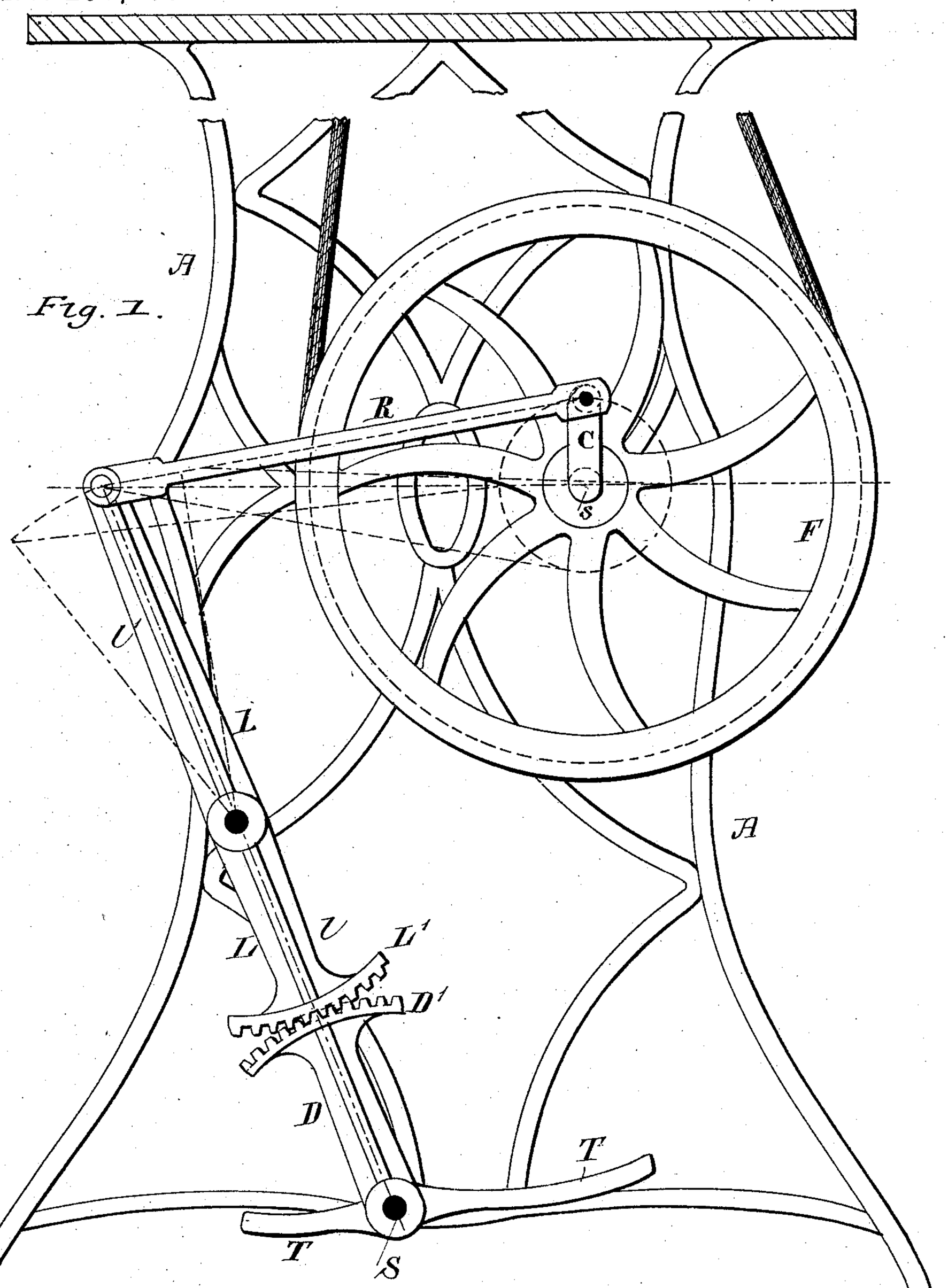
(No Model.) 2 Sheets—Sheet 1.

J. KAYSER.

TREADLE MOTION.

No. 291,200. Patented Jan. 1, 1884.

Fig. 1.



Witnesses.
H. E. Boulter
H. A. Daniels

Inventor
John Kayser
by Henry Orth
his att'y.

(No Model.)

2 Sheets—Sheet 2.

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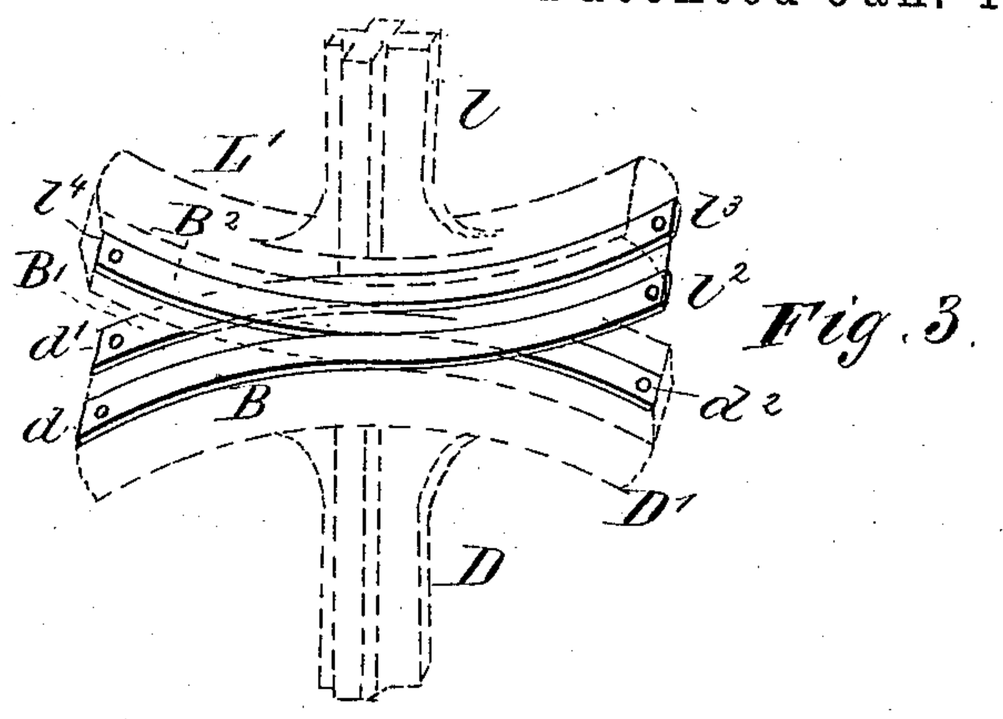


Fig. 3.

Fig. 2.

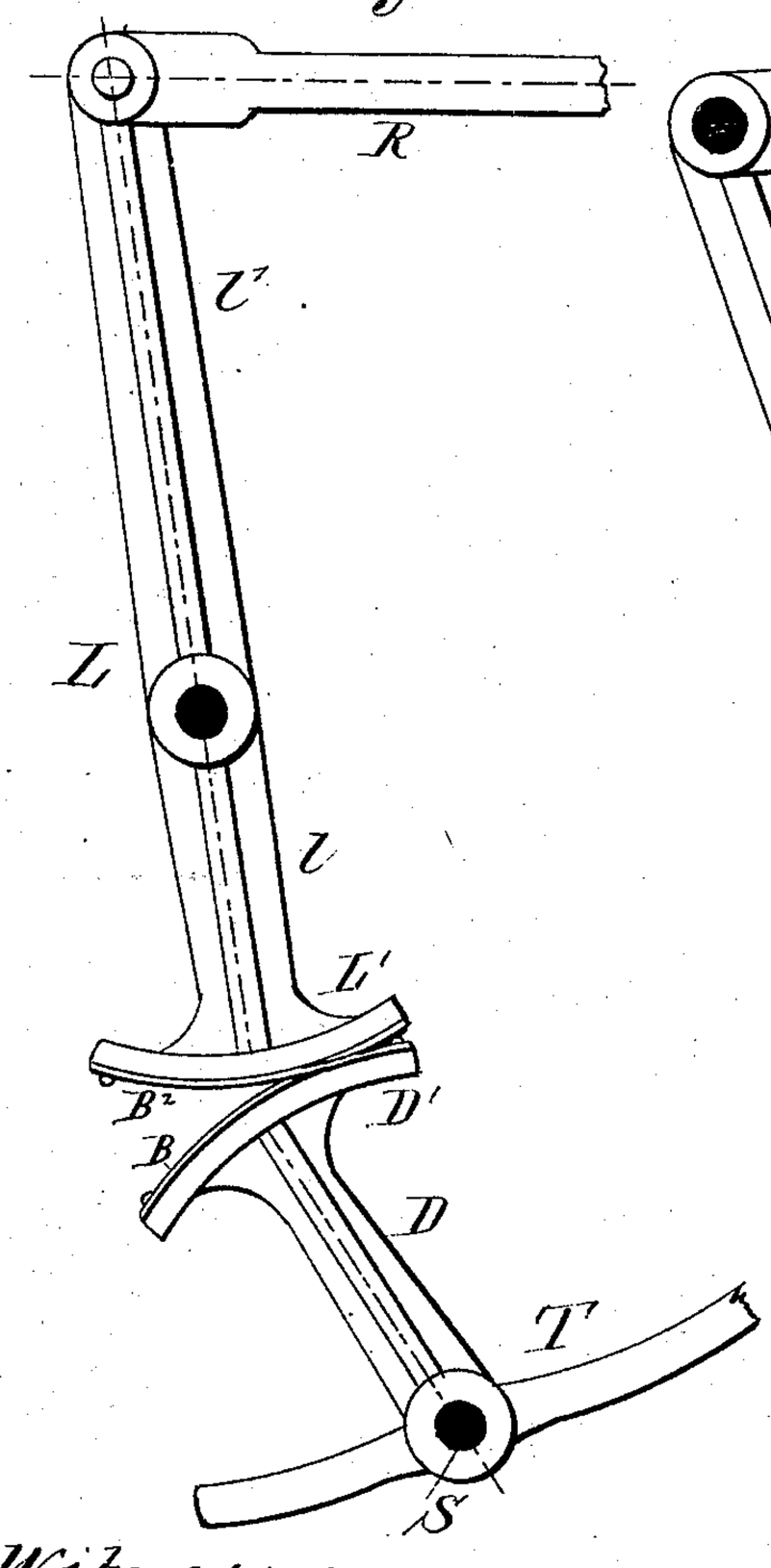
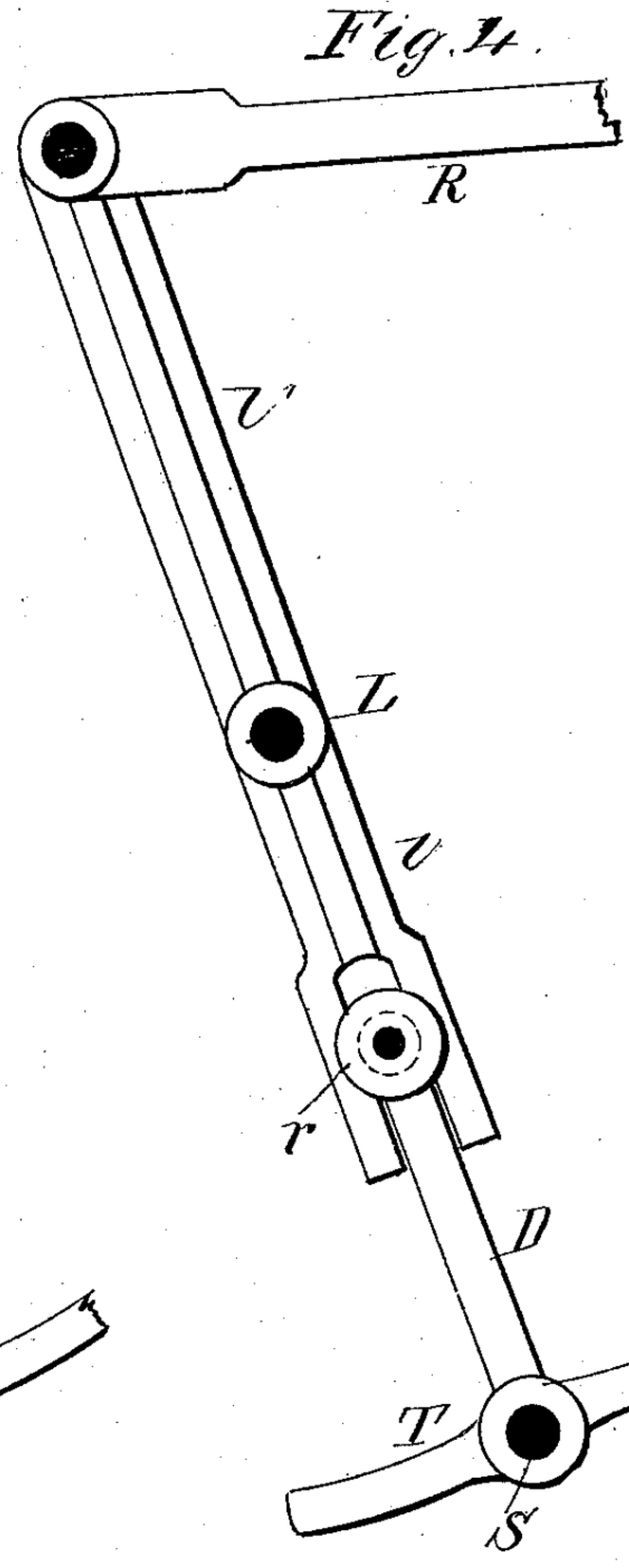


Fig. 4.



Witnesses
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his att'y.

UNITED STATES PATENT OFFICE.

JOHN KAYSER, OF KAISERSLAUTERN, BAVARIA, GERMANY.

TREADLE-MOTION.

SPECIFICATION forming part of Letters Patent No. 291,200, dated January 1, 1884.

Application filed August 18, 1883. (No model.) Patented in Germany February 13, 1883, No 23,339, and July 27, 1883.

To all whom it may concern:

Be it known that I, JOHN KAYSER, a subject of the King of Bavaria, residing at Kaiserslautern, Bavaria, Germany, have invented certain new and useful Improvements in Treadle-Motions; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

In sewing and other small machines operated from a treadle, the oscillations of which are converted into rotary motion communicated to a driving-shaft through the medium of a crank or eccentric and connecting-rod, when the power ceases to be applied to the treadle the weight of the crank and connecting-rod is usually such as to bring the former at rest on its dead-points—that is to say, the driving mechanism will come to rest with the vertical axes of the rod and crank in the same plane. In order to start the machine, it is necessary to impart by hand a partial rotation to the fly-wheel before the operator can apply power to the treadle. The described arrangement of driving mechanism has the further disadvantage of requiring undue exertion on the part of the operator relatively to the power required to drive the mechanism.

The object of this invention is to remedy these disadvantages, as will be fully described hereinafter, and as illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation, illustrating my improved treadle-motion as applied to a sewing-machine. Figs. 2, 3, and 4 illustrate slight modifications in the construction of said motion.

Like letters of reference indicate like parts wherever such may occur in the above figures of drawings.

A indicates the sewing-machine stand, S the treadle-shaft, F the fly-wheel, *s* the fly-wheel shaft, C the crank, and T the treadle, all of which may be of any usual or preferred construction.

To avoid the stoppage of the machine with the crank and connecting-rod at their dead-points, instead of connecting the latter directly with the treadle or with an arm secured to and projecting from the treadle-shaft, I connect the rod R with the treadle T through the medium of an intermediate lever, L, and in such manner that when the rod R and crank C are at their dead-points their axes will lie in a horizontal plane. In other words, instead of employing a vertical connecting-rod, I employ a horizontal connecting-rod, as shown. It is evident that with such a construction of treadle-motion, when power ceases to be applied to the treadle T, the weight of the connecting-rod R will automatically carry the crank C beyond its dead-points, and in this position the parts will come to rest. The machine may therefore be started at any time by applying power to the treadle without first imparting motion by hand to a rotating element thereof—as, for instance, the fly-wheel F of a sewing-machine—to overcome the dead-points. It being understood that the lever system of the operating mechanism is properly balanced and the machine in proper running order to reduce the power required to convert the oscillating motion of the treadle into rotary motion, and transmit the same to the rotating parts of the machine, I operate the lever indirectly from the treadle or the treadle-shaft—that is to say, instead of connecting the lever L directly with the treadle or its shaft, I employ an intermediate lever, D, connected either with the treadle or treadle-shaft to transmit the oscillations of the latter to said lever L. This may be effected positively or by friction in various ways. For instance, as shown in Fig. 1, the arm l' of lever L is connected with the rod R, and the arm l terminates in a toothed segment, L′, that meshes with a like segment, D′, on lever D, whereby the vibrations of the latter are transmitted to the former without great fatigue on the part of the operator. The vibrations of the lever D may also be transmitted to lever L by frictional contact between the two segments, their faces being slightly roughened or covered with some such substance as leather or rubber, whereby the necessary frictional contact is obtained.

Instead of lining the contacting surfaces of the segments L′ D′, as described, draft-bands or straps may be employed, as shown in Figs. 2 and 3. In this case I preferably employ three bands or straps, B B′ B^2, one end of the

straps B B′ being attached to one extremity of the segment D′, as shown at *d d′*, and the other end to opposite extremity of segment L′, as shown at l^2 l^3, the intermediate strap, B^2, having its ends secured to the opposite extremities, d^2 l^1, respectively, of the segments D′ L′, as shown in Fig. 3, in which, for the sake of clearness, the segments are shown in dotted lines, and the straps in full lines. It is obvious that when the lever D is vibrated by the vibration of the treadle T or its shaft S in the direction of the arrow, Fig. 3, for instance, the ends l^2 l^3 of the straps B B′ will pull on the segment L′, causing the same to move in a reverse direction, while the end d^2 of the strap B^2 will pull on segment D′, assisting its motion in the direction of said arrow, whereby an easy reciprocating motion is communicated to the lever L, requiring comparatively little power.

Fig. 4 shows a further modification in the appliances for transmitting the treadle-motion to the rock lever L, which latter, in this case, has the end of its arm *l* forked, the lever D carrying a pin, or a pin upon which is mounted a roller, *r*, that reciprocates in the fork of the lever L to rock the latter.

Instead of the pin or pin and roller, a slide-block of proper construction may be employed, and either the pin or roller, or the slide-block may be connected to the lever L, and the end of lever D may be slotted or forked. The arrangement of rock-lever L also provides a means whereby the throw of the treadle or the extent of the oscillations of the treadle-shaft may be varied without changing the length of the crank by simply changing the position of the fulcrum of the rock-lever; or, in other words, by changing the relative length of the lever-arms *l* and *l′*, as will be readily understood; and, further, in reversing the motion of the mechanism, the inertia of the lever L tends to counteract or avoid the usual shocks and back throw due to the reversal of the motion of the treadle, whereby the devices operated will run much smoother than is the case when the motion of the treadle is communicated directly to the crank by means of a connecting-rod.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a treadle-motion for sewing-machines, the combination, with the driven crank, a treadle-shaft, and a treadle carried by and oscillating on or with said shaft, of a connecting-rod, R, and intermediate mechanism to transmit the oscillations of the treadle or its shaft to the crank through the medium of the connecting-rod, as described.

2. In a treadle-motion for sewing-machines, the combination, with the driven crank and a treadle carried by and oscillating on or with said shaft, of a connecting-rod, R, a two-armed rock-lever, and intermediate appliances to transmit the vibrations of the treadle to the lever, and through the latter to the connecting-rod and crank, as described.

3. In a treadle-motion for sewing-machines, the combination of the driven crank, a connecting-rod, and an intermediate two-armed lever connected to said rod, with a treadle-shaft, a treadle, and a lever carried by and vibrating on or with said shaft, through which lever the vibrations of the treadle or its shaft are transmitted to the rock-lever and connecting-rod to rotate the crank, as described.

4. The combination, with the crank C, connecting-rod R, and lever L, of the lever D and treadle T, and means, substantially such as shown and described, to transmit the movements of the lever D to the lever L, as described, for the purposes specified.

5. The combination, with the crank C, connecting-rod R, and lever L, terminating in a segment, the face of which is provided with teeth or their specified equivalent, of the lever D, terminating in a segment, the face of which is also provided with teeth or their specified equivalent, and the treadle T, all arranged for operation substantially as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN KAYSER.

Witnesses:
J. ENGLERT,
FRANZ MÜLLER.