

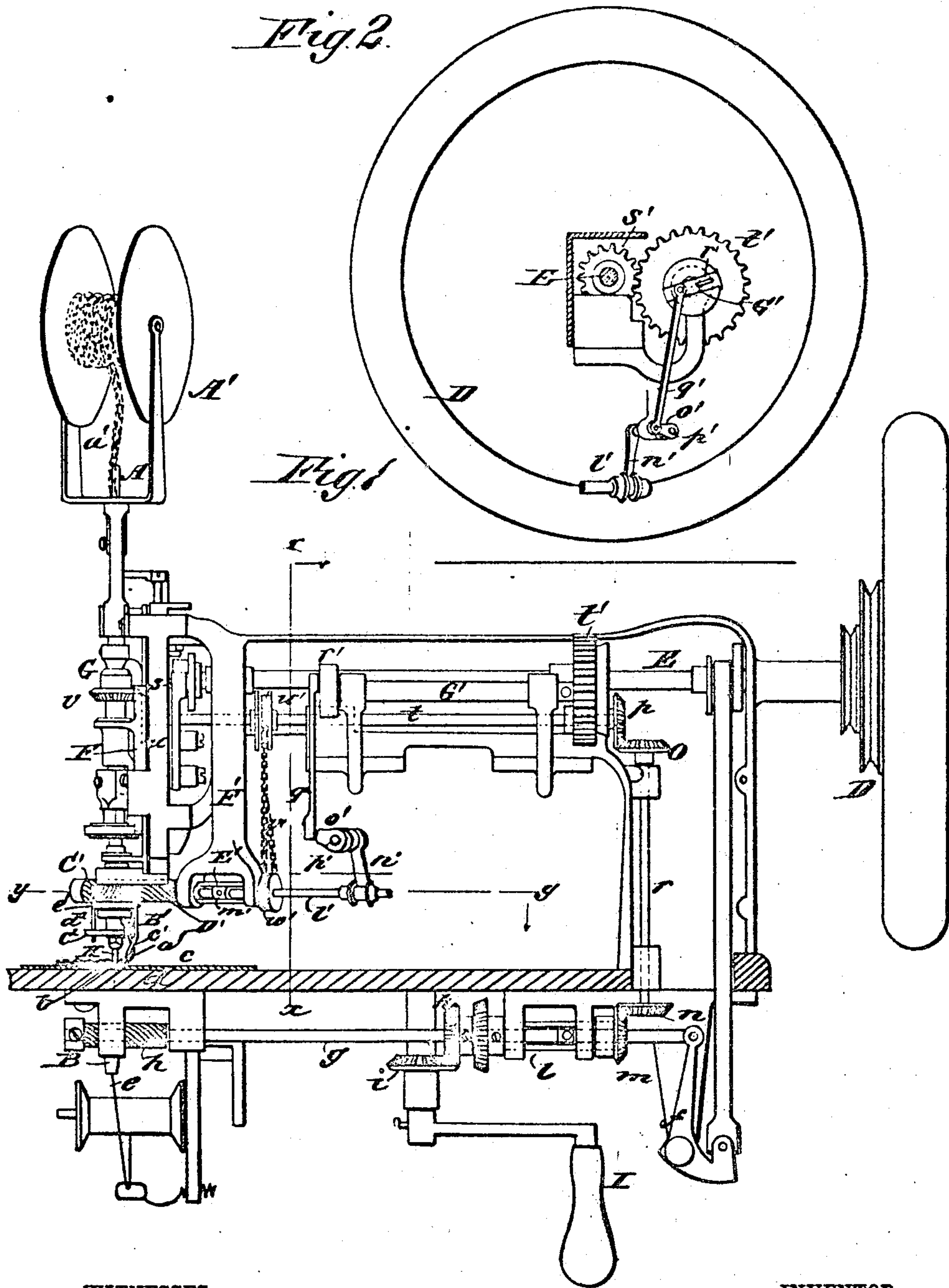
(No Model.)

2 Sheets—Sheet 1.

H. E. SCHMITZ & E. ALDOM.
EMBROIDERING MACHINE.

No. 337,088.

Patented Mar. 2, 1886.



WITNESSES:

C. M. Ardle.
C. Sedgwick

INVENTOR:

H. E. Schmitz
E. Aldom

BY

Munn & Co.
ATTORNEYS.

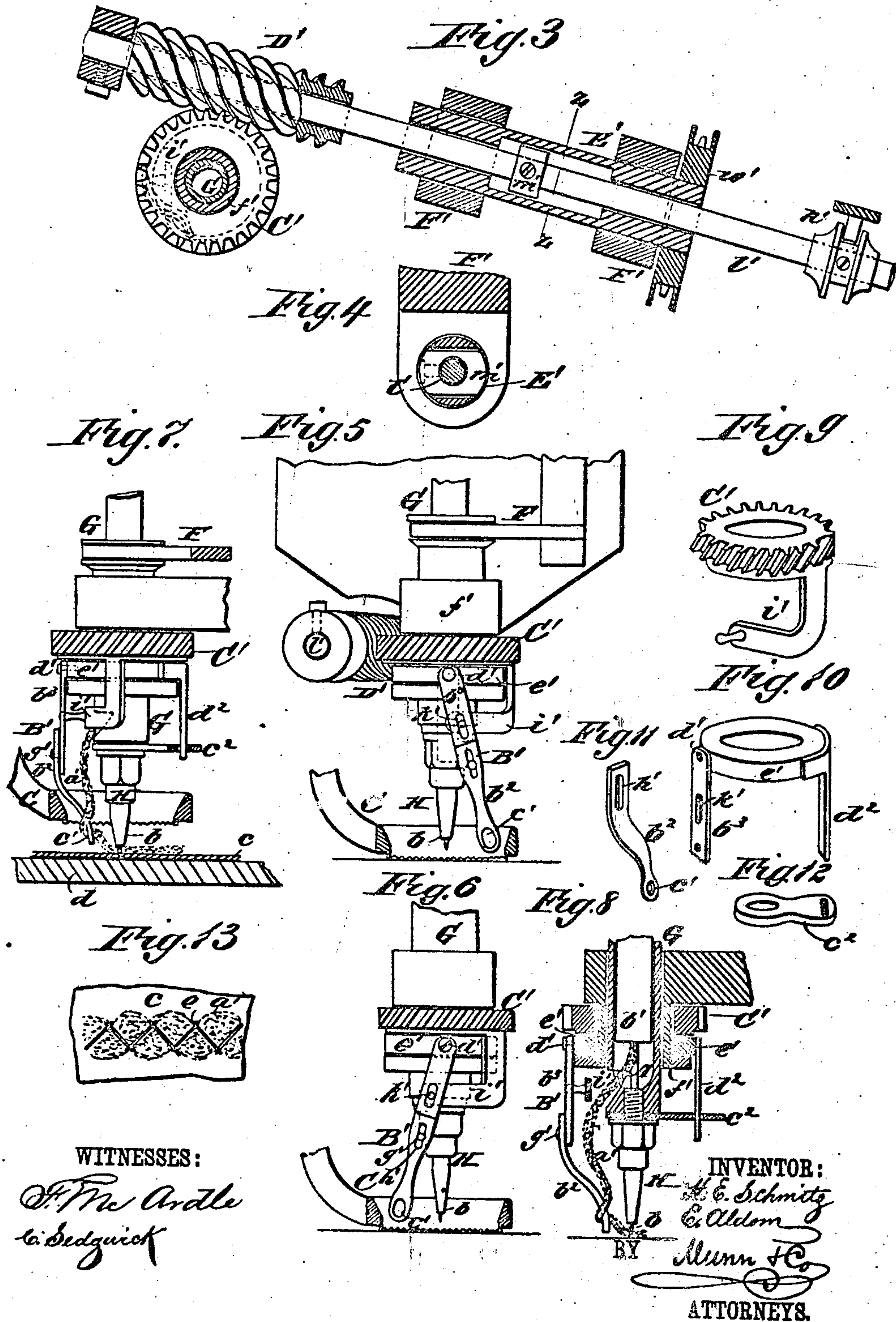
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UNITED STATES PATENT OFFICE.

HENRY E. SCHMITZ AND EDWARD ALDOM, OF BROOKLYN, NEW YORK.

EMBROIDERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 337,088, dated March 2, 1886.

Application filed October 30, 1885. Serial No. 181,412. (No model.)

To all whom it may concern:

Be it known that we, HENRY E. SCHMITZ and EDWARD ALDOM, both of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Embroidering-Machines, of which the following is a full, clear, and exact description.

This invention consists in a novel attachment to sewing-machines for embroidering, substantially as hereinafter described, and pointed out in the claims, and in which, for example, a single-thread chain-stitch is used to secure on the surface of the cloth or other material to be embroidered a strip or length of cord, braid, chenille, beading, or other embroidering-strip of any suitable color or colors.

The particular class of sewing or embroidering machines to which the invention is designed to be applied is that in which a universal feed-motion is used—as, for instance, the Bonnaz machine, patented November 10, 1868, No. 83,909. The leading feature of said Bonnaz machine, and which is the only one that has any bearing upon our invention, consists, as recited in said Letters Patent No. 83,909, in combining the several working parts of an embroidering-machine in such a manner that a universal feed-motion caused the cloth to move in any direction desired, and the hooks or needles which made the stitch moved, in combination with said feed-motion, so as not to change their relative positions to each other, whereby embroidery-work of any curved or intricate design could be made at any desired speed and without turning the cloth. We use substantially the same mechanism for this purpose as was used in said universal feed-motion machine, and therefore shall here only briefly describe or refer to such mechanism, and show in the drawings such leading parts thereof as are or may be necessary to elucidate our attachment, the action and object of which is that, while the machine makes an ordinary single thread or any suitable stitch, either in a straight or curved direction, the stitches present a zigzag appearance across the embroidering cord, chenille, &c., laid on the surface of the cloth by said cord, chenille, &c., being thrown alternately each succeeding stitch to opposite sides of the line of stitch; and the invention consists in novel means for

said purpose, substantially as hereinafter described, the same including a rocking pivoted arm or vibrating lever for carrying and laying the cord, chenille, &c., and made capable of rotation in common with the needle, so as to follow the needle when shifting the line or course of feed, and so that it will always be brought or occupy a position in front of the hook or eye of the needle.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a partly-sectional side elevation of a Bonnaz embroidering-machine in part, with our invention applied; but the invention is equally applicable to other universal feed-motion machines. Fig. 2 is a transverse section in part upon the line *xx* in Fig. 1. Fig. 3 is a horizontal section, on a larger scale, upon the line *yy* in Fig. 1, of certain mechanism for operating the arm or lever which lays the chenille, &c., on the cloth. Fig. 4 is a transverse section upon the line *zz* in Fig. 3. Fig. 5 is a front view in part with the ring of the feeder in section, mainly in illustration of the lever and its mechanism which lays the chenille; Fig. 6, a similar view to Fig. 5, but showing the lever after it has been vibrated to the opposite side of the line of stitch. Fig. 7 is a side view of parts shown in Figs. 5 and 6, and Fig. 8 a vertical sectional view of the same. Figs. 9, 10, 11, and 12 are views of certain details detached; and Fig. 13, a face view of a piece of cloth embroidered in accordance with our invention.

A is the needle-bar of a Bonnaz or universal feed-motion machine, carrying a hooked needle, *b*, and having a vertical reciprocating motion imparted to it in piercing the cloth *c*, which is supported by the cloth-plate *d*, the needle-hook taking the thread *e* beneath the cloth-plate and drawing it up through the cloth, then holding the thread while the feed motion takes place, and afterward returning downward to make the succeeding stitch.

B is the oscillating looper, (seen only in part,) which presents the thread to the hook of the needle each descent of the needle-hook, said looper taking hold of the thread, and when the needle has arrived at its lowest position making a turn for the greater portion

of a circle and laying the thread around the needle that on rising takes hold of the thread.

C is the cloth-feeder, of ring shape, surrounding the needle, and having, as in ordinary sewing-machines, a vibratory horizontal as well as a vertical motion, besides universal feed motion.

D is the driving-wheel of the machine, and E is the main shaft, connected at its forward end by an eccentric pin, *s*, with the needle-bar driver F, which, holding the needle-bar carrier G by suitable collars, imparts to said carrier and to the needle-bar A, secured thereto by a pressure-screw, the necessary vertical reciprocating motion.

H is the nipple surrounding the needle, and which is stationary and holds down on the cloth until the needle has cleared the cloth, to prevent the hook of the needle from pulling the cloth upward, but which afterward rises to permit of the feed of the cloth. The mechanism for thus operating the nipple may be the same as that used in the Bonnaz machine. The looper is turned the amount necessary to throw the thread into the path of the rising needle-hook by a bell-crank, *f*, deriving its motion by an eccentric from the main shaft E, and operating a sliding shaft, *g*, having on its forward end a screw, *h*, which engages with the looper, to operate it as required.

The vertical and horizontal motions of the feeder C are or may be effected by means substantially similar to those used in the Bonnaz machine referred to, and the mechanism which gives to the machine its universal feed motion does not essentially differ from that previously used. Thus I is the crank or handle beneath the platform of the machine, and secured on a vertical shaft, by which the feed may be directed by hand as required on turning the handle I. Upon this vertical shaft is a bevel-gear, *i*, which engages with a gear, *k*, on a tubular shaft, *l*, through which the shaft *g* is free to independently slide, as well as to rotate with.

Motion is transmitted from the tubular shaft *l*, when rotated, by gears *m n o p*, upright and horizontal shafts *r t*, and gears *u v*, to the needle-bar carrier G, so that by turning the crank I a combined turning movement is given to the looper, to the needle-bar carrier, and to the means connected with said carrier which controls the direction of the feeder, in order that any design, no matter how complicated, may be produced without turning the cloth, but by simply directing its motion by turning the crank, all as in the Bonnaz machine hereinbefore referred to, and other like machines.

Our attachment to such universal-feed embroidery-machine is substantially as follows: The chenille or other embroidering material *a'* is supplied from a reel, A', mounted on the needle-bar carrier G, and is passed down through said carrier, or rather through a tube, *b'*, fitted therein, to and through an eye, *c'*, in the lower end of an arm or lever, B', near the

surface of the cloth, and within the bearing or ring portion of the feeder C. This lever is pivoted at *d'* to a ring, *e'*, arranged around a tubular stud, *f'*, on the under side of the frame of the machine, and through which the needle-bar carrier G works. Said lever might be all in one piece; but it is preferred to make it of two independent sections or lengths, *b² b³*, adjustable one over or along the other, and united to each other, as by a screw, *g'*, passing through a slot, *h'*, in one of the sections, or by any other suitable fastening, to provide for lengthening or shortening the lever, as required. The lever B' has a vibrating motion from its pivot *d'*, as a center, during the laying of the chenille or its substitute *a'* on the cloth to be embroidered, for the purpose of throwing the chenille, &c., each succeeding stitch alternately to opposite sides of the line of stitch, which will cause the stitching-thread *e*, although straight on the under side of the cloth, to present a zigzag appearance across the chenille, &c., *a'*, on the upper surface of the cloth, as seen in Fig. 13. The means shown for thus vibrating the lever B', which vibration takes place in all directions of the feed, are as follows: Arranged around the tubular stud *f'* is a worm-wheel, C', from which a lower crooked arm, *i'*, projects, that engages with a slot, *k'*, in the lever B'. Gearing with this wheel C' is a screw or combined screw and rack, D', that is made capable of having both a longitudinal sliding and a rotary motion, but which has only a longitudinal forward and backward sliding motion when operating the wheel C', to throw the chenille by the lever B' to opposite sides of the line of stitch alternately, as described. Thus the shaft or shank *l'* of this screw is fitted to slide through a slotted guiding-tube, E', supported in bearings in a bracket, F', and serving by a projection, *m'*, on said shank, fitting the slot in the tube, to confine the screw D' to a longitudinal or reciprocating sliding movement, excepting when the tube E' is turned, when the screw D' will be turned with it. The screw D' is longitudinally reciprocated to throw the lever B' to opposite sides, alternately, of the line of stitch by means of cranks or arms *n' o'*, pivoted at *p'* and vibrated by a rod, *q'*, adjustably connected with a crank, *r'*, on a revolving shaft, G', driven by gears *s' t'* from the main shaft E. This gives the necessary oscillating motion to the wheel C' to vibrate the lever B', as described, the screw D' then simply operating as a rack. When the hand, however, is applied to the crank or handle I, to change the direction of the feed of the machine, or, in other words, to give to it its universal feed, then the screw D' is not only longitudinally reciprocated to vibrate the lever B', but is also rotated or turned about its axis in the same direction as the needle-bar carrier is turned, so as always to keep the lever B' or its eye *c'* in front of the hook of the needle *b*, which position is necessary to secure the proper laying of the

stitch across or about the chenille, &c., as the latter is vibrated to opposite sides of the line of stitch. The means shown for thus rotating the lever B' to follow the hook of the needle as it is rotated or turned, and which is done by turning or rotating the screw D', are as follows:

Upon the shaft *t* of the mechanism, which is used to change the direction of the feed, is a pulley, *u*', that, by means of an endless chain, *v*', serves to rotate a pulley, *w*', fast on the shaft *l*' of the screw B'; or any other suitable devices connected with the shifting mechanism of the feed may be used to rotate the lever B' in common with the hooked needle.

When the feed is in a straight line or course, and no motion is given to the handle I, then the needle-bar and its carrier G do not turn, but have simply a straight up-and-down motion. The vibrating lever B is then held from turning, so as to keep it opposite the hook of the needle, by a slotted arm, *c*², fast on the needle-bar carrier, and receiving through it an arm, *d*², fast on the ring *e*', which carries the lever B'; but as the ring or lever carrier *e*' is free to turn about the tubular stud *f*', then, when the needle-bar carrier is turned, as in changing the course of the feed, by the working of the handle I, the slotted arm *c*², turning with the needle-bar carrier, operates as a driver instead of a guide on the arm *d*², to rotate the ring *e*', and the lever B', in common with the needle-bar carrier. Thus in all manipulations of the feed the lever B' will be kept in front of the hook of the needle.

The invention may also be applied to double or lock thread stitch machines using a universal feed, the lever B' being operated, as described, to always face the eye of the needle in all changes of the feed.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In universal feed-motion embroidering-machines in which the embroidering cord or material is alternately laid upon opposite sides of the line of stitch, the combination, with the rotatable needle-bar carrier and universal feed-motion devices, operating substantially as described, of the arm or lever B', which carries and lays the embroidering cord or material, pivoted to swing or rock from an independent center, *d*', outside of and at an

angle to the axis of rotation of the needle-bar, and made capable of rotation in common with the needle-bar carrier and needle, essentially as specified.

2. In a universal feed-motion embroidering-machine, the combination, with said machine, of the rotatable and vibrating lever B', operating to lay the embroidering cord or material on opposite sides of the line of stitch alternately, the rotatable ring or lever-carrier *e*', provided with a leg or arm, *d*², the needle-bar carrier G, the arm *c*², attached to said carrier and engaging with the arm *d*², the longitudinally-reciprocating and rotatable screw D', the worm-wheel C', and the arm *i*', carried by said wheel and arranged to engage with the lever B', essentially as and for the purposes herein set forth.

3. In embroidering-machines having a universal feed-motion, and in which the embroidering cord or material is alternately laid upon opposite sides of the line of stitch, the vibrating and rotatable arm or lever B', which lays the embroidering cord or material, constructed in sections and made adjustable in direction of its length, in combination with the rotatable needle-bar carrier and universal feed-motion devices, for operation together, substantially as described, and whereby said arm or lever is made adjustable up or down relatively to the sewing or table surface of the machine, as herein set forth.

4. In embroidering-machines having a universal feed-motion, as described, the combination, with the vibrating and rotatable lever B', which lays the embroidering cord or material, of the rotatable ring *e*', to which said lever is pivoted, the worm-wheel C', the arm *i*' on said wheel, engaging with the lever B', the combined screw and rack D', the slotted guiding-tube E', capable of rotation together with the screw and rack, and providing for an independent sliding motion of the latter, the shaft G', deriving its motion by gears from the main shaft of the machine, and mechanism connecting the shaft G' and combined screw and rack D', for reciprocating the latter, essentially as specified.

HENRY E. SCHMITZ.
EDWARD ALDOM.

Witnesses:

A. GREGORY,
C. SEDGWICK.