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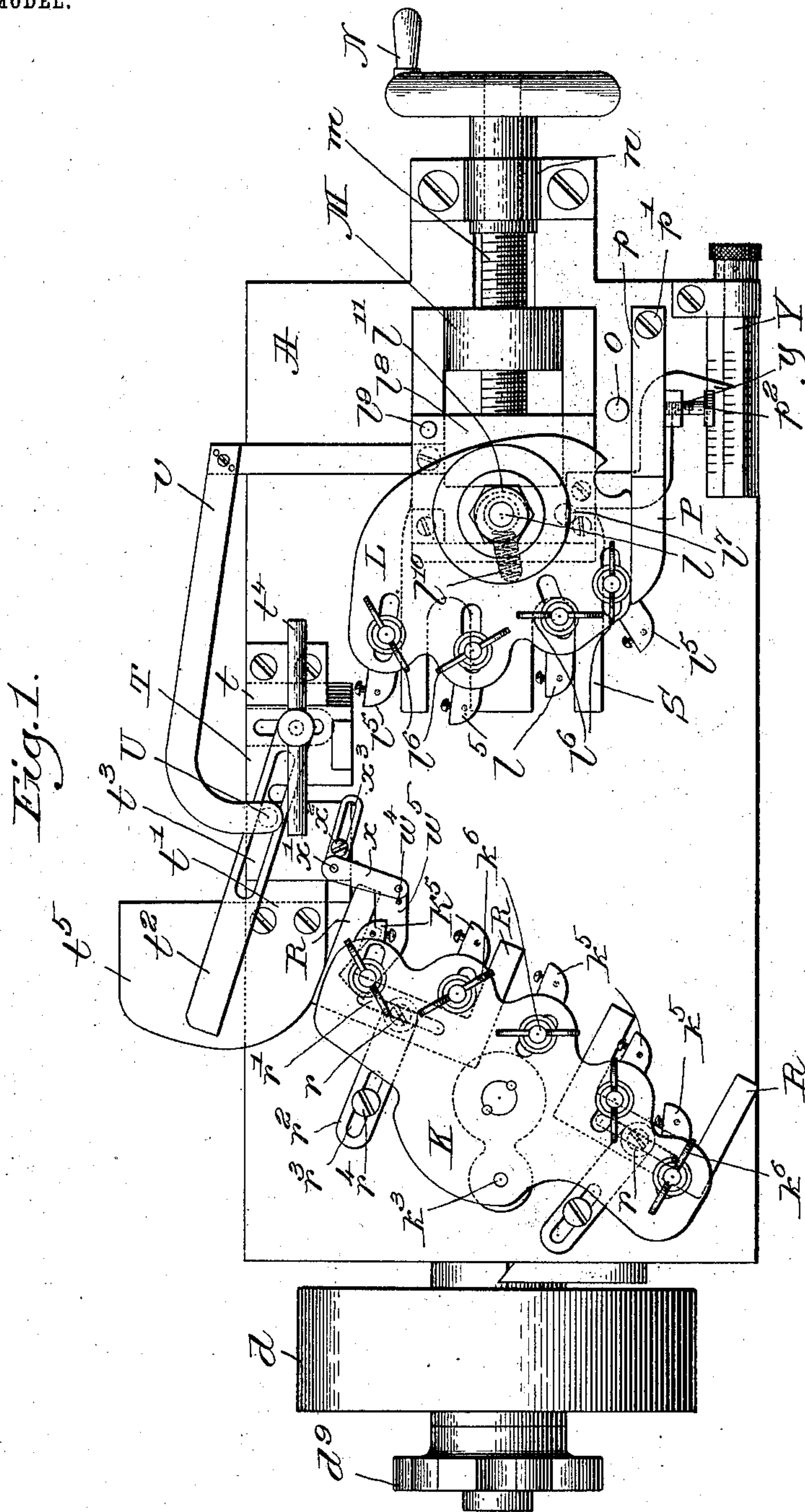
PATENTED DEC. 8, 1903.

W. J. DIX & T. QUINN.
MACHINE FOR MARKING SHOE LININGS.

APPLICATION FILED OCT. 24, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



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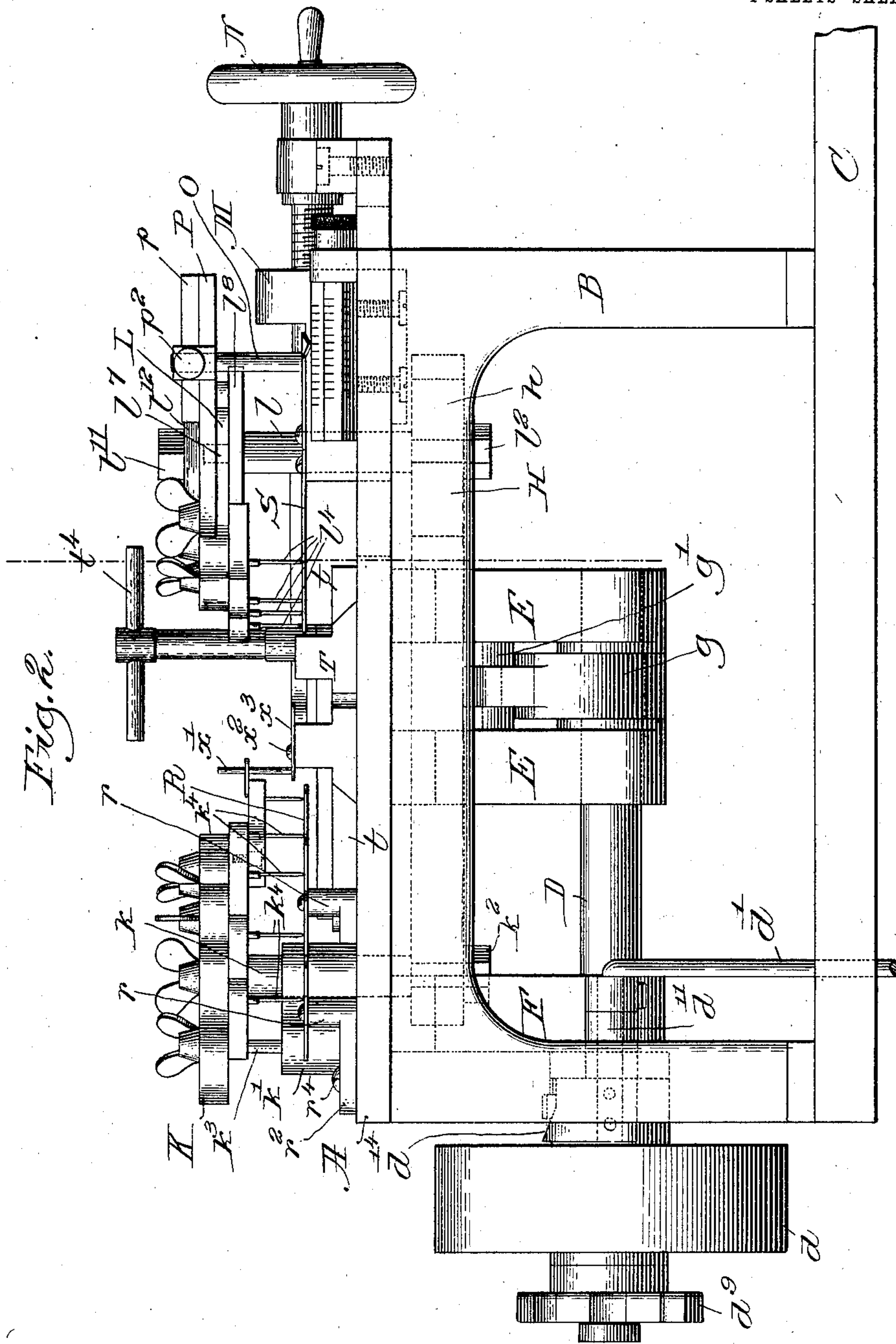
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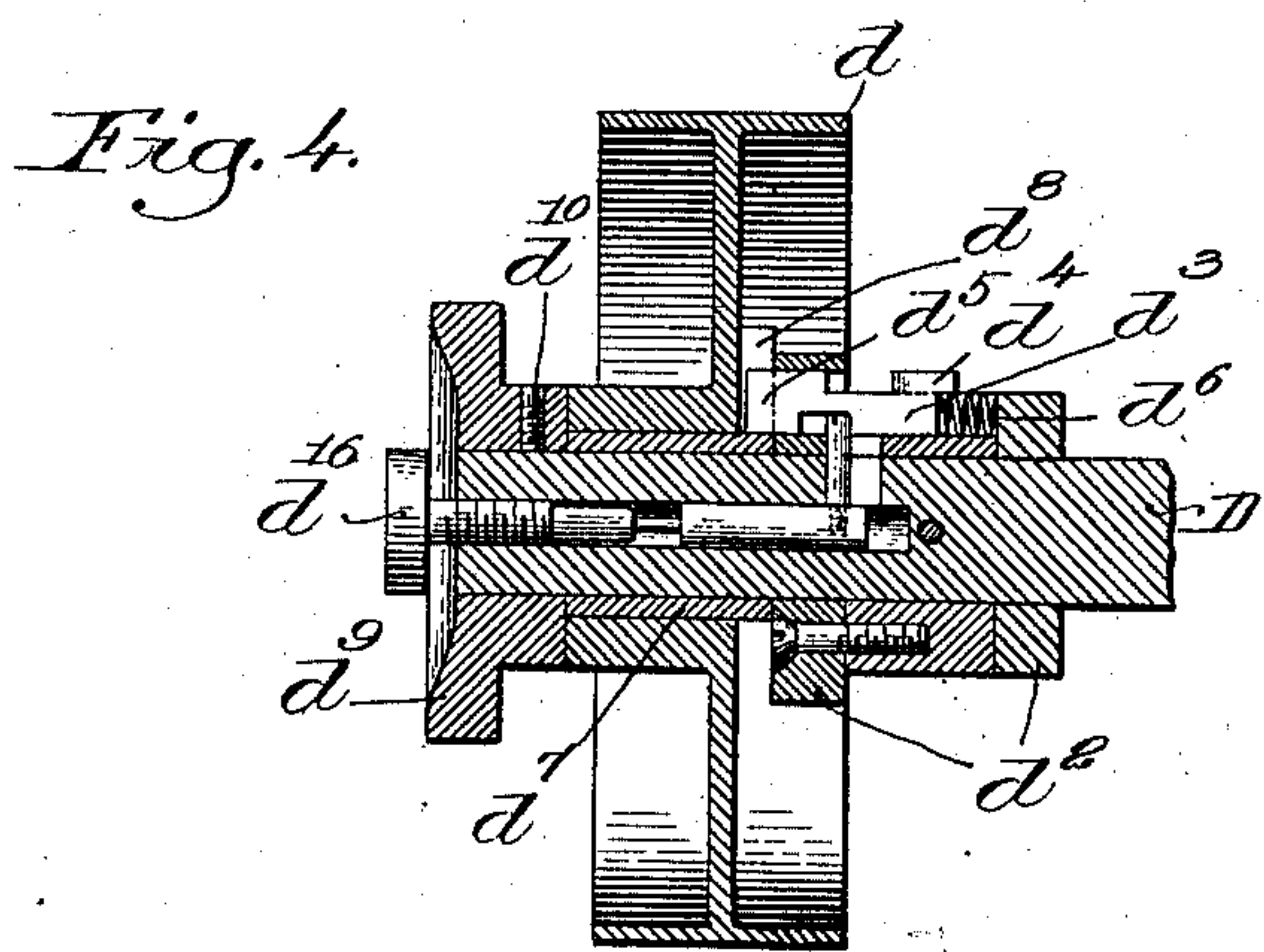
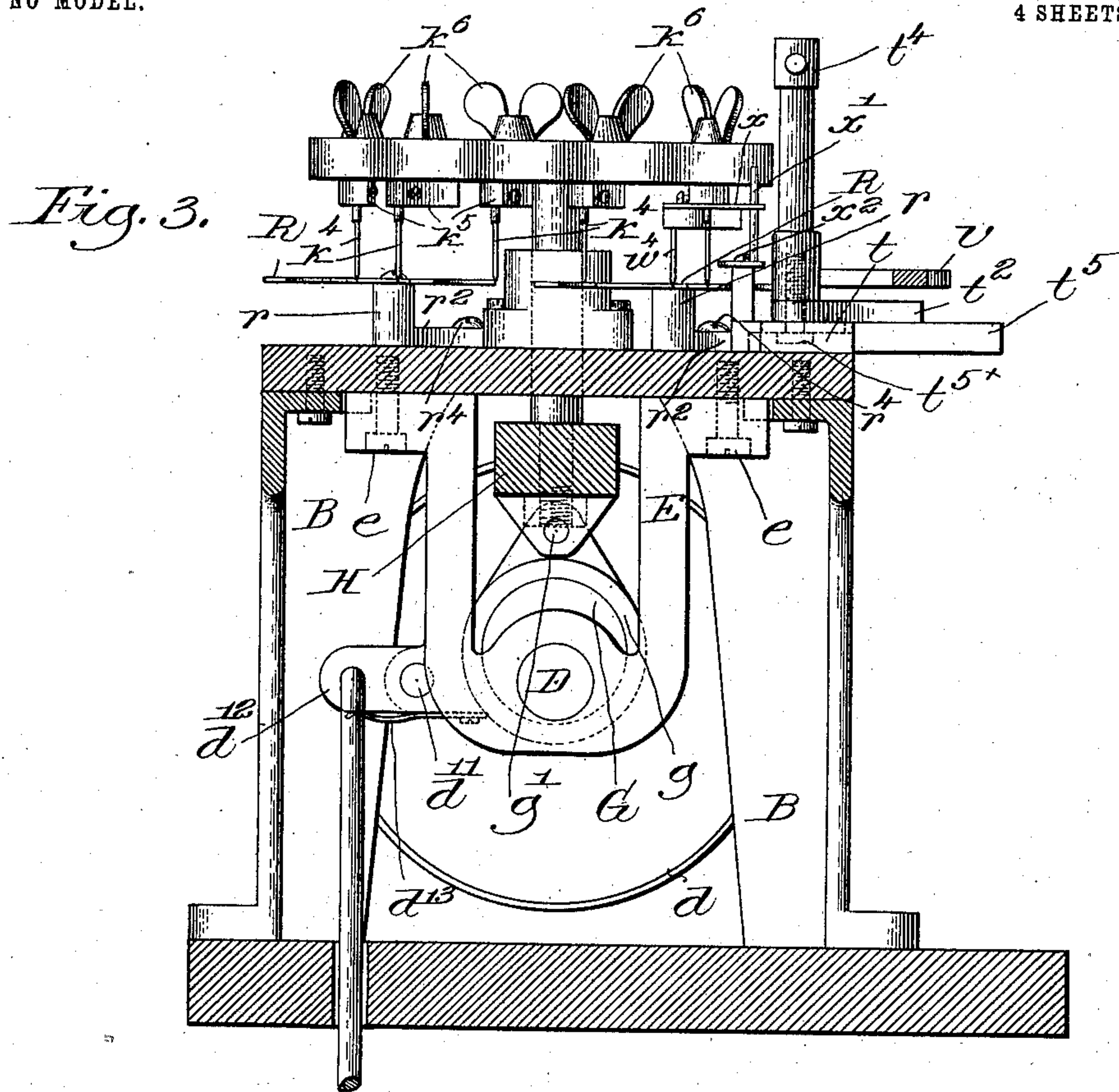
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4 SHEETS—SHEET 4.

Fig. 5.

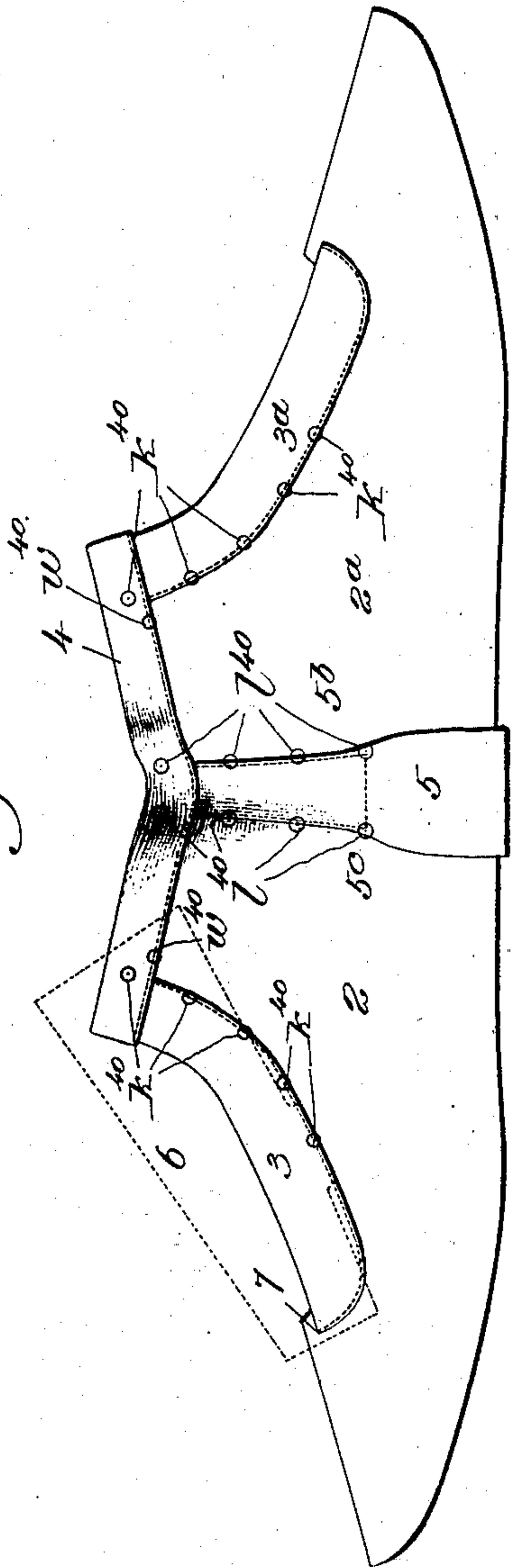
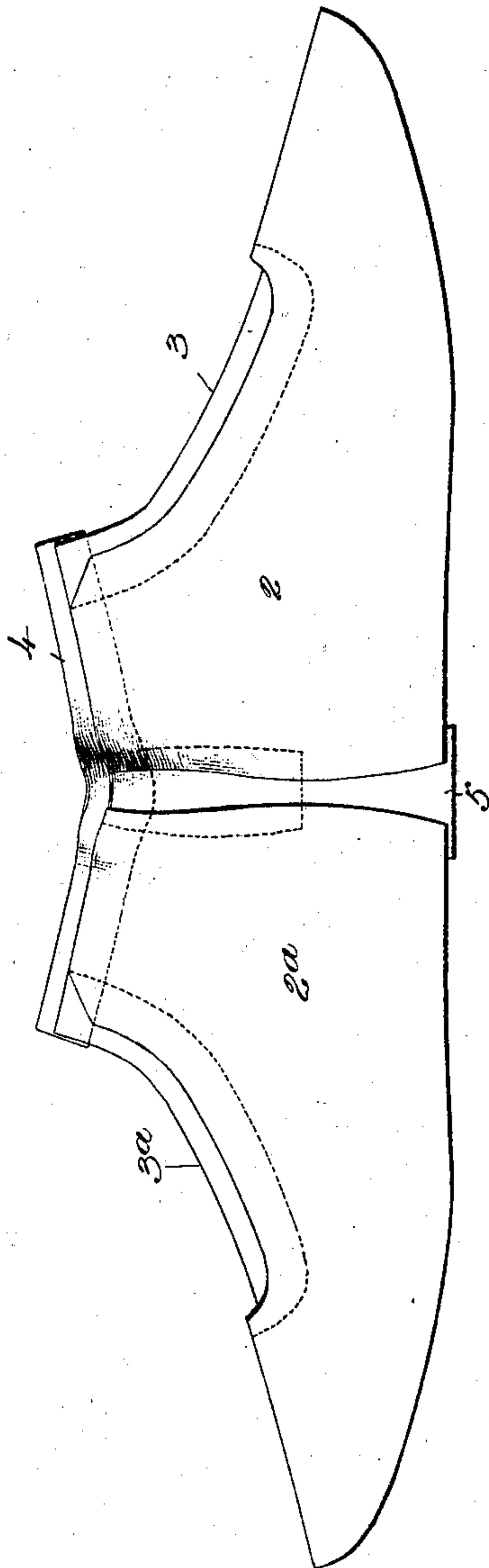


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM J. DIX AND THOMAS QUINN, OF MILFORD, MASSACHUSETTS.

MACHINE FOR MARKING SHOE-LININGS.

SPECIFICATION forming part of Letters Patent No. 746,470, dated December 8, 1903.

Application filed October 24, 1901. Serial No. 79,799. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM J. DIX and THOMAS QUINN, citizens of the United States, and residents of Milford, county of Worcester, State of Massachusetts, have invented an Improvement in Machines for Marking Shoe-Linings, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The object of this invention is to provide a machine for marking the cloth linings of shoes near their front, back, and top edges in order that front, back, and top stays may be stitched to the lining by the operator with great accuracy and rapidity. As will be hereinafter shown, the position of these various stays with respect to each other varies slightly with each size in length, with each size in width, and with each style or pattern of shoe.

It is a further object of this invention to render the machine easily adjustable for every style and pattern of shoe and also easily adjustable for every length and width of any style or pattern.

It is a further object of the invention after the machine has been adjusted for a particular style or pattern to render the adjustment of the various marking devices as to any length or size in that pattern as simple as possible.

In securing these objects the machine in its preferred form is constructed as illustrated in the accompanying drawings and as hereinafter described, it being understood that various changes may be made therein without departing from the invention.

The machine is illustrated in the accompanying drawings, in which—

Figure 1 represents a top plan view of the machine; Fig. 2, a front elevation; Fig. 3, a view in cross-section looking toward the left of the machine; Fig. 4, a detailed view, partly in section, of the clutch connections with the driving-shaft. Fig. 5 is a view of that side of the lining to which stays are applied, and Fig. 6 is a view of the opposite side.

The construction of the machine will first be described and then its mode of operation.

The bed-plate A of the machine supports or carries all the various operating parts. This bed-plate is mounted for convenience

upon an iron framework B, made in two sections, one fastened to the lower face of the bed-plate near the front edge and one to the lower face of the bed-plate near the back edge and each having two depending legs, which may be bolted or secured to the table or other support C.

The driving or operating shaft D is journaled in hangers E E F, each of which is secured to the lower face of the bed-plate in any suitable manner, as by the screws e. The shaft D is operated by the power-driven pulley d, mounted loosely thereon and connected therewith by a clutch controlled by the rod d', which rod may be operated by the foot of the operator or in any desired manner. The clutch is so arranged that upon the operation of the rod d' the pulley d is connected to the shaft and one revolution given to the shaft, when the pulley is automatically unclutched. The connections between the pulley and the driving-shaft are illustrated in Fig. 2 and also in detail in Fig. 4. The shaft has rigidly attached thereto the three-part casing d², which contains the movable parts of the clutch. The movable clutch member d³ has a stud d⁴ projecting through the peripheral face of the casing and a projection d⁵ projecting through the flat face of the casing adjacent the pulley and is capable of a sliding movement in the direction of the axis of the shaft. A spring d⁶ acts to press the clutch member in the direction of the pulley. A sleeve d⁷, provided with suitable lubricating-holes, is loosely mounted on the shaft between it and the pulley. The pulley is provided on its face adjacent the clutch with one or more, and preferably two, projections d⁸ and is retained on the shaft, and the projections d⁸ are maintained in close proximity to the vertical face of the clutch-casing d² by means of a nut d⁹, which is fastened to the shaft by a screw, as d¹⁰. A short rock-shaft d¹¹ is mounted in a suitable projection from the hanger F and is provided at one end with an arm d¹², by which the shaft is rocked in one direction by the rod d' and in the opposite direction by a spring d¹³. This rock-shaft is provided at its opposite end with a clutch-operating arm d¹⁴, provided with a beveled edge.

The operation whereby the power is trans-

mitted to the shaft is as follows: The clutch member d^3 is held normally in its retracted position by the engagement of the arm d^{14} with the stud d^4 , thus allowing the pulley to
 5 revolve freely on the shaft D. When it is desired to rotate the shaft, the rod d' is depressed, thus raising the arm d^{14} and allowing the movement of the clutch member d^3 under the action of the spring d^6 and the
 10 consequent engagement of the stud d^5 with one of the projections d^8 upon the pulley. The pulley thus locked to the shaft then rotates it until one revolution is completed, when the stud d^4 coming in contact with the
 15 beveled edge of the arm d^{14} is retracted, drawing the stud d^5 out of engagement with the projection d^8 , the pulley thrown out of engagement, and the shaft at the same time stopped by reason of the contact of the stud
 20 d^4 with the arm d^{14} . In order that the machine may be operated by hand, if desired, a screw d^{16} is provided, which may be turned so as to press and hold back the clutch member d^3 , as shown in Fig. 4, thus allowing the
 25 shaft to be rotated without the use of the pulley.

The shaft D is provided with an eccentric G, by means of which a vertical reciprocating movement is given upon the revolution of
 30 the shaft to the cross-bar H, the eccentric being connected to the cross-bar by an eccentric-strap g , pivotally connected therewith at g' .

Above the bed-plate the three sets of marking devices for the front, top, and back stays, respectively, are mounted.

The marking device for the front stay, as illustrated, comprises a cross-head K, having a post k , which post passes down through a support and guide k' , fastened to the bed-plate, and is connected to the cross-bar H in
 40 any suitable manner, as by a screw k^2 . A guide-pin k^3 , mounted in the support k' and passing through a hole in the cross-head K, insures the position of the cross-head as it
 45 is reciprocated by its connection with the cross-bar H. The markers themselves may consist of any suitable awl, punch, or other device, but are preferably conical pointed pins, (shown at k^4 .) Five such markers have
 50 been found sufficient to define the line of stitching of the front stay; but the number may be changed or varied, as desired. These markers k^4 are each mounted in a marker-arm k^5 . Each marker-arm k^5 is adjustable
 55 in any horizontal direction by means of a set-screw k^6 , connected thereto and passing through a slot in the cross-head K, whereby the markers may be set upon any desired curve. As we shall show, after the markers
 60 for the front stay are set to the desired pattern no further adjustment is necessary for any length or width of shoe made under that pattern.

The marking device for the back stay consists of a cross-head L, provided with a suitable number, as herein shown four, of markers l^4 , each mounted in a marker-arm l^5 and each ad-

justable in any horizontal direction by means of a set-screw l^6 passing through a slot in the cross-head L. As will appear later, it is necessary in the case of the marking device for the back stay not only to adjust the markers for the curve of the particular pattern, but to adjust the markers bodily when once set for the length and width, and this is secured by adjusting the cross-head L. In this adjustment it is necessary not only to vary the distance between the line defined by the markers l^4 and that defined by the markers k^4 , but also to vary the angle between these two lines.

The cross-head L is pivoted on a pin l^7 , which pin is mounted in a plate l^8 , upon which the cross-head L rests. A pin l^9 , fastened to the plate l^8 , limits the motion of the cross-head L, and a spring l^{10} , mounted in the cross-head L and pressing against the post l , tends to move the cross-head L about its pivot l^7 , in the direction of the marking device for the front stay, the cross-head L fitting loosely on the post l and being held thereon by a nut l^{11} and washer l^{12} . The post l and the plate l^8 are fastened together, and the post l passes through a vertical hole in a movable support M and is connected with the cross-bar H by
 95 a screw l^2 , passing through a slot h in the cross-bar. The support M is adjusted lengthwise of the bed-plate of the machine by means of a screw m and a hand-wheel or other device N, the screw m being threaded into the support M and rotatably mounted on the bed-plate of the machine at n . A stud O projects from the bed-plate, as shown, and the cross-head L is provided with a projecting arm P. A movable arm p is pivoted to the arm P at p' , and a set-screw p^2 , mounted on the arm P, bears against the arm p' , whereby the angle of the latter with respect to the arm P may be varied. It will thus be seen that in order to vary the distance between the two sets of marking devices for the front and back stays, respectively, it is only necessary to turn the hand-wheel N, whereby the support M, carrying the post l , will be moved either backward or forward, as desired. The adjustment of the angle between the lines made by the two sets of marking devices results from the arm P or the arm p bearing against the stud o and turning the cross-head L about its pivot against the spring l^{10} to the extent desired, which may be regulated by the screw p^2 .

Stripping devices R S are provided, consisting simply of fingers mounted in any desired way, either upon the bed-plate, as in the case of the device for marking the front stay, or upon the support M, as in the case of the device for marking the back stay. These stripping devices prevent the lining from adhering to the markers.

The gages for determining the position of the front edge of the lining must of course be adjustable and are herein shown as posts $r r$, mounted on plates r^2 , the said plates being

fastened to the bed-plate of the machine by means of screws r^4 r^4 , passing through slots r^3 r^3 in the plates r^2 r^2 . Thus the gages r r may be adjusted to any desired position. For convenience the strippers R are mounted, by means of a set-screw passing through the slot r' therein, upon the gages r , and thus the strippers may be adjusted to the desired proximity to the markers.

The gage for determining the position of the upper edge of the lining consists of a gage-plate T , mounted to move in ways t on the bed-plate. A cam-plate t^2 , provided with a slot t^3 , is attached in any desired position to the gage-plate T by means of a post t^4 , provided with a handle, and a screw t^5 , setting into said post. A stud U passes into the slot t^3 in the cam-plate t^2 and is connected in a suitable manner, as by an arm u , to the movable support M . It will thus be seen that upon the movement of the support M the gage-plate T will be moved back and forth, according to the angle between the slot t^3 and the line of movement of the support M . A plate t^5 is provided, upon which lines may be drawn to indicate the positions of the cam-plate t^2 for different styles or patterns.

In marking the position of the top stay it is desirable to have the top stay always the same distance from the top edge of the lining in a particular style outlined, and to this end we provide the following means for marking the position of the top stay: The marker w^4 is mounted in a marker-arm w^5 , which for convenience is attached directly to the nearest marker-arm k^5 , the only requirement being that it shall be pivotally mounted upon its support and capable of swinging within the desired distance of the gage-plate T . In order to keep the marker w^4 at a practical constant distance from the gage-plate T , it is connected, by means of a link x , to a pin x' , adjustably mounted on the gage-plate T by means of a set-screw x^2 , passing through a slotted projection x^3 from the pin x' .

A gage Y is mounted in suitable position upon the bed-plate, and a finger y extends from the movable support M over the gage Y . The gage may be marked in any desired way to indicate the position of the gage-finger y for any desired width and any desired length in any particular style of lining. For example, one face of the gage may indicate a particular width in a particular style and the marks on that face the various lengths in the particular width and style. It is obvious, however, that the gage may be marked as desired, it being noted that when the gage-finger is at the particular mark upon the gage it indicates that the markers for the front, back, and top stays are each set in proper position for the particular style, width, and length of shoe-lining.

The machine is operated and adjusted as follows: The patterns, as is well known, for any particular style of lining are first carefully designed on sheet metal or other sub-

stance, each pattern being for a particular style and having the limiting sizes designated thereon, together with the proper positions for the back, front, and top stays. The present machine is adjusted by moving the marking devices for the back stay and top gage-plate T into their advanced positions and then adjusting the gages r r against the front edge of the pattern and the gage-plate T against the top edge, the various markers k^4 and l^4 being then adjusted, by means of the set-screws k^6 and l^6 , to their proper positions and the marker w^4 to its proper position, all as indicated on the pattern for the smallest length. The cam-plate t^2 is then set at the angle which by experiment is found to be the necessary one in order to have the gage-plate T move from the shortest to the longest length, while the markers l^4 likewise move from the shortest to the longest length, this being easily obtained after one or two trials. The set-screw p^2 is at the same time adjusted so as to vary the angle of the markers l^4 with respect to the markers k^4 to the extent desired in passing from the shortest to the longest length, this being found necessary in most styles of shoes in order to obtain a properly-marked lining. The gage y may then be marked upon one of its faces to indicate the various lengths, and thereafter all that is necessary in order to adjust the gages for marking various widths in the desired length and the desired style of pattern is to move the hand-wheel N and bring the gage-finger y in the proper position on the gage Y .

In Figs. 5 and 6 of the drawings we have shown a lining with the back, front, and top stays attached thereto, 2 and 2^a indicating the sections of the lining which are exact duplicates, 3 and 3^a the front stays, 4 the top stays, and 5 the back stay. 6 indicates in dotted lines the tongue of the shoe, which is ordinarily attached at the same time the front stay 3 is sewed to the lining.

The variation which exists between the several lengths and the several widths or, in other words, between the several sizes of lining in a particular style of pattern is extremely slight, and yet this slight variation must be followed with extreme accuracy, or a misfit results. The same is true of the variation which exists between the various styles of patterns. It is absolutely necessary, therefore, to mark the positions of the stitching for the various stays with the utmost exactness. To insure this extreme nicety of construction of the lining, it is necessary in the first place to provide such a marking for the front stay as will enable the operator to attach the front stay in just the right position with expedition and accuracy. The stays themselves are cut with mechanical exactness, and the linings themselves are cut accurately; but when it is considered that a very slight variation in the position of these stays constitutes the difference between the various sizes in length and width of shoes it

will be seen that a very slight variation in position of the front stay—for example, such as even the most experienced operator is liable to make if required to position the stay by the use of the eye—is destructive to the exact fit. It is necessary, therefore, to define with the marking-machine the position of the front stay to such an extent that the action of the operator in positioning the stay shall be entirely automatic, requiring no judgment on the part of the operator as to where the stays are to be placed. If, for example, but one point in the position of the stay be marked, the operator is still obliged to position the stay by the eye and in doing so produces the very variation which it is the object of this invention to abolish. It will be noticed that the markers for the front stay in this machine have been fixed at five in number as a desirable number and that they outline the greater portion of the position of the front stay. On Fig. 5 of the drawings we have indicated at k^{40} the marks made upon the lining by the markers. It is of course obvious that the necessary position of these marks and the exact length in proportion outlined by the marks so long as it is a considerable portion of the length of the stay may be varied as desired. All the operator has to do is to place the stay upon the lining, the top edge of the stay and the top edge of the lining coinciding and the edge of the stay following the marks made by the machine. The stay may then be readily stitched to the lining, with the sewing commencing at either end of the stay. The importance of this last feature cannot be overestimated. Referring to Fig. 5 of the drawings, it will be apparent to any one skilled in this art that the only practical way in which the front stay 3 can be stitched to the lining 2 is by commencing at the upper edge of the lining and sewing toward the lower end of the stay, while in stitching the front a to the lining 2^a the stitching must commence at the lower end of the stay and proceed to the upper end. As a practical matter and in the actual manufacture of shoes it would be impossible to stitch the stay 3^a to the lining 2^a by commencing at the top end of the stay. It will be readily seen, further, that this invention secures the marking of the position of the front stay in such a manner that the front stay may be stitched to the lining as readily upon the right-hand as upon the left-hand section of the lining.

The requirements as to the exactness of the position of the back stay is the same which have just been set forth in regard to the front stays. An additional requirement also enters into the position of the back stay, and that is that the position of the back stay angularly with respect to that of the front stay varies slightly from size to size in a particular pattern and in different styles, and it is for this reason that the pivotal movement of the series of back stay markers is provided and is necessary. Markers for the back stay are

preferably so arranged as to mark the entire line of stitching required to connect the back stay with the lining. In Fig. 5 of the drawings at l^{40} are indicated the marks made by the markers upon the lining. The number of these marks may be varied as desired; but the mark nearest the lower edge of the lining should preferably be placed to determine the end of the horizontal line of stitching, which connects the two lining-sections or at the point 5^c indicated. In attaching this stay, which consists of a single piece attached to both sections of the lining, the operator in sewing the back stay 5 to the lining 2^a may commence at the top end of the stay and sew down to the point 5^b , the operator then adjusting the back stay 5 to the lining-section 2 by causing the upper end of the stay to coincide with the upper edge of the lining and the edge of the stay to follow the marking down to the point 5^c . At one operation the stitching may then be continued from 5^b to 5^c and over the other edge of the stay on the lining-section 2. For the reason which we have previously set forth it would be a commercial impossibility to fasten the stay 5 to the lining-section 2 by commencing the stitching operation at the top end of the stay. It will be seen, therefore, that the lining is marked by means of our invention in such a way that the back stay may be attached with great celerity to both sections of lining at a single operation and with absolute accuracy.

After the front and back stays have been attached to the two sections of lining it is obvious that all that remains to do is to place the top stay in such position that its lower edge shall coincide with the two points w^{40} and w^{40} , which have been marked by the top-stay marker, when the top stay will be readily fastened to the lining-sections.

It will thus be seen that a machine is provided by this invention which may be readily adjusted to correspond with any style of shoe and with any length or width of shoe; a machine which will mark with absolute accuracy the positions of the several stays, enabling the operator to work rapidly and without the use of judgment in locating the stays upon the lining; a machine in which after the primary adjustments have been made the operator may then adjust from size to size by simply turning a hand-wheel and noting the position of a finger upon a gage; a machine in which provision is made for the angular variation between the position of the front and back stays; a machine which when once adjusted any particular style or length of shoe may readily be readjusted by reference to a gage and style indicating plate; a machine, in fact, which may be adjusted and operated to mark any style or size of lining with extreme accuracy by even an unskilled operator.

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

front-stay markers, means for adjusting the top-stay marker with respect to the series of front-stay markers.

14. A machine for marking the linings of shoes and similar articles, comprising a series of independently-adjustable markers for marking the position of the front stay, a series of independently-adjustable markers for marking the position of the back stay, a marker for marking the position of the top stay, means for bodily adjusting the series of back-stay markers with respect to the front-stay markers, means for adjusting the top-stay marker with respect to the series of front-stay markers, a gage for indicating the relative position of the three sets of markers with respect to each other.

15. A machine for marking the linings of shoes and similar articles, comprising a series of independently-adjustable markers for marking the position of the front stay, a series of independently-adjustable markers for marking the position of the back stay, a marker for marking the position of the top stay, means for bodily adjusting the series of back-stay markers with respect to the front-stay markers, means for adjusting the top-stay marker with respect to the series of front-stay markers, a gage for indicating the relative position of the three sets of markers with respect to each other, means for giving a single reciprocation to the markers for the purpose of marking the lining.

16. A machine for marking the linings of shoes and similar articles, comprising a series of independently-adjustable markers for marking the position of the front stay, a series of independently-adjustable markers for marking the position of the back stay, a marker for marking the position of the top stay, means for bodily adjusting the series of back-stay markers with respect to the front-stay markers, means for adjusting the top-stay marker with respect to the series of front-stay markers, a gage for indicating the relative position of the three sets of markers with respect to each other, adjustable gages for positioning the lining to be marked, means for giving a single reciprocation to all the markers for the purpose of marking the lining.

17. A machine for marking the linings of shoes and similar articles, comprising an adjustable gage for positioning the front edge of the lining, an adjustable gage for positioning the top edge of the lining, a series of independently-adjustable markers for marking the position of the front stay, a series of independently-adjustable markers for marking the position of the back stay, means for bodily adjusting the series of back-stay markers to and from and angularly with respect to the front-stay markers, means for adjusting the gage for the top edge of the lining, simultaneously with the adjustment of the series of back-stay markers.

18. A machine for marking the linings of shoes and similar articles, comprising an ad-

justable gage for positioning the front edge of the lining, an adjustable gage for positioning the top edge of the lining, a series of independently-adjustable markers for marking the position of the front stay, a series of independently-adjustable markers for marking the position of the back stay, means for bodily adjusting the series of back-stay markers to and from and angularly with respect to the front-stay markers, means for adjusting the gage for the top edge of the lining simultaneously with the adjustment of the series of back-stay markers, a marker for marking the position of the top stay, and connections between the top-stay marker and the gage for the top stay whereby the former may be maintained a substantially constant distance from the latter.

19. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay, a marker for marking the position of the top stay, connections between the series of back-stay markers and the top-stay marker whereby the series of back-stay markers and the top-stay marker may be adjusted by one operation to the desired position with respect to the front-stay markers.

20. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay, a marker for marking the position of the top stay, connections between the series of back-stay markers and the top-stay marker whereby the series of back-stay markers and the top-stay marker may be adjusted by one operation to the desired position with respect to the front-stay markers, means for giving a single reciprocation to all the markers for the purpose of marking the lining.

21. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay, a marker for marking the position of the top stay, connections between the series of back-stay markers and the top-stay marker whereby the series of back-stay markers and the top-stay marker may be adjusted by one operation to the desired position with respect to the front-stay markers, adjustable gages for positioning the lining to be marked.

22. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay, a marker for marking the position of the top stay, connections between the series of back-stay markers and the top-stay marker whereby the series of back-stay markers and the top-stay marker may be adjusted by one operation to

the desired position with respect to the front-stay markers, adjustable gages for positioning the lining to be marked, means for giving a single reciprocation to all the markers for the purpose of marking the lining.

23. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay mounted upon an adjustable support, a gage for the top edge of the lining adjustable in a direction transverse to that of the adjustable support, adjustable connections between the said gage and said support, whereby upon the movement of the support, the gage will be automatically moved to the desired position, means for moving said support.

24. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay mounted upon an adjustable support, a gage for the top edge of the lining adjustable in a direction transverse to that of the adjustable support, adjustable connections between the said gage and said support, whereby upon the movement of the support, the gage will be automatically moved to the desired position, means for moving said support, a marker for marking the position of the top stay, connections between the top-stay marker and the said gage, whereby the marker is maintained at substantially a constant distance from the gage during the movement of the latter.

25. A machine for marking the linings of shoes and similar articles, comprising a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay mounted upon an adjustable support, a gage for the top edge of the lining adjustable in a direction transverse to that of the adjustable support, adjustable connections between the said gage and said support, whereby upon the movement of the support, the gage will be automatically moved to the desired position, means for moving said support, a marker for marking the position of the top stay, connections between the top-stay marker and the said gage, whereby the marker is maintained at substantially a constant distance from the gage during the movement of the latter, adjustable gages for positioning the front edge of the lining to be marked.

26. A machine for marking the linings of shoes and similar articles, comprising adjustable gages for determining the position of the front and top edges of the lining, a series of markers for marking the position of the front stay, a series of markers for marking the position of the back stay, said series of back-

stay markers being pivotally mounted on a support adjustable toward and from the series of front-stay markers, means for adjusting the support, means tending to swing the series of back-stay markers in one direction about the pivot, means to move said series in the opposite direction about the pivot during the adjustment of the support.

27. A machine for marking the linings of shoes and similar articles, comprising a series of independently-adjustable markers mounted in a vertically-movable cross-head for marking the position of the front stay, a series of independently-adjustable markers mounted in a vertically-movable cross-head for determining the position of the back stay, an adjustable marker mounted on the first-mentioned cross-head for determining the position of the top stay, means for giving simultaneously a single vertical reciprocation to the said cross-head, means for simultaneously adjusting the top-stay marker with respect to the front-stay markers, and the back-stay markers toward and from and angularly with respect to the front-stay markers.

28. A machine for marking the linings of shoes and similar articles, comprising a series of independently-adjustable markers mounted in a vertically-movable cross-head for marking the position of the front stay, a series of independently-adjustable markers mounted in a vertically-movable cross-head for determining the position of the back stay, an adjustable marker mounted on the first-mentioned cross-head for determining the position of the top stay, means for giving simultaneously a single vertical reciprocation to the said cross-head, means for simultaneously adjusting the top-stay marker with respect to the front-stay markers, and the back-stay markers toward and from and angularly with respect to the front-stay markers, a gage for indicating the relative positions of the three sets of markers.

29. A machine for marking the linings of shoes and similar articles, comprising a work-support and a series of independently-adjustable markers, means for giving a single reciprocation to said markers vertically with respect to said work-support, a movable support on which said series of markers are mounted, means for adjusting said movable support horizontally with respect to said work-support, means for swinging said series of markers with respect to said work-support.

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

WILLIAM J. DIX.
THOMAS QUINN.

Witnesses:

JOHN F. SUNDERLAND,
WM. P. DONNELLY.