(No Model.) 2 Sheets—Sheet 1.

J. STEWART.

BUTTON MAKING DEVICE.

No. 384,547. Patented June 12, 1888.

Fig. 2.

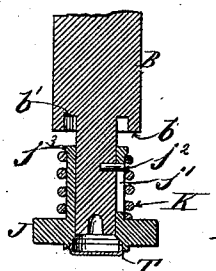


Fig. 3.

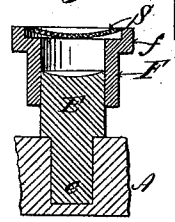


Fig. 4.

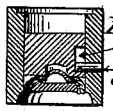
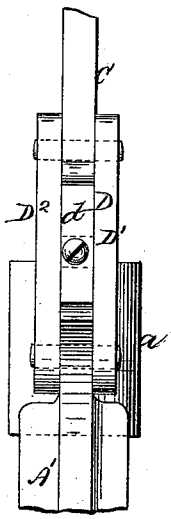


Fig. 1.

Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

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BUTTON MAKING DEVICE.

No. 384,547. Patented June 12, 1888.

Fig. 6.

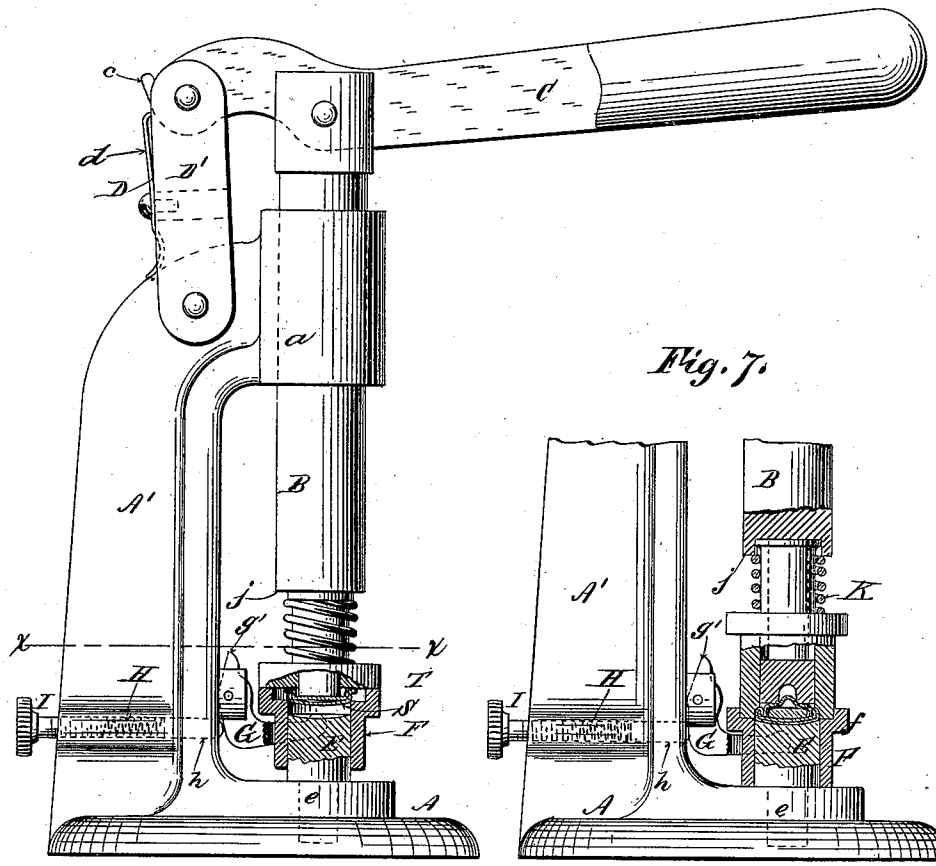
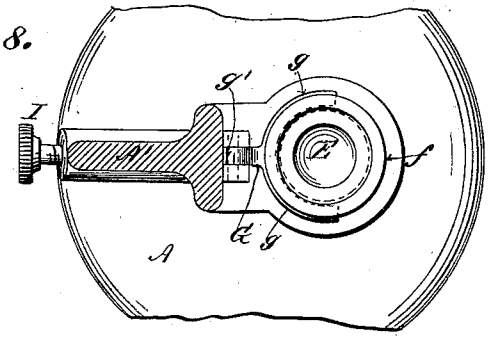


Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN STEWART, OF NEWARK, NEW JERSEY.

BUTTON-MAKING DEVICE.

SPECIFICATION forming part of Letters Patent No. 384,547, dated June 12, 1888.

Application filed July 14, 1887. Serial No. 244,351. (No model.)

To all whom it may concern:

Be it known that I, JOHN STEWART, a citizen of the United States, residing in the city of Newark, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Button-Making Apparatus, of which the following is a specification sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

My improvements relate to button-forming machines generally, but, for convenience of illustration, are shown as applied to the class of apparatus in which the cloth cover and shell are first pressed together within the lower die or sleeve surrounding the stationary post or anvil, and then the filling and backing previously inserted in the closing-die are united to the shell and cloth cover by the action of the plunger opposed to the stationary anvil.

Heretofore the lower die or sleeve has been supported in its highest position by a spiral spring surrounding its exterior, and the upper die has in like manner been supported loosely in position by a spiral spring the lower end of which clasped the die while the upper end clasped the shank of the plunger. Two coiled springs of nearly equal strength were thus opposed to each other in use, and their combined resistance had to be overcome in the operation of finishing the button. Such springs have necessarily been of very weak tension when extended; consequently the lower die especially has had to be removed and cleaned frequently; otherwise the failure of the spring to properly return the die to position has been the cause of frequent imperfections in work. They have also to be removed and others more suitable substituted when it is desired to employ a different thickness of cloth as a covering or to suit variations in the other parts of which the button is made. I obviate these objections by dispensing with the comparatively large spring surrounding the lower die and supporting the latter by means of a tension-lever pivotally suspended to the standard and tending constantly to sustain the die in its highest position, the shorter end of the lever acting as a stop or gage to such upward movement.

Various means for positively sustaining the lower sleeve or die in its highest position during the insertion of the covering-cloth and shell have been devised; but, as I design my apparatus more especially for the use of tailors, dress-makers, and others unskilled in the use of mechanical appliances, I not only purposely avoid any positive or rigid locking of the die during said operation, but also provide for the yielding of the die should undue pressure be applied. Considerable damage has heretofore been done to apparatus of this class where the lower dies have been positively sustained in their higher positions, as referred to, by the unnecessary or violent use of the plungers.

Another feature of my invention in this connection is the provision of means for varying and regulating the tension of the die-supporting lever, so that variations in the thickness of the covering-cloth or of other parts of the button may be readily compensated for without the removal or interchange of any portion of the apparatus.

The first operation of inserting the cloth cover and shell in the lower die in my improved apparatus being performed, as indicated, against the resistance afforded by the tension-lever only, I arrange the spring upon the upper die in such manner that it will permit of sufficient motion of the plunger to effect the said first operation without the compression of the said upper spring itself; but upon the insertion of the closing-die the lower die is forced down against the resistance of the tension-lever until it rests against the base or other stationary supporting-shoulder in the ordinary manner, when the full force of the spring is utilized in effecting the closing of the button. This lost motion or "play" between the upper die-spring and the plunger may be obviously effected in various mechanical ways which would be substantial equivalents, and I do not wish to confine myself strictly to the exact form and construction shown herein either in this respect or in regard to the means of effecting or adjusting the tension of the lever which supports the lower die.

An incidental feature of my invention consists in the special means employed for sustaining the plunger-lever and plunger when elevated.

In the accompanying drawings, Figure 1 is an elevation of a button-machine provided with my improved features of construction. Figs.

2, 3, and 4 are vertical sections of the upper die and lower end of plunger, the lower die or sleeve and anvil, and the closing-die, respectively, with the several parts essential to the formation of a button in their preliminary positions. Fig. 5 is a rear elevation of the upper portion of the standard, the lower portion of the plunger-lever, and the connecting-link, &c., between them. Fig. 6 is an elevation of the device with the plunger lowered and in the act of pressing the cloth cover and shell into the lower die, which latter, with the tension-lever, is broken away, to more clearly show the relative positions of the parts. Fig. 7 is a sectional elevation of the lower portion of the apparatus, the dies being broken away to show the relative positions of the parts during the completion of the button. Fig. 8 is a horizontal section on plane of line *x x*, Fig. 6, the upper die and plunger being omitted.

In general construction and operation the apparatus is substantially the same as heretofore known. A suitable base, A, and standard or frame, A′, is provided, the latter being formed with the vertical collar *a*, through which the plunger B passes. The plunger-lever C is fulcrumed in the upper end of a link-piece, D, the lower extremity of which is pivoted to the rear of the standard A′. The link D is formed with a spring-catch, *d*, the upper end of which engages with a shoulder, *c*, upon the plunger-lever C when the latter is raised, as shown in Fig. 1, thus sustaining the parts of the apparatus in position for the insertion or removal of the several parts of the button, the closing-die, &c., during use. The spring *d* acts automatically in engaging and holding the plunger-lever when raised, and it has sufficient elasticity to avoid objectionable resistance to the lowering of the lever.

The ordinary post or anvil, E, is supported and centralized upon the base A, being formed with a tenon, *e*, which enters a mortise formed in the base for its reception. Resting over the anvil-post E is the usual lower die or sleeve, F, which is sustained in its highest position away from the base A by the tension-lever G. This lever G is preferably, though not necessarily, bifurcated, forming the arms *g g*, which project underneath the flange *f* of the lower sleeve or die, F. The lever G is pivotally suspended from the standard A′, and its short arm *g′* is formed to constitute a stop or gage to the upward movement of the arms *g g* by its contact with the standard A′. The tension or upward pressure of the lever G may be effected by any suitable form of spring, or by counter-weights or other equivalent means, although the means shown in the drawings are preferable as being readily adapted to effect the adjustment of the tension. As shown, a spiral spring, H, is inclosed in a suitable bore or recess in the standard A′, which spring presses forward a bolt, *h*, which impinges against the longer arm, *g*, of the lever G, and tends constantly to keep the latter elevated in the position shown in Fig. 1.

In order to regulate the degree of pressure to be exerted by the spring H against the lever G, provision is made for compressing it more or less by any convenient and well-known mechanical device, a convenient means of accomplishing this being by the use of an adjusting-screw, I, which abuts against the rear end of the spring H.

The upper sleeve or die, J, is of usual construction, except that its connection and relation to the plunger are peculiar in that it has a certain degree of motion downward before coming in contact with the spring surrounding the upper die. This is for the purpose of permitting the plunger alone to be used in pressing the cloth cover S and the shell T into the lower die, as shown in Fig. 6, against the resistance of only the comparatively light tension-spring H, which supports the lever G.

Various mechanical means may be employed for affording the requisite degree of play or free motion between the plunger and die. For instance, the ordinary form of loose connection between the said parts may be resorted to in which the opposite extremities of the encirling-spring bind against the die and the plunger, respectively, with sufficient friction to retain the die upon the plunger, it only being necessary in such case to make the spring of reduced length, so that the plunger may descend a certain distance into the lower die or sleeve, F, before it begins to compress the said spring.

The spring K is compressed between the shoulder j^3 and the flange of the die to a degree which will enable it to overcome the resistance of the tension-lever without compression itself until the lower die rests against the base, and then its elasticity is utilized in performing the work of closing the button.

As shown in the drawings, the sleeve of the upper die, J, is formed with the vertical slot j', in which a pin, j^2, projecting from the plunger B, rests. The upper end of the sleeve J is also formed with a narrow flange or shoulder, j^3, which projects very slightly beyond the cylindrical surface of the sleeve.

Instead of being made annular, as shown in the drawings, the shoulder or flange j^3 may be replaced by a suitable number of radial projections which will engage and confine the upper end of the spring without interfering with the downward stroke of the plunger.

It will be seen that, as shown, the shoulder j^3 is of less width than the cross-section of the spring K employed, so that while the latter is confined between the said shoulder and the lower flange of the die the edge *b* of the plunger (which is formed with the annular recess *b′* for the reception of the upper end of the sleeve J) will engage and compress the said spring when the upper die, J, is held by the lower die, F, against the continued and forcible descent of the plunger by the lower die, F.

The operation of the apparatus is as follows: The parts being in the position shown in Figs. 1, 2, and 3, a section of covering-cloth is laid

upon the lower die, F, and a shell is pressed within the annular shoulder formed for its reception upon the bottom of the upper die, J, as heretofore. The plunger-lever is now lowered until the faces of the two dies F and J meet, the continued downward motion of the end of the plunger removing the shell from the upper die and forcing it and the cloth into the upper portion of the lower die, F, above the anvil E. After the contact of the dies the plunger has ample motion in which to effect this result before the edge *b* of the plunger B comes in contact with the upper extremity of the spring K; but should undue pressure be used, and the plunger be forced downward unnecessarily, the tension-spring H will yield before the superior strength of the upper spring, K, and thus avoid all lateral or undue strain upon the dies. The plunger having been again elevated, the closing-die L, into which the filling and backing for the button have been previously inserted, is placed upon the top of the lower die or sleeve, F, in the usual manner, and the plunger again caused to descend by means of its lever C. Owing to the additional thickness of the closing-die L, which is of the usual construction, the edge *b* of the plunger B soon encounters the upper end of the spring K, and, as the latter is of greater strength than the tension-spring H, the tension-lever G and lower die, F, are forced down into the position shown in Fig. 7, so that the end of the plunger can act against the hammer *l* of the closing-die to compress the parts constituting the button against the face of the anvil E in the usual manner.

It will be noticed that the link D consists of two parallel bars, D′ D^2, connected by a web, D^3, to which the body of the spring *d* is secured, the lower end of the said spring resting between the parallel bars D′ D^2, thus insuring the proper position of the spring.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a button-forming apparatus, substantially such as described, the combination, with the lower die or sleeve and its anvil or post, of a spring tension-lever, substantially such as described, arranged to sustain the said lower die in its normal position by an elastic pressure, substantially in the manner and for the purpose described.

2. In a button-forming apparatus, substantially such as described, the combination, with the die F, anvil E, and lever G, of means, substantially such as described, for sustaining the said lever and die in their normal position by an elastic pressure, for the purpose and substantially in the manner described.

3. In a button-forming apparatus, substantially such as designated, the tension-lever G, formed with the stop or bearing-arm *g*, in combination with the die F and with means for holding the said lever G and die F in their normal positions, substantially in the manner and for the purpose described.

4. In a button-forming apparatus, substantially such as described, the combination, with the die F and tension-lever G, of means for adjusting the tension or pressure exerted by the latter, for the purpose and substantially in the manner described.

5. In a button-forming apparatus, substantially such as described, the combination, with the die F and lever G, of the bolt *h*, spring H, and adjusting-screw I, substantially in the manner and for the purpose described.

6. In a button-forming apparatus, substantially such as described, the combination, with the plunger B, formed with a spring-compressing shoulder, *b*, of the die J, provided with the compressed spring K, confined thereon by means which admit of its further compression by the said plunger, substantially in the manner and for the purpose described.

7. In a button-forming apparatus, substantially such as described, the combination, with the plunger B and plunger-lever C and the link D, of a spring-latch for holding the said parts in a prescribed position, substantially in the manner and for the purpose described.

8. In a button-forming apparatus, substantially such as described, the combination, with a plunger and with an opposed die, of a die having a spiral spring compressed and confined upon its cylindrical portion between two flanges, one of which latter is formed of less width than the thickness of the said spring, for the purpose and substantially in the manner described.

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Witnesses:
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