T. M. RICE.

EMBROIDERING ATTACHMENT FOR SEWING-MACHINES.

No. 192,283. Patented June 19, 1877.

Fig. 1

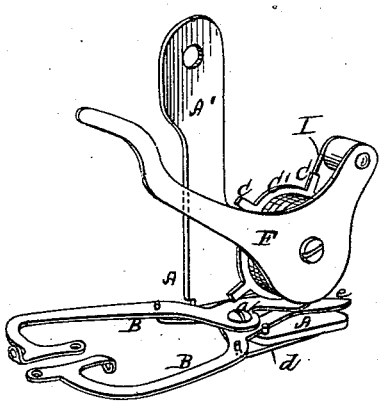


Fig. 2

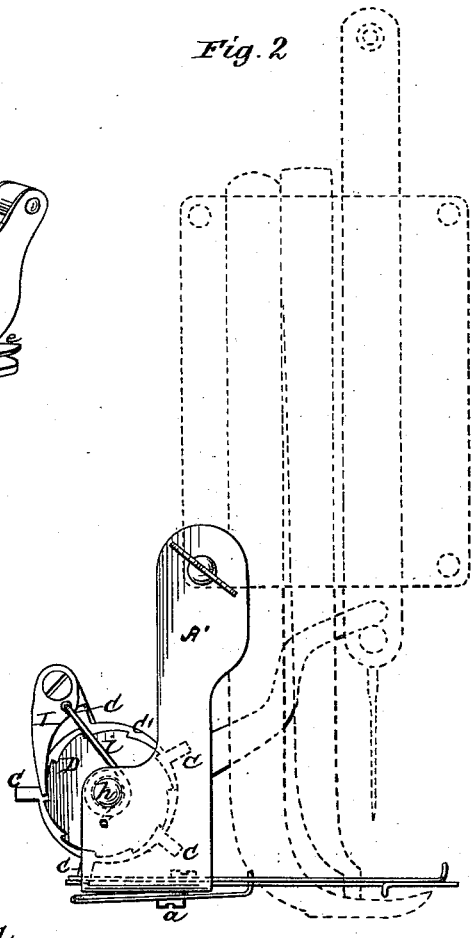


Fig. 3

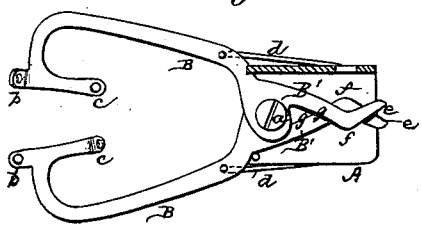


Fig. 4.

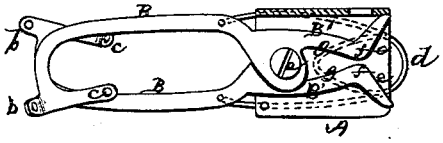
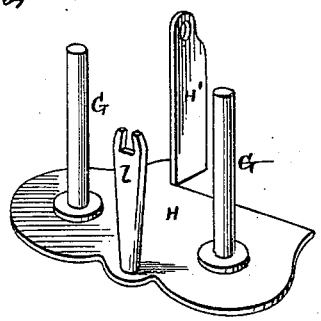


Fig. 5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN EMBROIDERING ATTACHMENTS FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **192,283**, dated June 19, 1877; application filed May 2, 1877.

To all whom it may concern:

Be it known that I, T. MARSHALL RICE, of Kalamazoo, Michigan, have invented certain new and useful Improvements in Embroidering Attachments for Sewing-Machines, of which the following is a specification:

The attachment in which my invention is comprised is designed to be detachably connected with a sewing-machine of ordinary or suitable construction, and is characterized principally by the combination, with vibrating thread-crossing arms, of intermittently-moving fingers, which are operated each in succession to enter between and spread apart the arms, and then to quit the arms for the purpose of allowing the latter to come together again. This movement of the arms is intermittent, and serves to cross the thread alternately in opposite directions along the line of stitching. It takes place only when the needle is rising or out of the cloth, and has the effect of crossing the two embroidery or surface threads at a point under the needle, so that the stitch formed by the descending needle will secure the two surface-threads to the work at their point of crossing.

The vibrating arms are actuated to move in the one direction by the intermittently-moving fingers and in the other direction by a spring, which, by its recoil, actuates them as soon as they become disengaged from said fingers.

The means by which the intermittently-moving fingers are operated consist of a vibrating angle-lever which, by engaging the needle-yoke nut, derives its movement from the rising and falling needle-bar, and carries a spring-pawl that engages a rotary ratchet-wheel, to which is made fast the fingers or the disk that carries said fingers.

The nature of my invention and the manner in which the same is or may be carried into effect will be understood by reference to the accompanying drawing, in which—

Figure 1 is a perspective view of an attachment made in accordance with my invention. Fig. 2 is an elevation of the same. Fig. 3 is a plan representing the thread-crossing arms in their open or spread-apart position. Fig. 4 represents the same arms in their closed position.

The several working parts of the attachment are all carried by a frame, A, which is adapted to be secured to a sewing-machine of ordinary or suitable construction. The frame will, of course, vary according to the style of machine for which it is intended, and according to the manner in which it is to be secured to the machine, whether to the cloth-plate or to the head. The attachment shown in the drawing is adapted to be used with the Davis sewing-machine, and is to be attached to the head of the machine by the shank A′, which is clamped to the rear plate of the head by the back bottom face-plate screw, as indicated in the drawing, where the head, presser, feed, and the needle-bar are indicated by dotted lines.

To the base of the frame A are pivoted, at *a*, the two embroidering-thread carrying-arms B, each of which is a counterpart of the other, as seen in Fig. 3. The front end of each arm has thread-eyes *b c*, through which passes a thread from a spool on a rack on the machine, in the manner indicated. Each arm has its own thread, and the two threads, after passing to the arms, are carried back under the presser and the feed. The two arms are in different horizontal planes, so that the end of one may move in its vibration past the end of the other without danger of interference.

The two arms are normally spread apart as to their thread-carrying ends by means of a spring, *d*, as shown in Fig. 3. In this position their opposite ends B′ cross each other slightly. The interior opposite edges of these ends are peculiarly formed. They have outer inclined portions *e*, which converge toward central portions *f*, and thence they diverge from one another, as at *g*.

The inclines *e* are to permit the intermittently-moving fingers hereinbefore named, each in its turn, to spread apart the ends B′, to rest momentarily between the parallel faces *f*, and thence to pass out from between the ends into the space left by the divergent faces *g*.

When the needle rises one of the intermittently-moving fingers enters between and spreads apart the ends B′, and consequently closes up or crosses the thread-carrying ends of the arms. This has the effect of crossing their threads under the needle. The finger

rests without motion between the faces *f* while the needle descends and sews the threads at their point of crossing to the cloth. When the needle again rises the finger is moved forward from between the ends B′, and the arms consequently move apart with the effect of crossing their threads in the opposite direction, and the crossed threads are, as before, sewed to the cloth by the descending needle.

The intermittently-moving fingers above referred to are indicated at C. They radiate from a hub or disk, C′, mounted to revolve on a stud, *h*, projecting from frame A. Fixed to the disk C′ is a ratchet, D. There are two ratchet-teeth to each finger. Mounted on the same stud *h* is the vibratory angle-lever F, whose shorter arm carries a pawl, I, mounted on a pin projecting laterally from the end of said arm, and so located as to engage the ratchet. The pawl is held in engagement with the ratchet by a spring, *i*, one end of which is attached to the pawl. The other end is first coiled around the stud *h*, and is then fixed to frame A. Under this arrangement the spring not only serves to hold the pawl down on the ratchet, but also serves to pull down the longer arm of the angle-lever. This arm rests upon the needle-yoke nut, and is consequently raised when the needle-bar rises. When, on the other hand, the needle-bar descends, the spring *i* causes the longer arm of the lever to move in a corresponding direction. Thus the lever is moved in one direction by the needle-bar and in the other direction by the spring. If desired, however, the longer arm of the lever may be slotted or otherwise formed to engage the nut on the needle-bar, so as to have a positive movement in both directions.

The embroidery or surface threads are taken from spools specially provided. A rack for such spool is shown in Fig. 5. G G are the two vertical spool-pins, supported by a frame, H, provided with an upright arm, H′, by which the rack may be secured to the head or other suitable part of the sewing-machine. The two threads pass through a thread yoke or guide, *l*, and thence to the thread-crossing fingers.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of two pivoted thread-carrying arms, formed at one end with cam or inclined surfaces, substantially as described, and intermittently-moving fingers, each of which in turn enters between and spreads apart these cam-like or inclined ends of the arms, substantially as and for the purposes set forth.

2. In an embroidery attachment for sewing-machines, the combination, substantially as set forth, of two horizontally-vibratory thread-carrying arms, with intermittently-moving fingers, each of which in turn enters between and spreads apart the cam or inclined ends of the arms, and a spring or springs by which said arms are returned to their normal position when disengaged from said fingers.

3. The two horizontally-vibratory thread-carrying arms and their spring or springs, in combination with the intermittently-moving fingers and the ratchet, spring-pawl, and lever for actuating said fingers, substantially as set forth.

4. The embroidery attachment for sewing-machines, consisting of the two thread-carrying arms and their spring or springs, the intermittently-moving fingers, the ratchet, pawl, and lever, all mounted on and carried by a frame adapted to be attached to the sewing-machine, and combined and arranged for joint operation, as shown and described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

T. MARSHALL RICE.

Witnesses:
ESTELLA E. DAVIS,
NELLIE ELDRED.