to its original position and hold it in such position, and, third, the cam for operating the nail or slug carrier c^3 to hold it out of operative position until the top lift is moved beneath the templet, and to then move it into po-

sition to deliver its nails or slugs to the proper holes in the templet, and to hold it during the driving of said nails or slugs, and to then return it to its original position and hold it in said position. For certain kinds of work the top-lift carrier only need be used, for other kinds the top-lift carrier and the nail-carrier c^2 , for yet other kinds the heel-blank carrier, top-lift carrier, and nail-carrier c^2 , and for other kinds the heel-blank and top-lift carriers and the two nail-carriers. When two sets of nails are to be driven into the heel, the templet A is provided with two lines of holes b b' , and if the nails are also driven through the top lift the top-lift spanker-plate d is provided with the holes b^2 .

I have represented in Figs. 4 and 5 the top-lift spanker-plate and top-lift holder as provided with various adjustments for the purpose of varying the position of the top lift in relation to the templet. I would also say that the same adjustments, or such of them as are desirable, may be used in connection with the plates or levers for holding the heel-blank holder and the two nail-carriers. By making the lever or plate d^3 in the two parts g g' , as represented in Fig. 5, and by attaching the part g' , which carries the top-lift spanker-plate and holder, to the part g by means of a pivot g^5 the angle of the plate and holder in relation to the vertical median line of the templet A may be varied to any desired extent, and the section g' is locked in any position to which it may be moved for the purpose of obtaining such adjustment by means of the set-screws g^3 , carried by lugs g^4 , one on each side of the plate g and adapted to be set against each edge of the section g' .

By making the hole through which the pivot g^5 passes either rectangular lengthwise the lever and either in the section g' or in the section g , or both, as may be preferred, the top-lift spanker-plate and holder are provided with an adjustment lengthwise the templet A to vary its position by a forward or backward movement in relation to it. By making the top-lift spanker-plate d separate from the section g' or from the end of the lever d^3 and providing in the front edge of said section g' a horizontal dovetail recess g^6 , which receives a horizontal dovetail tongue g^7 upon the inner edge of the said top-lift plate, the top-lift plate and holder are provided with a movement crosswise the templet A , or from side to side, and to limit and control said movement set-screws g^8 , passing through appropriate lugs or holders to secure them to the section g' , bear against each end of the dovetail tongue g^7 of the plate. The breast-shoulders d^2 are made adjustable lengthwise the arms of the top-lift holder in any desired way. I have represented two of these ways.

In Fig. 7 I have shown the shoulders as formed by the ends of screws h , which extend from the front end of each arm to bring their inner ends d^2 in line with the edge h' ,

whereby the screw upon being moved in or out maintains substantially the angle of the edge h' , and its point d^{21} forms the shoulder.

In Fig. 6 I have represented each shoulder d^{22} as formed upon a slide piece or block h^2 , secured to the end of its respective arm by a dovetail h^3 upon the block or piece h^2 and a dovetail recess h^4 , formed in the side of the finger and receiving the dovetail tongue. The piece h^2 has a bent end h^5 , through which an adjusting-screw h^6 passes into the end of the arm or finger and by means of which the piece or block h^2 is made movable on the finger and the location of the shoulder d^{22} varied. I prefer that the arms of the heel-holder be provided with similar adjustable breast-shoulders, and also that in addition to the shoulders the arms of the holder at a point adjacent to the shoulders be shaped as represented in the figures, so that in addition to the breast-gage there is also a side gage or surface k of limited extent, whereby upon the closing of the fingers by their operative spring and the pushing forward of the top lift or heel-blank by the back holder the heel or top lift is held with its breast against the shoulders, while the gages k are pressed against the sides of the blank or top lift near the breast. (See Fig. 7.) It is desirable that the springs operating the back slide-plate and the fingers of the holder be so proportioned that the top lift or heel-blank will be pressed forward against the breast-gages, while the fingers shall close sufficiently to bring the said gages k in contact with the sides of the top lift or heel-blank. I would say, however, that in many instances the side gages k may be dispensed with.

In Fig. 9 I have represented a construction which varies somewhat from that shown in the other figures in that the arm or lever c^{11} , which is shown as a top-lift-carrier arm or lever, but which is a type of all the arms or levers used for the various holders, is pivoted at its rear end d^{14} , while the cam-pin d^{15} engages the cam-groove in cam c^{22} at the proper distance from said end. This of course makes the lever or arm longer, but it also permits a very easily-constructed cam to be used.

It will be seen that the top-lift spanker-plate d , Fig. 8, extends outward beyond the breast-shoulder d^2 and that there is an opening or space between the ends of the fingers d' . This construction provides a guide for directing the top lift or heel-blank as it is placed in the holder, both the opposing edges of the projecting ends of the holder and the under surface of that portion of the spanker-plate which projects in front of the breast-shoulders serving as means for steadying and guiding the top lift as it is introduced into the holder, and by this movement of the top lift into place the arms are opened or caused to be moved from each other sufficiently to permit the top lift to pass by the shoulders and come in contact with the back pressure-plate,

and the top lift is moved sufficiently far beyond the shoulder d^2 to permit the shoulders to close from each side of the top lift into a position to receive the breast of the top lift when it is moved backward by hand or by the forward movement of the back holding pressure-plate. I consider this feature of very considerable importance, especially where the top lift is fed automatically from a stack-holder, as the projecting ends of the holder serve to receive and center the top lift and to hold it while it is being directed or carried into the holder proper, and so far as this feature of the invention is concerned the same advantage would be obtained if the shoulders d^2 were not used and the top lift held by the bearing of sections of the arms upon the side. I would say that where the lift is pressed by hand in the holder with the shoulders d^2 it is possible to do away or dispense with the use of the back pressure-plate, but as a rule it is preferable to use it.

The invention in question provides a simplicity of construction and an accuracy very desirable in this class of machines, and not only this, but considerable advantage is obtained from the fact that the various top-lift, heel-blank, and nail carriers which constitute the delivery mechanism are held in favorable positions for loading by the operator or by an attendant when out of operative position, and are moved from such favorable positions to their operative positions by an easy and accurate movement.

It will be understood that while I have used throughout the specification the terms "nail-carriers," "heel-blank carriers and holders," and "top-lift carriers and holders" in referring to the various elements I have, for the purpose of condensing the statement of invention in the claims as much as possible, used the generic term "carrying device" or "delivery mechanism" to indicate any one of these various devices. These different instrumentalities are not, however, true equivalents of one another, as each has a distinct and independent function in a different place and in different relations in connection with the other elements which complete the combination, the nail-carriers operating above the templet and feeding nails to the latter, the heel-blank carrier presenting a heel to the under surface of the templet and holding it there during the driving of the attaching-nails through the templet into the blank, while the top-lift carrier transfers a top lift to a position under the templet and holds it there as the last and its shoe move upward and forces the heel, with its projecting nails, against the said top lift.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a heel-attaching machine, the combination with the heel-attaching devices, of a carrying device or delivery mechanism

mounted on the machine so as to be movable upon an arc to and from one side of the median line of the templet, whereby in its inoperative position it is at one side of and in advance of the templet, substantially as described.

2. In a heel-attaching machine, the combination with the nail-driving devices, of a heel-carrier plate and heel-carrier mounted thereon attached to the machine to be movable upon an arc to and from one side of the median line of the templet whereby in its inoperative position it is at one side of and in advance of the templet, substantially as described.

3. In a heel-attaching machine, in combination with the heel-attaching devices, a top-lift-carrier plate and top-lift carrier mounted thereon attached to the machine to be movable upon an arc to and from one side of the median line of the templet, whereby in its inoperative position it is at one side of and in advance of the templet, substantially as described.

4. In a heel-attaching machine, in combination with nail-driving devices, a nail-carrier plate and nail-carrier c^2 mounted thereon attached to the machine to be movable in the arc of a circle to and from one side of the median line of the templet whereby in its inoperative position it is at one side of and in advance of the templet, substantially as described.

5. In a heel-nailing machine, the combination with the nail-driving devices, of the heel-blank-carrying plate c and the top-lift-carrying plate c' one of which is pivoted at one side of the median line of the templet from front to back, the other of which is pivoted upon the other side thereof so as to move in the arc of a circle to and from their operative positions, as and for the purposes described.

6. The combination in a heel-nailing machine with the nail-driving devices, of the templet and the nail-carrier plates c^2 , c^3 supported by their respective holding-plates one of which nail-carrier plates is pivoted at one side of the median line of the templet from front to rear and the other of which nail-carrier plates is pivoted upon the opposite side thereof, substantially as described.

7. The combination, in a heel-nailing machine with the nail-driving devices, of an arm pivoted at one side of the templet, and adapted to carry a heel-blank holder, top-lift carrier, or nail-carrier to cooperate with said nail-driving devices for the attachment of a heel, an operating-cam for swinging said arm on its pivot, and a rearwardly-extending portion of said arm connecting with said cam, substantially as described.

8. The combination, in a heel-nailing machine, with the nail-driving devices, of an arm pivoted at one side of the templet, and adapted to carry a heel-blank holder, top-lift carrier, or nail-carrier to cooperate with said nail-driving devices for the attachment of a heel,

and an operating-cam for swinging the mechanism carried at the front end of said arm in the arc of a circle to and from its operative position, substantially as described.

9. In a heel-nailing machine, as a means of adjusting the position of a movable heel-blank, top-lift, or nail carrier relatively to the nailing devices, a pivoted lever or arm in two sections one of which carries the holder and is attached to the other by a pivot and a locking device for locking it at any required angle, or in any desired position.

10. In a heel-nailing machine, as a means of adjusting the position of a movable heel-blank, top-lift, or nail carrier, relatively to the nailing devices, a pivoted lever or arm in two sections one of which carries the holder and is attached to the other by a device such as a slot and locking-screw whereby it may be moved inward or outward upon such part, substantially as described.

11. In a heel-nailing machine, the combination with the nailing devices, of a heel-blank, top-lift, or nail carrying device, a lever to move said heel-blank top-lift or nail carrying device into and out of its operative position relative to the nailing devices, and a plate having a dovetailed tongue-and-groove connection with said operating-lever by which the heel-blank, top-lift or nail carrier is supported, and locking-screws to secure said supporting-plate in any adjusted position, substantially as described.

12. The combination in a heel-nailing machine with the nailing devices, of a templet, a lever pivoted at one side of the templet, a holder pivoted at the front end of said lever, and adapted to carry the heel-blank, top-lift or nail carriers and means whereby said holder may be adjusted at different angles upon said lever with respect to the median vertical line of the templet from front to rear, substantially as described.

13. In a heel-attaching machine, the combination with the nail-driving devices, of delivery mechanism mounted on the machine and movable in an arc to and from one side of the median line of the templet; whereby in its inoperative position, it is at one side of and in advance of the templet, substantially as described.

14. In a heel-attaching machine, the combination with the nail-driving devices, of a delivery mechanism cooperating with said nail-driving devices in the attaching of a heel, said delivery mechanism being mounted on the machine and movable in an arc to and from one side of the median line of the templet; whereby, in its inoperative position, it is at one side of and in advance of said templet, and means for adjusting said delivery mechanism in relation to said templet.

15. In a heel-attaching machine, the combination with the nail-driving devices, of delivery mechanism mounted on each side of the median line of the templet and movable in an arc to and from the median line of the

templet; whereby, in inoperative positions, they are at one side of and in advance of said templet, substantially as described.

16. In a heel-attaching machine, the combination with the nail-driving devices, of delivery mechanisms pivoted upon the machine on either side of the median line of the templet and movable in an arc of a circle to and from said median line whereby when in inoperative positions they are at one side of and in advance of said templet, and means for alternately bringing said mechanisms into operative positions relative to said nail-driving devices, substantially as described.

17. In a heel-nailing machine, the combination with the nail-driving devices, of delivery mechanism mounted upon the said machine and movable in the arc of a circle toward and from said nail-driving devices, and a rearwardly-extending arm engaging an operating-cam to impart motion to said delivery mechanism, substantially as described.

18. In a heel-nailing machine, the combination with the nail-driving devices, of delivery mechanisms pivoted on either side of said nail-driving devices, arms extending rearwardly from said delivery mechanisms, an operating-cam, and connections between the said operating-cam and said rearwardly-extending arms whereby the delivery mechanisms are alternately brought into operative relation to said nail-driving devices, substantially as described.

19. In a heel-nailing machine, the combination with the nail-driving devices, of delivery mechanisms, pivoted on the machine and movable as described, said delivery mechanisms having rearwardly-extending arms connect-

ing with a cam, whereby said delivery mechanisms are alternately brought into operative relation to said nail-driving devices, substantially as described.

20. The combination in a heel-attaching machine of a stationary templet having holes through which attaching-nails are driven, two nail-carriers above said templet arranged one on each side thereof and each adapted to be loaded with nails when out of operative position at one side of said templet, and to be moved from said inoperative position over said templet to deliver the nails thereto, with heel-blank centering and carrying and top-lift centering and carrying devices below said templet and alternately moved into and out of operative position beneath the same.

21. The combination in a heel-attaching machine, of a stationary templet having holes through which attaching-nails are driven, two nail-carriers above said templet arranged one on each side thereof and each adapted to be loaded with nails when out of operative position at one side of said templet, and to be moved from said inoperative position over said templet to deliver the nails thereto, with heel-blank centering and carrying and top-lift centering and carrying devices below said templet and alternately moved into and out of operative position beneath the same, and means for varying the position of the heel-blank holder and the top-lift holder lengthwise the templet.

FREEBORN F. RAYMOND, 2D.

In presence of—

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