2 Sheets—Sheet 1.

W. C. HICKS.

Sewing Machine.

No. 29,268. Patented July 24, 1860.

Fig. 1

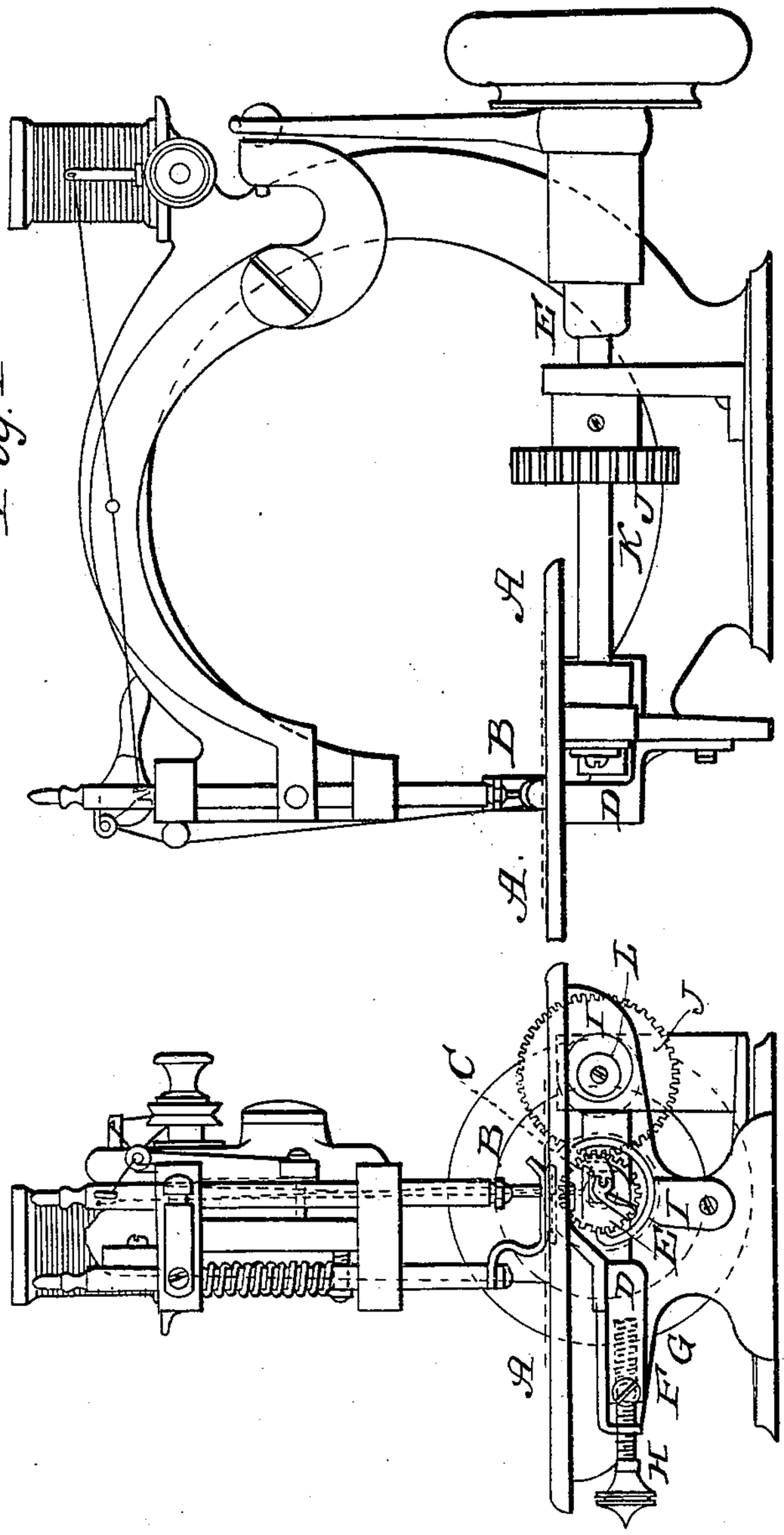
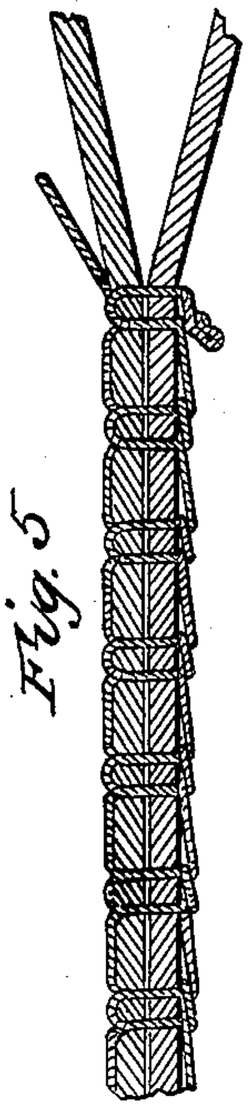


Fig. 2.

Fig. 5



Witnesses
W. Saufal
E. Ring.

Inventor
by Wm. C. Hicks.
A. Block his atty.

2 Sheets—Sheet 2.

W. C. HICKS.

Sewing Machine.

Patented July 24, 1860.

No. 29,268.

Fig. 3

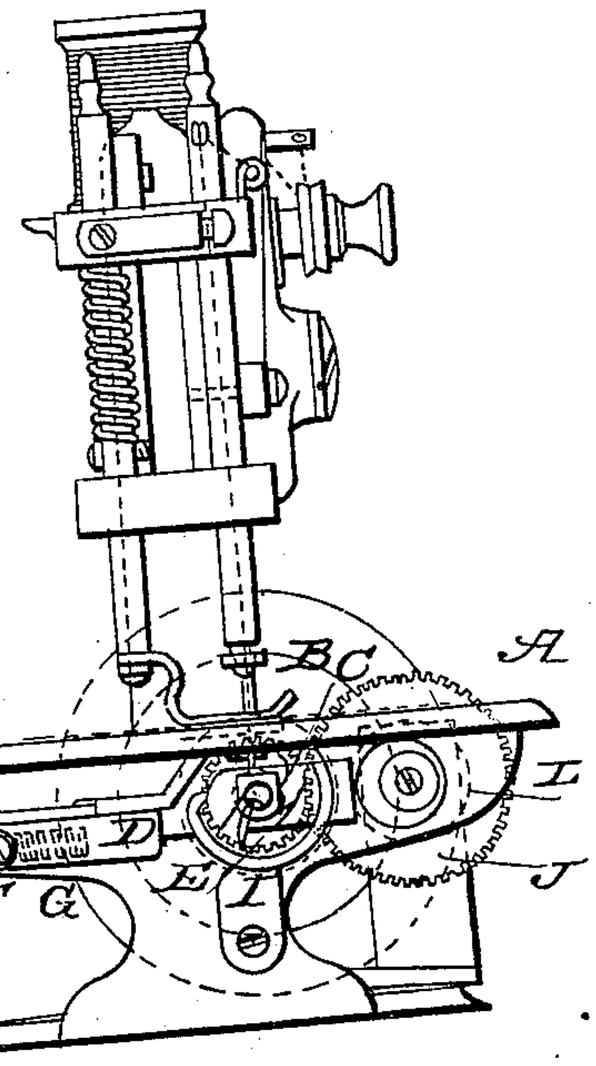
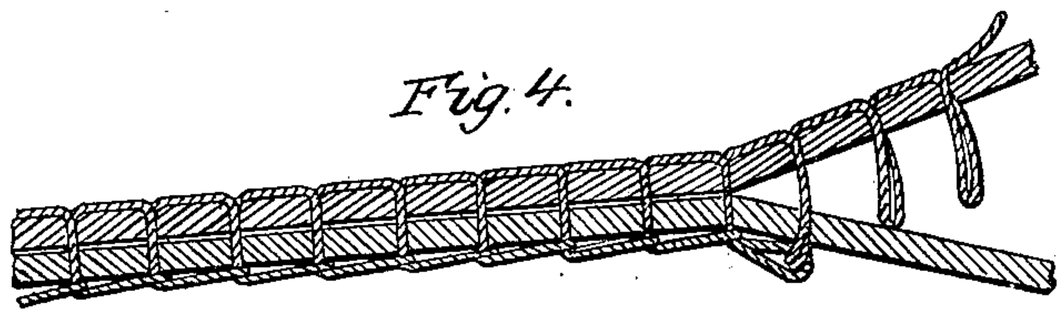


Fig. 4.



Witnesses
W. Saifar.
E. Rugg.

Inventor
Wm C. Hicks by
A. Bleak his atty.

UNITED STATES PATENT OFFICE.

WM. CLEVELAND HICKS, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **29,268**, dated July 24, 1860.

To all whom it may concern:

Be it known that I, WILLIAM CLEVELAND HICKS, of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful mode of sewing or uniting cloth or other material by a succession of differential chain-stitches automatically or by the aid of mechanism; and I do hereby declare that the following is an exact and full description of the same, reference being had to the accompanying drawings, the same making part of this specification.

It is unnecessary in the present application to otherwise than briefly allude to the method heretofore practiced of sewing by the aid of machinery in a succession of chain or tambour stitches. Such character of stitch is the one now commonly adopted for machine-sewing where a single thread only is used. However great its advantages, there are well-known defects peculiar to such "stitch," among which may be mentioned its failing to make a tight seam in sewing two pieces of cloth or other material together, by its allowing said two pieces to come apart if, by accident or wear, one of the many loops necessary to form the seam is "dropped," broken, or fails to interlock with its adjoining loop. This liability of the seam to rip open renders the tambour or chain stitch useless for many purposes, and is a serious defect in all.

The object of my invention is to remedy this defect in machine-sewing, and I do it in a manner that has not heretofore been practicable in any of the many single-thread chain-stitch sewing-machines, inasmuch as it has been the aim with all of these machines in which an automatic feed of the cloth is used to sew in a series of stitches of equal length, with provision, of course, for sewing coarse or fine; and to this principle of action my invention is diametrically opposed.

To illustrate my invention I would observe that when the stitches in any one series of stitches (coarse or fine) are of equal length, as represented in the diagram (marked Fig. 4) in the accompanying drawings, and when two pieces of cloth are sewed together, no difficulty is experienced after once breaking a stitch in ripping the seam or separating the two pieces, as each two adjoining stitches in succession, being of equal length, and the pieces of cloth separating with facility in a succession of distances equal in length to the stitches, the stitches readily pass the one out of the other in succession, the cloth, in separating, giving a sufficient space for them to do so. By my invention this ripping of the seam is made impossible, whether the attempt to rip be begun by straining to tear at a dropped stitch, or cut or worn, yet while thus making what may be termed a "light seam" I retain all the advantages of a single-thread or chain stitch, and am able to pull out the seam by hand from one end, (termed "raveling,") as heretofore.

My invention is applicable to any chain-stitch sewing-machine, and the mechanism for carrying it into effect may be variously modified; but the hereinafter-described devices, in connection with a well-known style of chain-stitch machine, will suffice to explain my invention.

Referring to Figs. 2 and 3 of the accompanying drawings, A is the cloth bed or table of a machine, B the reciprocating eye-pointed needle, and C a revolving hook or looper for catching the one loop as it is brought down by the needle and causing it to interlock with the succeeding loop.

D is an ordinary feeding bar or device operated by a cam or cams on the looper-shaft E, and arranged to project through the cloth-bed, so as, in connection with a foot or presser above it, to feed the cloth forward intermittently or at intervals by working up against the cloth and moving it forward the length of a stitch, and then moving down from the cloth and in a contrary direction to the feed, as well understood. Such rising and falling and reciprocating intermittent feed, with its ordinary stops and means for varying its constant stroke in the formation of a seam to sew coarse or fine, or any other ordinary feeding mechanism, is only calculated to effect sewing in stitches of equal length successively, according to the set given the feeder as coarse or fine sewing is required. Such action does not meet the purpose of my invention, which requires the chain-stitches to be of irregular length in the running of a seam, and preferably alternately long and short, though it may be alternately two or three long and one short, or two or three short and one long, or the stitches otherwise equivalently disposed, so that if not at regular intervals at least at

frequent intervals the seam or series of chain-stitches in the seam will be caught here and there by the interlocking of a comparatively long stitch with or by a short one, as hereinafter more fully described; but my invention is best illustrated and the desired object is most effectually attained by an alternate arrangement of long and short stitches, and I therefore show the mechanism I employ to illustrate my invention as pitched to effect that result.

With the cloth-feeding mechanism I have before described are shown combined a stationary projection, F, and spring G, the latter bearing against the former and acting at its other end against the feeding-bar to urge the bar back at the close of each feeding-stroke.

Attached to the feeding-bar, on the opposite side of the projection F to which lies the spring G, is an adjusting-screw, H, that, being adjusted to strike sooner or later the projection F in the return-stroke of the feeder, regulates the general length of the stitches—that is, varies the feed to sew coarse or fine. Said screw, however, need only be used in the present instance to regulate the length of the long stitches in the combination of long and short stitches I have before referred to, as it is seldom that the short stitches in such combination require to be varied. A special or additional device is used to limit the stroke of the feeder to effect the short stitches, which additional device need not, as previously observed, limit the feeder in its long strokes, and may, if desired, be adjustable to regulate the length of the short stitches. Thus in gear with the shaft E by gears I J, of disproportionate diameters, is a shaft, K, running in the present instance once only during every two revolutions of the first-named shaft E. When the arrangement of stitches is not designed to be first a long and then a short one alternately, but, say, two or three long and one short, or two or three short and one long, then the relative speeds of these shafts may be varied, or the altered condition be otherwise met. On the feed end of this second shaft, K, is an eccentric or cam, L, which may be called the "feed-changer," inasmuch as it intersperses with the long or general feed, whatever its adjustment may be, a series of short feeds at intervals. This eccentric is shown so set as that the feeding-bar D, every alternate back-stroke, strikes it before the adjusting-screw H reaches the stationary stop F, which of course necessitates every alternate stitch being made shorter than the next stitch, and this difference in the stitches as effected by the adjusting-screw H and eccentric L, acting as stops to the feeder in succession, should preferably be made considerable. By shifting the eccentric L on its shaft, or by setting said shaft a little closer to or farther from the main feed-operating shaft, the length of the short stitches may be increased or diminished; also, by sliding the eccentric L out of striking play with the feeding-bar, or otherwise disconnecting these devices from acting the one against the other, the ordinary chain-stitch or series of stitches of equal length and adjustable by the screw H to any fixed uniform length may be made. Where a combination of alternate long and short stitches, such as I have described, are required, the adjusting-screw H may, if desired, be dispensed with, and the feeding-bar made to strike alternately the eccentric L, first, at a point farthest from the center of the latter, and next at a point nearest thereto, and so on in succession; but such may not be desirable excepting where very long stitches are required. Now, it will be seen on reference to Fig. 5, in which two pieces of cloth are shown as sewed together by alternate long and short chain-stitches, that in attempting to rip the seam by separating the two pieces of cloth said cloths are restrained by the short stitches from separating sufficiently far to let any one long stitch pass through its adjoining short stitch, and that the long stitch is caught by the short stitch, and the latter, by the strain thrown upon it, made to form a tight noose, so as to clip or hold the long stitch, and the greater the effort to separate the cloth the tighter the short stitch is drawn round or on the long stitch. In this way the seam, though sewed by a series of chain-stitches, is made a tight one.

Having thus described my invention and shown how it may be carried into effect, I claim as new and useful—

The application to a single thread sewing-machine of an automatic feeding apparatus or device operating in contact with an eye-pointed needle or looper, or their equivalents, so as to make a succession of chain-stitches of different lengths, and so that the long stitches in the seam are connected by one or more short stitches alternately, substantially as and for the purpose or purposes herein set forth.

WM. CLEVELAND HICKS.

Witnesses:

WILLIAM H. HADLEY,

JAMES M. HICKS.