S. HAAS.
Machine Treadle

No. 200,390. **Patented Feb. 19, 1878.**

Fig. 1.

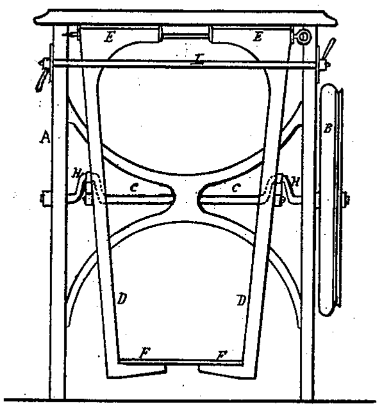


Fig. 2.

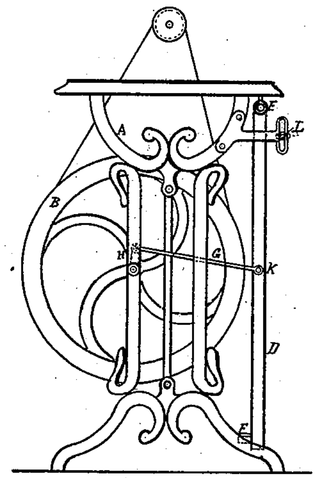


Fig. 5.

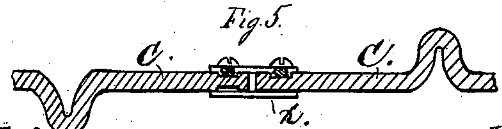


Fig. 3.

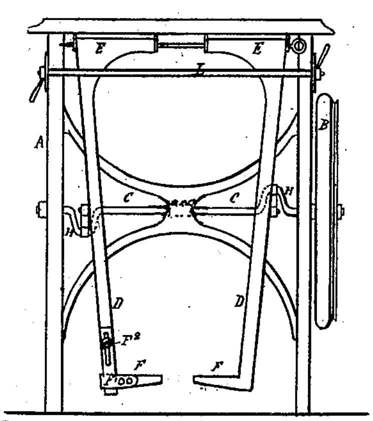
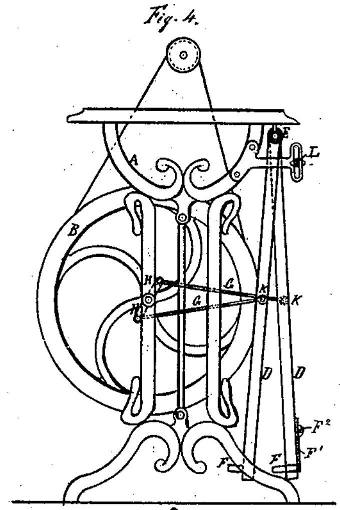


Fig. 4.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINE-TREADLES.

Specification forming part of Letters Patent No. **200,390**, dated February 19, 1878; application filed December 27, 1877.

To all whom it may concern:

Be it known that I, SIMON HAAS, of Lyons, in the Republic of France, have invented certain new and useful Improvements in Mechanism for Driving Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which 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 the letters of reference marked thereon, which form a part of this specification; and I hereby further declare that a patent has been applied for for this invention in France, October 20, 1877.

Heretofore sewing or embroidering machines, when not driven by steam-power, have usually been set in motion by horizontal treadles, either single or double, connected by vertical links with a crank-shaft or a crank-pin on which a fly-wheel is fixed. This system is very simple, but also very objectionable, the most serious objection being the excess of work brought upon the women who use these machines, and who are so completely tired out by them that they either must leave off working for a time or suffer from serious diseases caused by this kind of work.

Many contrivances have been suggested and tried to avoid these inconveniences; but, according to my opinion, these schemes have not yet been directed in the way where the solution of the problem lies. The presiding thought seems to have been limited to lessening the driving work instead of changing it, and they kept the treadles in spite of the numerous inconveniences resulting from the motion which feet and legs must impart to them. Thus, click-and-spring work, either single or double, has been applied, with the view of more completely utilizing the impulsion of the fly-wheel, but leaving the treadles with their defects, coupled with a more complicated driving mechanism.

The defects of the ordinary sewing-machines with treadles are so well known that it has been thought necessary to bring out hand-machines; but these machines are insufficient as to speed, and, besides the motion of the arm they require, as well as the friction of the arm against the body which results from this motion, are also very prejudicial to the health of women, and exceedingly tiring; and, again, one hand is thus lost for the manipulation of the work.

My invention is an improvement upon that class of treadles which have a swinging motion; and it consists in a special construction of parts, hereinafter particularly described, whereby the two pendulous or swinging treadle-levers may be swung together or alternately, at option, and in other details.

With one single pendulum both legs can be stretched out and be brought back again together; but as the motion of one leg alone is sufficient to apply the required power to the machine, each leg can work and rest alternately. If two pendulums are used, both legs are required to work at the same time, but the motion of one alternates with that of the other. This second way of applying this system will, in certain cases, allow of a lighter fly-wheel.

This invention, which is applicable to all kinds of sewing, embroidering, and other similar machines, meets every requirement on the three points—mechanics, good manufacturing, and hygiene.

First, as regards the mechanical point, it is extremely simple, and at the same time necessitates but a slight expenditure of strength, as the lever-arms used are of very different proportions, and their arrangement corresponds with a natural motion of the legs.

Second, as regards manufacture or workmanship, this system allows the arms and hands to be perfectly steady, so that they are quite at liberty, and have a greater facility, a greater delicacy of execution, and a greater precision than with the ordinary treadle system.

Third, as regards hygiene and health, the advantages belonging to this system are the following: (A) All the bending motions of the thigh against the pelvis are suppressed; (B) all the muscles belonging intrinsically to the pelvis are not set in action, as they are with the old treadle system; (C) instead of being close to each other and placed in inside rotation, the thighs are slightly separated and placed in outside rotation.

Therefore, if we analyze the muscles set in action, we find for the old system, first, the complete group of the pelvi-trochanterian muscles—that is to say, all the muscles which go down from the pelvis to the femur, (*i. e.*, the three breech muscles, the pyramidal, the two obturators, the gemelli, the psoas iliacus,) viz., nine muscles; second, the group of the adductors of the thigh; third, the muscles of the vertebral gutters, which must be contracted in order to keep the pelvis steady and give a support to the aforesaid other muscles. Let us note, lastly, every muscle of the thigh and of the hind region of the leg.

On the contrary, with the new system, the muscles of the thigh alone are set in action—viz., triceps, sartorius, crural biceps, right internal, half-tendinous muscle, half-membranous. The adductors of the thigh are not set in action.

The consequences of this improvement are obvious. The pelvis muscles being at rest and the thigh being kept motionless, women can drive the machine without any danger, even when they are going to be mothers, and young girls will not be liable to those inconveniences on account of which sewing-machines have been looked upon as a cause of physical and moral mischief.

The accompanying drawings show two different types of pendulum-treadles, which can be applied to any description of sewing or embroidering machine, and do not require any essential alteration of their arrangement.

Figures 1 and 2 are front and side elevations of a single pendulum apparatus, and Figs. 3 and 4 front and side elevations of a double apparatus; and Fig. 5, a detail in section, showing an adjustable divided crank-shaft and its coupling.

In Figs. 1 and 2, A is the frame or standards of any description of sewing or embroidering machine; B, the fly-wheel or driving-pulley, fixed on driving or crank shaft C; D, the pendulum oscillating on E, which points of suspension E can either be taken on the table or the standards of the machine. F are cross-pieces or foot-rests attached to the lower extremities of the pendulum D, provided with oscillating soles, and they can be raised or lowered, according to the length of the legs, by means of the sockets F^1, and fixed in place by means of the screws F^2, or their mechanical equivalents. I also, according to circumstances, marry the two foot-rests F by means of a small horizontal cross-board. G, links connecting the pendulum at joints K with the crank-shaft C.

In Figs. 3 and 4 the same letters show the same pieces, with an arrangement similar, as to principle, to that above described, but differing in this point, that the pendulums act alternately upon the crank-shaft, so as to give the fly-wheel a divided and more regular motion. To effect this in the same machine, I make the crank-shaft C in two parts, coupled together by means of a coupling-sleeve or fastener, *x*, whereby, upon loosening the screws or detaining device which unites such coupler to these two parts of the shaft, the crank on one part may be turned to any desired position or angle relatively to the crank on the other part, and then these two parts firmly secured to such adjusted position. (See Fig. 5.)

In order to regulate the apparatus so that the knees correspond as much as possible with the points of suspension of the pendulum or pendulums, a traverse or cross-bar, L, can be screwed up against the standards A, or under the table, which traverse can be lowered or raised, according to the length of the legs, the foot-rests F being at the same time lowered or raised accordingly. A proper disposition of these means of regulating the apparatus will so determine the position of the knees that the legs will be perfectly parallel to the pendulum, this cross-piece or traverse L at the same time preventing any rising motion of the thighs.

Having thus described the nature of my invention, and in what manner the same may be applied, I would have it understood that I do not confine myself to the precise details herein shown and described.

I claim—

1. The combination, with the pendulums D and the sectional crank-shaft C, of the links G, connecting such shaft and pendulums directly to each other, the combination being and operating as described, and whereby the foot-rests or treadles may be actuated simultaneously in the same or in opposite directions, as set forth.

2. In combination with the pendulums, arranged to swing upon the same fixed fulcrum, and connected to the crank sectional shaft between their points of suspension and the lower swinging ends, the adjustable foot-rests F, applied, as described, to the lower extremities, as shown and described, and for the purpose set forth.

3. In combination, the swinging parts or pendulums D D, the sectional crank-shaft C, and the adjusting shaft-coupling sleeve and screws, as and for the purposes set forth.

SIMON HAAS.

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