No. 619,922. Patented Feb. 21, 1899.

L. T. ADAMS.

UPPER FOLDING MACHINE.

(Application filed Apr. 12, 1898.)

(No Model.) 3 Sheets—Sheet 1.

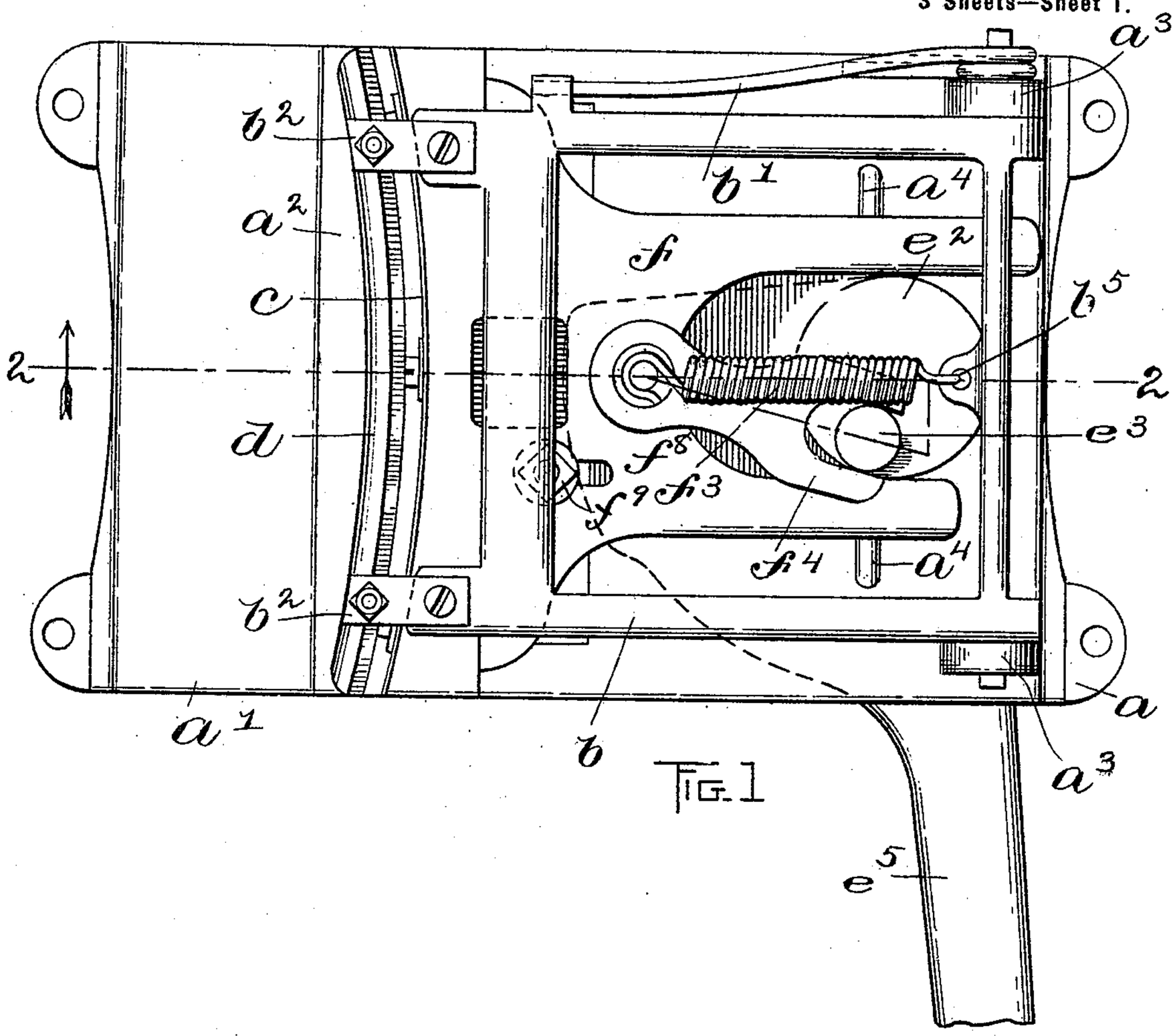

FIG. 1

FIG. 2.

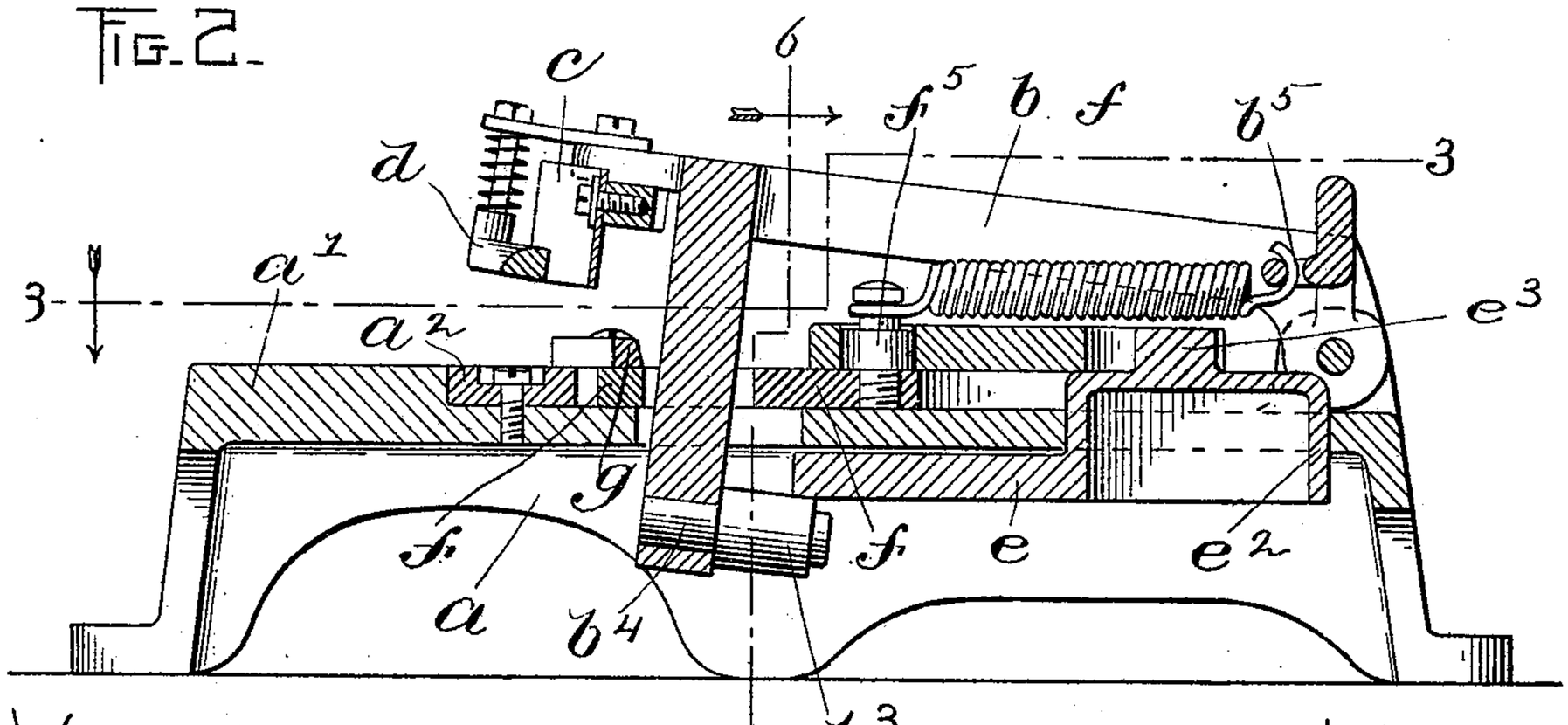

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FIG. 3.

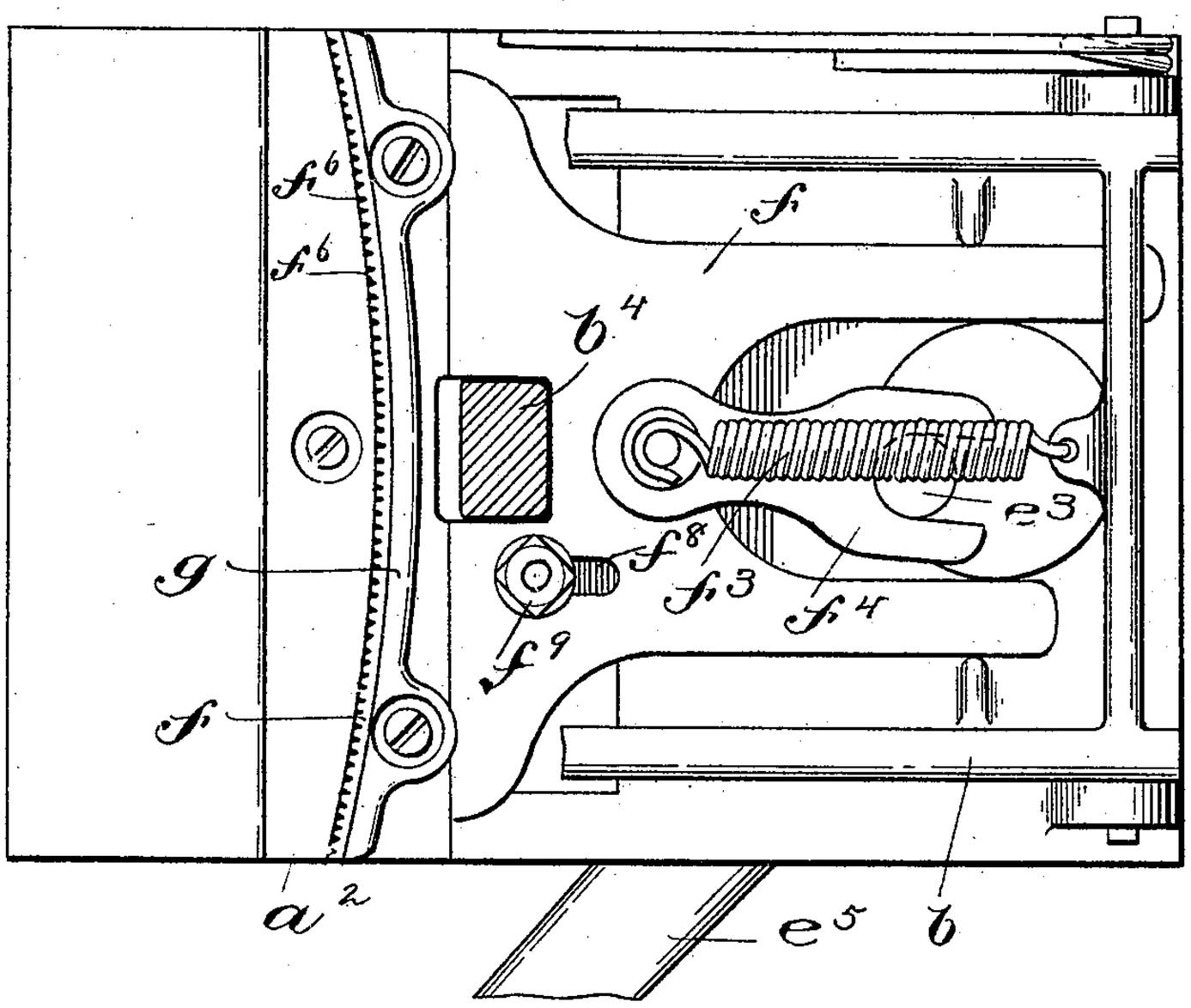

FIG. 4.

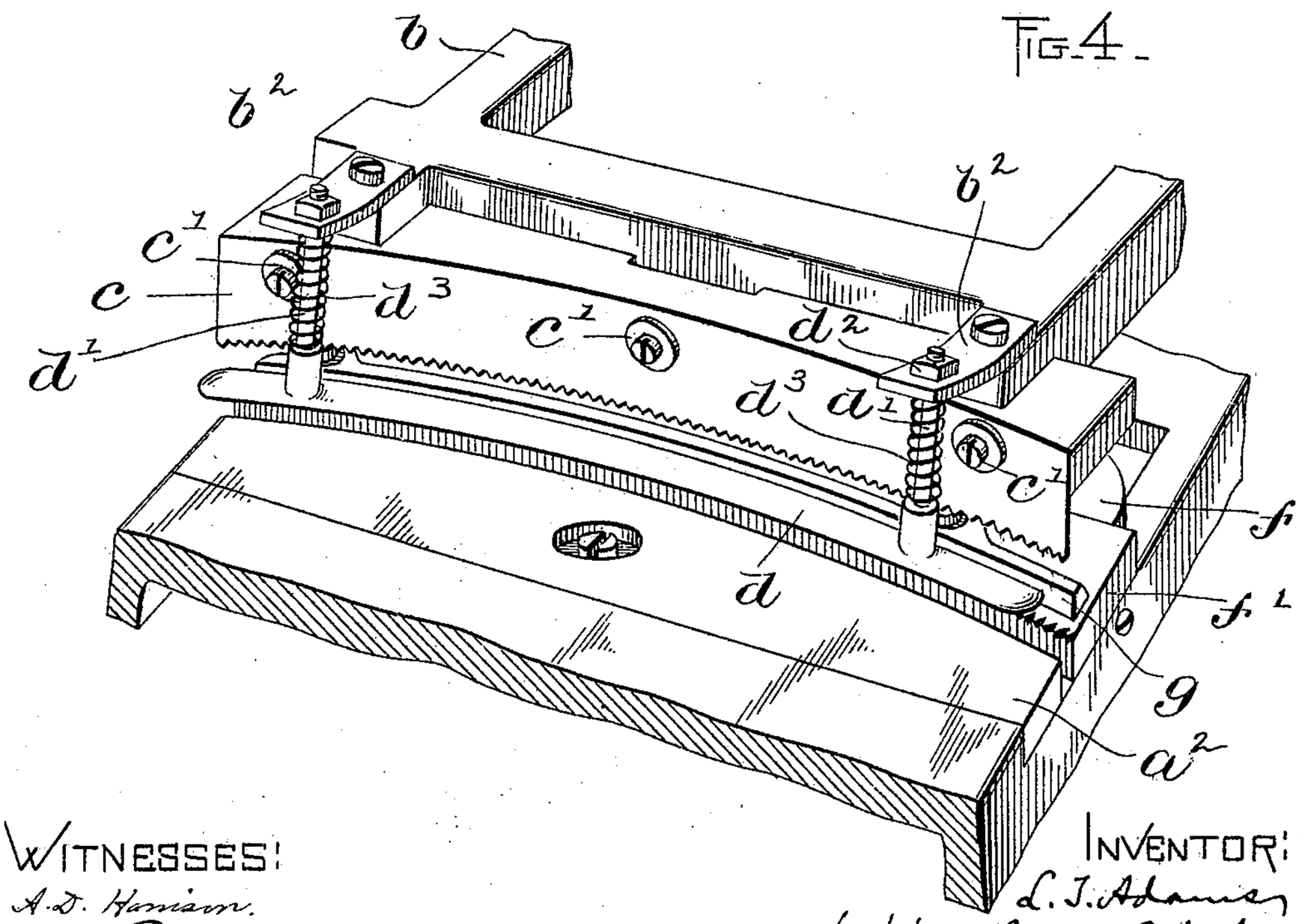

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FIG. 5

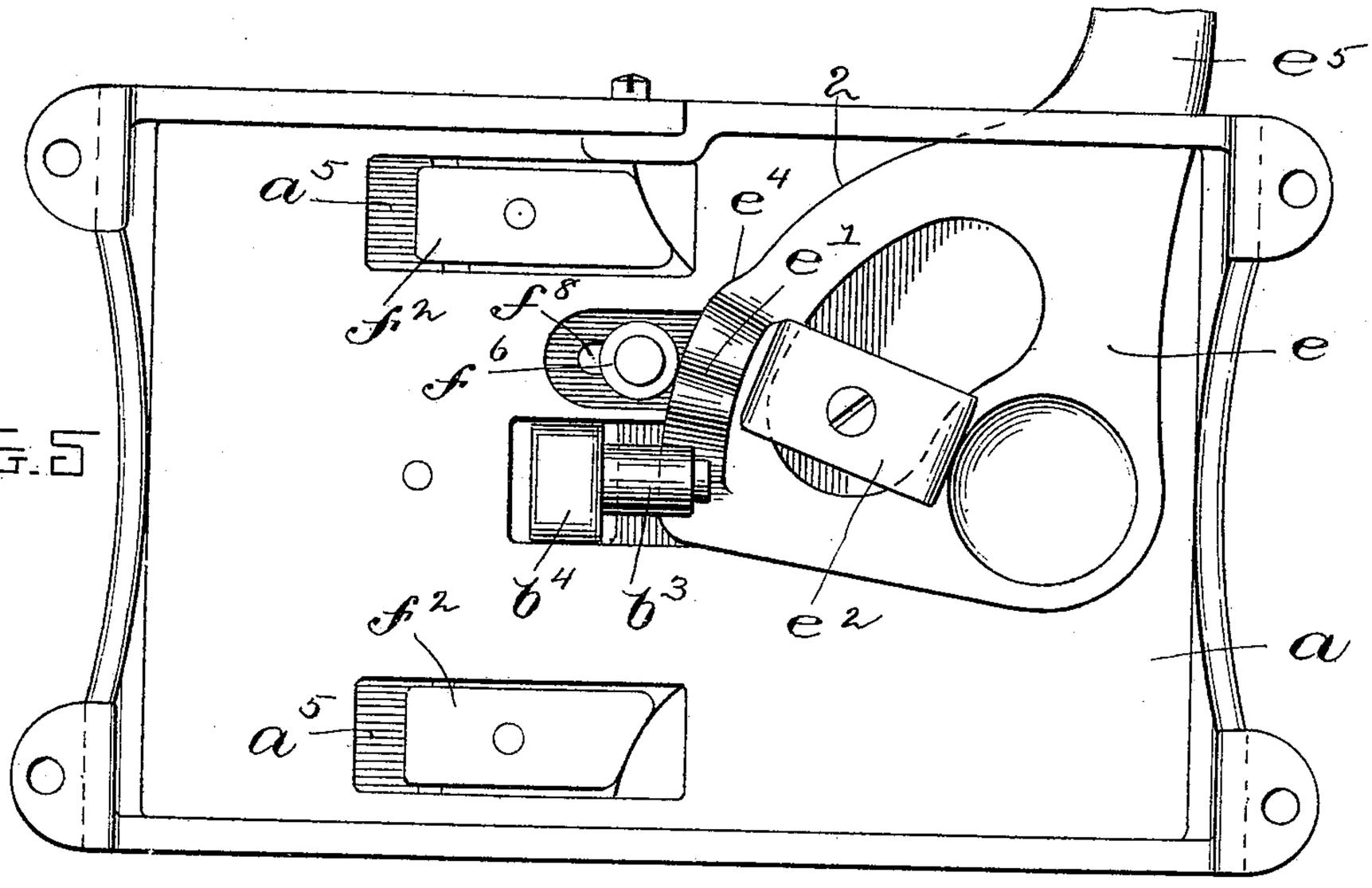


FIG. 6.

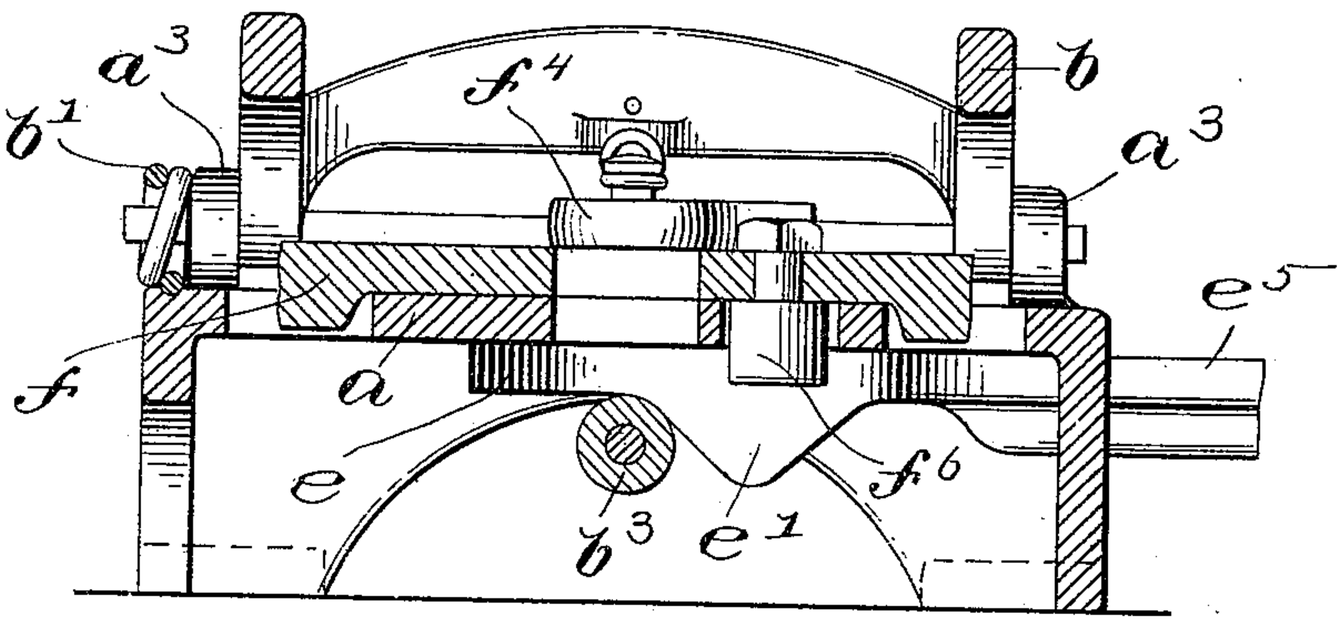


FIG. 7.

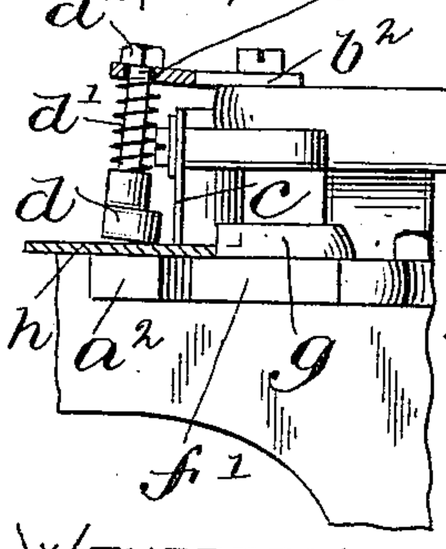


FIG. 8.

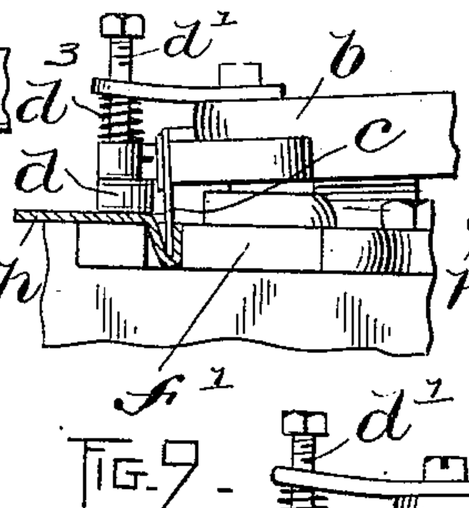


FIG. 10.

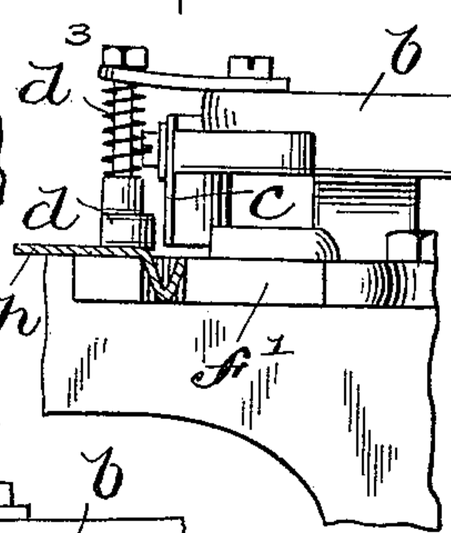


FIG. 11.

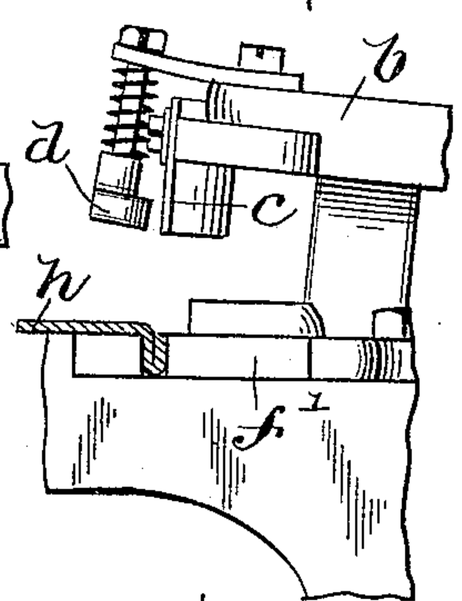
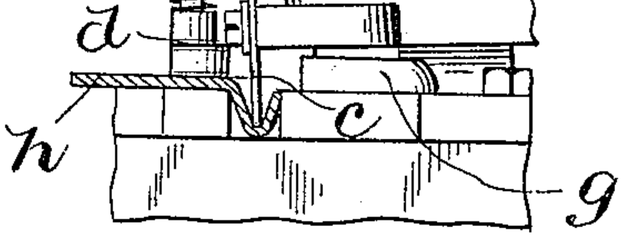


FIG. 9.



WITNESSES:
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Attys.

UNITED STATES PATENT OFFICE.

LEWIS T. ADAMS, OF WHITMAN, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO NEWTON CHURCHILL, OF EAST BRIDGEWATER, MASSACHUSETTS.

UPPER-FOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 619,922, dated February 21, 1899.

Application filed April 12, 1898. Serial No. 677,265. (No model.)

To all whom it may concern:

Be it known that I, LEWIS T. ADAMS, of Whitman, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Upper-Folding Machines, of which the following is a specification.

This invention relates to machines for folding the uppers of boots or shoes, linings for the same, or other pieces of material.

It has for its object to provide improvements affecting the operation of machines of this class, and it also has for its object to provide a simple, compact, and durable construction.

To these ends the invention consists in the improvements which I shall now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a top plan view of a folding-machine constructed in accordance with my invention. Fig. 2 represents a section on line 2 2 of Fig. 1. Fig. 3 represents a section on line 3 3 of Fig. 2. Fig. 4 represents a partial perspective view of the machine. Fig. 5 represents a reverse plan view. Fig. 6 represents a section on line 6 6 of Fig. 2. Figs. 7 to 11, inclusive, are detail views representing the action of the folding parts.

The same reference characters indicate the same parts in all the figures.

Referring to the drawings, a is a base or frame whose front portion is formed as a work-supporting table a', the rear end of which is an abutment-plate a^2.

b is a carrier-frame hinged or pivoted between ears a^3 a^3 on the base a and normally raised or retracted by means of a spring b'. On the front of said carrier and attached thereto by screws c' c' is a creasing or folding blade c, which is provided, as here shown, with a serrated lower edge to take a hold on the work.

d is a clamping-foot mounted in front of the creasing-blade c and adapted to press on the work and clamp the same to the table when the creasing-blade moves downwardly into the folding-groove. Said clamping-foot is attached by means of rods d' d', projecting through enlarged apertures (see Fig. 7) in brackets or plates b^2, attached to the carrier b and provided on their upper ends with nuts d^2 d^2, which may be adjusted to vary the relative position of the clamping-foot with respect to the creasing-blade. Springs d^3 d^3, interposed between the plates b^2 and the clamping-foot, exert a downward pressure on the latter, but permit the same to yield in the manner shown in Fig. 8 when it comes in contact with the work. This loose connection between the clamping-foot and the carrier b permits the former to move with the work in the direction of the folding-groove, when the creasing-blade operates to draw said work into the groove. This action, which is illustrated in Figs. 7 and 8, prevents the creasing-blade from injuring the material.

e is a horizontally-rotatable cam member pivotally mounted below the base a and provided with a projection e', which operates on a roller-stud b^3, attached to a lug b^4, formed on the carrier b and projecting downwardly therefrom through an aperture in the base. When the cam member is rotated or oscillated on its pivot, this projection operates on the roller-stud b^3 in such manner as to draw the carrier downwardly against the tension of its spring b'. The cam member e is formed with a large stud e^2, projecting upwardly through an aperture in the base a, and is held in place by means of a plate, Fig. 5, screwed to the base.

f is a slide provided at its forward end with a presser f', which, together with the abutment-plate a^2, forms the folding-groove. The slide f is forked or slotted at its rear end to embrace the stud e^2 on the cam member e and is guided in its movements by means of lugs a^4 a^4, formed on the base a, and also by means of guide-plates f^2 f^2, Fig. 5, which occupy slots a^5 a^5 in said base. The slide is normally retracted by means of a spring f^3, attached to an ear b^5 on the carrier b and to a stud f^5 on the slide, and is arranged to be actuated in a forward direction by the action of an eccentric pin or stud e^3, formed on the cam member e, which coöperates with an arm or link f^4, pivoted on the stud f^5 and having a slotted end which embraces the stud e^3. An additional connection between the slide and the cam member is provided by a roller-stud

f^6, which bears against the edge or periphery 2 of the cam member *e*. The arrangement is such that at the beginning of a stroke or oscillation of the cam member, Fig. 5, the stud f^6 rests on a projecting or high portion of the edge 2; but as the stroke proceeds and while the stud b^3 on the carrier *b* is depressed by the projection *e'* on the cam member the said stud f^6 moves over a shoulder e^4 onto a low portion of the edge 2, and thereby permits the slide *f* to be slightly retracted by its spring.

The operation of the machine is as follows: The piece of material to be folded is placed on the table *a'* when the carrier *b* is up and its edge is held against a gage *g*, attached to the presser *f'*. The cam member *e* is then moved from its position shown in Figs. 1 and 5 by applying power to a handle or lever e^5, and the carrier *b* and creasing-blade *c* are caused to occupy the successive positions shown in Figs. 7 and 8, whereby the piece of material *h* is forced down in the folding-groove between the abutment-plate a^2 and the presser *f'*. Before the creasing-blade moves out of the groove the roller-stud f^6 on the slide *f* moves over the shoulder e^4 on the cam member and causes the presser *f'* to be slightly retracted, as shown in Fig. 9, so as to increase the normal width of the folding-groove and permit the creasing-blade to be withdrawn without pulling the end of the piece of material out of the groove. Immediately thereafter the projection *e'* on the cam member passes the roller-stud b^3 and allows the carrier and creasing-blade to rise, as shown in Fig. 10. As soon as the creasing-blade is withdrawn from the groove the eccentric-pin e^3 on the cam member acts upon the pivoted arm f^4 and moves the slide and presser in such manner as to decrease the normal width of the folding-groove and complete the fold, as shown in Fig. 11. These operations all take place in the movement of the operating-lever e^5 from its position in Fig. 1 to its position in Fig. 3.

By referring to Figs. 3 and 4 it will be noted that the upper edge of the presser *f'* is formed with serrations or teeth f^7 f^7. I have found in practice that this construction aids in the proper folding of a piece of material when the folded edge is curved, as would be the case with the machine which I have illustrated.

The means for producing the peculiar action of the folding members as above described form an important and distinguishing feature of my invention. It is common in folding-machines to use a creasing-blade or former which presses the material into a groove, the blade being then withdrawn and the groove closed up to press the sides of the fold together. In my improved folder the creasing-blade is carried downward close to the back jaw or side of the folding-groove, allowing only enough space for the thickness of the material, and then while the blade is still in the groove the said back jaw or side is separated from the blade to permit the latter to be withdrawn without lifting the material from the groove, and said groove is finally closed up against the material to press the fold.

In the drawings it will be seen that the pintle of the stud f^6 occupies an elongated slot f^8 in the slide *f* and is provided with a nut f^9, whereby the stud may be fixed at different adjustments to vary the relation of the presser *f'* and the creasing-blade *c* for different thickness of material.

It is obvious that the completion of the fold, as shown in Fig. 11, might be effected by a movement of the front side of the folding-groove toward the back side instead of in the manner shown. In other words, the blade *c* and the member *f'*, forming the back side of the groove, may have the described relative movement, as shown in Figs. 9 and 10, and the fold then be completed after the withdrawal of the blade by a movement of the abutment a^2 toward the part *f'*.

I do not confine myself to the particular means here described for effecting the proper action of the folding parts. Any means whereby the creasing-blade is carried up and down in the manner described and a relative movement of the blade and the side of the groove produced for the purpose set forth would come within the scope of my invention.

Having thus explained the nature of my invention and described a way of constructing and using the same, although without having attempted to set forth all the forms in which it may be embodied or all the modes of its use, what I claim is—

1. In a folding-machine, an abutment and a presser forming a folding-groove, a creasing-blade movable into and out of said groove, means for actuating the presser toward the abutment to decrease the normal width of the groove after the creasing-blade is withdrawn therefrom, and means for producing a relative transverse movement of the creasing-blade and presser with respect to the groove while said blade is in the groove.

2. In a folding-machine, an abutment and a presser forming a folding-groove, a creasing-blade movable into and out of said groove, means for actuating the presser toward the abutment to decrease the normal width of the groove after the creasing-blade is withdrawn therefrom, and means for separating the creasing-blade and presser transversely with respect to the groove while the said blade is in the groove.

3. In a folding-machine, an abutment and a presser forming a folding-groove, a creasing-blade movable into and out of said groove, means for actuating the presser toward the abutment to decrease the normal width of the groove after the creasing-blade is withdrawn therefrom, and means for moving the presser transversely away from the abutment, to increase the normal width of the groove while the creasing-blade is in said groove.

4. In a folding-machine, a horizontally-rotatable cam member, an eccentric-pin on said cam member, a spring-retracted horizontally-movable slide, a slotted arm pivoted to said slide and embracing said pin, a carrier, a creasing-blade mounted on said carrier, and a connection between the cam member and carrier, the arrangement being such that the rotation of the cam member causes movements of the slide and creasing-blade transverse to each other.

5. In a folding-machine, a base, a horizontally-rotatable cam member mounted on said base, a spring-retracted pivotal carrier located above said base, a creasing-blade mounted on said carrier, a lug projecting from said carrier forward of its pivot, through the base, and provided below said base with a roller-stud which engages the cam member, a slide, and a connection between said slide and the cam member, the arrangement being such that the rotation of the cam member causes movements of the slide and creasing-blade transverse to each other.

6. In a folding-machine, a pivotal cam member, an abutment and a presser forming a folding-groove, a connection between the cam member and presser, whereby the rotation of the former causes movement of the latter to vary the size of the groove, and an additional connection between the cam member and presser, whereby the rotation of the former causes movement of the latter to vary the size of the groove, independent of the movement due to the first-mentioned connection.

7. In a folding-machine, members forming a folding-groove, a work-supporting table, a carrier, a creasing-blade mounted on said carrier, means for actuating the carrier to move the creasing-blade into and out of the folding-groove, and a clamping-foot mounted on the carrier and adapted to press on the work in front of the folding-groove to clamp the same to the table, the said clamping-foot being constructed and arranged to move with the work in the direction of the groove, when the creasing-blade draws said work into the groove.

In testimony whereof I have affixed my signature in presence of two witnesses.

LEWIS T. ADAMS.

Witnesses:
C. F. BROWN,
NEWTON CHURCHILL.