(No Model.) 2 Sheets—Sheet 1.

C. S. GOODING & R. L. ELLERY.

MECHANISM FOR OPERATING MOVABLE DIES FOR MACHINES FOR MAKING SHOE BUTTONS.

No. 459,371. Patented Sept. 8, 1891.

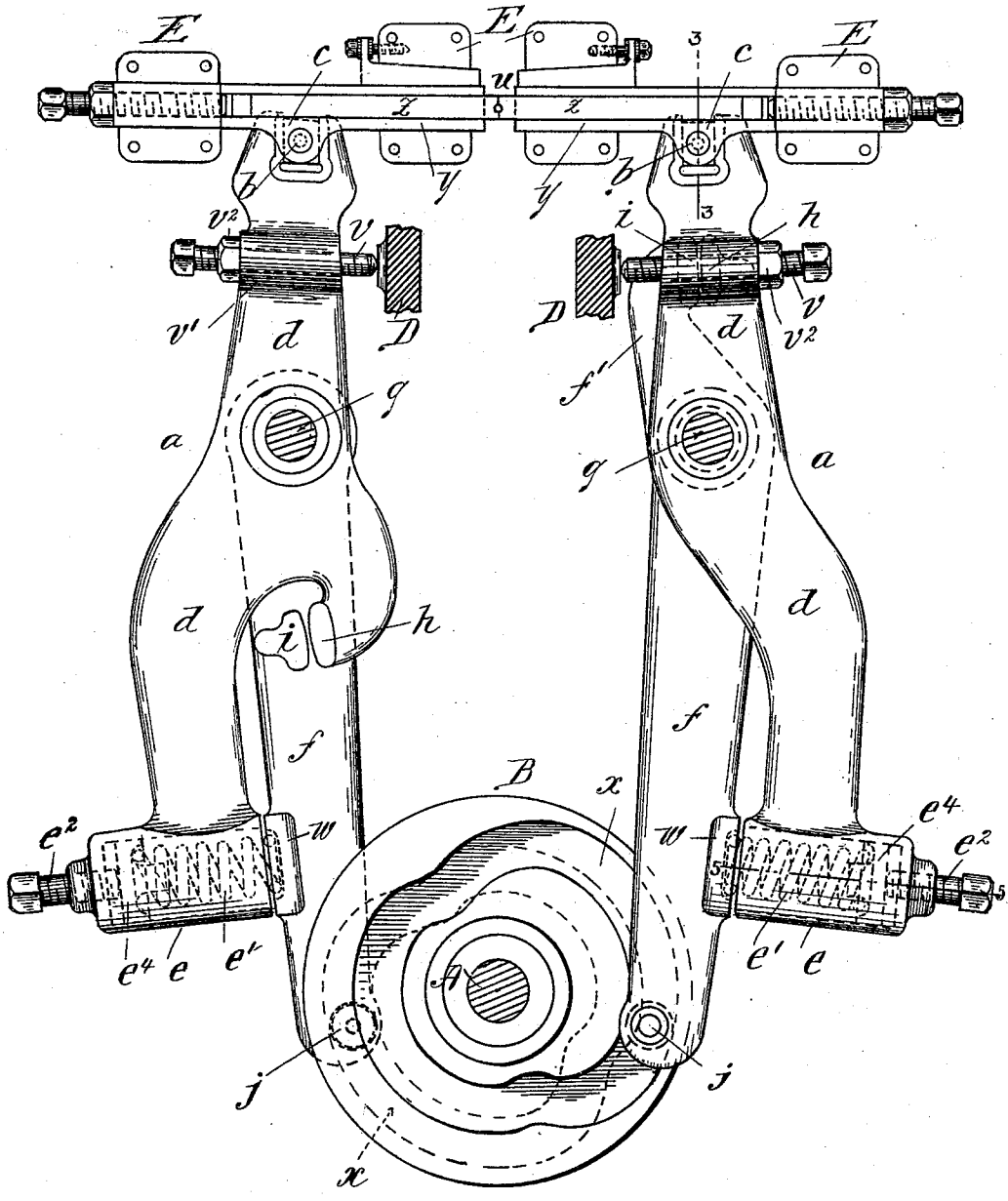


Fig. 1.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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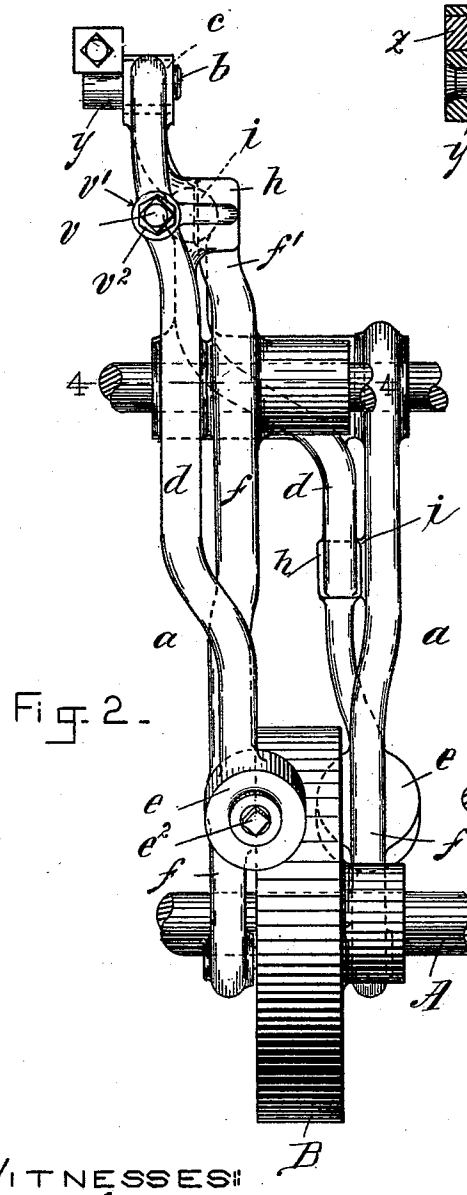


Fig. 2.

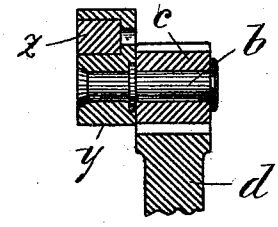


Fig. 3.

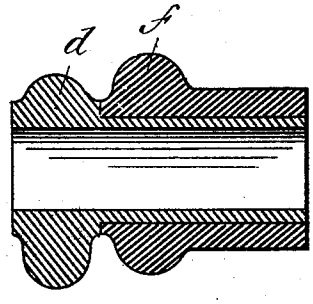


Fig. 4.

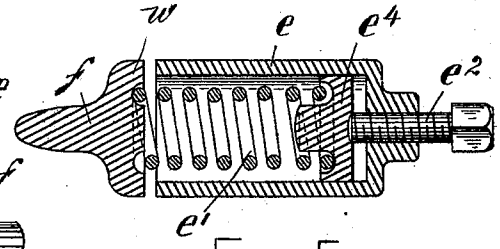


Fig. 5.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING MOVABLE DIES FOR MACHINES FOR MAKING SHOE-BUTTONS.

SPECIFICATION forming part of Letters Patent No. 459,371, dated September 8, 1891.

Application filed December 6, 1890. Serial No. 373,830. (No model.)

To all whom it may concern:

Be it known that we, CHARLES S. GOODING, residing at Boston, in the county of Suffolk, and ROBERT L. ELLERY, residing at Taunton, in the county of Bristol, State of Massachusetts, citizens of the United States, have invented new and useful Improvements in Mechanism for Operating Movable Dies for Machines for Making Shoe-Buttons, of which the following is a specification.

This invention particularly relates to improvements in mechanism for operating dies one or both of which are movable toward and from the other, the purpose of the invention being to provide in operating mechanism for the die or dies, the motive element of which is usually a cam of a given throw, capabilities for regulating the traverse of the die or dies, whereby, notwithstanding wear which may ensue in the cam or mechanism intermediate thereof and the die, the dies will always be brought to the desired and most efficient juxtaposition.

The operating mechanism of this invention is especially advantageous for embodiment in a machine for making shoe-buttons, wherein the button-body is by the dies struck out from papier-maché, and in which machine it is necessary that the proximate ends of the dies be brought to and permitted to remain for a short period during each complete button-making operation of the machine in contact, and also in which machine it is desirable, almost to the degree of necessity, that the dies be not forced with positive pressure or pounded the one upon the other.

The invention therefore essentially comprises, in combination with a lever pivotally mounted and an operating means therefor, whereby said lever is moved forward to effect a working action and then returned, of another lever, also pivotally mounted coincident with said first lever, having an engagement with the part to be operated, a spring interposed between said two levers, whereby the working movement imparted to the primary insures a swinging movement of the secondary lever as one therewith, said secondary lever being capable, however, of a yield upon or with relation to the primary lever under a resistance against the forward movement thereof greater than that of said spring, and said secondary lever being provided with an abutment portion or member for the engagement therewith of the primary lever on its return movement, whereby a return movement is imparted to the secondary lever.

The invention further consists in novel constructions and combinations of parts, all substantially as will hereinafter appear, and be set forth in the claims.

In the accompanying drawings the invention is illustrated, Figure 1 being an elevation transversely of the driving-shaft of the machine of a pair of movable dies, the actuating-cam, and the novel mechanism between the cam and the dies. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical section to illustrate a detail of construction taken on the line 3 3, Fig. 1. Fig. 4 is a section on the line 4 4, Fig. 2; and Fig. 5 is an enlarged section taken on the line 5 5, Fig. 1.

In the drawings, A represents the driving-shaft of a machine, on which is the cam-disk B, having in opposite faces thereof the cam grooves or paths x x, said cams, as shown, being graded to throw oppositely at a given time.

D, Fig. 1, represents portions of a fixed standard or frame of the machine, and E E represent fixed supports and guides for the die-carriers y y, which slide on said guiding-supports in a line longitudinally thereof toward and from each other, and which carry the blocks z z, in the approached extremities u of which the dies are formed. The movements of the dies and die-carriers toward and from each other are insured by the mechanism intervening between the said dies and carriers and said cam, to be now described.

a a represent a pair of compound levers, each consisting of two separate minor levers f and g, both mounted on a common fixed pivot forming stud g. The minor lever f of each compound lever will be herein termed the "primary lever," and it extends into proximity to the face of the cam-disk, and by the stud and roll j thereon has an engagement with one of said cam-grooves x respectively there-

for. The other lever d of each compound lever, herein termed the "secondary lever," is extended upwardly from its support relative to said stud g, and by means of the recessed formation of its extremity and of the stud b and sliding block c has an efficient engagement with one of the die-carriers y. The said lever d also extends downwardly alongside the primary lever f, and has formed at its extremity a transversely-disposed cylinder e, chambered or socketed from its end adjacent the lever f, and opposite the open end of said socketed cylindrical part the lever f is formed with a suitable rest, as shown at w, between which and the closed end portion of said socketed cylinder a spiral spring e' (of suitable resistance) is interposed. A screw e^2 passes with its thread engagement through the closed end of the said cylinder, and is by its inner end in bearing against the circular movable block e^4, forming the rest for the inner end of said spring, and the desired amount of compression may be imparted to the spring by properly turning the screw. Now with a suitable extent of separation between the cylinder end of the lever d and the side of the lever f, which, however, in practice is slight, substantially as shown, and the interposition of the spring e' it will be clear that on a forcing outwardly by the cam of the lever f the lever d will swing as one therewith during such outwardly-forcing action by the cam unless an obstruction is placed in the way of the lever d having a resistance greater than that of the spring; but of course if before the completion of the working movement of the primary lever the secondary meets such a resistance and remains stationary for an instant there will be a slight motion of the lever f toward the adjacent portion of the one d against the compression of the spring. Of course as the cam imparts to the lever f its return swing the spring reacts and provision is necessary for insuring from the return movement of the primary lever a corresponding movement of the secondary lever, and to this end there is an extension or abutment i formed on the primary lever and adapted to have an engagement with a suitable portion h of the other lever at the time the primary lever is making its return swing. As the spring between the primary and secondary levers in practice is always under a considerable compression, the abutment-stops $h\,i$ serve, in any position occupied by the levers, to prevent the expansion of the spring, and said stops are always in contact, except when the dies are forced together and the spring for the compound lever is being compressed in its unusual extent. In the compound lever at the left of Fig. 1 the abutment i is formed on the one lever f under the pivotal stud g, and the portion of the lever d engaged by said abutment consists of the arm at the right of the main portion of the lever and extended downwardly under the pivoted stud with proximity to the said stop i, while in the compound lever at the right of Fig. 1 the abutment i is formed on an arm f', which is provided as an extension of the lever f above and beyond the pivotal stud g and adapted to bear on a lug on the arm h, then formed on and near the upper end of the lever d.

It is to be understood that while the design of the two compound levers is in some respects different the principle is the same in both, and the arrangement of the said abutments may be varied in conformance with convenience or various exigencies, as in the combination in the machine of other mechanism in compact relations with certain portions of said levers may become necessary.

The resistance against the swing of the secondary levers to the fullest extent that might be imparted thereto by and as one with the primary lever may be constituted by the end-to-end abutment of the dies under proper adjustments thereof; but it is preferred that the said dies be fully and exactly brought into contact and yet practically without any force, and so the stop provided for each lever d is constituted by the screw v, passing through a hub r' on the lever and adapted to come against a suitable stop-forming part, as D, of the machine-frame, there being a check-nut v^2 on each of said screws for locking it in adjustment. It will be clear, however, that the screw may be applied on the frame and adapted to present its end to act as the stop on the abutment thereagainst of the lever d.

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

1. In combination, a lever pivotally mounted and operating means therefor whereby said lever is moved forward to effect a working action and then returned, another lever also pivotally mounted coincident with said first lever, and a movable die with which said latter lever has an engagement, a spring interposed between said two levers, whereby the working movement imparted to the primary insures a swinging movement of the secondary lever as one therewith, said secondary lever being capable, however, of a yield relative to the primary under a resistance against the forward movement thereof greater than that of said spring, and said secondary lever provided with an abutment for the engagement therewith of the primary lever on its return movement, whereby a return movement is imparted to the secondary lever, as set forth.

2. In combination, a lever pivotally mounted and operating means therefor whereby said lever is moved forward to effect a working action and then returned, another lever also pivotally mounted coincident with said first lever, and a movable die with which said latter lever has an engagement, a spring interposed between said two levers, whereby the working movement imparted to the primary insures a swinging movement of the secondary lever as one therewith, said secondary le-

ver, however, being capable of a yield on the primary under a sufficient resistance against its forward movement, and a device for regulating the compression of said spring, substantially as described.

3. In combination, a movable die, an operating-cam, a lever pivotally mounted and having an engagement with said cam, another lever pivotally mounted to swing as one with said first lever and having an engagement with the said movable die, a spring interposed between said two levers, whereby on the working movement of the primary the secondary lever moves as one therewith, said secondary lever, however, being capable of a yield relative to the primary, as set forth, and a stop for limiting the forward movement of said secondary lever, substantially as described.

4. In combination, a movable die, an operating-cam, a lever pivotally mounted and having an engagement with said cam, another lever pivotally mounted to swing as one with said first lever and having an engagement with said movable die, a spring interposed between said two levers for the purpose set forth, and a stop (for limiting the forward or working movement of said secondary lever) which is adjustable, for the purpose specified.

5. In combination, a lever pivotally mounted and operating means therefor, another lever also pivotally mounted to swing in unison with said first lever, one of said levers provided with the socketed cylinder *e*, which is open at its end toward the other lever, the spring within said cylinder-socket, and a regulating-screw passing through the closed head of said cylinder and having a bearing against the said spring, substantially as and for the purposes set forth.

6. In combination, a movable die and a guide and support therefor and a fixed stop, as the machine-frame D, a primary lever *f*, pivotally hung, and a cam with which it is in engagement for a forward or working action and for a return movement, another lever *d*, by one portion having an engagement with said die and pivotally mounted to move in unison with said primary lever and a spring interposed between said two levers, an abutment on said secondary lever with which a portion of said primary lever engages on its return movement, and a screw passed transversely through said secondary lever and adapted to contact with said stop in the forward swing of said lever, substantially as described.

7. In combination, a pair of dies movable toward and from each other, guides and supports therefor, a pair of studs *g g* and a pair of primary levers *f f* hung thereon, a cam-disk having cam-grooves, with which said levers are in engagement for forward or working actions and return movements, secondary levers *d* in engagement with said dies and also pivotally mounted on said studs, the springs interposed between said two levers, substantially as and for the purpose set forth, abutments *h* on said secondary levers, with which portion said primary levers engage on their return movements, and adjustable stops for limiting the forward movements of said secondary levers, substantially as described.

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