

T. Williams,

2 Sheets, Sheet 1.

Treadle.

N^o 43,551.

Patented July 12, 1864.

Fig. 3.

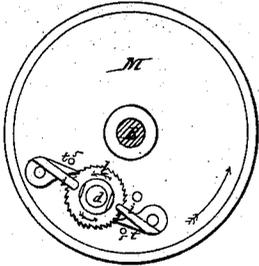


Fig. 2.

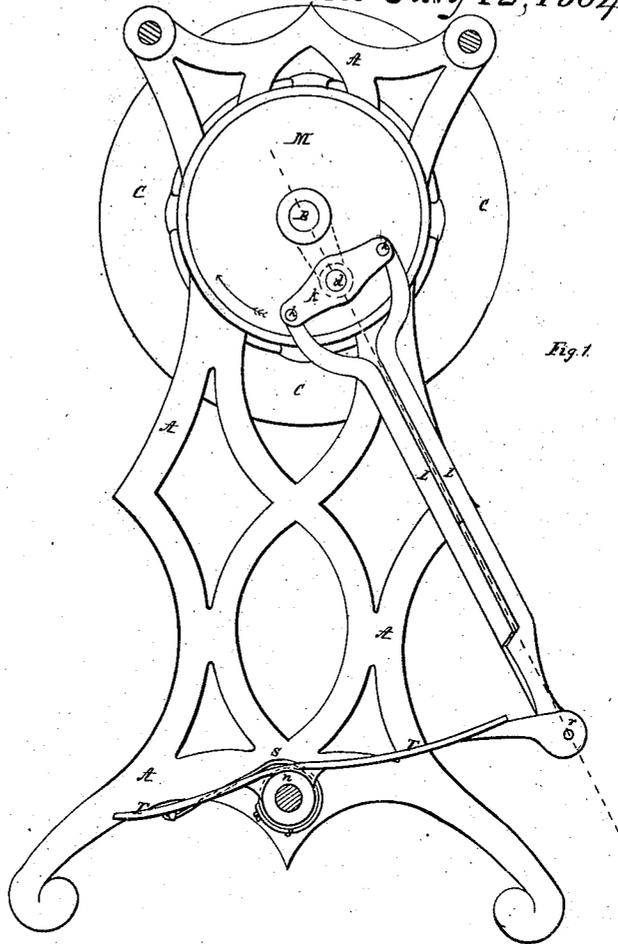
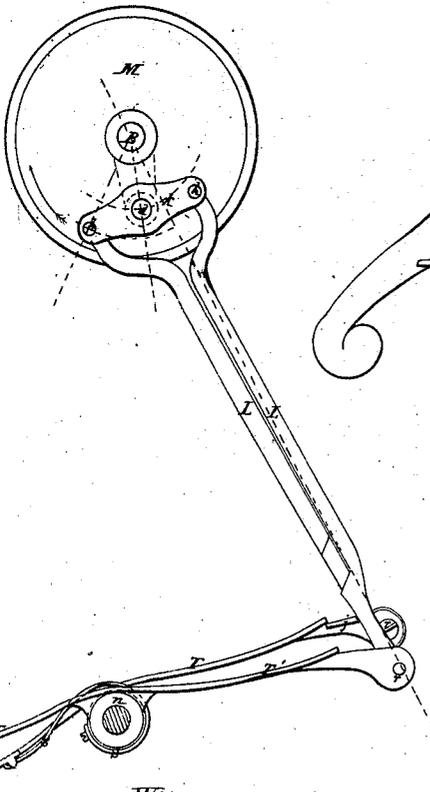


Fig. 1.

Fig. 4.

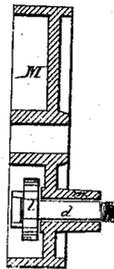


Fig. 5.



Fig. 6.



Witnesses:

James A. Powell
George G. Phillips

Inventor:

Turner Williams

T. Williams,

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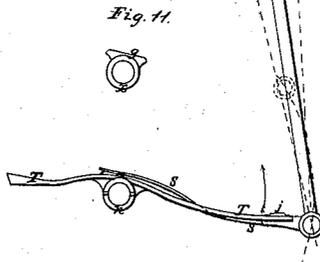
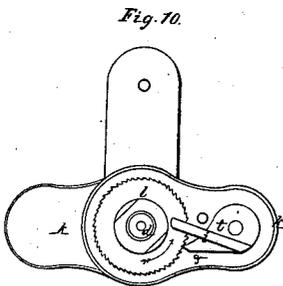
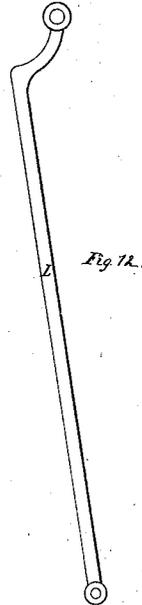
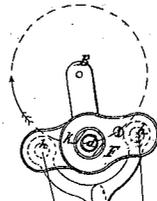
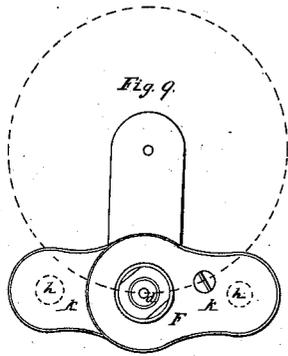
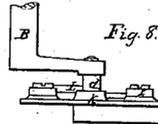
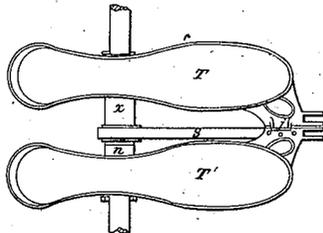


Fig. 13.



Witnesses:

David A. Bromell

George C. Phillips

Inventor:

Turner Williams

UNITED STATES PATENT OFFICE.

TURNER WILLIAMS, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO HIMSELF AND DAVID HEATON, 2D, OF SAME PLACE.

IMPROVEMENT IN DRIVING MECHANISMS FOR SEWING-MACHINES, &c.

Specification forming part of Letters Patent No. 43,551, dated July 12, 1864.

To all whom it may concern:

Be it known that I, TURNER WILLIAMS, of Providence, in the county of Providence and State of Rhode Island, have invented a new and useful Improvement in the Driving Mechanisms of Sewing-Machines, which is also applicable to other purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a side elevation of the frame and driving mechanism of a sewing-machine embodying my improvement, one side of the frame being removed to give an unobstructed view of the working parts. Fig. 2 is a side elevation of the said driving mechanism detached and with the several parts in a position calculated to illustrate the peculiar mode of operation. Fig. 3 is a view of the reverse side of the driving-wheel M from that shown in Fig. 1, together with the parts arranged thereon. Figs. 4, 5, and 6 are details which are referred to in the course of the description. Fig. 7, Plate II, is a side elevation of a modified arrangement of the said mechanism, having the same mode of operation. Fig. 8 is a plan of the upper portion of the same. Fig. 9 is a side elevation of said upper portion shown full size. Fig. 10 is a similar view with the plate F removed to show the interior arrangement. Figs. 11 and 12 are details which are referred to in the course of the description. Fig. 13 is a plan of the peculiar treadle adapted to driving mechanisms having a similar mode of operation.

Similar letters of reference indicate corresponding parts in all the figures.

In the schedule attached to Letters Patent No. 2,723, granted to me, the said TURNER WILLIAMS, on the 12th day of November, A. D. 1861, a description is given of a certain improvement in cranks for driving sewing-machines, the distinctive features of which are, first, that the connecting-rod (which transmits the movements of the treadle) is attached to two auxiliary pins, instead of directly to the crank-pin, as in the usual way; and, second, that the said auxiliary pins are alternately connected and disconnected to and from the crank-pin in the act of turning the crank by

means of the treadle, whereby the auxiliary pin so connected for the time performs the function of the crank-pin proper, and being of necessity that in advance of the crank-pin, (considering the direction in which the crank is to turn,) the crank is readily started forward from its "dead-center" in one direction only, thereby preventing any backward movement, which would reverse and derange the working of the sewing-machine, and, besides, placing the movement of the main shaft wholly under the control of the treadle in obtaining a slow or swift positive movement of said shaft, and starting from any points of its revolution, always in one and consequently the right direction.

The improvement hereinafter described is an improvement of the invention so patented on the 12th of November, 1861, and although, as will be seen, the connecting-rod is attached to two auxiliary pins, instead of directly to the crank-pin, the other and remaining portions of the mechanism are materially changed, so much so that a new mode of operation is produced differing essentially from the alternate connecting and disconnecting of the two auxiliary pins to and from the crank-pin by means of the treadle, which is the second feature of improvement, although the general result in the movement of the crank forward in one direction and past the dead-center is similar.

My present invention consists in arranging the two auxiliary pins in the two opposite ends of a rocking lever on the crank-pin; in connecting the said auxiliary pins to the treadle by two curved connecting-rods, and in the use of a treadle formed in two parts, each of which has or is susceptible of an opposite movement in one direction, and by reason of the two connecting-rods being attached each to one of the two parts of the treadle the said opposite movement of the treadle is transmitted to the two opposite ends of the said rocking lever, which produces an engagement of a pawl or ratchet with a ratchet-wheel on the crank-pin, thereby rendering the said rocking lever fixed and immovable with respect to the crank-pin, so that the further rocking movement of the said lever impels the crank forward in the one desired direction past the dead-center by a force applied to both the auxiliary pins simul-

taneously in advance and behind or following the crank-pin, thus producing a more equable revolution of the main or driving shaft without any perceptible extra exertion on the treadle.

To enable others who are familiar with machines of this character to make and use my said invention, I will proceed to describe the same.

In Fig. 1, A is the frame of the machine, which may be of cast-iron. B is the main or driving shaft; M, the driving-pulley, and C a balance-wheel thereon. *d* is the crank-pin, which is fitted to turn freely in the hub or boss *m*, formed on the driving-wheel M, as shown clearly in Fig. 4. *l* is a ratchet-wheel secured on one end of said crank-pin on the back side of the driving-wheel, as shown in Fig. 3, and *t t* are two ratchets, which are arranged to engage with the ratchet-wheel when the crank-pin is turned in the hub *m* in the direction indicated by the arrow, and to become disengaged and allow the said crank-pin to turn freely in the said hub *m* in the opposite direction, the disengagement being produced by the pressure of the ends of the springs *i i* against the sides of the ratchet-wheel, which, when turned in the given direction, have the effect to lift the ratchets out of the teeth of the wheel and press them against the pins *s s*, fixed in the driving-wheel, the use of such springs for the purpose being old and well known. To the opposite end of the crank-pin *d* is secured the rocking lever *k*, in the opposite ends of which, and equidistant from the crank-pin, are secured the two auxiliary pins *h h*, to which the upper ends of the two connecting-rods *L L'* are attached in a swinging joint. These connecting-rods are formed as shown to provide for their respective movements in connection, and their lower ends are attached at a common point to two separate studs, *r r'*, in the treadle T, as shown clearly in Fig. 2. This treadle T is formed in two pieces, each being calculated for one foot of the operator, and the two pieces are designed to move together as a whole until the contingency arises of a stoppage on the dead-center, and to that end a spring, S, is secured at one end to the hub *n* of one foot-piece of the said treadle, while the other end presses against the under side of the heel of the other foot-piece, and so arranged serves to keep the two foot-pieces together and cause them to act as one treadle, except in the contingency above alluded to. In connection with the said spring a stop or projection, *j*, is provided on the toe of one of the foot-pieces, which bears against a corresponding projection beneath it on the other foot-piece by the force of the spring S, and thus holds the two pieces in position, as shown in Fig. 2 and in Fig. 13.

The several parts being thus arranged, the operation is that, with both feet upon the treadle, the crank is turned with all the usual ease and facility with which a crank can be turned by means of a treadle; but in the event of a

stoppage on the dead-center—as, for instance, in the position shown in Fig. 1—by an opposite movement of the feet, which will separate the two foot-pieces, as shown in Fig. 2, the crank-pin becomes instantly fixed and stationary in its hub *m*, and the opposite movement of the two foot-pieces is transmitted to the two auxiliary pins *h h* with an effect to rock the lever, which results in carrying the crank easily past the dead-center in the direction indicated by the arrow to and forward from the position shown in Fig. 2, and to continue the revolution of the shaft and driving-wheel.

In the modification of the construction and arrangement already above described, as exhibited in Figs. 7, 8, 9, 10, &c., the crank-pin *d* is fixed in the crank in the usual way, the ratchet-wheel *l* is fixed on the outer end of said crank-pin, and the rocking lever *k* turns freely on the crank-pin when the crank is turned in the given direction, in lieu of the crank-pin turning in the hub *m* of the wheel M, as stated in the previous description, the immediate effect being alike in both instances. In Fig. 10 only one ratchet, *t*, is shown, which, with its ratchet-wheel *l*, is inclosed within this portion of the rocking lever and covered with a cap, F, to exclude the dust, as seen in Fig. 9.

The form and construction of the ratchet are shown in detail in Figs. 5 and 6, in which a lip, *v*, is shown, which extends beneath the edge of the ratchet-wheel and keeps the ratchet in its place.

Fig. 12 shows one form of construction of one of the curved connecting-rods L.

Fig. 13 represents a modification in the arrangement of the spring S with the two foot-pieces of the treadle, the said spring in this instance being firmly riveted to the toe or fore part of one foot-piece, with its loose end bearing against a cam, *g*, Fig. 11, forming part of the hub *x* of the other foot-piece, and serving to press the foot-piece T' at the foremost end up against the stop or projection *j* on the foot-piece T, and thus to hold the two together, the mode of operation and effect being the same as above described.

Having thus described the construction and operation of my improved mechanism, I wish it understood that I do not restrict myself to the particular construction and arrangement of the parts as described; but I claim all merely formal variations performing the same mode of operation by equivalent means.

What I claim, and desire to secure by Letters Patent, is—

The arrangement of the auxiliary pins *h h*, the rocking lever *k*, and crank-pin *d*, as described, in combination with a pair of curved connecting-rods; or their equivalent, and a treadle constructed in two parts, as described, the whole operating substantially as specified.

TURNER WILLIAMS.

Witnesses:

ISAAC A. BRUNNELL,
GEORGE G. PHILLIPS.