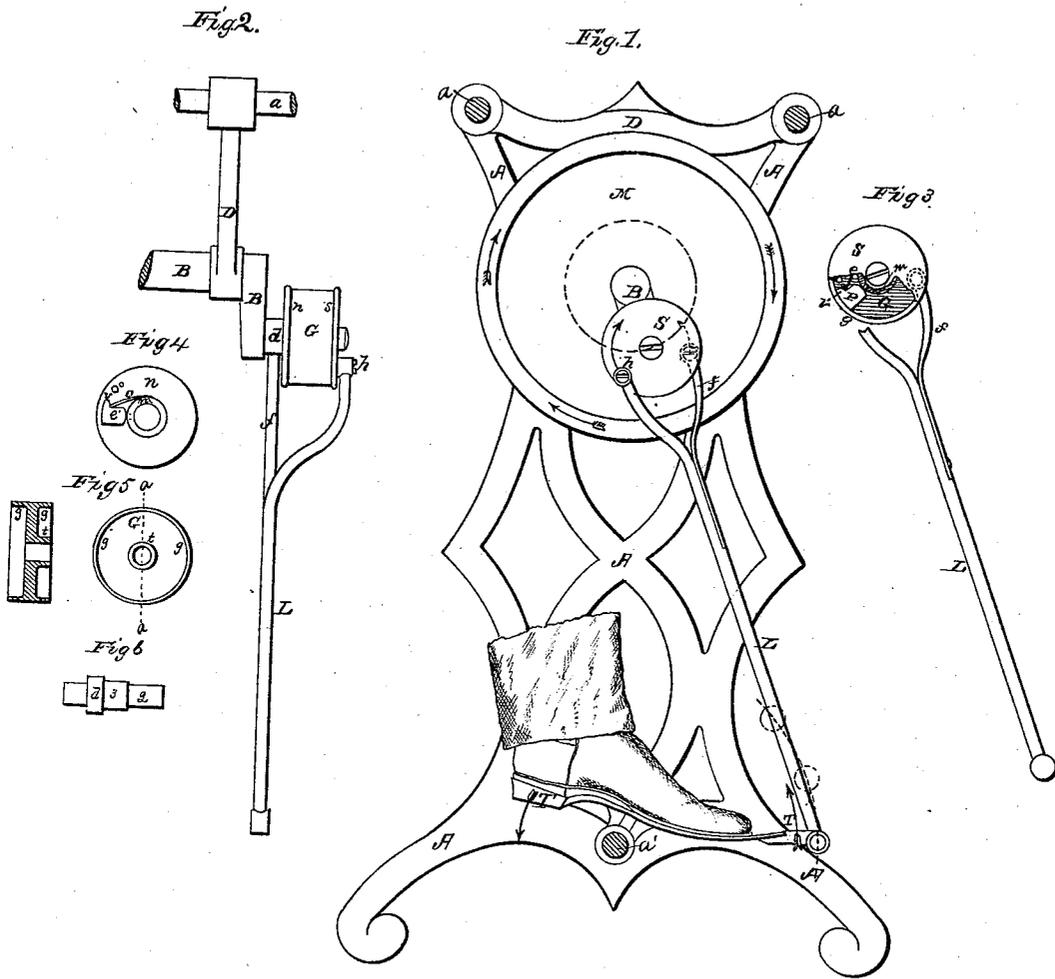


T. Williams,

Treadle.

N^o 33,727.

Patented Nov. 12, 1861.



Witnesses.

Isaac A. Brunnell
W. M. Patten.

Inventor

Turner Williams

UNITED STATES PATENT OFFICE.

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

IMPROVED CRANK FOR DRIVING SEWING-MACHINES AND OTHER MACHINERY.

Specification forming part of Letters Patent No. 33,727, dated November 12, 1861.

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 Cranks for Driving Sewing-Machines and other Machinery; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of the machine, with the end piece corresponding with A removed to show the working parts plainly. Fig. 2 is a front view of the working parts, excepting the treadle, detached from the frame A. Fig. 3 is a detached view of the wheel G and rod L. Figs. 4, 5, 6 are details which are referred to as the description proceeds.

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

In the schedule attached to Letters Patent No. 645, granted to me, the said Turner Williams, and David Heaton, 2d, assignees, bearing date of March 5, 1860, a description is given of two friction-pawls acting alternately upon two circular pathways formed upon the under side of a wheel's rim for the purpose of revolving such wheel steadily in one direction, and placing the movements of the said wheel wholly under the control of the treadle. My invention in this case consists in combining the said device or an equivalent mechanism with a crank, by means of which I am enabled to avoid the "dead-center" in said crank, to turn the crank always in one direction, and to limit or measure the stroke of the treadle without the aid of buffers or any similar device.

To enable others skilled in the art to make use of my invention, I will proceed to describe the same.

In the drawings the parts corresponding with those in general use for the purpose are the frame A, composed of two end pieces of cast-iron united by the rods *a a a'*, the treadle T, swinging upon the rod *a'*, the driving-wheel M, the shaft B, having a crank, B', upon one end and supported by the hanger D, Fig. 2.

d is the crank-pin of the crank B', formed as shown in Fig. 6, to which the device above

referred to is attached, and may be described as follows:

G is a wheel, (a detached view of which is shown in Fig. 5,) which is fixed upon the crank-pin *d* at 2. Upon the crank-pin, each side of the wheel G, is placed a circular plate, *n s*, one of which turns loosely upon the crank-pin at 3, and the other, *s*, upon the hub *t* of the wheel G, this arrangement being convenient and simple. To the hub of each of these plates is attached a pawl, *o* and *p*, as shown in Fig. 4, by being formed with a teat which enters a hole drilled in the hub *m* of the plates *n s*. The pawls may be formed as shown in Fig. 4, having a spring, *c*, which serves to press the pawls into action at the proper time. A pin, O, projects from the plate, which limits the motion of the pawls and affords a support thereto; and the said pawls are arranged upon opposite sides of the crank-pin *d* and act upon the pathways *g g* upon the wheel G. The plates *n* and *s* are made to vibrate upon the crank-pin in opposite directions by means of the forked rod L, which connects the said plates with the treadle, as shown in Figs. 1 and 2, in doing which the two pawls attach themselves alternately, by a nipping action, to the surfaces *g g* of the wheel G; and the same movement of the treadle which causes one of the pawls to attach itself to the surface *g*, with which it acts, also frees the opposite pawl from close contact with its pathway *g*. The nipping action is produced by the binding of the pawl between the hub *m* of the plate and the surface *g* of the wheel G, Fig. 3, the said pawl being elongated in one direction at *v*, as shown. This action may be produced as well by making the pawl in the form of a roll or a ball and forming either of the surfaces against which it acts with an incline or wedge, the only difference being that in the first case the nipping action is due to the irregular form of the pawl, and in the second case said action is due to the irregularity of the surface against which the regular roll, ball, or pawl acts, both being equivalent as a means for the purpose of producing the aforesaid nipping action. The end *f* of the forked rod consists of a spring bent in the proper form and attached to the shank of the rod

by a screw or rivets, the object in view being to provide for the separate action of the ends of the fork produced by the opposite vibrations of the plates *n* and *s*, to which said ends are respectively attached.

The several parts being constructed and arranged as above described, and the crank being in the position shown in Fig. 1, upon the lower dead-center, the operation is that, the rear end of the treadle being depressed by the foot of the operator, the forward end and the rod *L* are moved upward, which causes the pawl *p* upon plate *s* to attach itself to its pathway *g*, and at the same time the opposite pawl, *e*, to detach itself from its pathway *g*, in consequence of the opposite simultaneous movement of the plates *n* and *s*, as before explained, resulting from this upward movement of the treadle, which being continued, a force is exerted upon the pin *h*, which being in advance of the dead-center occupied by the crank-pin, the crank is revolved in the direction indicated by the arrows until the crank-pin arrives at the upper dead-center, when the motion of the treadle is reversed, thereby reversing the action of the pawls and exerting the entire force of the treadle upon the pawl *e* in advance of the upper dead-center, which carries the crank-pin in the direction indicated by the arrows until it arrives at the lower dead-center and completes the revolution.

It will be seen that the connecting-rod *L* is attached to two auxiliary pins, *h*, instead of directly to the crank-pin *d*, as formerly practiced; that in the act of turning the crank by means of the treadle the said auxiliary pins are alternately connected and disconnected to and from the crank-pin *d* at the beginning of each stroke of the treadle by the binding action of their respective pawls, the auxiliary pin in advance of the crank-pin, as the crank

revolves, becoming temporarily fixed to and performing the functions of a crank-pin, *d*, the action of the rear auxiliary pin, for the time, being subordinate to that in advance; that in consequence of this connecting and disconnecting of the auxiliary pins the movement of the treadle is always directed upon some other point of the revolution than that in a direct line with the axis of the crank, otherwise known as the "dead-centers;" and as the connected auxiliary pin is of necessity that in advance of the crank-pin *d*, the crank will be turned in but one direction.

Having described the construction and operation of my invention, I wish it to be understood that I do not limit myself to the precise construction and arrangement of the parts as herein described; nor do I restrict myself to the use of the peculiar friction-pawls, as balls, rollers, ratchet, hooks, &c., if skillfully arranged, will perform the alternate connecting and disconnecting function of the pawls, substantially as herein specified.

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

1. Attaching the connecting-rod *L* to two auxiliary pins, *h*, or their equivalent, instead of directly to the crank-pin *d*, substantially as herein shown and described.

2. The alternate connecting and disconnecting of the said auxiliary pins, or an equivalent means of attachment, to and from the crank-pin *d* of a crank, in the act of turning such crank, by means of a treadle or other device for imparting a reciprocating movement, substantially as herein described, for the purpose specified.

TURNER WILLIAMS.

Witnesses:

ISAAC A. BROWNELL,
W. U. POTTER.