No. 653,783. Patented July 17, 1900.

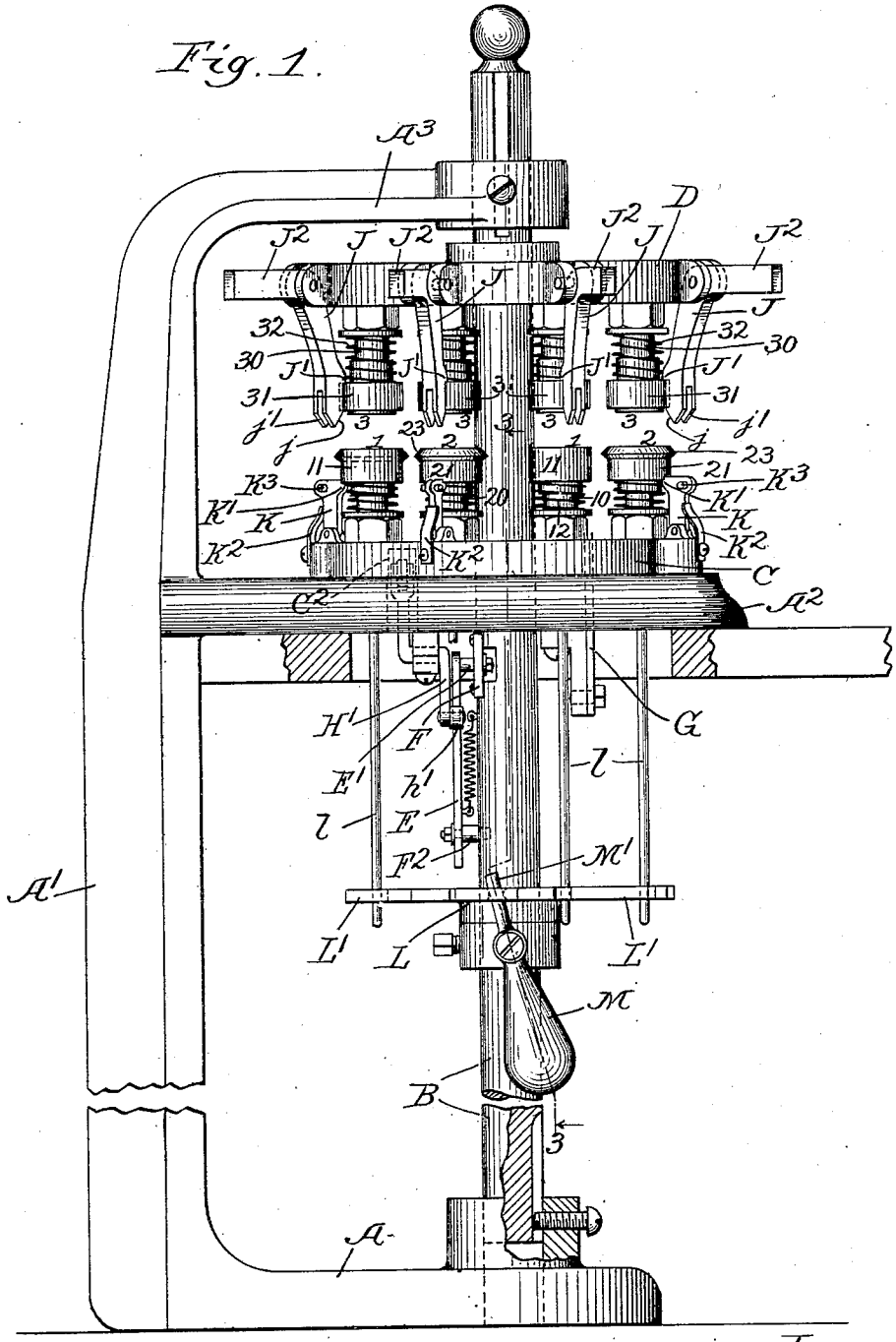
E. W. SILSBY.

PRESS FOR MAKING BUTTONS.

(Application filed May 29, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.



Witnesses.

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

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Fig. 2.

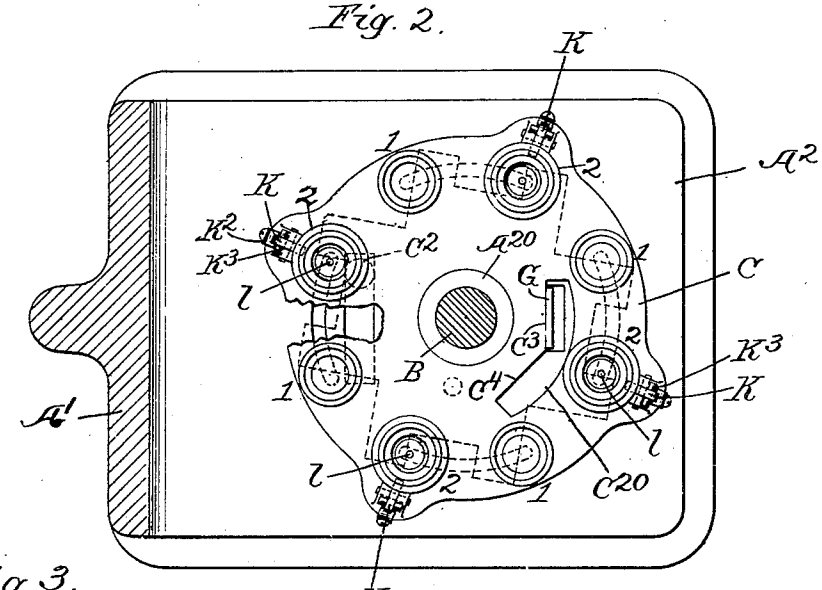


Fig. 3.

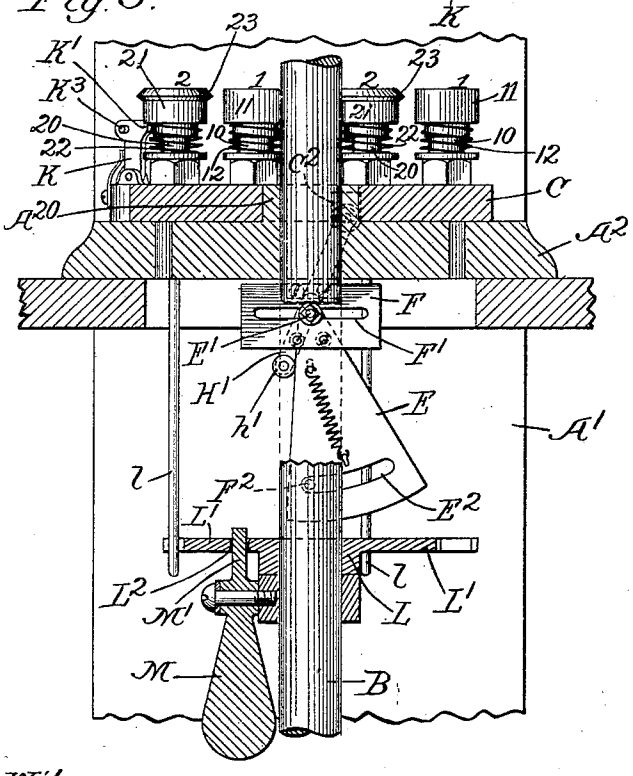
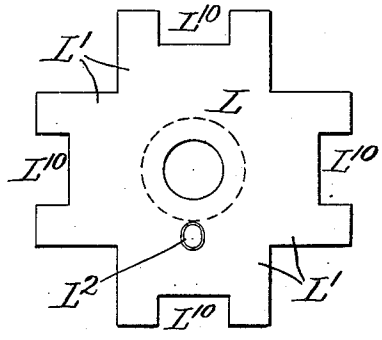


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

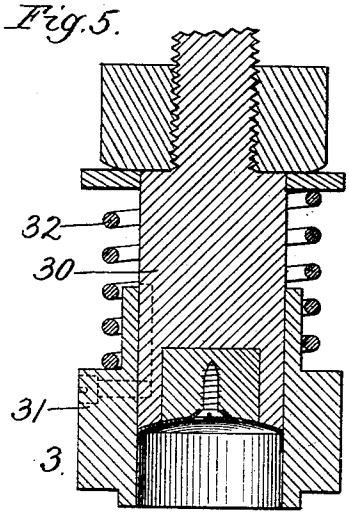
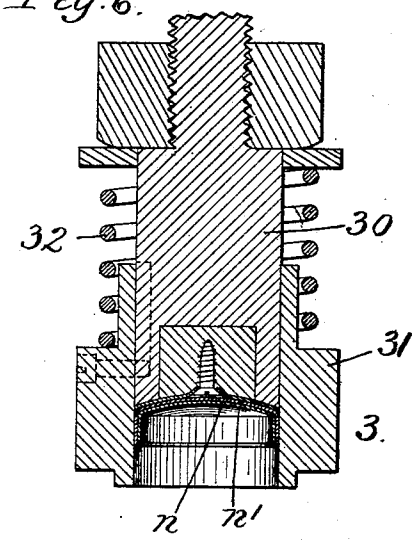
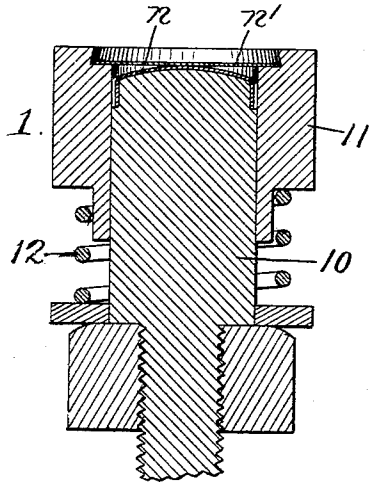
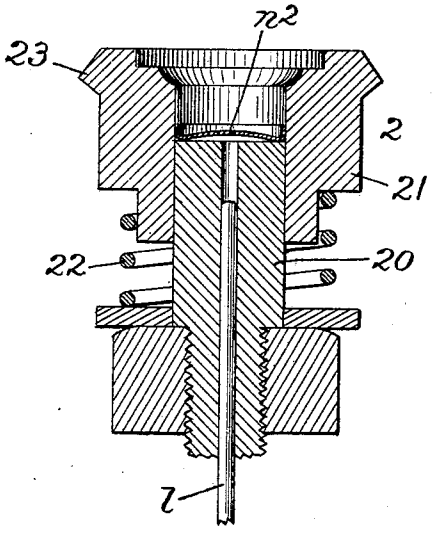


Fig. 6.







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UNITED STATES PATENT OFFICE.

EUGENE W. SILSBY, OF CHICAGO, ILLINOIS.

PRESS FOR MAKING BUTTONS.

SPECIFICATION forming part of Letters Patent No. 653,783, dated July 17, 1900.

Application filed May 29, 1899. Serial No. 718,720. (No model.)

To all whom it may concern:

Be it known that I, EUGENE W. SILSBY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Presses for Making Buttons, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide improved mechanism for making buttons or other articles which are made by the coöperation of dies and in which two or more operations are performed requiring successive coöperative action of the opposed dies. It is in some respects an improvement upon the button-making press shown in my application Serial No. 702,153, filed January 14, 1899.

It consists in the employment of a plurality of dies or holders in the upper or reciprocating part of the press and a plurality of dies or holders also in the lower oscillating member, and one clenching-die being provided in the oscillating member between each two assembling-dies, so that the oscillation or equivalent movement by which the dies are moved laterally step by step a distance equal to the distance between the centers of consecutive dies opposes the clenching-die and a different one of the upper dies or holders at each step action.

It consists also in features of construction by which the guide-stem of the reciprocating member is utilized as a draft-bar through the pedal or other actuating device.

It consists, further, in features of construction by which the two telescoping parts of the lower die are respectively locked during a portion of the outer movement of the upper die in coöperation therewith and are unlocked to permit one part to yield with respect to the other during another portion of said reciprocating movement.

It consists, further, in specific devices for throwing out a button at each action of the press and in details of construction which are specified in the claims.

Figure 1 is a side elevation of my improved button-making machine. Fig. 2 is a horizontal sectional plan of the oscillating carrier and its dies. Fig. 3 is a detail section at the lines 3 3 on Fig. 1. Fig. 4 is a detail plan of trip-plate for throwing out the buttons. Fig. 5 is an axial section through two dies coöperating in the first step of formation of the button. Fig. 6 is a similar section through two dies coöperating in the second or final step.

The press-frame comprises a base A, standard A′, table A^2, and upper guide-bracket arm A^3.

B is the draft-bar and stem of the reciprocating head. It obtains vertical guidance in the base A, table A^2, and upper guide-bracket A^3. Suitable coöperating seats and keys in these bearings prevent it from rotating, while permitting it to reciprocate. On the table A^2, concentric with the draft-bar and stem B, I mount the carrier C, adapted to oscillate or rotate about the axis of the draft-bar B, preferably providing a boss A^{20} on the upper side of the table A^2 to afford bearings for such movement of the carrier. On the carrier C are mounted any desired number, as four, assembling-dies 1 1 1 1 and alternating with them an equal number of clenching-dies 2 2 2 2. Rigid with the draft-bar and stem B, above the table and below the upper guide-bar of said stem in the bracket A^3, is the head D, in which are held eight similar compound dies 3 3 3, &c. Each of the dies 1 comprises a central element 10 and an exterior sleeve 11, arranged to reciprocate upon the central element, and a spring 12, tending to hold the sleeve thrust outward to a determined limit on said central element. Each of the dies 2 also comprises a central element and outer sleeve 21, arranged to reciprocate upon it, and a spring 22, tending to hold the sleeve thrust out to some determined limit. Also each of the dies 3 comprises a central element 30, an outer sleeve 31, arranged to reciprocate upon the central element, and a spring 32, tending to thrust the sleeve outward to a limit on the central element. The eight dies carried by the head D are in respect to radial distance from the axis and angular separation from each other made to correspond with the eight dies on the carrier C, so that when one die of the head is axially in line with one die of the carrier the other dies are similarly opposed each to each. The carrier C is given oscillating movement

through an angle equal to the angle of separation between consecutive dies on the carrier. This angular movement is derived from the reciprocating movement of the draft-bar and stem B, such reciprocating movement being communicated in any method, as by a pedal and return-spring. The means by which the oscillating movement is derived from the reciprocating are the same as shown in my application Serial No. 702,153, above mentioned, and these devices are only shown in this case in so far as they necessarily appear in the views which show other features. The several parts, however, of the device for this purpose may be mentioned, comprising, in addition to the draft-bar and stem B, a cam E, which is mounted on the side of the draft-bar B, having a plate F fastened rigidly on the draft-bar, the apex of the cam having a stud E′, which enters and is guided in a transverse slot F′ in the plate F, and the bar having a stud F^2, which enters and is guided in a grooved slot E^2, which extends transversely in the lower portion of the cam. This cam thus mounted encounters by one or the other of its lateral edges the abutment *h′* at the lower end of the lever H′, which is suitably fulcrumed on the under side of the table A^2 and at its upper end has a suitable terminal which engages in a slot C^2 in the oscillating carrier C and oscillates the latter as the shaft rotates.

G is a flat spring secured at the lower end of the table and extending up through the aperture C^{20}, so that its upper end bears against one or the other of the flat faces C^3 C^4, which bound the aperture at one side and form an angle which is the supplement of the angle of oscillation of the carrier, the spring seating against one of said faces at one position and against the other at the alternating position of the carrier, so that it tends to bring the carrier definitely to one or the other of these positions whenever in the oscillation of the carrier, the apex of the angle made by the flat faces C^3 C^4 passes the point at which said faces make equal angles with the flat faces of the spring.

The processes to be performed by the cooperation of the dies of the oscillating carrier and reciprocating head require that each of the dies 3 of the head in the first action in which they coöperate with the assembling or receiving dies 1 on the carrier shall operate as a single rigid die, the sleeve 31 being locked against yielding upwardly with respect to the central element 30, these upper dies 3 in that action being by their coöperation with the dies 1 loaded or charged with certain of the elements of the button to be formed, which are forced into said upper dies when it is locked by the coöperation therewith of said lower dies 1, so that in the next movement these upper dies become carriers for the button elements with which they have thus been loaded.

The second step, for the performance of which the upper dies coöperate with the clenching-dies 2 of the carrier requires that the sleeve of the upper die shall be unlocked and in condition to recede upward as the spring above it yields when the upper and lower dies come into coöperation. The action in this respect is identical with that described in my application Serial No. 792,153, above mentioned. For the purpose of locking the outer elements of the upper dies, so that they shall not yield with respect to the inner elements during their coöperation with the lower dies in this first step of the process, and for unlocking them, so that they may coöperate with the lower dies in the second step by yielding upward, I provide, associated with each of the upper dies, a latch J, having an aperture or tooth J′, which engages above the upper edge of the sleeve 31 and prevents it from moving upward. This latch is held normally in a position to thus lock the sleeve by gravity, the horizontal arm J^2 serving to overbalance it and hold the lower end of the latch inward with its shoulder engaged above the upper corner of the sleeve. When the head descends, the latches of four of the dies which descend into coöperation with the dies 1 of the carrier encounter nothing to disengage them, and the dies remain locked, as described, and withdraw without disengagement of the latches; but the four clenching-dies of the carrier have each a marginal flange 23, which protrudes into the path of the beveled lower end *j* of the latch J, so that as the head descends the latch, encountering at its said beveled end the beveled margin of the flange 23, is deflected, and its shoulder J′ is disengaged from above the sleeve of the upper die, so that when the upper and lower dies come together said sleeve is in a position to yield upward. During the earlier part of the reciprocating action of the clenching-dies with the dies opposed to them it is necessary for the purpose of the process to be performed upon the elements of the buttons which are contained in the dies at this stage that the sleeve 21 of the clenching-die should not yield, but should operate as if rigid with its central element 20, and it is necessary at a little later stage, after the head has descended a short distance farther, that said sleeve 21 should yield downward. To effect this result, I provide a detainer in the shape of a dog K, pivoted at its lower end on the carrier C, adjacent to the clenching-die, and arranged to engage by its nose K′ under the lower edge of the sleeve 21, a spring K^2 being provided to hold it yieldingly in that position. A pin K^3, set through this dog at the upper end outward from the nose, is in position to permit the point of the latch J to enter between it and the die, and said latch has at its lower end, at the outer side, a bevel *j′*, which encounters the pin K^3 as the latch thus enters between it and the die. The parts are so po-

sitioned and proportioned that this engagement of the latch with the pin occurs and proceeds to a sufficient extent to disengage the dog after the upper die has descended far enough to have completed the portion of the process which requires the sleeve 21 to be rigid with the central element 20 of the clenching-die, so that said dog is disengaged and the sleeve 21 is permitted to recede at a proper time to perform the last operation of the process which requires such yielding and recession of said sleeve. When the head withdraws and the dies separate, both the latch J and the dog K resume their positions shown in Fig. 1, locking the sleeves, respectively, of the dies to which they pertain against yielding longitudinally with respect to the central elements.

The processes performed during the coöperation of the upper dies with the clenching-dies leave the buttons lying completed in the lower or clenching dies. It is necessary to eject them from these dies during the rising movement of the head and upper dies. For this purpose the rod *l* is provided and operates as in my former application, Serial No. 702,153; but in the compound structure herein illustrated this button-ejecting thrust-rod must be given an ejecting movement by being thrust upward at each rising movement of the head and not merely, as in said former application, at each alternate rising movement. In order to accomplish this result, I employ a device necessarily somewhat different from that shown in my former application, in which a button was completed only at each alternate reciprocation of the head. On the draft-bar or stem B below the table there is loosely carried, resting on a suitable carrier or shoulder, a spider or collar L, having four radial arms L′ L′ L′ L′. Below the spider there is pivoted to the draft-bar and stem B a pendulous lever M, weighted at the lower end and terminating at its upper end in a nose M′, which engages a slot L^2 in the spider L. The pendulous lever tending to hang in a certain position and to return to that position when disturbed, tends by the engagement of its nose in the slot L^2 to hold the spider in a certain position, but permits it to be rotated or oscillated from that position a short distance, such movement of the spider having the effect to swing the pendulous lever out of normal position, so that in its tendency to recover its normal position it tends to restore the spider to the first position. The arms L′ in this, which may be termed the "normal," position of the spider with respect to the stem or draft-bar B, occupy at their extremities a position corresponding with the paths of oscillation of the thrust-rods, being somewhat wider than the full range of movement of the lower ends of such thrust-rods, but having each a notch or aperture L^{10} extending through a portion of said path.

The action of the device in coöperation with the thrust-rods is as follows: At the lowest position of the draft-bar and stem B, being the position at which the buttons are finished in the clenching-dies, the ends of the thrust-rods overhang each respectively the ends of the arms L′ at one side of the notches L^{10}. When the stem B rises, therefore, the thrust-rods are encountered by the arms L′ and the buttons are thrust out. This occurs during the first part of the rising movement. During a following part of said movement the carrier is given its lateral movement of oscillation, and the rods are carried off the arms L′ and immediately drop into the notches L^{10}. The lateral movement continuing, the rods travel laterally through the extent of the notches L^{10} and encounter the opposite side, and still being carried laterally they give to the spider a rotary movement about the stem, disturbing the normal position of the pendulous lever M. Now when the draft-bar B and the reciprocating head descend at the next movement the arms L′ are carried down until they clear the ends of the rods, whereupon the pendulous lever M restores the spider to normal position, at which the arms L′ again stand under the ends of the thrust-rods *l*, which now, however, overhang said fingers at the opposite sides of the notches from their former position. The next rising movement repeats the process above described, the carrier making its return oscillation, causing the fingers to drop off into the notches, as before, and encounter the opposite side and move the spider in the opposite direction, with the same effect, however, of disturbing the pendulous lever from its normal position, swinging it in the opposite direction from that in which it was swung before, so that when the rising movement is completed and the thrust-rods clear the arms L′ the latter are again restored to position under the ends of the thrust-rods *l*.

For the purpose of certain details of construction of the dies it is desirable that the specific operations performed in assembling and completing the button should be underderstood, as well as the general construction of the dies to adapt them to these purposes. These details of construction may be understood by referring to Figs. 5 and 6. In Fig. 5 one of the upper dies 3 and one of the lower receiving or assembling dies 1 are shown in the relative position occupied before the commencement of the downstroke, certain elements of the button being lodged in the receiving or assembling die 1. These elements vary according to the particular style of button to be made; but as illustrated in the drawings they comprise the back shell *n*, cupped and open downward as it lies in the die on the upper end of the central element 10 and the face-covering disk n^3. When the die 3 advances upon the die 1 for the first process, the margin of the disk n^3 is folded

downward, embracing the flange of the cupped shell n, the outer sleeve of the lower die yielding as it is forced downward by the sleeve of the upper die, and at the conclusion of this movement the two parts of the button are contained in the sleeve or holder of the upper die and are carried up with it. In this position they are shown in the upper die in Fig. 6, which represents the position of such die as it stands opposed to the lower die 2, in which is lodged the collet or back n^2 preparatory to the final clenching action. As the upper die descends to load the clenching-die the outer sleeve or holder of said upper die being locked, as above described, yields when it encounters the sleeve of the clenching-die, and the central element 30 of the upper die tending to move down forces the button elements out of the sleeve or holder 51 into the sleeve or holder of the clenching-die, the first effect being to fold inward the lower edge of the flange of the face-disk n' where it encounters the beveled edge of said sleeve of the lower die. At this stage the said sleeve of the lower die is unlocked from the central element, and the further downward movement of the upper die forces said sleeve downward, bringing the button into contact with the central element 20 of the lower die, between which and the central element of the upper die the final clenching-pressure is given, finishing the button, leaving it in the lower die, from which it is ejected, as above described, when the upper die rises. In this process it will be noticed that the sleeves of the upper dies are properly holders for receiving and holding the button elements, so that they may be brought into opposition to the clenching-die, and that in the first process the inner element of the upper die is entirely inactive except as a stop or stem for the sleeve-holder, and it will be obvious also that for the purpose of bringing the upper die, loaded with the button elements, into opposition to the clenching-die it is not material which of the opposed elements has the movement of translation or lateral travel; but it is more convenient to give such movement of translation to the clenching-dies than to the holding or upper die.

In using thin celluloid sheet material for the face-covering n of buttons and medallions made in dies of this nature great difficulty is experienced by reason of the tendency of the celluloid to curl or roll up on account of the slight stretch or compression given to the edge in the process of cutting disks from the sleeves, and when the disks are laid in the die, as shown in Fig. 5, even though when first placed they may appear to be lodged in proper position, they are liable to curl up upon the slight jar which results from the movement of the upper die, so that by the time the contact between the dies occurs the disk n' may be folded under, so that the proper cupping, flanging, and clenching are not performed, but instead the disk is ruined. I find this difficulty may be entirely avoided by making the open mouth or entrance of the holder or sleeve of the lower die slightly less in diameter than the disk which is to be lodged in it and widening the cavity back from the mouth to accommodate the full diameter of the disk. The slight cup of the disk, which tends to cause it to curl, makes it easy to enter it through the slightly-reduced aperture, and when it is forced through it will react, so as to extend into a slightly-enlarged recess back of the aperture and be retained and prevented from folding or curling while the dies act upon it.

In making buttons which have a face-covering of certain material, such as "frosted" or "dull-finish" celluloid, great difficulty has always been experienced in applying such face-covering and completing the button without marring the surface of the covering, which shows said marring by a polished line or spot wherever the pressure was in excess by reason of the lack of perfect conformity of the face of the upper die to the form which the disk tends to assume when subjected to the cupping and marginal clenching pressure. The most microscopic accuracy in the formation of the die and the finest polish which can be given to its operating-face fail to obviate this defect; but I have been able to overcome it in the following manner: I employ the upper die to cut out a disk of material—such as zinc, for example. This may be done by opposing the zinc lodged on the end of a block of wood to the action of the die when it is locked. The zinc thus cut is of the full size of the bore of the sleeve of the outer member of the die. Such disk I then substitute in the place of the celluloid-face disk in the final process of clenching a button between the dies, with the result that while the zinc disk lacks the marginal flange, which if present would be clenched, it is nevertheless cupped or dished according to the same law—that is, in obedience to the same strain or pressure as the celluloid face would be if present instead. The zinc disk thus formed I now secure at the center of the face of the inner element of the upper die, which has been shaped approximately to the desired form, taking care that the face end of said element is not cupped or dished so deeply as to cause the zinc disk to be changed in form by being thus secured to the center. Now employing the die with this disk as the forming-face of the inner element I find that either its perfect agreement with the form which the celluloid tends to assume under the pressure to which it is subjected in the final process or its tendency easily to conform thereto by a very slight yielding wherever necessary results in the formation of the button with the frosted celluloid face without any liability to mar the latter. It will be understood that in this process of clenching the

button the clenching pressure is in fact applied generally at the margin, and it is customary and quite practicable to make the central element of the upper die hollow, as shown in the drawings, giving it a bearing on the elements of the button only on the margin to a sufficient extent to effect the clenching. With ordinary face material, even such as polished or bright-finish celluloid, no undesirable effects are produced when the die is made this way. For the purpose of employing the zinc disk, as described, I fill the hollow center with a core of wood, which serves as a means of attaching the zinc at the center.

I claim—

1. In a button-making machine in combination; a reciprocating die-carrying head and a pivoted die-carrier, the actuating-stem of the former being extended through the pivotal support of the latter; the dies on the carrier in which the buttons are completed ready for discharge; thrust-rods depending from such dies respectively, and an arm on the actuating-stem arranged to encounter the thrust-rods to eject the buttons from the dies when the head rises.

2. In a button-making machine in combination; a reciprocating die-carrying head and a pivoted die-carrier, the actuating-stem of the former being extended through the pivotal support of the latter; dies on the carrier in which the buttons are completed ready for discharge; thrust-rods depending from such dies adapted to eject the buttons upward, and the recessed or notched arm L′ horizontally pivoted on the actuating-stem and the pendulous lever M, also pivoted to the stem and engaging the arm, substantially as and for the purpose set forth.

3. In a button-making machine in combination; a reciprocating die-carrying head and a pivoted die-carrier, the actuating-stem of the former being extended through the pivotal support of the latter; a plurality of similar compound dies carried by the head, each comprising two elements, one of which is adapted to yield longitudinally with respect to the other; a lock to cause them to operate as rigid; switch devices associated with certain of the dies on the carrier, arranged to release such lock when a die having the same descends toward a die having a switch.

4. In a button-making machine in combination; a reciprocating die-carrying head and a pivoted die-carrier, the actuating-stem of the former being extended through the pivotal support of the latter, the compound die on the carrier having a lock to secure its two elements to cause them to operate as rigid, the dies on the head having each a switch adapted to encounter said devices for locking the carrier-die, and to unlock the same after partial coöperation of the two dies.

5. In a button-making machine in combination with a reciprocating head and a plurality of similar dies carried thereby, each comprising two elements, one of which is adapted to yield with respect to the other; a lock to prevent such yielding; a carrier having a plurality of dies arranged in consecutive order transverse to the path of reciprocation of the head and comprising dies of two sorts, a die in which the buttons are finished ready for discharge being located between each of the two dies of the other sort; a switching device associated with each such finishing-die adapted to be encountered by the same when the die having such lock descends.

6. In a button-making machine, in combination with a reciprocating head and a plurality of similar compound dies carried thereby, each of said compound dies comprising two elements, one of which is adapted to yield longitudinally with respect to the other; a lock to prevent such yielding and cause the two elements to operate as if rigid; a carrier having a plurality of dies arranged in successive order transverse to the path of reciprocation of the head, and comprising a clenching-die between each two other dies, and means for moving such carrier in such transverse direction, and halting the same with its dies registered with the opposed dies respectively of the reciprocating head; and a switch device associated with each clenching-die of the carrier adapted to be encountered by said lock when the opposed coöperating die descends to disengage said lock; no two consecutive dies on the carrier being thus provided, and no two consecutive dies being without such provision.

7. In a button-making machine, in combination with a reciprocating head having a plurality of compound dies, each comprising two elements one of which is adapted to yield longitudinally with respect to the other; a locking device associated with each of said dies, adapted to lock the two elements so that they shall operate as one; and a carrier oscillating transversely to the path of reciprocation of the head, and having a plurality of dies arranged successively in the path of oscillation, and adapted to register with the dies of the head at the limits of such oscillating movement; each alternate die on said carrier having associated with it a switching device adapted to be encountered by the locking device to disengage the same when the head descends.

8. In a button-making machine in combination with a reciprocating head and a plurality of dies carried thereby, a carrier having movement transverse to the path of reciprocation of the head, and a plurality of compound dies thereon adapted to coöperate with the dies of the head; said compound dies each comprising two elements one of which is adapted to yield longitudinally with respect to the other and provided with a spring to hold it yieldingly protruded; each alternate one of said compound dies having a locking device adapted to lock said two parts, and

cause them to operate as one; each of the reciprocating dies having a switch device constructed and arranged to encounter said locking device as the head descends and disengage it after a partial coöperation of the opposed dies.

9. In a button-making machine in combination with a reciprocating head and a plurality of dies carried thereby; a carrier arranged to move transversely to the path of reciprocation of the head, and means for giving it alternating movements in opposite directions; a plurality of compound dies carried thereby, and arranged to register with the dies of the head at the limits of said opposite movements; said compound dies comprising each two elements, one of which is adapted to move longitudinally with respect to the other, and a spring to hold such element toward the opposed die; each alternate one of said compound dies having a device adapted to lock the two elements together to cause them to operate as one, and each of the dies on the reciprocating head having a switch which engages said locking devices to unlock said elements after partial coöperation of the opposed dies.

10. In a button-making machine in combination with a reciprocating head and a plurality of compound dies carried thereby, comprising each two elements one of which is adapted to move longitudinally with respect to the other; and a locking device for each die adapted to prevent such longitudinal movement, and cause the two elements to operate as one; a carrier and a plurality of dies thereon, and means for moving the carrier to carry the dies in a path transverse to the path of reciprocation of the head, and to halt the carrier at positions at which the dies of the reciprocating head are registered with dies on the carrier, each alternate one of the dies on the carrier comprising two elements one of which is adapted to move longitudinally with respect to the other, and a spring to yieldingly resist such movement in one direction; a locking device adapted to prevent the movement of said elements against the spring, a switch device associated with each alternate die to engage the locking device of the reciprocating dies and disengage the same when they respectively advance in registration with said alternate die, said locking device of the upper dies being arranged to encounter the locking device of the lower alternate die and disengage the same after the said locking device of the upper die has been disengaged by said switch.

11. In a button-making machine in combination with a reciprocating head having a plurality of dies, a carrier having movement transverse to the reciprocating movement of the head, and a plurality of dies carried thereby; each alternate die on said carrier being a clenching-die adapted to complete the formation of the button, and having a button-ejecting thrust-rod protruding at the lower end; an oscillating element having two lodgments or steps adapted to encounter the lower end of the thrust-rod, and protrude between said lodgments; said oscillating element being constructed and arranged to rest normally in position to present one or the other of said steps in line with the rod.

12. In a button-making machine in combination with a base or table, a head having a stem reciprocating through the table, a carrier supported on the table and pivoted about the stem, a plurality of dies or holders on the head, and a plurality of dies on the carrier adapted to register with those on the head, a mechanism by which the reciprocation of the stem and head gives movement to the carrier about its pivot to shift the registration of the dies thereon with those on the head at each reciprocation of the latter.

13. In a button-making machine in combination with a base or table, a head above the base having a stem extending through the base and adapted to be reciprocated therein, a carrier mounted on the base and pivoted about the bearings of the reciprocating stem therein, a plurality of dies or holders on the head, and a plurality of dies on the carrier adapted to register with those of the head, means for reciprocating the stem and head, and mechanism by which each such reciprocation rotates the carrier a step equal to the distance between the centers of consecutive dies thereon, to shift the registration of such dies with those of the head; certain of the dies on the carrier having a button-ejecting device comprising a thrust-rod protruding below the die, a radially-armed spider or notched disk mounted on the stem below the table and free to oscillate thereabout, a weighted pendulum pivoted on the stem and loosely engaging the spider or disk; the notches in such disk being so situated that the thrust-rods overhang the disk adjacent to said notches when the pendulum hangs at rest, and the circumferential extent of the notches being each less than the movement of the thrust-rods at each step movement of the carrier.

14. In a button-making machine in combination, a reciprocating die-carrying head, and a pivotally-supported die-carrier adapted to move about its pivot in a direction transverse to the reciprocation of the head; a table which supports the carrier about this pivot, the actuating-stem of the reciprocating head penetrating the table and carrier at the pivot of the latter, and mechanical connection by which the reciprocation of the head and stem gives the carrier movement about this pivot.

15. In a button-making machine an assembling-die having its mouth or aperture slightly less than the diameter of the disk to be lodged therein, and slightly enlarged in diameter back of the mouth to accommodate the disk.

16. In a button-making machine in combination with a holder in which the button elements are assembled and the plunger coöp-

erating therewith, a clenching-die comprising two elements, one of which is adapted to yield with respect to the other, a spring to resist such yielding, a locking device to positively prevent such yielding, and an unlocking device which is operated any time with the approach of the plunger toward the clenching-die.

In testimony whereof I have hereunto set my hand, this 26th day of May, 1899, at Chicago, Illinois, in presence of two witnesses.

E. W. SILSBY.

Witnesses:
CHAS. S. BURTON,
EDWARD T. WRAY.