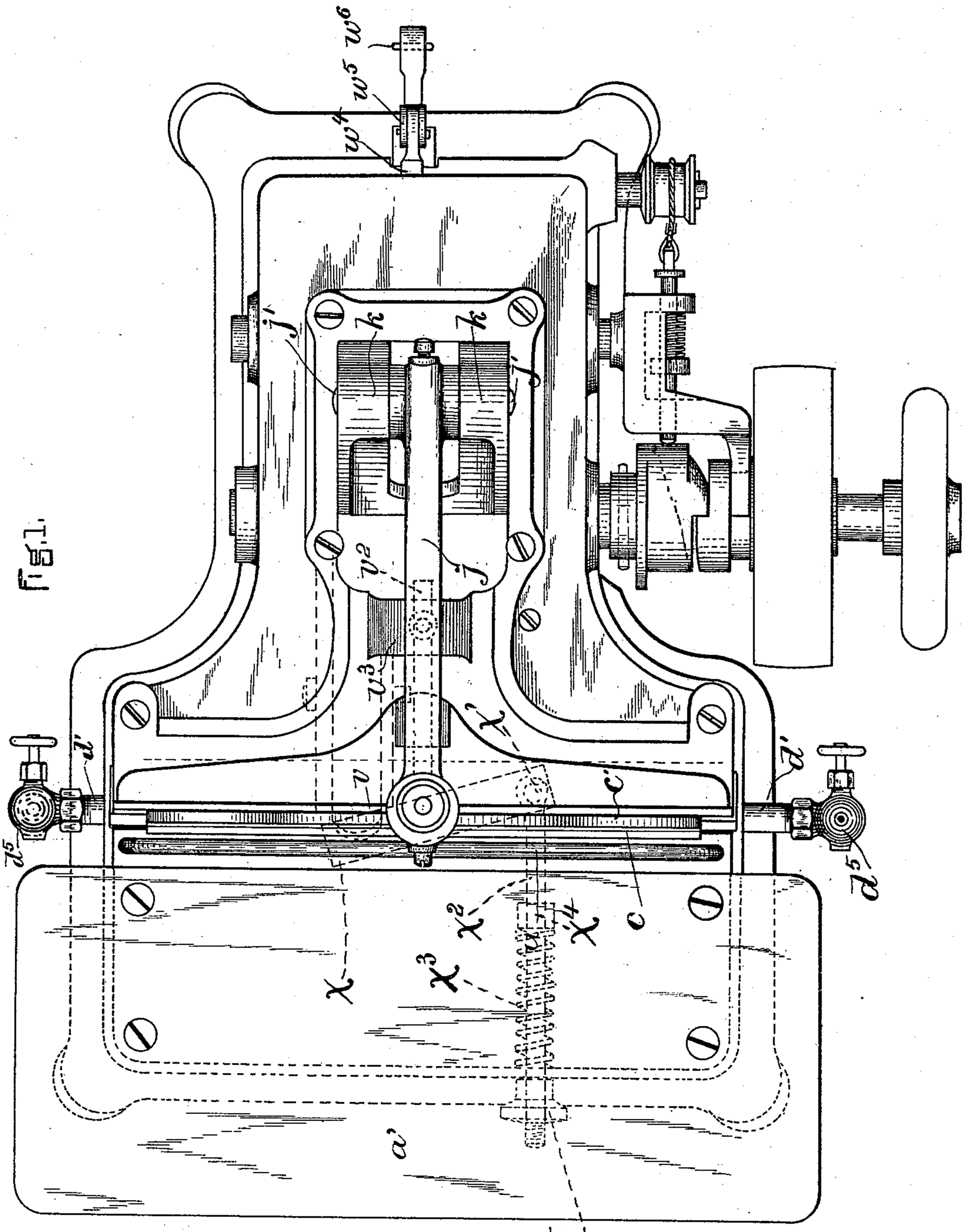
(No Model.) 4 Sheets—Sheet 1.

C. E. WILLIAMS.

UPPER FOLDING MACHINE.

No. 488,593. Patented Dec. 27, 1892.

Fig. 1.



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(No Model.)

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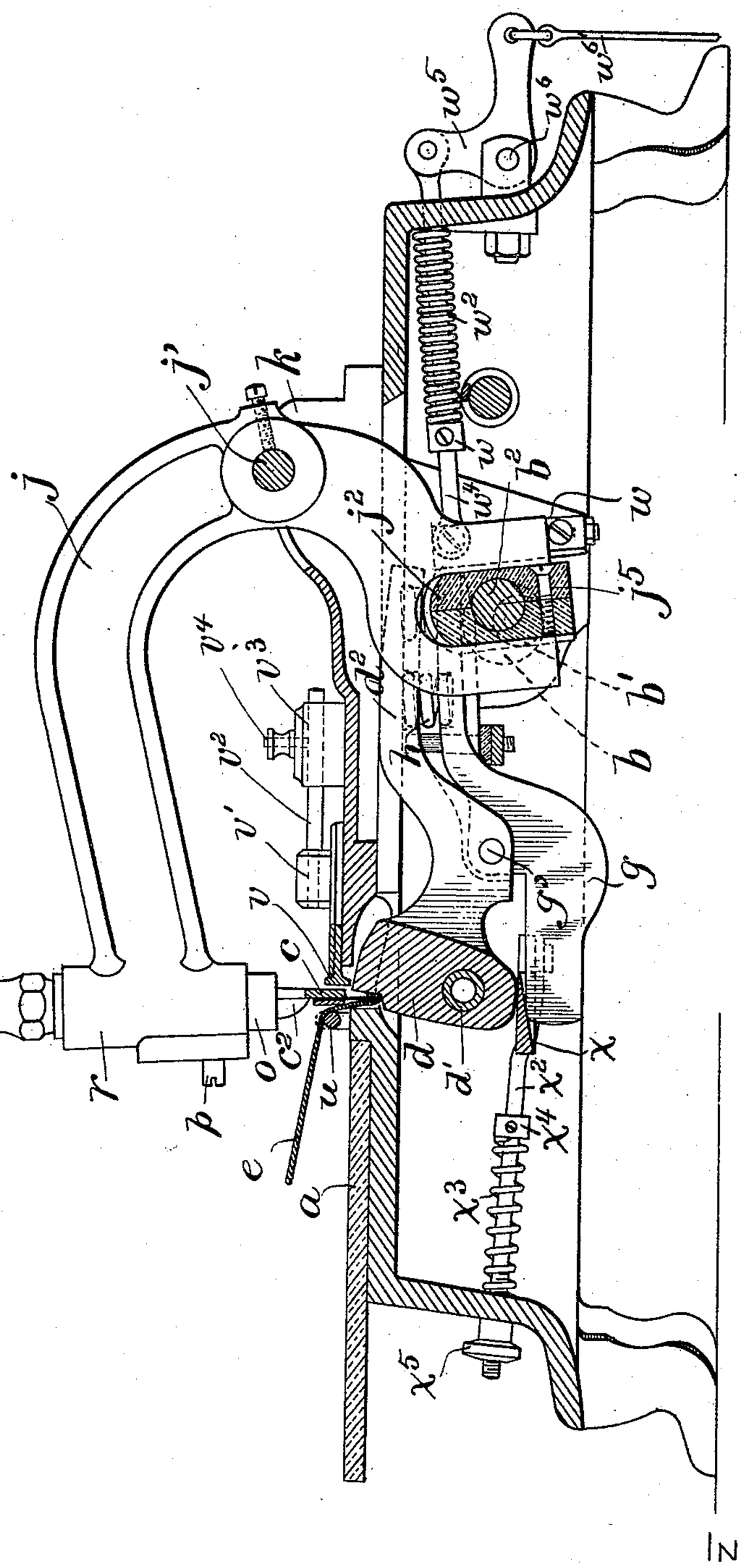

FIG. 2.

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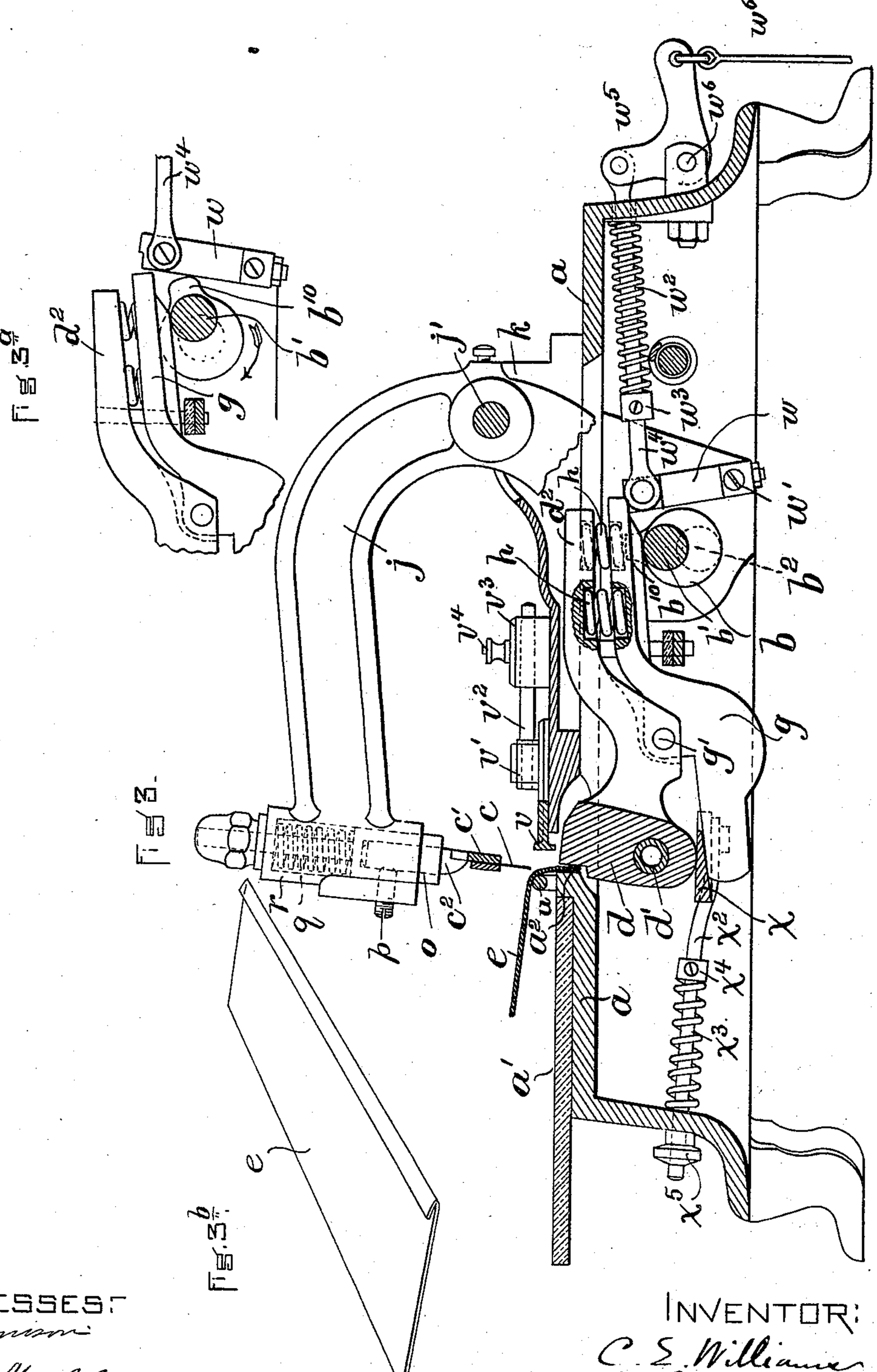

Fig. 3a.

Fig. 3.

Fig. 3b.

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UPPER FOLDING MACHINE.

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Fig. 4.

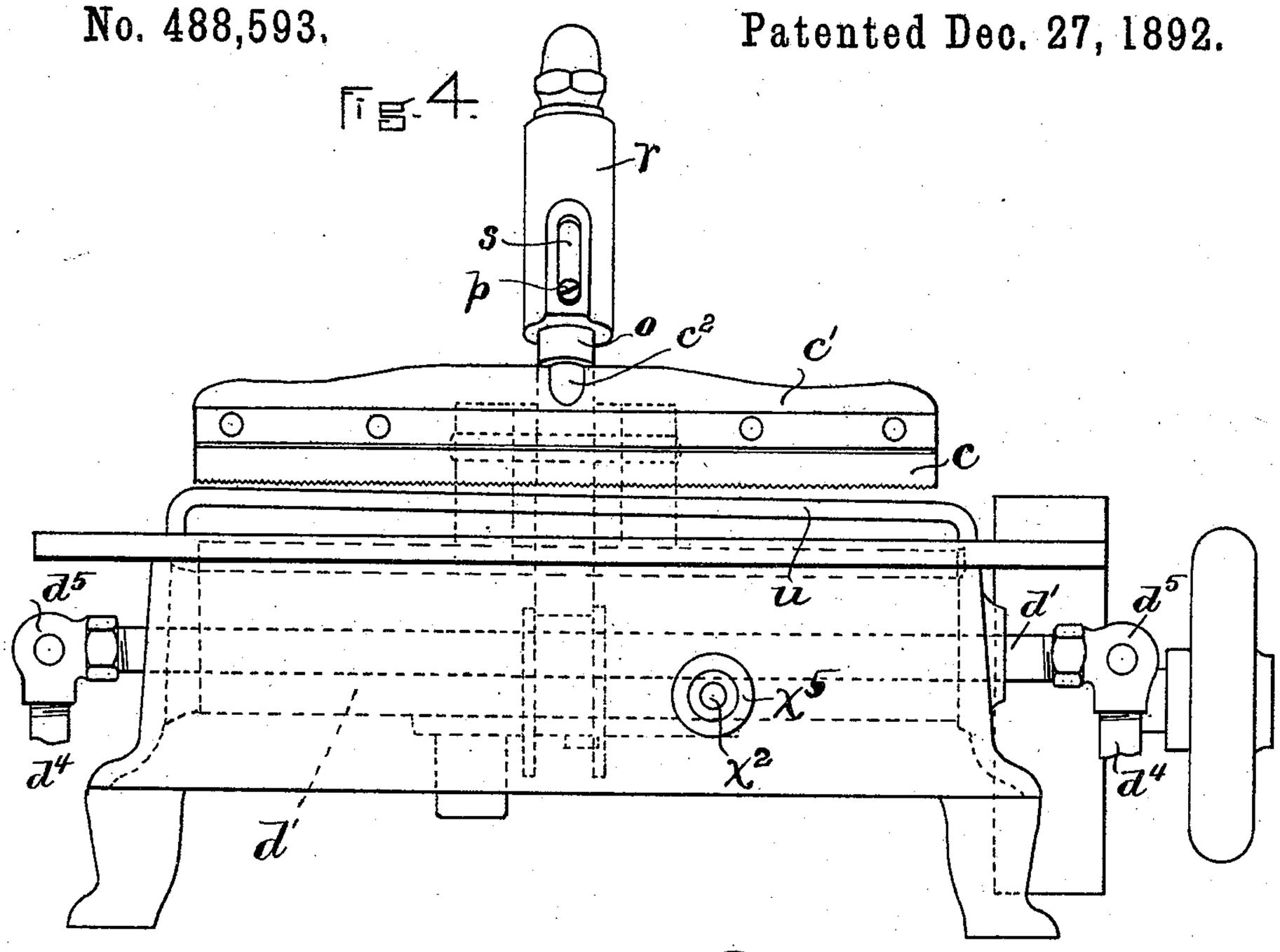
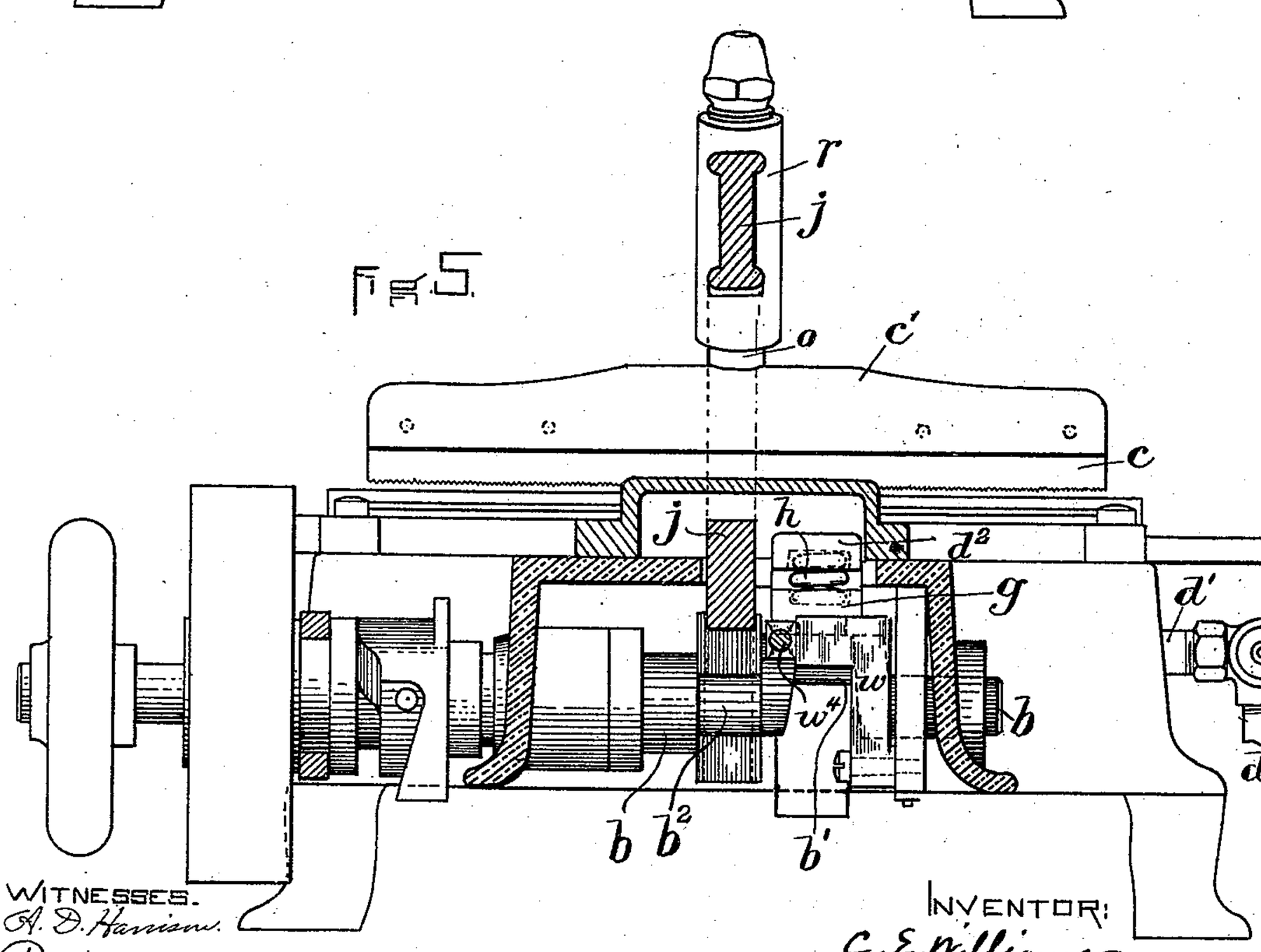


Fig. 5.



WITNESSES.
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INVENTOR:
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UNITED STATES PATENT OFFICE.

CHARLES E. WILLIAMS, OF MILFORD, MASSACHUSETTS.

UPPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 488,593, dated December 27, 1892.

Application filed February 5, 1892. Serial No. 420,392. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. WILLIAMS, of Milford, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Folding Parts of Boot and Shoe Uppers, of which the following is a specification.

This invention relates to machines for crimping or folding parts of the uppers of boots or shoes, in which the part or piece to be folded is pressed between two opposing surfaces so that a sharp crease is formed at the folded edge.

The present invention has for its object to provide certain improvements on the construction shown in the machine for which Letters Patent of the United States were granted to me February 9, 1892, No. 468,590, and it consists in the several improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming part of this specification: Figure 1 represents a top plan view of a folding machine provided with my improvements. Fig. 2 represents a side view and partial section of the same. Fig. 3 represents a longitudinal section and partial side elevation of the machine. Fig. 3^a represents a side elevation of a part of the construction shown in Fig. 3. Fig. 3^b represents a piece of material folded by the machine. Fig. 4 represents an end view of the machine. Fig. 5 represents a view of the opposite end.

The same letters of reference indicate the same parts in all the figures.

In the drawings: *a* represents a suitable base or bed, having bearings in which is journaled a crank-shaft *b*, the same having the cranks or eccentric wrist-pins b' b^2, Fig. 3, which give motion, through the devices hereinafter described, to the creasing blade *c* and to the rocking presser *d*. The bed *a* is provided at one end with a horizontal table a' which supports the piece *e* to be folded, one end of said table forming a wall or pressing surface a^2, which co-operates with the rocking presser *d* in folding and creasing the portion of the piece *e* that is interposed between said parts. The rocking presser *d* is provided at its ends with trunnions d' d', which are journaled in bearings in the sides of the base *a*. Said trunnions are preferably the ends of a steam pipe which passes through the rocking presser, and is supported in the side pieces of the base, said pipe being connected at its ends with steam supply and exhaust pipes d^4, having valves d^5. To said presser is affixed a lever d^2, which projects rearwardly over the crank-shaft *b*.

g represents a lever, which is pivoted at g' to the lever d^2, and also projects over the crank-shaft, said lever *g* being interposed between the crank-shaft and lever d^2, and having its rear end arranged to bear on the wrist-pin b'. The rotation of the crank-shaft *b* causes the wrist-pin b' to rise and fall, and impart a like movement to the lever *g*. One or more springs are interposed between the lever *g* and the lever d^2, said springs constituting a yielding or elastic connection between the levers d^2 and *g*, and exerting the upward pressure on the lever d^2 which forces the rocking presser *d* forward toward the fixed surface a^2 with which it co-operates, said springs enabling the presser *d* to conform to the thickness of the leather interposed between it and the surface or shoulder a^2.

j represents a curved lever, which is provided with trunnions j', journaled in bearings *k k* on the base *a*. One end of the lever *j* is provided with a slot j^2, which receives the wrist-pin b^2, and a block j^5 mounted on the wrist-pin and fitted to slide in the slot. The revolution of said wrist-pin causes the lever *j* to oscillate, and thus alternately raise and depress the creasing blade *c* which is supported by the opposite end of said lever. The creasing blade *c* is arranged over the space between the presser *d* and the shoulder a^2, so that when it is depressed it enters said space and forces a part of the piece *e* thereinto, thus forming a bight or loop in said piece *e*, as shown in Fig. 4. The blade is serrated on its lower edge, as shown in Fig. 6, the object of the serrations being to prevent the piece *e* from slipping under the edge of the blade, as it might do if the blade were not serrated. The blade *c* is affixed to a holder c', having a shank c^2 which is inserted in a socket in a vertically movable rod or plunger *o*. The rod or plunger *o* is fitted to move vertically in a socket *q* in the upper end of the lever *j*, and

is normally pressed downwardly in said socket by a spring r until the screw p bears on the lower end of a slot s, as shown in Fig. 6.

The operation of the machine above described is as follows: The piece e to be creased or folded is placed upon the table a' with its inner end against an adjustable gage u, affixed to the frame a by a screw v passing through a slot v' in said gage, the blade c being at this time raised, and the presser d retracted or drawn back to its greatest distance from the shoulder a^2. The crank-shaft b is then rotated, and its wrist-pins b' b^2 act respectively on the levers that carry the presser d and blade c, force the blade downwardly into the space between the presser and the shoulder a^2, and then force the presser forward against the material thus tucked or folded into said space, the blade being retracted while the presser is moving forward, so that it leaves the space between the presser and shoulder a^2 unobstructed, and permits the presser to force one thickness of the material closely against the other in said space. The presser remains in its projected position long enough to permit the heated surfaces of the bed and presser to give the desired result in folding and creasing the material, after which the presser is retracted, and the piece e removed.

The above description is substantially taken from the patent above mentioned, in order to avoid the necessity of reference thereto for the understanding of my present improvement. The only material difference between the construction above described in the present case and that shown in my former patent being the means for heating the rocking presser, said presser being heated in my former patent by a gas burner, while in the present case it is heated by a steam pipe, which constitutes the bearing or support for said presser, said steam pipe constituting one of my present improvements.

The other improvements which I have made upon the previous construction will now be described. The piece e to be folded is supported at a point close to and substantially parallel with the folding blade by a rod u, which is affixed to the bed a and is raised above the same, so that it holds the main portion of the piece e above the bed, and enables the folding blade to force the material down into the space between the shoulder a^2 and presser d with less frictional resistance than would be experienced if the piece rested directly upon the flat table a, as heretofore. Said rod u is preferably a stout piece of wire, having its ends bent downwardly and inserted in sockets formed in the bed. I prefer to make one end of the rod u slightly higher than the other, as shown in Fig. 4, so that when the folding blade is raised, the space between it and the bar will be wider at one end than at the other.

In inserting the piece under the folding blade against the gage v, which is provided to guide the operator in adjusting the piece, one edge of the piece is inserted in the wider end of said space between the folding blade and the rod u, the piece being then moved along said rod until its upper surface comes in contact with the lower edge of the folding blade. The contact of the piece with the folding blade before the latter is depressed, prevents the piece from slipping or being displaced before the descent of the blade. The serrated edge of the blade prevents the slipping of the material upon the blade when the latter is descending.

The gage v is provided with an ear v', to which is affixed a rod v^2 extending backwardly from the gage and entering a socket v^3, affixed to the base of the machine, said socket having a clamping screw or nut v^4, which secures the rod v^2 and gage v in any desired position. The object of the ear v' and the rod v^2 is to enable the screw that secures the gage to be located at a distance from the heated portion of the machine, so that said screw will not become heated and uncomfortable to operate. When the presser d is moved forward, it is locked in said position by means of a latch w, which is arranged to engage with the rear end of the lever g. Said latch is pivoted to the frame at w', and is forced forward by means of a spring w^2 interposed between the frame and a collar w^3 on a rod w^4, which is pivotally connected with the swinging end of the latch w, and is adapted to slide in an opening in the frame or base a. The spring w^2 normally holds the latch w in the position shown in Fig. 3, thus engaging it with the lever g, and through the latter locking the presser in its forward position.

w^5 represents a bell-crank lever, pivoted at w^6, and having one of its arms connected with the rod w^4. The other arm of said lever is connected by a rod $w^{6'}$ to the treadle (not shown) whereby the operator may move the latch w through the described devices out of engagement with the lever g.

The machine is provided with an automatic stop motion, which is or may be constructed like the stop motion described in my former patent and is arranged to disconnect the shaft b^2 from its driving pulley, when said shaft reaches the position shown in Fig. 3, and therefore holds the presser d in its forward position.

Means are provided whereby the operator may re-engage the shaft b with the driving pulley, and thus start the machine. The shaft b is provided with a cam or projection b^{10}, which, when said shaft is at rest, is in the position shown in Fig. 3; but, when the shaft is again rotated, said cam is moved so as to displace the latch w, as shown in Fig. 3^a, and thus prevent injury to any of the parts of the machine in case the operator fails to displace said latch by the devices above described.

x represents a wedge, which is formed on one end of a lever, pivoted at x' to the supporting-frame (see dotted lines in Fig. 1), and adapted to be inserted between the lower end

of the rocking presser and the corresponding end of the lever *g*. Said wedge is so arranged that, when pressed inwardly between the said parts, it will press the rear ends of the levers *g* and d^2 toward each other, compressing the springs *h*, thus giving the rocking presser a slight backward adjustment. When said wedge is drawn outwardly, it permits the springs to expand, and thus give the rocking presser a slight forward adjustment. These adjustments of the rocking presser are for the purpose of adapting it to the thickness of the piece *e*, so that the throw or forward movement of the presser may always be proportioned to the thickness of the material. The wedge *x* is moved by means of a rod x^2, pivoted to one end of the lever on which said wedge is formed, and a spring x^3 on said rod, said spring bearing at one end against the frame of the machine, and at the other end against a collar x^4 affixed to the rod. The spring tends to normally withdraw the wedge from between the presser and the lever *g*. When it is desired to force the wedge inwardly, a nut x^5 on the threaded outer end of the rod x^2, and bearing on the frame of the machine, is turned in the direction required to draw the rod x^2 outwardly.

I claim:

1. In a folding machine, the combination of the supporting frame or bed having the pressing shoulder a^2, the fixed steam pipe passing through said frame below said shoulder and having valved steam connections at its ends, the rocking presser mounted to oscillate on said steam pipe and heated thereby, said steam pipe being engaged with the frame at the ends of the presser and serving both to support and heat the presser, the reciprocating folding blade and means for operating said presser and folding blade, as set forth.

2. The combination with the fixed pressing shoulder a^2, the movable presser and the folding blade, of the fixed rod, arranged to support the piece to be folded at one side of the path of the blade, as set forth.

3. The combination with the fixed pressing shoulder, the movable presser and the folding blade, of the gage *v*, the rod v^2 attached to and extending backward from the gage, and clamping devices for said rod, as set forth.

4. The combination with the fixed pressing shoulder, the rocking presser, the lever d^2 affixed to said presser, the lever *g* pivoted to the lever d^2, and a spring interposed between said levers, of the wedge, arranged to adjust the said levers and thereby vary the position of said presser, and means for adjusting said wedge, as set forth.

5. The combination of the fixed pressing shoulder, the rocking presser, the levers *g* and d^2 connected with said presser, the crank-shaft adapted to move said levers, the latch *w* arranged to engage the lever *g* and lock the presser in its pressing position, and devices including the rod w^4 and lever w^5 whereby the operator is enabled to move said latch and unlock the presser, as set forth.

6. The combination of the fixed pressing shoulder, the rocking presser, the levers *g* and d^2 connected with said presser, the crank-shaft adapted to move said levers and provided with a cam, and the latch adapted to automatically engage the lever *g* and thereby lock the presser, and arranged to be displaced by said cam for the purpose of releasing the presser, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 18th day of January, A. D. 1892.

CHARLES E. WILLIAMS.

Witnesses:

C. F. BROWN,

A. D. HARRISON.