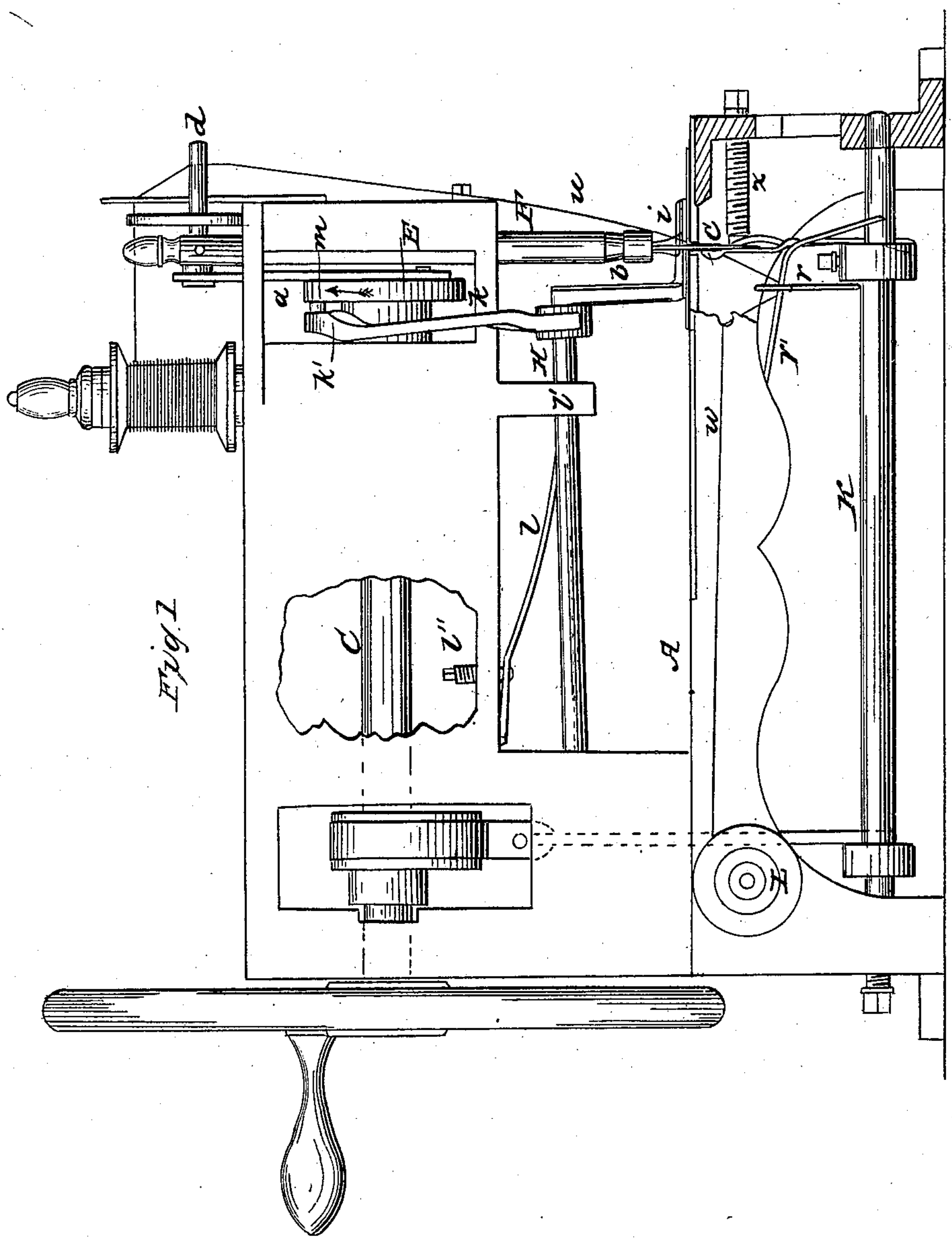


W. LYON.
Sewing Machine.

No. 12,066.

Patented Dec. 12, 1854.

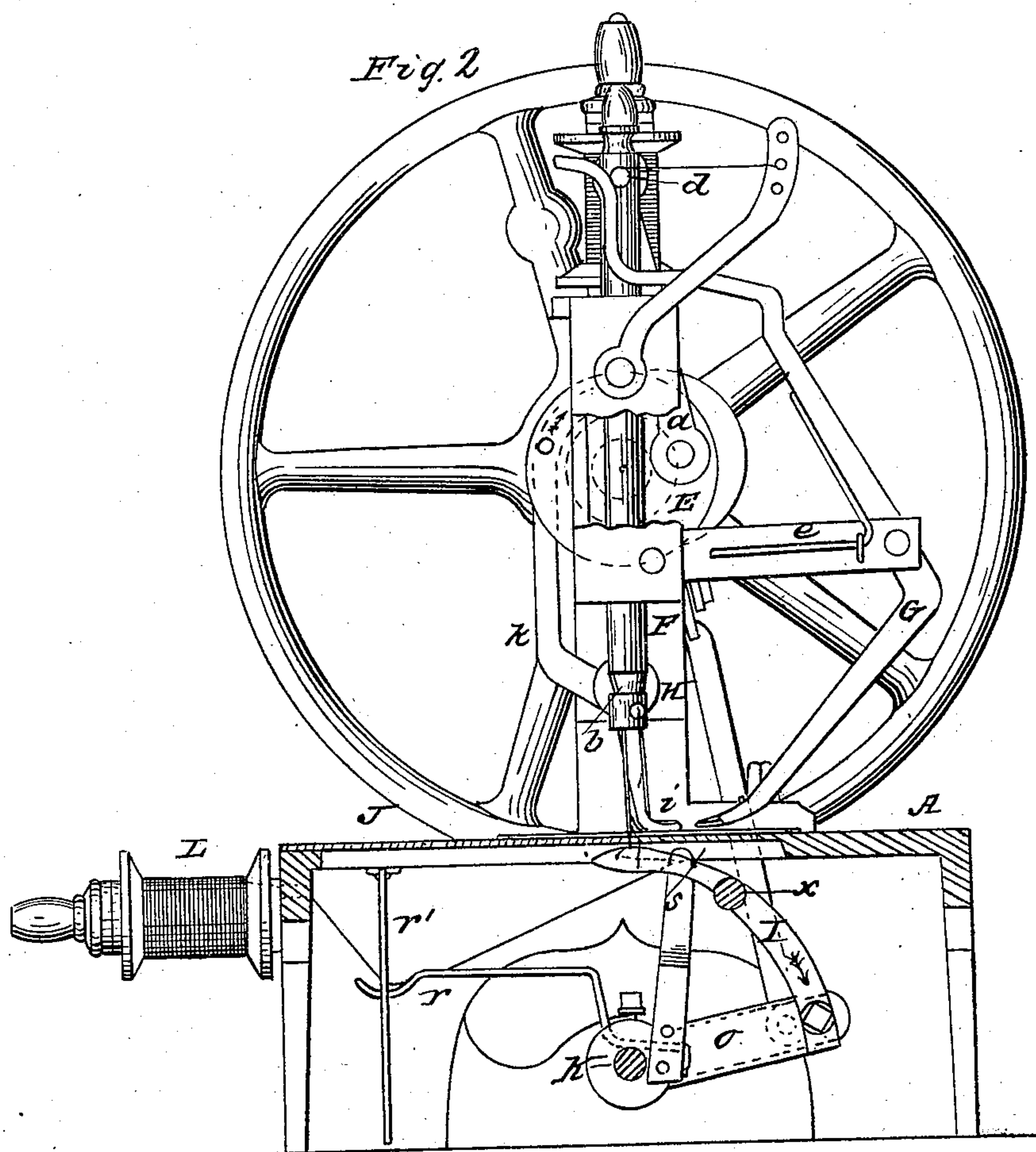


W. LYON.
Sewing Machine.

3 Sheets—Sheet 2.

No. 12,066.

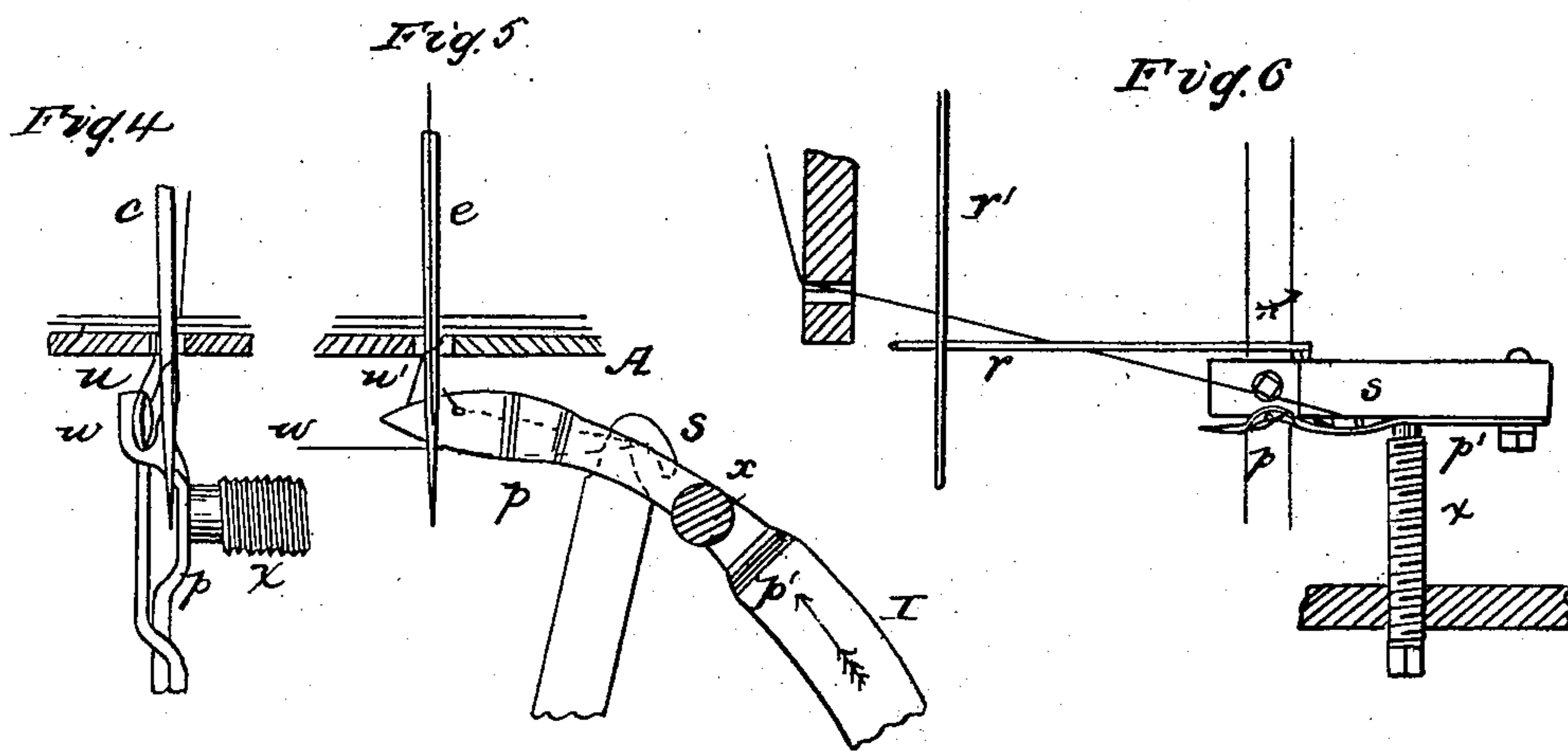
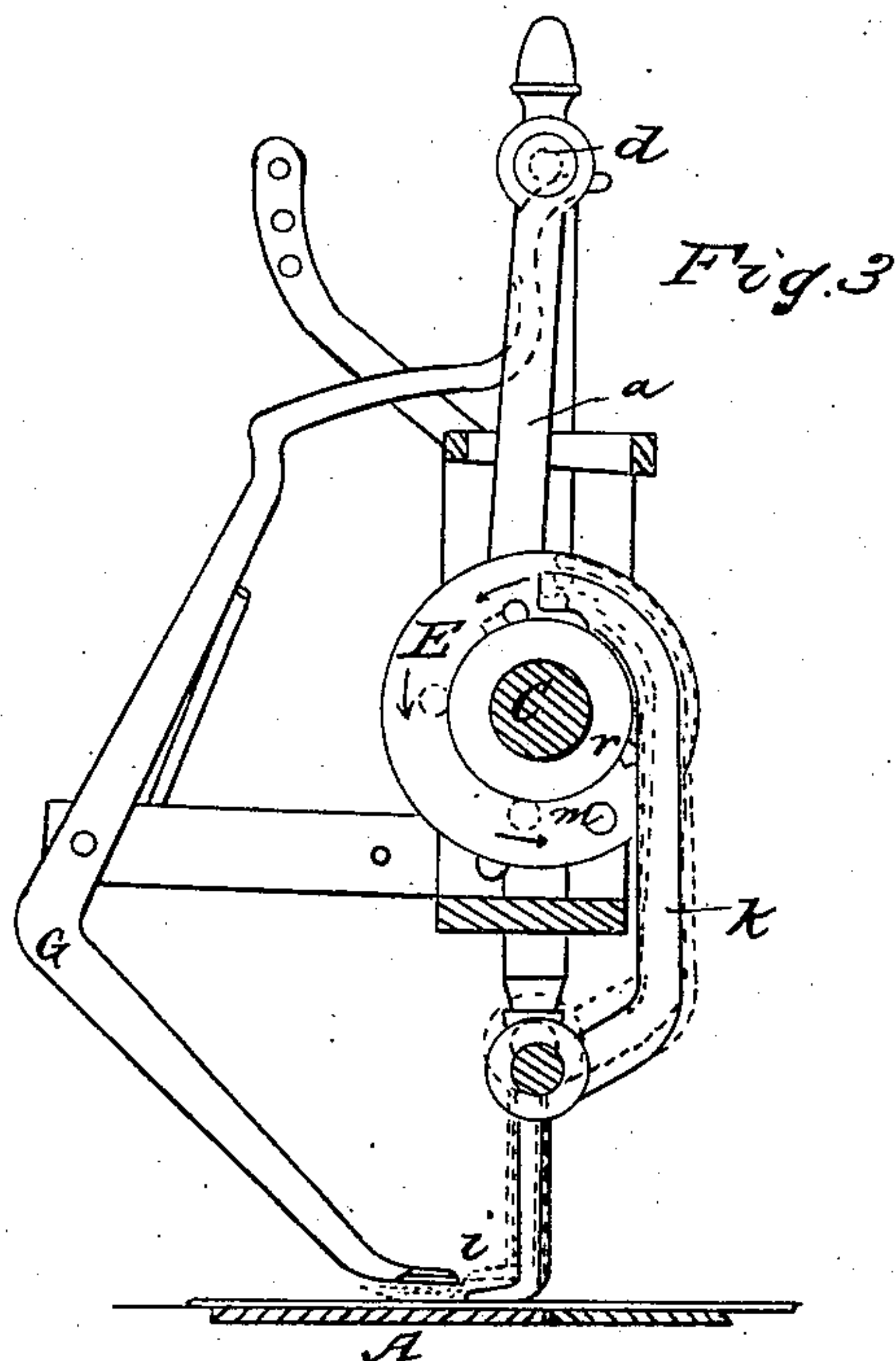
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UNITED STATES PATENT OFFICE.

WILLIAM LYON, OF NEWARK, NEW JERSEY, ASSIGNOR TO F. SIMPSON, G. SIMPSON, B. DODD, AND C. B. MERRIMAN.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **12,066**, dated December 12, 1854.

To all whom it may concern:

Be it known that I, WILLIAM LYON, of Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the accompanying drawings, making a part of this specification, in which the several figures are fully referred to herein, and similar letters refer to similar parts throughout.

My invention consists of certain improvements in those parts of the sewing-machine which effect the feeding and the holding in place of the material to be worked. In order to exhibit clearly the construction and the working of said parts, I shall find it necessary to describe somewhat at length the operation of a machine to which my improvements are applied.

At A is the table, upon one end of which is secured a strong overhanging frame, B, supporting the needle-carrier and the mechanism for operating that and the feeding apparatus. This leaves a clear space all round the needle upon the table for working the cloth. All parts are set in motion and propelled from the main shaft C, suspended in the frame B, the back end being supplied with a crank or pulley for revolving it. At the opposite end, and beyond the journal, there is a wheel from which the feed motions are given and the needle bar or carrier worked, as seen at E in the several figures.

At F is the needle-bar, standing in a vertical position immediately in front of the wheel E and on a line with its axis. To keep it in its vertical position while playing up and down it is supported by two bearings, one being at the top of the frame B and one below, as shown. A connecting-rod, *a*, fixed to a crank-pin in the wheel E and to another pin in the head of the needle-bar, is the means for giving the proper reciprocating motion to the latter.

At *d* is a pin extending through the head of the needle-bar. This performs a twofold office. One is to carry the thread along with the bar as it moves up and down, and thereby keep it always in proper tension and prevent it from kinking, and the second use is to op-

erate the feed-clamp and make it hold down the cloth at those times when the regular feeding-fingers are raised to prepare for taking a new hold of the cloth, in the manner now to be described. This clamp is a crooked lever, as seen at G, having its fulcrum near the middle on a projecting arm, as shown. The bottom terminates in a foot near the top of the table, and the upper end is curved for a distance equal to the play of the pin *d*, a spring, *e*, always acting to keep that end pressing against the said pin. By means of the curve at the top of G a vibrating motion is imparted to it as the pin *d* plays up and down along with the needle-bar. This vibration causes the foot to rise and fall upon the table, so that whenever a piece of cloth is placed under it is alternately clamped or held down and released by every stroke of the needle-bar. This releasing and clamping work is alternating with the motion of the feeding-finger, which also acts as a clamp when down. Thus the moment the feeding-finger begins to push the cloth along the table, which it does toward the clamp, the foot of the latter rises and allows the cloth to go on. It then comes down and holds it while the feeding-finger is going through its motions preparatory to giving the next feed and while the stitch is being taken, as will now be described. The feeding-finger has a peculiar set of motions given it. In the first place, while pressing on the cloth, it remains stationary for a time—*i. e.*, while the needle, having passed through the cloth, is returning. It then moves horizontally the distance for the length of stitch, thus pushing the cloth, which is then seized by the clamp G at the moment the needle has entered. It then rises to a position immediately over that first described, whence it descends vertically upon the cloth again before the needle has been withdrawn, again to feed the cloth when the needle has left, and so on. The mechanism is as follows:

H is a rod having one end cranked, the lower end of which terminates in the feeding-finger at *i*. There is a branch which extends upward and terminates behind the wheel E, as represented at *k*. The rod lies horizontally under the overhanging frame B, to which it is attached at the vertical post, and it is kept in

place and allowed to have free movement in every direction by a socket-and-ball termination. Near the arm *k* is another bearing, being a slot cut vertically in the bracket *l'*, so as to prevent lateral but permit vertical and rotary motions.

At *l* is a spring, the force of which is directed downward to keep the finger pressing upon the cloth. To perform the movements before described, there are two regulating cams or projections upon the wheel *E*, which strike upon the arm *k* in revolving at the proper times for raising, lowering, and pushing forward the feed-finger. One of these projections or studs is upon the inside face of the wheel, as seen at *m*, and the other projects from the circumference of its hub, as at *n*, Figure III. The stud *n* is so set that in revolving with the shaft *C* it strikes against the inner edge of the arm *k*, while the other stud, *m*, strikes against its side. The space between them is also such that *n* strikes first. The effect of this is to push the arm away, the rod *H* being then an axis, and thus the finger *i* is moved horizontally, as shown in the duplicate lines, Fig. III. This feeds the cloth along for the stitch. The stud slides along the edge of the arm *k*, which is bent into a circular form at this part, as seen in Fig. III, and keeps the finger in place still upon the cloth until the needle has entered the cloth. The other stud now arrives, and, striking against the side of the arm at an inclined bend or bevel, (seen at *k'*), raises it up, thus lifting the rod *H* and finger *i*. This stud then rides over the bevel, and in its onward movement carries the arm back to a position directly over that from which it was pushed by the stud *n*. As the stud clears the end of *k*, the finger drops and presses upon the cloth as the needle is about to be lifted out, holding it firm close to the thread. The ascent of the needle-shaft causes the clamp-lever *G* to vibrate, lifting the clamp from the cloth just as the stud *n* is about to strike the arm *k* and give the feed, as before described.

I now come to describe the manner of forming the stitch. In the first place the end of the thread *u* must be put through the eye of the needle and drawn out a short distance along the table and put under the feeding and clamp fingers. Next the thread *w* must be passed through the hole in the side of the table, thence under the tightening-rod *r*, around the guide-hook *s*, and through the hole in the spring-hook *I*, and the end then passed up through the needle-hole in the top of the table, and carried along under the feeding-finger with the other thread. To facilitate the passing of this thread through the various places under the table, and also to enable the operator to examine the machine below it, a part of the top is cut out to form a sliding or revolving lid, as represented in the section at *J*, Fig. II. This lid joins the permanent part just along the needle-hole, so that when it is drawn off it leaves an entrance to said hole by a nar-

row cut made in the side of the plate, so that instead of being obliged to put the end of the thread through, it is passed into the hole by this slot or cut, the movable part of the table closing it up, and thereby keeping the thread in place. The cloth or other material to be worked being now put upon the table and the leading edge placed under the feeding-finger *i* and the clamp, the sewing will go on by turning the crank upon the shaft *C*.

In order to lengthen or shorten the stitch, it is only necessary to screw out or in the stud *n*, for by projecting farther out it increases the throw of the feeding-finger *i*, and, on the contrary, screwing it in lessens that throw. The general operation is as follows: The needle having been properly adjusted and the thread *w* brought up through the needle-hole and carried with the other thread under the feeding-finger, the materials to be sewed or ornamented are laid upon the table, the operator sitting on that side of it along which the thread *w* is carried, so as to have the right hand free to guide the cloth, while with the left the machine is kept in motion. With a treadle attached this latter may be done by the foot; or other power may be employed, and thus free both hands. Care must now be taken to give the right degree of tension to the thread by setting up the pinch-nuts upon the spools. If too much, the thread will break, and if too little the work will be badly sewed. The materials once under the feed apparatus will be kept going on in a straight line; but if curves are to be followed, the hand must guide the materials in all directions other than straight. This is done by merely turning the materials around one way or the other, as may be, and in a manner common to many sewing-machines. The revolution of the main shaft puts in vibration the lower shaft, *K*, which vibrates the spring-hook by means of an eccentric placed upon the upper shaft and connecting by a rod with an arm on the lower. To increase the grip of the finger, a set-screw, *l''*, pressing upon the spring *l*, adds to the set or tension of the latter, and thus forces down the fingers *i*.

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

1. The arrangement of the feeding-pieces—that is to say, the rod *H*, suspended at one end by a universal joint, so that the unattached end may be permitted to play vertically, and also to rock or vibrate as an axis, and having on said unattached end a feeding-finger, *i*, and arm *k*—in combination with the governing-studs *m n* upon the wheel *E*, as set forth.

2. The clamp *G*, in combination with the needle-bar *F*, and working in connection with the feeding-finger, as described.

WM. LYON.

Witnesses:

J. P. PIRSSON,
S. H. MAYNARD.