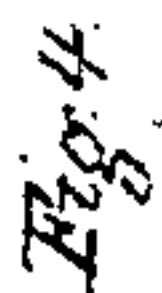


G. W. Livermore.  
Collar Machine.

*Patented, Nov. 1. 1864*

Geo W Livermore



2 Sheets Sheet 2

*Patented. Nov. 1. 1864.*

Fig. 3.

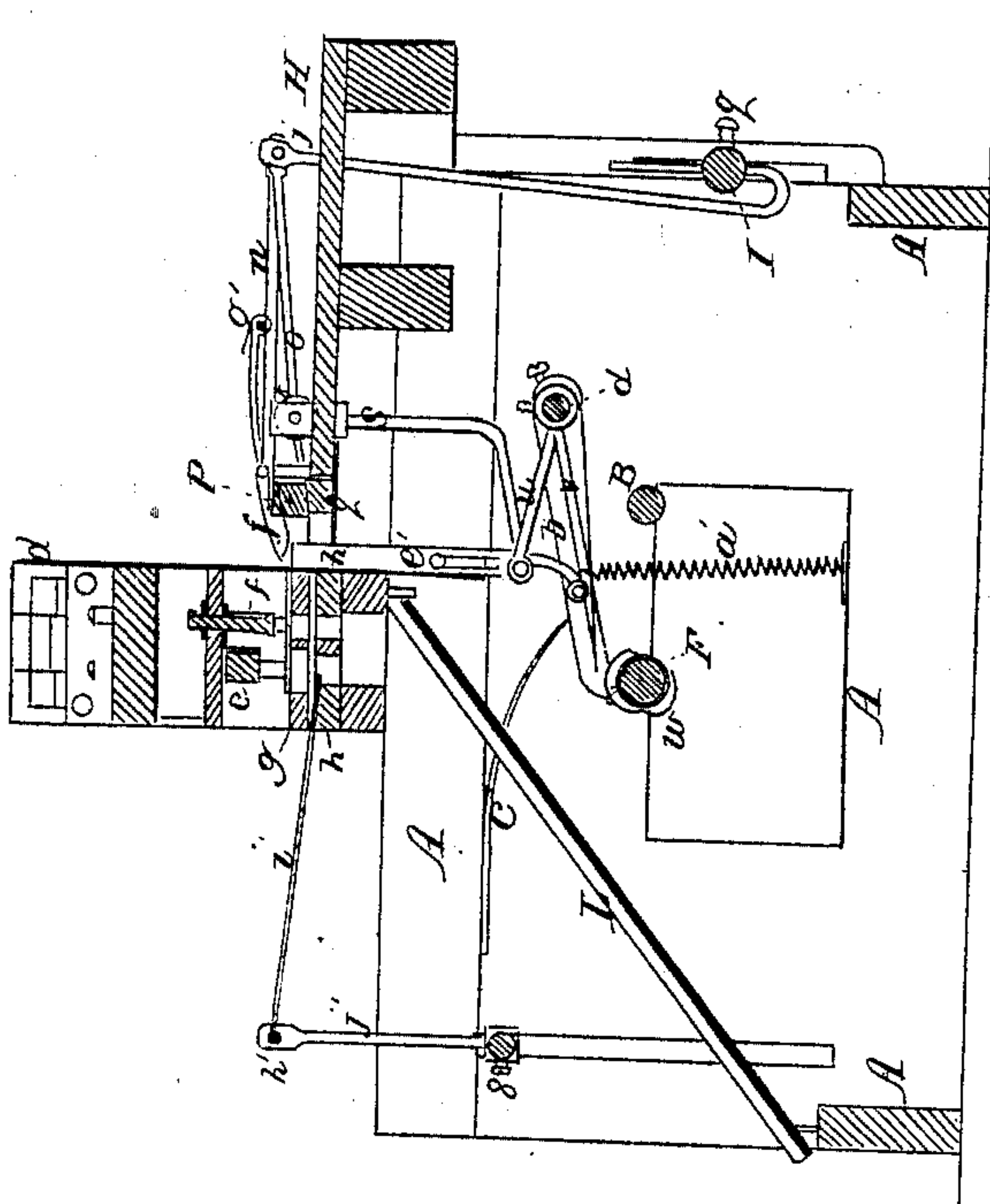
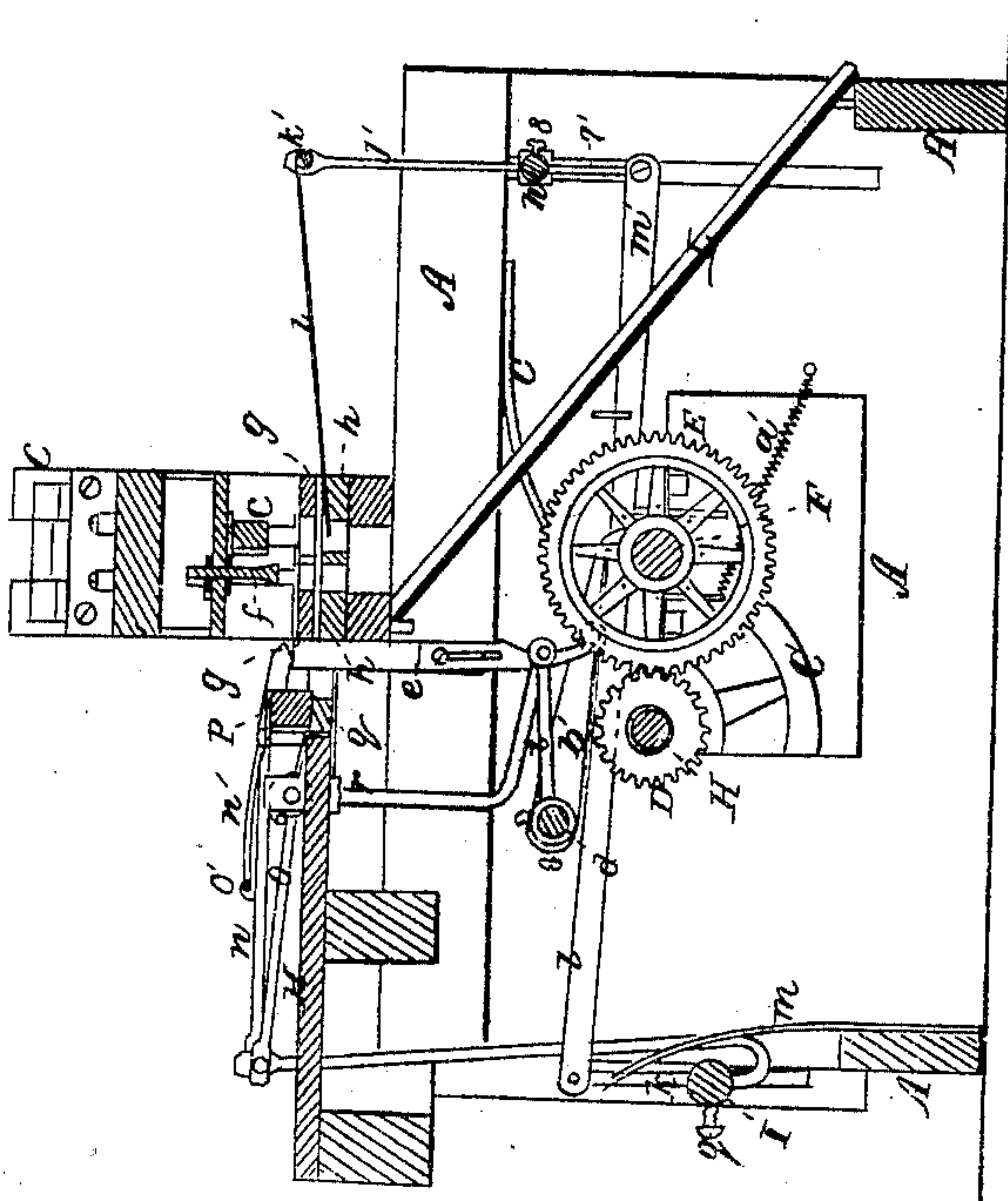


Fig. 2.



Witnesses,  
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# UNITED STATES PATENT OFFICE.

GEORGE W. LIVERMORE. OF CAMBRIDGE, MASSACHUSETTS.

## IMPROVEMENT IN MACHINES FOR MAKING PAPER COLLARS.

Specification forming part of Letters Patent No. 44,871, dated November 1, 1864.

*To all whom it may concern:*

Be it known that I, GEORGE W. LIVERMORE, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Machine for Making Paper Collars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a perspective view of my machine for making paper collars. Fig. 2 is a longitudinal vertical section through the same, looking in the direction of the arrow *x*. Fig. 3 is a longitudinal vertical section through the same, looking in the direction of the arrow *y*. Fig. 4 is a view of the cam-shaft F detached.

My invention consists in a new and useful machine for making paper collars, by means of which the collar is cut from a continuous strip of paper, and the button-holes punched and the rows of imitation stitching for the next collar to be cut produced at one operation, thus effecting a great saving in time and labor, and reducing the cost of manufacture.

To enable other skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A is the frame-work, in suitable bearings, in which runs the driving-shaft B, to which is secured the fly-wheel C. This shaft carries the gear D, which engages with the gear E on a shaft, F, having its bearings in the frame-work. To each end of this shaft F is secured a crank, *a*, which is connected with the frame or carriage G by means of a pitman, *b*. This frame moves up and down in suitable ways in the standards *c d*, and has attached to its under side a solid die or cutter, *e*, of the form of the collar to be cut, and three punches, *f*, for cutting out the button-holes. The die *e* and punches *f* in their descent pass through suitable holes in a presser-plate or clearer, *g*, (the under side of which is covered with india-rubber or other elastic material,) and into holes in a bed or table, *h*, which are made of the exact size to receive them, and form the under dies.

I will now proceed to describe the manner in which the strip of paper from which the collar is to be cut is fed under the die or cutter.

It is a table, through slots in which project

the rods *i j*, which are secured at their lower ends to a shaft, I, which is rocked by means of a rod, *k*, to which is pivoted a rod, *l*, which is moved in one direction by a cam, 5, on the shaft F, and in the opposite direction by the spring *m*. To these rods *i j* are pivoted the rods *n o*, to the former of which is attached the upper jaw, *p*, and to the latter the lower jaw, *q*, of a pair of nippers. The lower jaw, *q*, plays in a transverse slot in the table H, and its upper edge is flush with the surface of this table. *r s* are two bent rods, the upper extremities of which are enlarged and pass up through the table H, and are forked so as to embrace the rods *n* and admit the friction-rolls 6. The lower extremities of these rods *r s* are pivoted to arms *t u*, projecting from a shaft, J, (having its bearings in the frame-work,) which is rocked by means of an arm, *v*, Fig. 3, which is raised by means of a cam, *w*, on the shaft F, against the resistance of a spring, *a'*, so as to raise the rods *n* and open the nippers.

*b' b'* are two levers which are pivoted to the shaft J, and are raised against the resistance of springs *c'* by means of cams *d'* on the shaft F. To these levers are pivoted the arms *e'*, which are made adjustable in length by means of screws and slots in the ordinary manner. The upper ends of these arms *e'* are bent over and attached to the clearer *g*, so that as they are depressed it will be brought down onto the table *h* to hold the paper and keep it perfectly smooth while it is being cut. The clearer *g* also serves to throw the paper off from the upper die, *e*, and punches *f* as they rise after the cut is made.

*f' f'* are two spring-levers pivoted to uprights projecting from the table H, their longer arms being connected together by a rod or roller, *g'*, that rests on the rods *n* of the nippers, their shorter arms resting on the bent ends of the arms *e'*, by which means, as the presser-plate or clearer *g* is raised, the rod *g'* is forced down onto the rods *n*, thus closing the nippers onto the strip of paper. The nippers are then carried forward by the vibration of the rods *i j*, and the paper is fed in the required distance. One or more rows of steel points, 7, project up from the table *h* in advance of the lower dies, which form the button-holes, so that as the paper is pressed down onto the table *h* by the clearer *g*, with its elastic sur-



face, the imitation stitching will be produced around the edge of the collar as required, the button-holes being cut and the stitching produced in the paper before the collar is cut out by the die *e*, and any other device besides the imitation, stitching may be stamped on the collar at the same time by the descent of the clearer *g*, suitable dies being provided for the purpose.

*i'* is a flat strip of metal, which projects (while the paper is being fed in) nearly over the hole or under die in the table *h*, which corresponds to the form of the cutter *e*, so as to form a guide and prevent the paper from striking the edge of the lower die. This strip *i'* is withdrawn out of the way, before the die *e* descends, by the following device:

*K* is a shaft having its bearing in the frame-work from which rise the rods *j'*, which are connected together at their upper ends by a rod, *k'*, to which the strip *i'* is secured.

*l'* is a rod projecting down from the shaft *K*, to which is pivoted the rod *m'*. This rod is bent over at its opposite end, and is carried in one direction by a cam, *n'*, Fig. 4, on the shaft *F* against the resistance of a spring, *o'*, by which it is retracted, and thus, as the shaft *K* is rocked, the strip *i'* will be carried forward and back at the required times. The rods *j'* and *l'* pass through holes in the shaft *K*, and are made adjustable therein by means of screws *8*, and the shaft *K* is made adjustable in vertical slots in the frame-work, by means of which adjustments the throw of the strip *i'* can be varied, as desired. The amount of motion of the feed-nippers can also be varied in a similar manner, the shaft *I* being made adjustable in vertical slots in the frame-work and the rods *i j* passing through holes in the shaft *I*, where they are secured in place by screws *9*.

The upper die, *e*, and punches *f* may be adjusted exactly with respect to the lower dies by means of screws and slots and wedges in the frame or carriage *G*, and the pitmen *b* are made in two pieces, which are joined together by screw-connections *10*, by which means their length can be varied, as desired. The several cams on the shaft *F* are also made adjustable by means of set-screws in a well-known manner.

The pins *7*, instead of projecting up from the table *h*, may project down from the presser-plate *g*, if desired, a portion of the table *h* beneath them being made elastic.

In the above-described machine I am enabled to use a continuous strip of paper, instead of using sheets, as heretofore, thus preventing a

great waste of material and greatly facilitating the process of manufacture.

Operation: The machine being set in operation, the end of a long strip of paper is fed into the nippers *p q*. The clearer *g* is then raised by the arms *e'*, as explained, causing the spring-levers *f'* to press the rod *g'* onto the rods *n* and close the nippers onto the paper. The shaft *I* is now rocked by the rod *k*, as before explained, which causes the rods *i j* to carry forward the nippers with the paper the required distance, the paper passing between the clearer *g* and the table *h* and being guided across the lower die by the metallic strip *i*, which extends nearly across the opening. The clearer *g* is now brought down and holds the paper firmly onto the table *h* and presses the steel points into the paper, to produce the imitation stitching. The die *e* and punches *f* now descend, (the strip *i'* having been withdrawn by the rocking of the shaft *k*, as before explained,) cutting out a collar and punching the button-holes for the next collar to be cut. While this is taking place the rods *n* are raised by the forked rods *r s*, (the pressure of the friction rod *g* having been relieved by the descent of the clearer,) thus opening the nippers, which are then carried back over the paper by the vibration of the rods *i j*, to take a fresh hold, as already described. The die *e* and punches *f* now ascend, the clearer *g* serving to throw the paper off and keep them clear. The clearer *g* is now raised off the table *h*, to allow the paper to be carried forward by the nippers, the strip *i'* is carried forward over the lower die, and the operation continues as before, a collar being cut out and the button-holes and the imitation stitching produced on the paper for the next collar to be cut at each operation of the machine.

The collar, after it is cut, passes through the table *h* into a trough, *L*, by which it is carried out of the machine.

I do not confine myself to the precise details of construction here described, as it is evident that these may be varied to a considerable extent without departing from the spirit of my invention.

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

The feeding-nippers *p q*, in combination with the cutting-out dies, the presser-plate *a*, and table *h*, operating substantially as set forth, for the purpose specified.

GEO. W. LIVERMORE.

Witnesses:

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