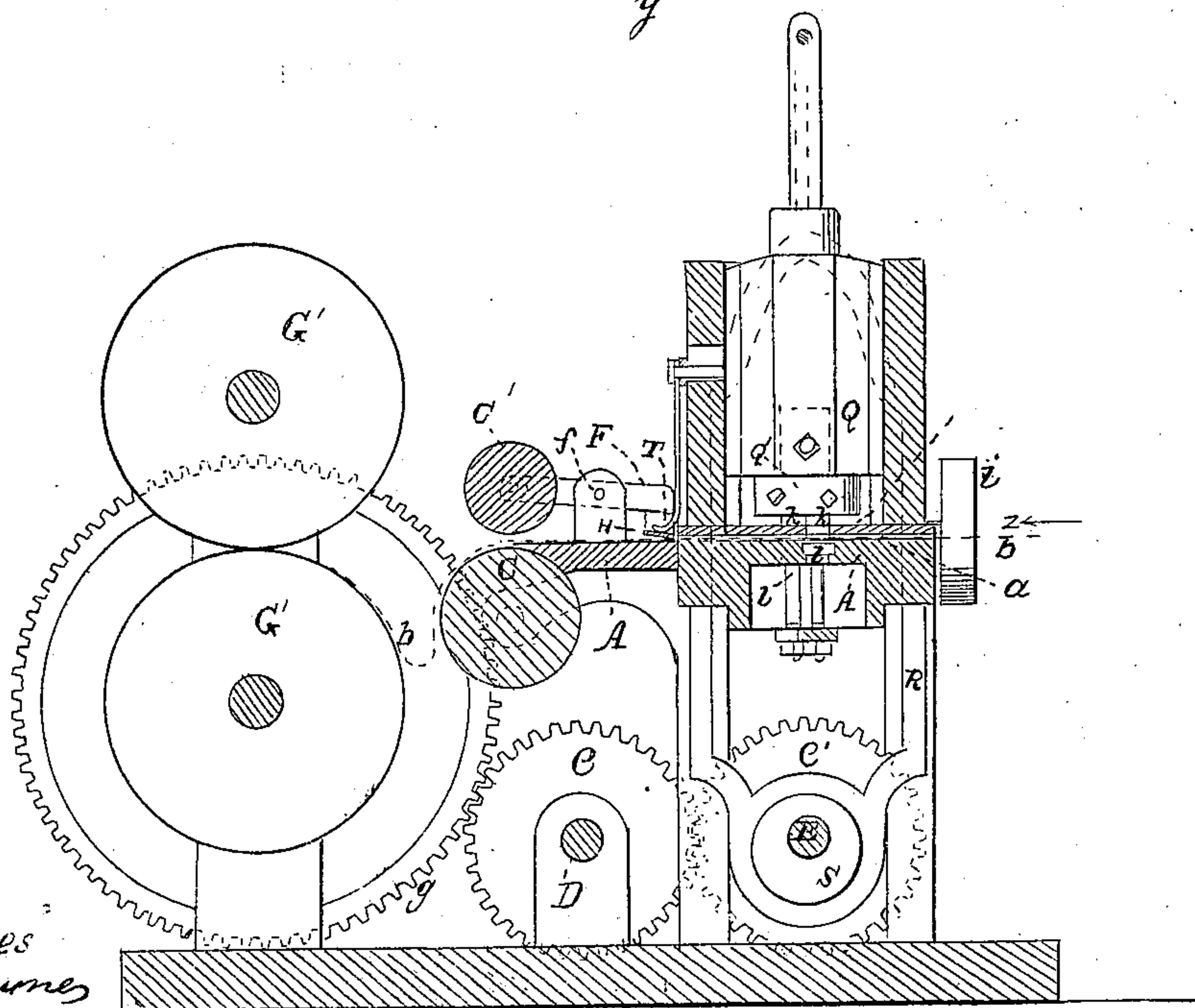
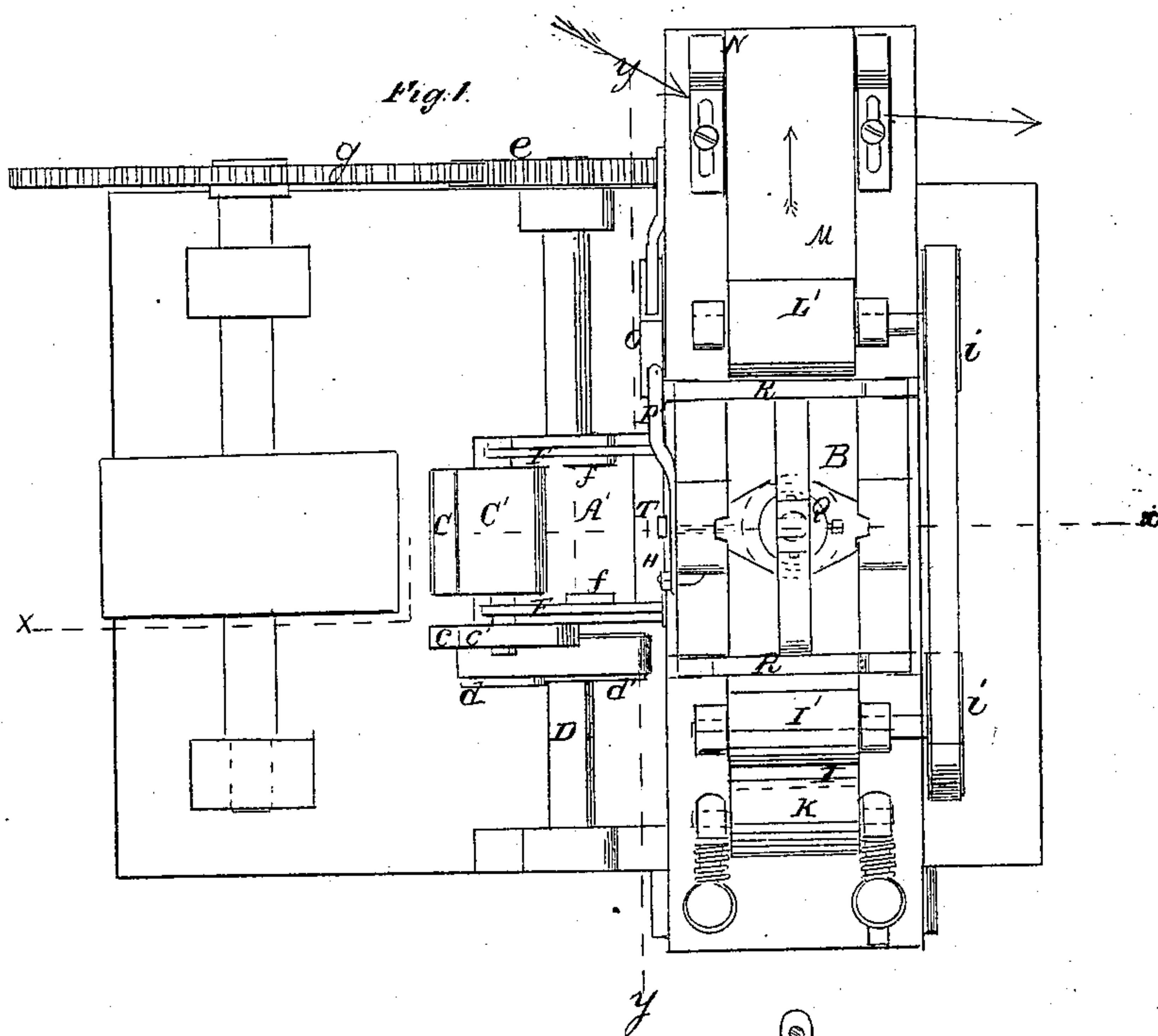


S. Shepherd. Collar Machine.

2 Sheets. Sheet 1.

No 964,91.

Patented. Nov 2 1869

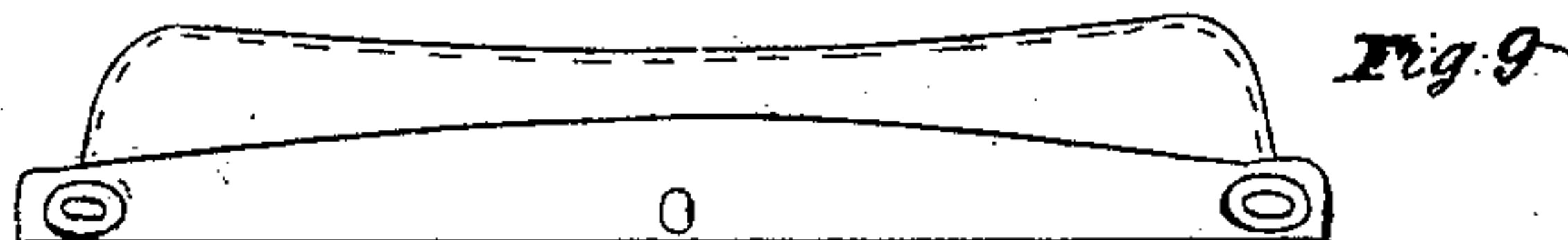
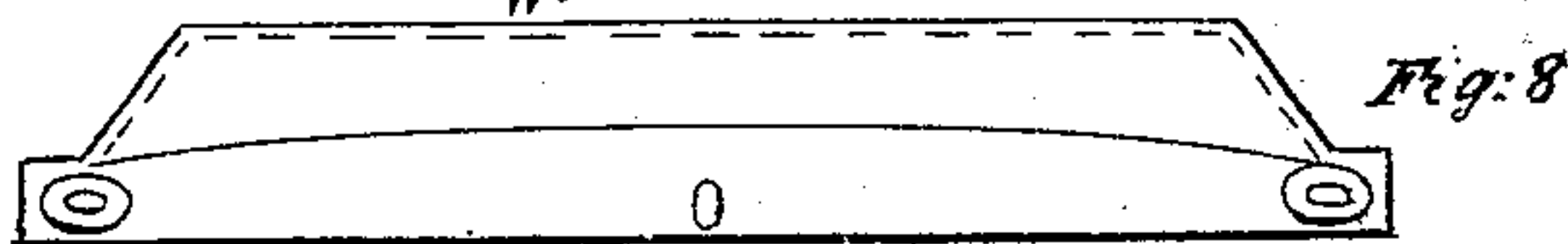
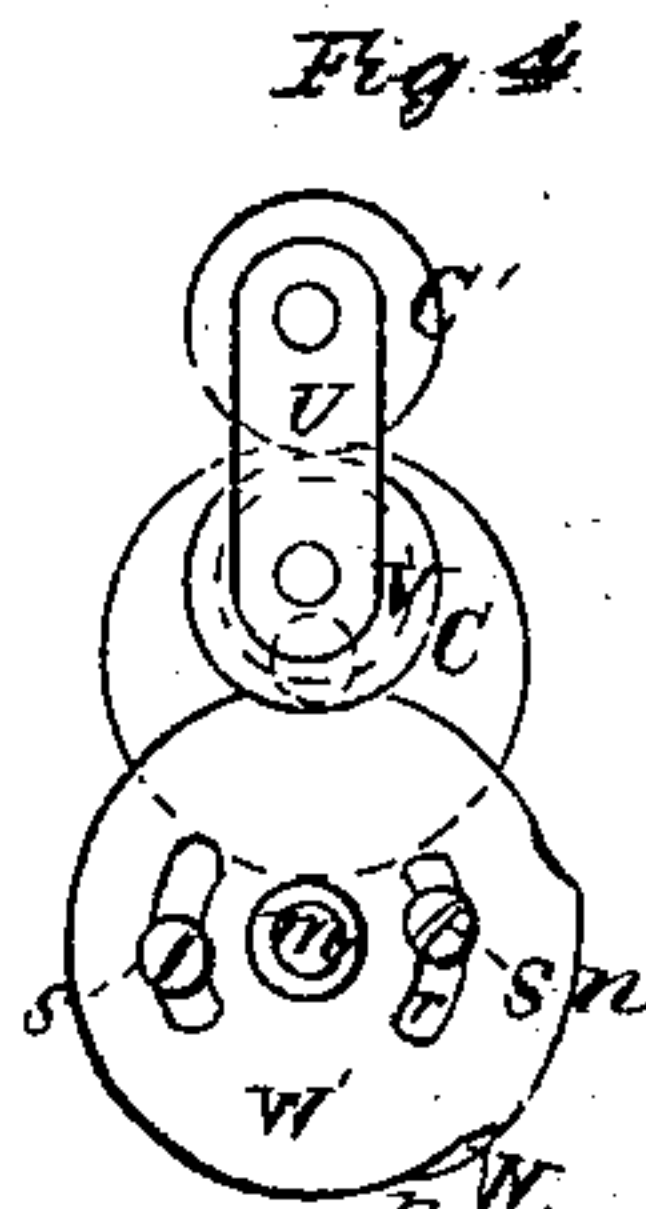
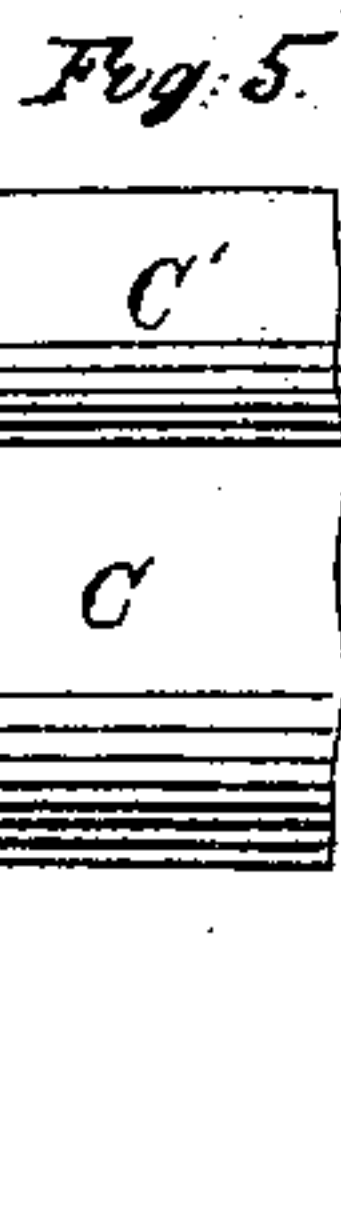
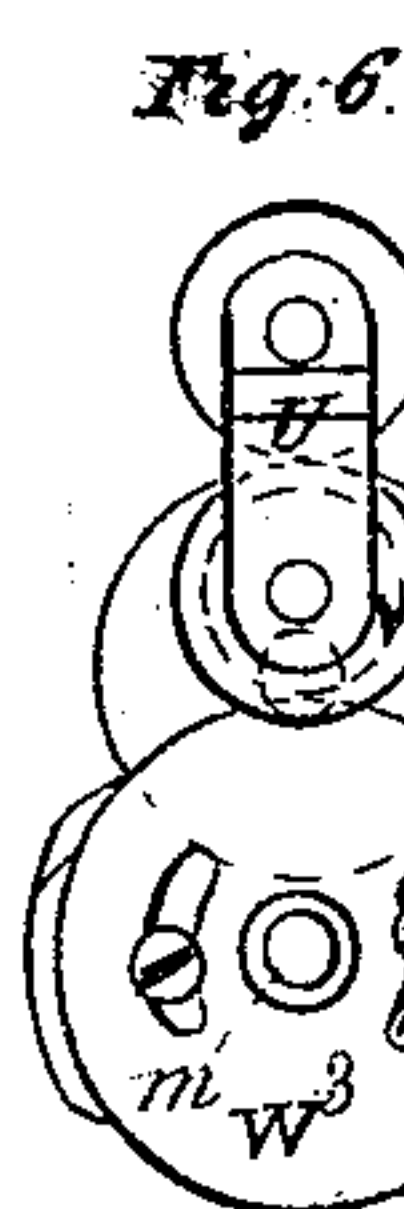
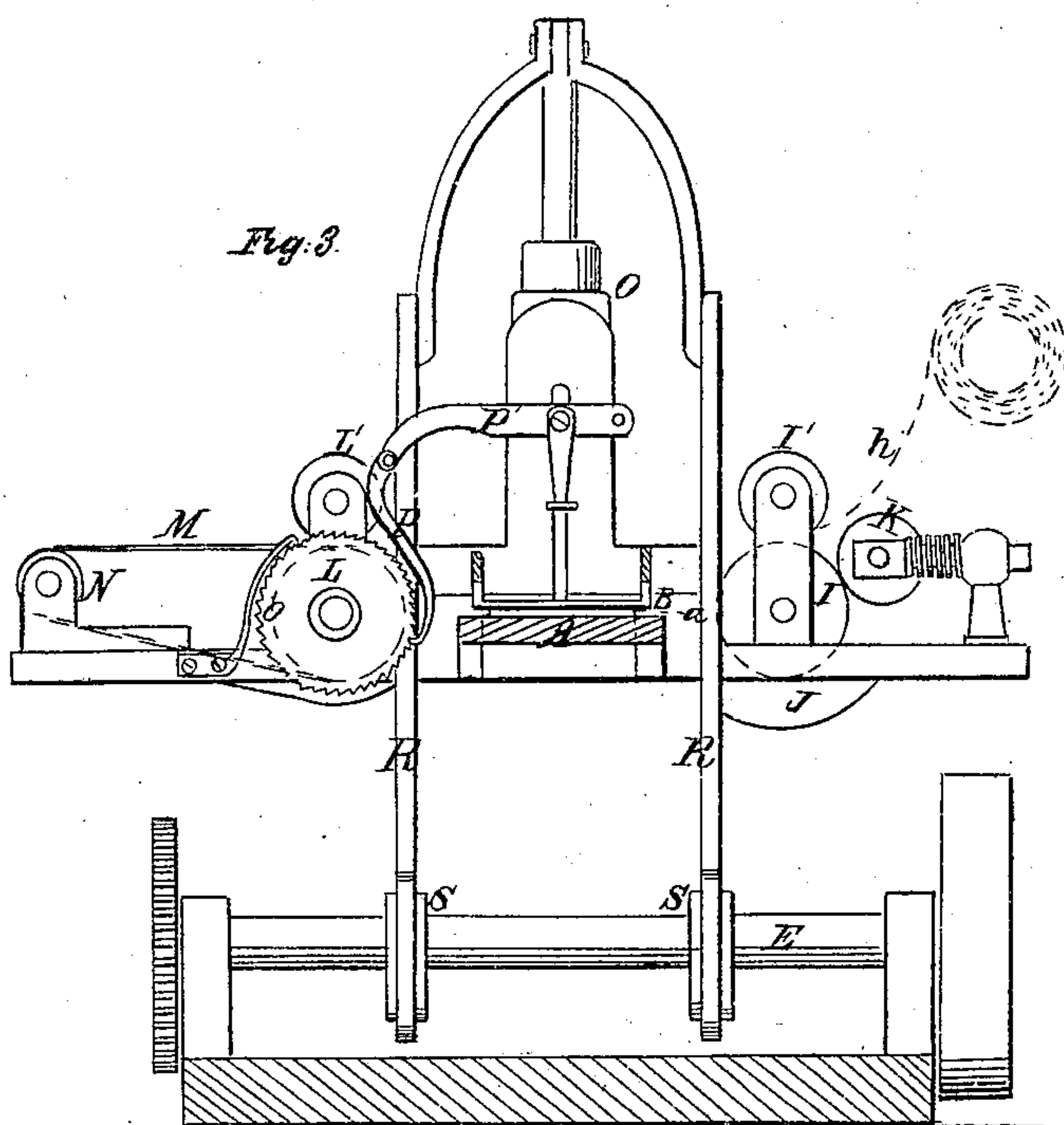


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Collar Machine.

Patented. Nov. 2. 1869.



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SAMUEL SHEPHERD, OF NASHUA, NEW HAMPSHIRE.

Letters Patent No. 96,491, dated November 2, 1869.

IMPROVEMENT IN PAPER-COLLAR MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, SAMUEL SHEPHERD, of Nashua, in the county of Hillsborough, and State of New Hampshire, have invented a new and useful Improvement in Machinery for Making Paper Collars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 represents a plan of a machine constructed in accordance with my improvement.

Figure 2, a sectional elevation of the same, taken as indicated by the line *x x* in fig. 1.

Figure 3, a further sectional elevation, taken as denoted by the line *y y*.

Figures 4 and 5, side and end views of certain devices connected with the feed of the strip or fabric through the machine, and

Figures 6 and 7, similar views of a modification of said device.

Figures 8 and 9 represent views of collars made and patched by my improved machine.

My improvement has reference to machines for making paper collars, in which the button-holes, or certain of them, are patched with any suitable material, secured to the paper strip out of which the collars are formed, before or during its feed through the machine for cutting out the collar-blanks.

In my improvement for the production, in an automatic manner, of such collars, the paper out of which the collars are to be formed is fed through the machine in a continuous strip, of a suitable width corresponding to the width of the collar or collars to be made, while the material out of which the patches are stamped is also fed, in a continuous strip of suitable width, over the first-named strip, but at suitable angles to the rim of the latter. As the two strips are thus fed through the machine, the patch-blanks are punched out of the one strip and stuck on to the other strip, the patching-strip having adhesive material suitably applied to its face for that purpose. During this sticking of the patches on to the collar-strip, which occurs at suitable intervals in the feed of the strips, corresponding to the distance of the button-holes apart, both the collar-strip and patch-strip remain stationary. To enable the movement of the patch-strip to be suspended at the time of patching, (while the patches are applied,) its movement is accelerated during the intervals of time between the patchings. This is the general action of the machine, which includes various novel features and combinations of details for making the same practicable or efficient, as will be hereinafter described.

Referring to the accompanying drawings—

A is a bed, over or between which and a cover, B, through a slot, *a*, the collar-paper, in the form of a

continuous strip, is passed, the same being drawn from or supplied by a roll or otherwise.

This strip, which is represented by the dotted line *b*, is fed in the direction indicated by the arrow *z*, and is of a suitable width to pass through the slot *a*, which may be sufficiently wide for two or more collars abreast to be formed out of the strip, and certain operating-parts be duplicated or arranged accordingly; but it will here suffice to describe the same as for making collars in single file.

Said paper or collar-strip *b* is fed or drawn through the machine, over the bed A and extension A', to the latter, by the action of feed-rolls C and C', which may be geared together or made to operate in unison by frictional contact or bite of wheels C C', but the lower one, C, of these rolls only is driven, as, for instance, by belt and pulleys *d d'*, from a shaft, D, that derives its motion, by gear-wheels *e e'*, from a main shaft, E.

The upper feed-roll C' is supported in a swinging frame, F, pivoted at *f*, so as to allow of said upper roll being brought down to bear or to release its pressure on the collar-strip *b*, according as it is required to feed the latter to the collar-forming cylinders G G', or to pause in supply of the same thereto, while the patches or blanks are being stuck on to the collar-strip *b*. But while the collar-strip *b* is thus made to pause, for the purpose specified, by the release of pressure of the upper roll C', no actual pause takes place in the feed of it, so far as the run of the same through the collar-forming cylinders G G' is concerned, by reason of the rolls C C' being geared to run faster than the cylinders G G', which have a continuous rotary motion, by means of gear-wheels *e* and *g*.

The cylinders continuously form the collars, and take up the slack in the strip as produced by this intermittent faster feed of the rolls C C'.

The amount of slack and difference of speed established between the rolls C C' and collar-forming cylinders G G', must be in accordance with the length of the collars or distance of the button-holes from one another.

The collar-strip *b* is held or clamped, while the patches or blanks are being stuck on it, by the action of a clamp or holding-bar H attached to or projecting from the rear of the swinging frame F, which supports the roll C', so that when said roll C' is pressing down, for the purpose of producing feed of the collar-strip, the clamp is free or raised, and *vice versa*; that is, when the clamp H is down, or holding said strip stationary, the roll C' is raised, and free from bearing down on the collar-strip *b* and feeding the same forward.

The cylinders G G' are suitably finished on their peripheries with dies for embossing and cutting the collars in succession out of the collar-strip *b*, and punch-

ing the button-holes therein as said cylinders take up said strip, in the slack, with the cloth patches or blanks arranged on or cemented to it at the proper places for the button-holes.

The means for adjusting or timing the feeding-action of the rolls C C' and duration of the clamping-action of the bar H, on the strip, to suit various lengths of collars, also the means for giving the said clamping-bar and feed rolls their necessary pressure on the strip, will be hereinafter described.

The patching-strip *h*, of stout paper, cloth, or other suitable material, out of which the patches are formed, and which may be prepared with adhesive material properly distributed on it, is supplied from a roll above, and fed intermittently across, or at right angles to the travel of the strip *b*, through and between clamping-rolls I I', the lower one, I, only being driven, and such lower clamping-roll also being made to dampen the adhesive material on the strip *h*, by its contact with water or other suitable fluids in a trough, J, underneath it, any surplus supply of moisture being removed by a wipe-roll, K, that has spring pressure applied to its back. Said patching-strip *h*, in its run through the machine, passes over the bed-cover or portion B, and to or through feed-rolls L L', that operate in connection with an endless delivery-apron, M, carried by the lower one, L, and a back-roll, N.

Such feeding-devices to the strip *h* should move in unison with the clamping-rolls I I', for which purpose they may be connected by band and pulleys *i i*, and the necessary intermittent motion be communicated to them through a ratchet-wheel, O, on the shaft of the feed-roll L, by means of a pawl, P, jointed to a lever, P', which is connected with and operated by a vertically-reciprocating punch-stock, Q.

This punch-stock Q works in suitable guides, or ways, and is operated by eccentric side straps R R, from or through eccentrics S S, on the main shaft E.

Said punch-stock has fitted to it, at its bottom, a punch-carrier, Q', having punches K K in it of the necessary size and shape required to form the button-hole patches.

These punches may be set to occupy relative positions across or over the strip *h*, according to the necessary arrangement of the button-holes for any given formation of the collars out of the strip *b*, or distance of the adjacent button-holes apart.

For this purpose, they may be attached by set-screws, and made removable, to fit any of a series of holes in the carrier Q', or the latter may have a socket-fit or connection with the punch-stock Q, which will admit of said carrier being turned so as to swing or swivel the punches as required.

These punches, on the descent of the punch-stock, work through dies or holes in the bed-portion B, opposite corresponding openings in the portion A, fitted with anvils I I', which parts should be suitably constructed to admit of their adjustability, in conformity with the adjustment hereinbefore referred to, of the punches *k k*, so that the latter, when adjusted, will be opposite or in line with the dies and anvils.

A piece or strip of rubber may be fastened on top of the anvils I I', to secure a soft and elastic action for the punches, as the latter, in descending, punch out the patches or blanks from the cemented and dampened portions of the strip *h*, and carry them through the dies in the bed-portion B, and stick them, by pressure, on the paper strips *b*, and afterward rise or retire for a repetition of such action.

To prevent the punches from becoming gummed or clogged by their repeated contact with the gummed or cemented portions of the strip *h*, and to keep the dies through which they work also free, I propose to have the punches work through stuffing-boxes packed with paraffine or other suitable cleaning-material, such

stuffing-boxes to be arranged on top of the bed-portion B.

The alternate action of the feed-roller C' and clamp H to feed the patched collar-strip, and to secure the necessary pause in the travel of the same, for the purpose of putting on the patches as described, as also the necessary pressures of these devices on the collar-strip, may be effected, in part, by a spring presser-foot, T, connected with the punch-stock Q or lever P', and arranged to bear down on the clamp H each time the punch-stock descends, and serving to keep said clamp hard down on the strip while the punches are putting on the patches.

This depression of the clamp simultaneously raises the roll C' and stops the feed, but on the punch-stock rising again, the weight of the roll C' raises the clamp, and re-establishes the feed, by causing said roll to bite or bear on the strip. A spring pressure, however, may be substituted for the weight of the roll C', if desired.

As a substitute for the presser-foot T, I propose to employ adjustable means of a different character for timing, with the greatest nicety, the lift of the roll C', and for holding it raised till the patches have been secured on the strip *b*, also for establishing proper length of feed, and varying the same to suit different lengths of collar or distances of the button-holes from one another. Thus U, in figs. 4 and 5, is a link or vertical slide, connected with the end or ends of the shaft of the roll C', and carrying at its bottom an anti-friction roller, V, under or against which rotating cams W W' are brought to bear.

These cams lie face to face, and rotary motion is communicated to them, at a proper velocity, by or through any suitable gear applied to their shaft *m*.

They are for the most part concentric with their shaft, but are each formed with a rise, or lift, *n*, which lift or lifts, when coming round under the roller V, raise the roll C' and depress the clamp H, which action is only the reverse of operating on the clamp to lift the roll.

By making, however, the one, W, of these cams fast on its shaft *m*, or, preferably, adjustable by set-screws around the same, and the other cam, W', loose on said shaft, and adjustable, as by slots *r r* and set-screws *s s*, on the face of the other cam, provision is made for not merely varying the time for lifting the roll C', but also for lengthening or shortening, as required, the duration of its lift, according as the portions *n n* are brought in line or made to more or less overlap each other, so as to produce a longer or shorter lift. In this way may the feed and retention from feed of the strip be regulated to the greatest nicety.

Where collars of alternately-varying length throughout the strip are required, that is, first a long collar and then a short one, then substantially the same arrangement of means as shown in figs. 4 and 5 may be used, but with the addition, as represented in figs. 6 and 7, of a second set of cams, W² W³, with their lifts *n n'* and roller V, which cams operate conjointly with or in succession to the cams W W'.

Of course the driving-gear to the several motions may be varied to suit different combinations and circumstances, also various forms of collars may be made by the machine, for which purpose the collar-forming cylinders G G' may be of the ordinary or any suitable construction.

The patching-apparatus herein described may be used independently of the rolls G G', to simply patch paper or other material which may be delivered in continuous lengths into any suitable receptacle, or be taken up by a take-up roll, to be afterward cut into collars or treated in any other way.

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

1. The arrangement of the rolls O C', for feeding the collar-strip, the rolls L L', for feeding the patch-strip transversely to the collar-strip, and the punches k k', for cutting out the patches, substantially as herein specified.

2. The combination, with the patching-devices, of feeding-devices operating to feed the patched strips intermittently, substantially as and for the purpose herein described.

3. The combination, with the rising and falling feed or pressure-roll C', of the clamp H, operating intermittently on the collar-strip, substantially as and for the purpose herein specified.

4. The combination, with the rising and falling feed

or pressure-roll C', of the cam or cams W W¹ W² W³, adjustable substantially as and for the purpose herein set forth.

5. The combination of the feed-rolls L L' and clamping-rolls I I', for feeding the patch-strip, the punch-stock Q, with its punches k k' and their relative dies, the collar-strip feed-rolls O C', and the clamp H, the whole operating together substantially as and for the purpose herein described.

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Witnesses:

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