K. VOGEL.

SEWING MACHINE FOR BUTTONHOLES.

No. 80,520. Patented July 28, 1868.

Fig. 3.

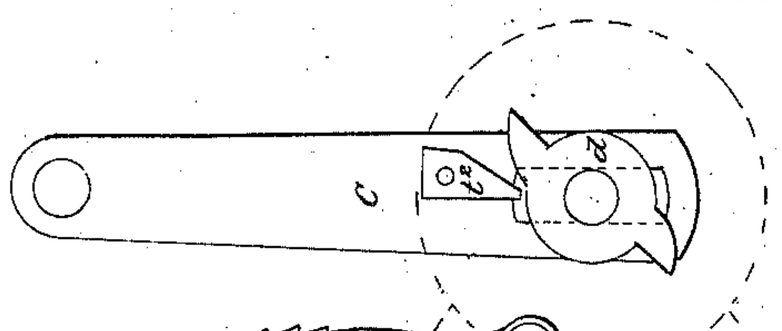


Fig. 2.

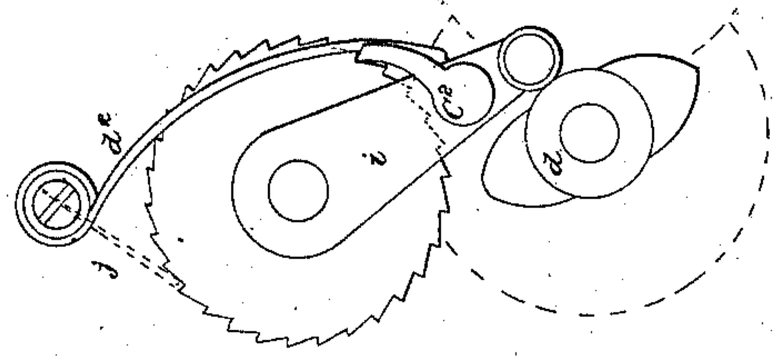


Fig. 1.

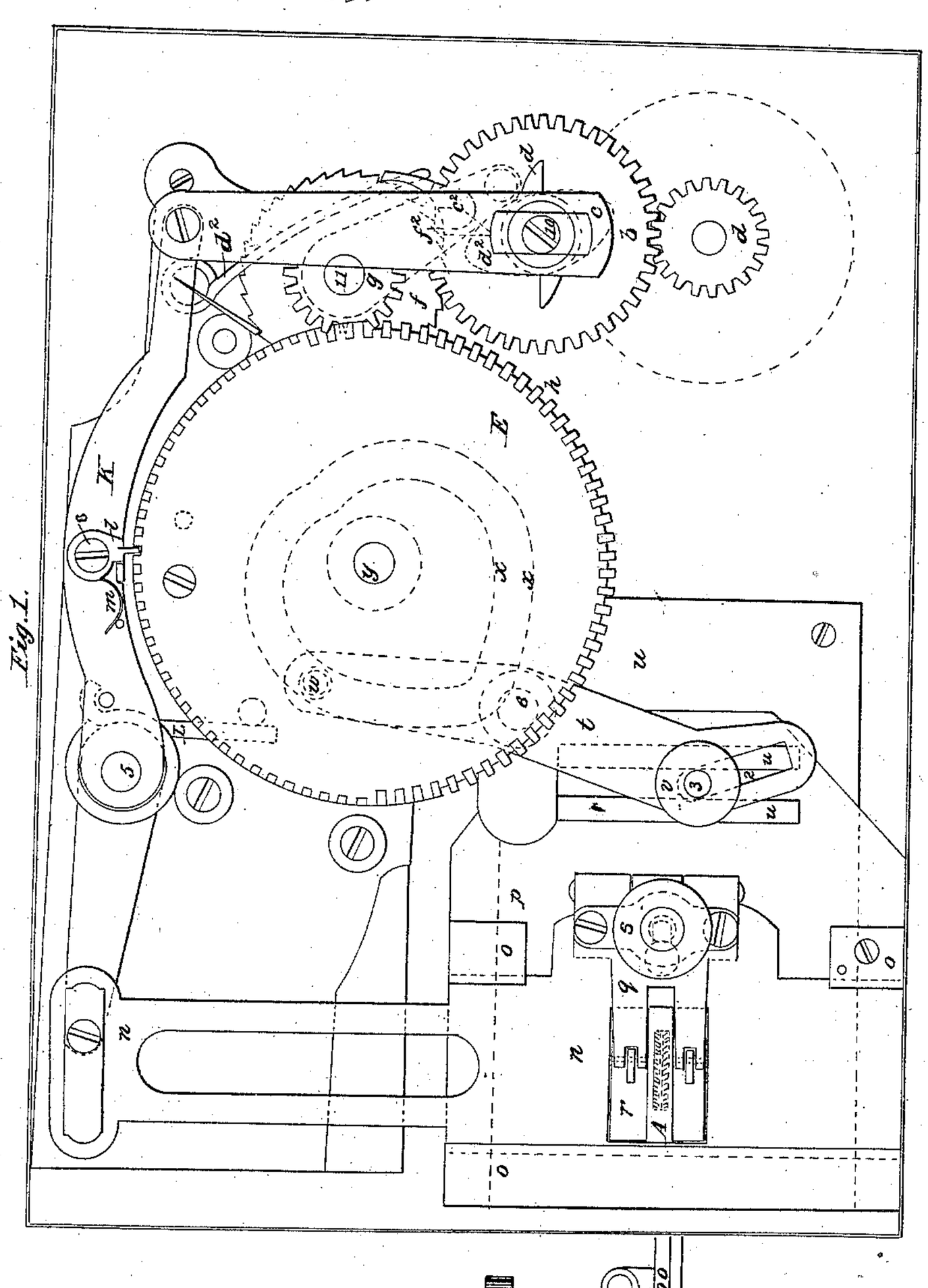
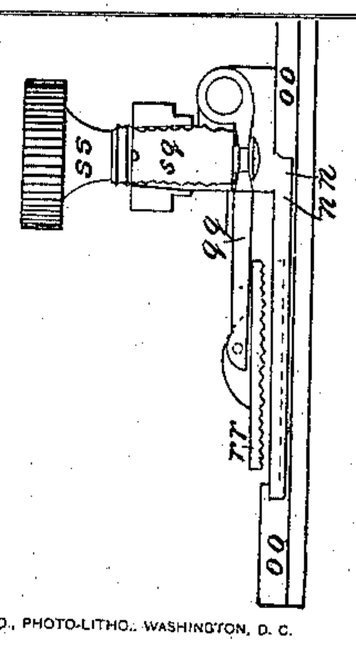


Fig. 4.



Witnesses:

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KASIMIR VOGEL, OF CHELSEA, MASSACHUSETTS, ASSIGNOR TO EBEN W. LOTHROP, OF SAME PLACE.

Letters Patent No. 80,520, *dated July* 28, 1868.

IMPROVEMENT IN SEWING-MACHINE FOR BUTTON-HOLES.

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, KASIMIR VOGEL, of Chelsea, in the county of Suffolk, and Commonwealth of Massachusetts, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in an improved mechanism designed to be attached to and operated in connection with common plain sewing-machines, and by means of such attachment said machines may be used for stitching button-holes and other over-edge work and embroidery, as hereinafter described.

Figure 1 of the accompanying drawings is a top view of said mechanism, with all its parts represented.

a represents a gear on the vertical shaft of a "Singer" family sewing-machine, which operates said attachment, when it is secured to the table of said machine and in connection with such gear, by imparting motion to the gear *b*, upon which is a cam, *d*, which works against a projection, f^2, indicated by dotted lines on the slotted connecting-arm *c*, (more fully shown in fig. 3,) which arm, *c*, being moved by said cam *d*, rocks the lever *k* on its stud, 5, and thus a lateral vibrating motion is imparted to the clamp *n n*, which holds and guides the material to be stitched. Around said stud 5 is a coiled-wire spring, *z*, which gives a return movement to the parts operated by the cam *d*. On the under side of said gear *b* is another cam, a^2, indicated by dotted lines, which works against a trundle on the end of the arm *i*, which arm swings on the stud 11 under the ratchet *f* and pinion *g*, as indicated by the dotted lines. On this arm *i* is a pawl, c^2, operated by said arm against the ratchet *f*, thus giving motion to said ratchet, and to the pinion *g* fixed on the same shaft therewith. Said pawl c^2 is held against said ratchet *f* by the spring d^2, and said ratchet is prevented from turning backward by the catch *j*. All these last-named parts are more fully shown in fig. 2.

E represents an irregular-toothed cam or former, which is attached to an under gear, *h*, and revolves therewith around the stud *y*. In the under side of said gear *h* is cut a groove in the form indicated by the dotted lines *x x*, in which groove the trundle *w*, on the lever *t*, which rocks on the stud 6, works, and, as said gear *h* revolves, imparts an intermittent forward and backward movement to the opposite end of said lever *t*, and through said lever to the plate *p*, which carries with it or feeds along the clamp *n n*, which holds the material to be stitched. Said lever *t* has a slotted end, 2, through which the pin 3, which works between the bars 4 4 on the plate *p*, passes, and forms the connection between the said plate and lever *t*. On said pin 3 are two washers, one above and one below the lever *t*, and the pin is secured in any desired position in the the slot of the lever by turning the thumb-nut *v*, and the extent of the movement of the plate *p* forward and backward according to the different lengths of button-holes to be stitched, is regulated by moving the pin 3 to different positions in the slot 2 in said lever *t*.

Figure 4 represents a sectional side view of the clamp, which holds and guides the material to be stitched.

s s is the screw, which, working in the hub s^2, depresses and raises the jaws of the clamp *r r*, between which and the bed *n n* of the clamp the material to be stitched is held.

In fig. 1, again, A represents a stitched button-hole in its proper position in the clamp.

In the process of stitching the button-hole A, the needle of the stitching-machine descends (when the button-hole is cut before stitching) alternately through the hole cut and the edge of the cloth around the hole, by reason of the lateral vibrations of the clamp holding the cloth produced in the manner described. Thus the plain sewing stitch, whatever it may be, of any machine to which this attachment is applied, is converted into an over-edge or button-hole stitch, and the extent of such vibrations limits the depth of the stitching in the cloth around the edges of the button-hole, and the extent of such vibrations or length of the stitches laterally is regulated and varied as desired, for button-hole or other stitching, by means of said irregular-toothed cam or former E.

The lever *k*, upon which is the spring-catch *l*, is rocked upon its hub, 5, by means of the cam *d* and the

spring *z*, coiled around said hub 5, as before described, and the inward movement of said lever *k* is regulated, as desired, by the revolving of the cam E, so that the spring-catch *l* on said lever *k* rests alternately on the ends of the teeth of said cam, and in their intermediate spaces.

During the forward intermittent movement of said clamp *n n*, to the extent of the length of the button-hole to be stitched, said cam E moves around on its axis intermittently nearly one-half a revolution, presenting, during said movement, to said catch *l*, alternately, the teeth and intermediate spaces on that portion of said cam, which teeth are of a uniform size and distance from the axis of said cam. Then, to stitch across or bar the end of the button-hole, four longer teeth and spaces are in like manner presented to said catch, which increase the extent of the vibrations of said lever and clamp laterally for a few stitches, and thus the stitching of one side and end of the button-hole is completed. Then, as the motion of the clamp is reversed and moves backward the length of the button-hole, the said cam E moves around, as before, nearly another half revolution, presenting, as before, to said catch *l*, teeth and spaces, alternately, like those on its opposite side, but at a greater distance from the axis of the cam, which greater distance throws out of range of the needle the side already stitched, and when said cam has thus nearly completed this last half of its revolution, it again presents to said catch four longer teeth and spaces, which increase the extent of the vibrations, as before, and thus finish off the last end and complete the stitching of the button-hole.

By varying the teeth around the circumference of said cam or former E, as has been shown, the length of the stitches laterally is regulated and varied according to the variations in the teeth and spaces, each tooth and space representing the length of a stitch laterally, and by making the circumference of said cam more irregular, the line of stitching may thereby be varied from a straight line, like that of the edges of a button-hole, to any irregular form, thus adapting it to stitching scallops, points, embroidery, and such other work as requires to be stitched on irregular lines and with variable lateral stitches.

It is obvious that the same results may be attained without deviating from the principle of my invention, by using, instead of a revolving former like the cam E, an irregular cam or former, with varying teeth constructed upon and embodying substantially the same principle of invention as the cam E, but formed and adapted to work with a rocking or reciprocating instead of a rotary movement for like purposes and with the same results.

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

1. The irregular-toothed cam or former E, whether having an intermittent rotary, rocking, or reciprocating movement, substantially as and for the purposes described.

2. The several parts of the described mechanism, when constructed, combined, and operating substantially in the manner and for the purposes described.

KASIMIR VOGEL.

Witnesses:

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