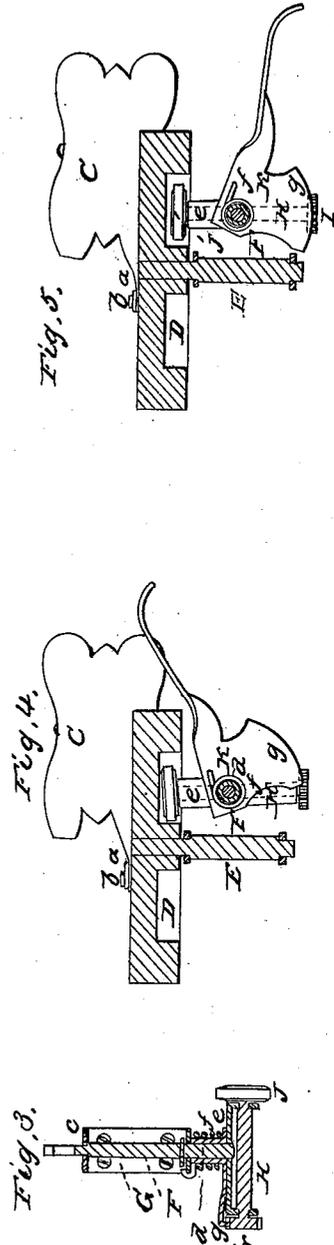
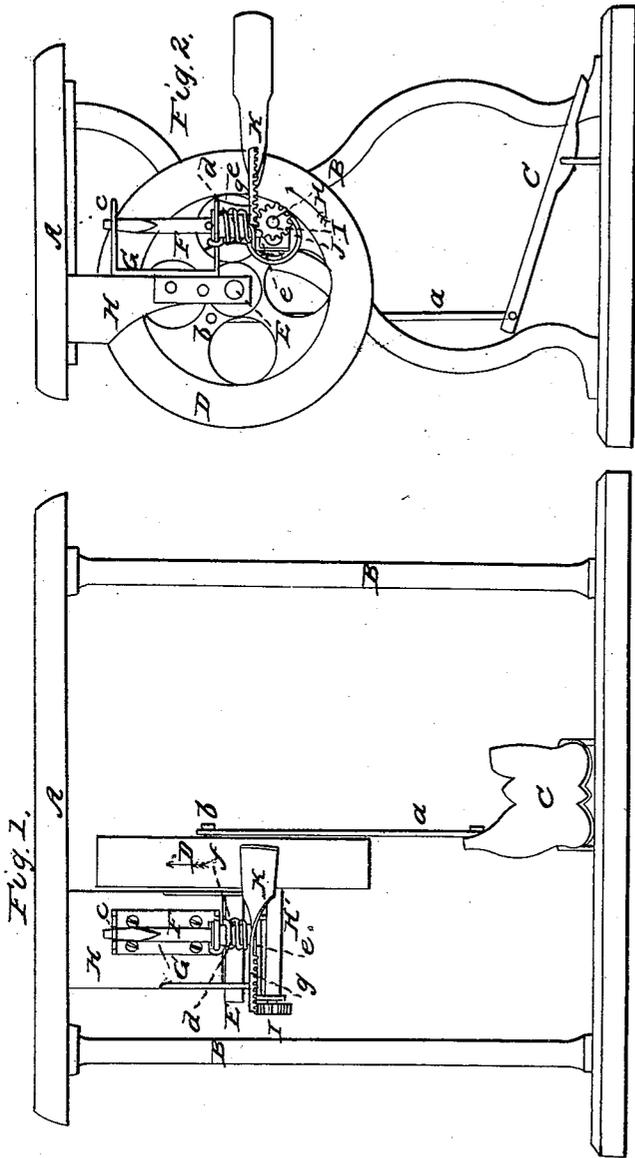


T. J. ALEXANDER.

Sewing Machine.

No. 28,642.

Patented June 12, 1860.



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UNITED STATES PATENT OFFICE.

THOMAS J. ALEXANDER, OF WESTERVILLE, OHIO.

IMPROVEMENT IN MECHANISM FOR STARTING SEWING-MACHINES.

Specification forming part of Letters Patent No. 28,642, dated June 12, 1860.

To all whom it may concern:

Be it known that I, THOMAS J. ALEXANDER, of Westerville, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement on Starting Arrangements to Sewing-Machines, and for other purposes, of which the following, taken in connection with the accompanying drawings, is so full and clear a description as that others having a practical knowledge of such matters will be enabled therefrom to make and use my improvement.

It has before been proposed to connect with the driving-shaft of a sewing-machine a pawl-and-ratchet gear under the control of the knee of the operator for the purpose of preventing back motion in working the machine, and to assist in starting the main shaft when the latter, driven by a crank and treadle, hangs in its movement by reason of the crank being on the dead-center. Such and other arrangements for the like purpose or purposes do away with the necessity of the operator removing his hand from the "work" to start the driving wheel or shaft in the right direction. The many advantages attendant upon dispensing with the removal of the hand from the work on the cloth bed or table each time it is necessary to start the machine, and the disadvantages or breakages, &c., which are avoided by compelling the machine to start and run in the right direction, are too well known to need special comment here, and are only now alluded to in passing for the reason that my present improvement has these ends in view, but which it accomplishes in an entirely novel manner. The various automatic arrangements which have been from time to time proposed and adopted for effecting the same or like objects have (or at least many of them) serious objections, and this my improvement in no wise relates to devices of that character; but I prefer to illustrate the action and superiority of my improvement by contrasting it in part with the arrangement I have alluded to at the onset, and in which the knee of the operator is employed to control the starting and run of the machine in the right direction. I also employ the knee or knees of the operator for the same purpose or purposes, but in a totally different and much more effective manner. In the arrangement referred to at the onset, when the operator is ready to start the

machine he or she elevates the left knee by raising the heel from the floor until the knee touches and actuates a pawl and puts it into gear with a ratchet-wheel on the driving-shaft, which action locks the latter from back movement. Should the driving-shaft have stopped with its crank on the dead-center, then an additional movement of the knee is resorted to for the purpose of making the pawl slightly urge forward the ratchet-wheel and its shaft. Among some of the objections to such an arrangement it may be observed that it is wanting in simplicity and freedom from friction, the pawl, with its operating-lever, being carried by bars that hang on the driving-shaft, and said shaft further having the weight of a ratchet-wheel to carry when running. Likewise, the back movement is prevented by a dead lock or stop, which, being suddenly applied, is liable to produce jar or breakage. As a starting arrangement, too, it is very deficient. Thus, if the crank has stopped on the dead-center, the operator, in starting again, has first to raise the knee until the pawl locks the shaft from back movement. She then, pressing on the intermediately-hung treadle to work its respective ends up or down, may find that the machine fails to start, which, supposing to arise from her pressing on the treadle to work the shaft in the wrong or locked direction, she next presses on the treadle in a contrary way; but as there is still no movement, she concludes that the crank must be on the dead-center, and consequently gives her left knee the additional motion to urge the crank over that point, when she again presses on the treadle; but, not realizing whether the crank is up or down, she first presses in a wrong way, but, quickly perceiving this, changes the pressure to actuate the crank in a right direction, after which she drops her knee to throw the pawl out of gear. Sometimes a less number of movements and changes may be needed, which is dependent in a great measure upon the position the driving-crank stands in when it is required to start the machine, and upon the accidental act of the operator to press upon the treadle in the right direction at the proper time. Such an irregularity of necessary movements, however, produces great confusion not only to the tyro, but to the expert also, because the movements going on or attempted to be made are mostly beneath the table and out

of sight. Furthermore, such an arrangement prevents starting the machine with more than one foot on the treadle; and to give an efficient start and pass the crank from a position in advance of the dead-center over that point and beyond it, requires an inconveniently high lift of the knee to give the necessary action to the pawl; and the lifting of the knee is a very objectionable action, inasmuch as the knees of different operators stand at different heights, while the lever to be acted upon stands at a fixed height, which might make the operation of the same device by an adult and child an impossibility. I have been thus minute in specifying objections to this one particular arrangement, not by way of disparaging the same, but, as these objections are avoided by my invention, to show the substantial difference which exists between the two, and that my method of employing the knee of the operator for the purpose or purposes mentioned is totally distinct therefrom and superior thereto, and which the following description of parts and their actions, taken in connection with what has been previously stated, will show.

The arrangement represented in the accompanying drawings is not a locking device against back movement other than by virtue of its starting the driving-shaft in the right direction.

Figure 1 in the accompanying drawings represents a front view of a sewing-machine table or stand with its mechanism for operating the machine and my improvement for starting the driving-shaft in the right direction applied thereto. Fig. 2 shows a side view of the same with one of the side supports to the stand removed. Fig. 3 is a vertical section of the device for starting the driving-shaft in the right direction, and Figs. 4 and 5 are sectional plans in illustration of said device in different positions and in connection with the driving mechanism shown in Figs. 1 and 2.

My improvement may here be supposed to be applied to driving the "Wheeler & Wilson" or other such like machines. To adapt it to machines of a different character will require some little different modification of parts; but such change or changes, as also equivalents of devices here used, will readily suggest themselves to the minds of those practically acquainted with constructing and operating sewing-machines.

A is the table-top; B B, its side supports; C, the intermediately-hung treadle, connected by a rod, *a*, to a crank or wrist pin, *b*, projecting from the one side or face of a wheel, D, that may serve for both balance and band wheel to drive the working parts of the machine, the shaft E of said wheel being here supposed to be the driving one. The band which passes round the wheel D may be run up through the table to drive the mechanism above the table, as usual. The proper direction for the run of the band-wheel is supposed to be away from the operator at its top.

F is a vertical shaft arranged at a little dis-

tance from the one side of the band-wheel D. This shaft is made square at its upper end, where it fits in a mortise, *c*, made in the upper leaf of a bracket, G, which is bolted fast to a piece, H, secured to and projecting downward from the table-top. The fit of this square end of the vertical shaft F in the mortise *c* is a free one, so as to admit of said square end or shank slightly turning therein, the mortise *c* being a fraction larger than the shank. The lower end of this vertical shaft F passes through the under leaf of the bracket G, down through a thimble, *d*, and below this firmly secured to a cross-bar, *e*, the ends of which are turned down to form bearings to a horizontal shaft, H', that carries at its outer end a pinion, I, and at its inner end, and within the rim of the band-wheel, a friction pad or wheel, J. The thimble *d* has a spiral spring, *f*, wound round it and made to bite at its one end on the fixed bracket G, and at its other end attached to a lever, K, which is secured to the thimble *d*, that fits loose on the vertical shaft F. This lever K is extended in front and made somewhat in the form of a spoon or spoon-handle, to admit of a lateral action of the knee or knees of the operator against it. Said lever has a toothed segment, *g*, which gears with the pinion I of the horizontal shaft H'. The play of the square end of the vertical shaft F in the mortise *c* is sufficient to admit of the cross-bar *e*, together with said shaft, being slightly twisted or turned, so as to make the friction-wheel J just clear the rim of the band-wheel, or, if turned in the contrary direction, to make the friction-wheel come in close or hard rubbing contact with said rim. The spring *f* serves to throw the lever K back to its starting position and to keep the friction-wheel free from contact with the band-wheel, and it is only when the lever K is being moved to the left, or from its position shown in Fig. 4 to that occupied by it in Fig. 5, that said wheel is brought in hard rubbing contact with the band-wheel by reason of the segment *g* acting on the pinion I, which action slightly twists or moves the cross-bar *e*, so as to make the friction-wheel J bear against the rim of the band-wheel, and at the same time to be turned or rotated so as to operate or drive or start the band-wheel in the right direction. The distance of the pinion I from the vertical shaft F is preferably greater than the distance of the friction-wheel J therefrom, to secure a powerful bite of the friction-wheel on or against the rim of the band-wheel, and to prevent slipping when the knee operates the lever K to make the friction-wheel start the band-wheel. After the machine has been thus started or set running, there is no friction on the band-wheel consequent upon the starting devices, and it or its shaft has no extra weight to carry. Also, when the velocity of the band-wheel D is made to exceed the speed of the friction-wheel J, then the former becomes the driver of the latter, which last, in turning, causes the pinion on the other end of its shaft H' to act upon the segment *g*, so

as to induce such twist of the cross-bar *e* as will make the friction-wheel clear itself of close rubbing contact with the band-wheel; hence the operator is relieved from exercising timely care to remove his knee or knees from the starting arrangement when or after sufficient motion has been given to the band-wheel, and whereby the starting device is made self-freeing. The operator may keep both his feet on the treadle and move either one or both knees laterally, so as to actuate the lever *K* to bear the friction-wheel *J* up against the rim of the band-wheel *D*, and in doing this to turn the friction-wheel so as to start the band-wheel in the right direction. Sufficient motion may by this means or method be readily communicated to the driving-shaft *E* to more than carry the crank over the dead-center, though in advance of it at starting, and to give the balance-wheel the necessary impetus to continue the working of the shaft in the right direction by the aid of the treadle, which is set in motion as the foot or feet of the operator should work it. Also, all inconvenient raising of the knee to start the driving-shaft is avoided, and whether the device be operated by an adult or child, there will not in the lateral action of the knee be experienced any difficulty; nor is more than one action necessary both to prevent back motion and to give a good and effective start to the machine in the right direction; neither is there any dead lock or stop against back motion to produce jar or breakage, and no multitude or confusion of movements in starting the shaft, but a simple action that a child may manage. Contrary to most automatic arrangements, the main shaft may be driven backward by the action of the treadle when such back motion is required or desired.

My improvement is of course equally applicable to starting other than sewing-machines when operated by treadle.

Having thus described my invention, I claim as new and useful—

1. So constructing and hanging or arranging the lever or its equivalent, which serves for the knee or knees of the operator to set in motion mechanism for starting the treadle-driven shaft in a forward or given direction, as that said lever requires the lateral action of the knee or knees to actuate it, essentially as herein set forth.

2. The employment, in combination with a treadle and for starting the treadle-driven shaft in a forward or given direction, of a friction pad or wheel set in motion against a band or other wheel connected with said shaft and actuating the same, substantially in the manner described.

3. So hanging and operating the friction pad or wheel, which is employed to start the treadle-driven shaft in a forward or given direction, as that the same movement on part of the operator which serves to rotate or communicate driving motion to the friction pad or wheel firstly brings said friction-pad in close rubbing contact with the wheel it operates, and whereby the friction pad or wheel is made self-freeing after having started the wheel or shaft it is employed to direct the movement of and give starting impetus to, substantially as herein specified.

In testimony whereof I have hereunto subscribed my name.

THOS. J. ALEXANDER.

Witnesses:

R. R. ARNOLD,
M. ARNOLD.