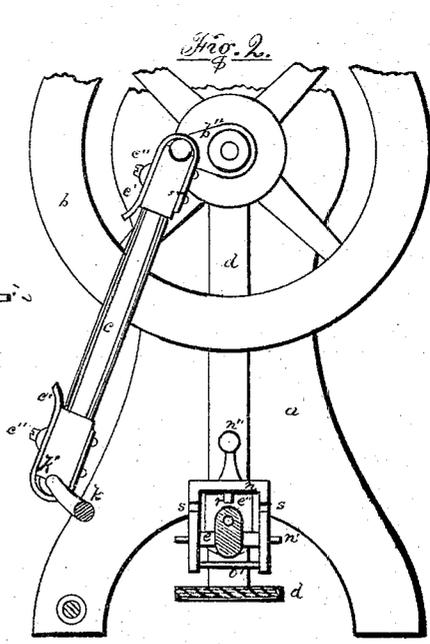
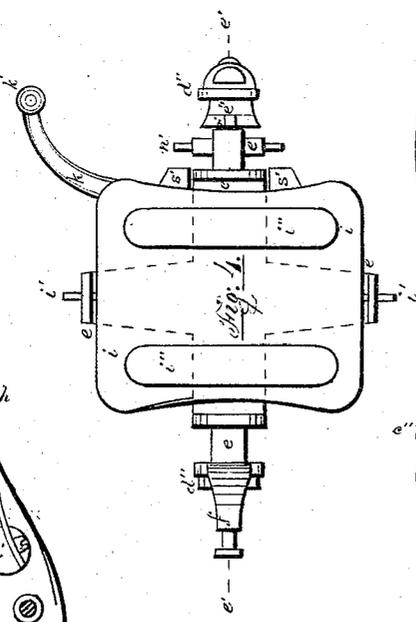
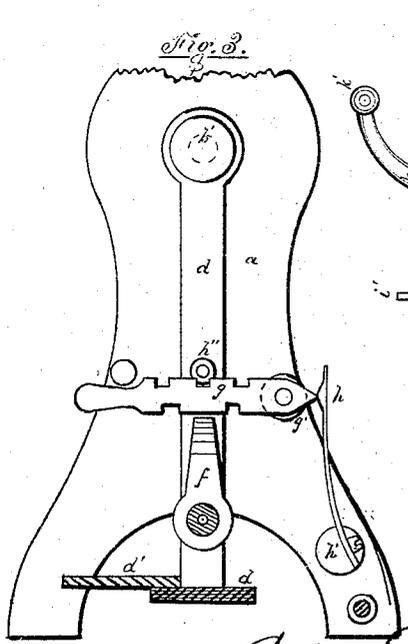
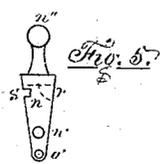
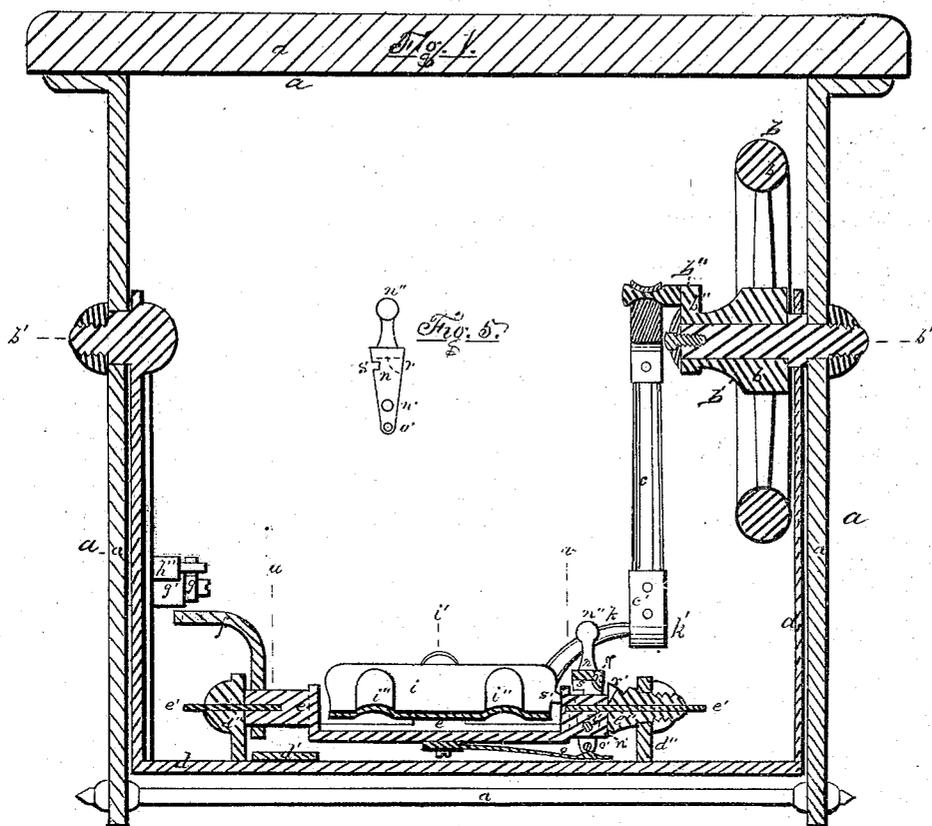


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Improvement in Treadle for Sewing Machines.

No. 125,283.

Patented April 2, 1872.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN TREADLES FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. 125,283, dated April 2, 1872.

To whom it may concern:

Be it known that I, WM. H. ELLIOT, of the city, county, and State of New York, have invented a new and Improved Treadle for Driving Light Machinery; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Similar letters of reference indicate the same devices in all the figures.

To enable others skilled in the arts to comprehend, make, and use my invention, I will proceed to describe its nature, construction, and operation.

The nature of my invention consists in constructing a treadle in such a manner that its foot-rest may be tilted upon several different axes, whereby the operator is made to exercise a different set of muscles with each change of axes, giving him perfect rest in some sets of muscles while others are at work. To accomplish this I construct my treadle in three principal parts—viz.: A swing, which is pivoted to the frame in the axis of the fly-wheel. This swing supports the spider, which is tilted upon an axis parallel with but below the axis of the fly-wheel. The spider supports the foot-rest, which is tilted upon an axis at right angles to that of the fly-wheel. These principal parts are provided with locking levers or bolts, one of which locks the spider so as to prevent it from tilting upon its axis while it leaves the foot-rest free to tilt upon its axis, or it locks the foot-rest while it leaves the spider free. The other locking-lever locks the swing to the frame in different positions; or, liberating the swing, it locks the arms of the spider to the frame, by which a compound movement of the foot-rest is produced. The notch for the locking-lever, which prevents the movement of the spider upon its axis, is adjustable so as to accommodate the position of the several parts to the length of the pitman. The pitman is joined to the foot-rest by means of a universal joint, of peculiar construction, to accommodate the universal movement of the foot-rest. The universal joint is arranged at about equal distances from the axes of the spider and foot-rest, so that the movement of the foot-rest in either connection will be about the same.

Figure 1 is a vertical section of the frame, fly-wheel, and treadle in and parallel with the axis of the fly-wheel. Fig. 2 is a vertical cross-section of the frame and treadle at dotted line *v*. Fig. 3 is a vertical cross-section of the frame and treadle at dotted line *u*. Fig. 4 is a plan of the treadle and spider. Fig. 5 is an elevation of the locking-lever of the spider and foot-rest.

a, frame; *b*, fly-wheel; *b'*, axis of the fly-wheel and also of the swing; *b''*, crank; *c*, pitman; *c'*, straps forming a part of the joints or bearings; *c''*, screw and washer for fastening strap *c*; *d*, swing pivoted at *b'*. This supports the spider and foot-rest upon the bracket *d''*. *d'*, auxiliary foot-rest attached to the swing; *e*, spider; *e'*, axis or bearing of the same; *e''*, adjustable head of the bracket *d''*; *f*, arm of the spider; *g*, locking-lever or bolt, which locks the swing in any desirable position, and also locks the arm *f* of the spider; *g'*, stud and pivot supporting the same; *h*, spring which operates the lever *g*; *h'*, support of the same; *h''*, pin upon which lever *g* takes hold to lock the swing; *i*, foot-rest; *i'*, axis or bearing of the same; *i''*, portions of the foot raised so that the feet may roll upon them from side to side when the foot-rest is moving upon its axis *i'*; *k*, arm of the foot-rest; *k'*, ball or universal joint; *n*, locking lever or bolt; *n'*, pivot of the same; *n''*, handle of the same; *o*, spring of bolt *n*; *o'*, pin upon which spring *o* bears; *r*, tongue on bolt *n*, which enters notch *r'* on the bracket-head *e''*; *s*, notches on bolt *n* for the reception of projections *s'* on the foot-rest for locking the same; *u*, point of section of Fig. 3; *v*, point of section of Fig. 2.

My invention is intended to improve the present method of driving light machinery, such as sewing-machines, knitting-machines, watch-lathes, &c., by bringing into action, one after the other, several sets of muscles, so that while the operator is resting one set of muscles he will be working with another, and thus avoid those physical evils which are always attendant upon the overworking of one part while other parts of the person are at rest.

The swing *d* is pivoted to the frame *a* at *b'* in the axis of the fly-wheel, and is supported at one side by the stud upon which the fly-wheel revolves, and at the other side by a bolt

and nut. This swing, when not locked by lever *g*, is free to move back and forth upon its bearings *b'*. Upon the lower part of the swing the brackets *d''* are supported. Through these brackets the pins *e'* pass, and serve as bearings upon which the spider tilts. The spider has ears turned up at the sides, through which the pins *i'* pass, and serve as bearings, upon which the foot-rest tilts. The arm *k* is attached to the foot-rest and terminates in a ball, *k'*. This ball is equally distant from the axis *e'* and the axis *i'*, so that, while moving upon either of these axes, the amount of motion in the foot-rest is the same.

To accommodate tall or short persons the swing, with the foot-rest upon it, is locked back or forward, to suit their convenience, by the locking-lever *g* taking hold upon pin *h''*; and, as the pivot of the swing is in the axis of the fly-wheel, its adjustment does not derange the operation of the foot-rest and pitman upon the crank.

It may be seen by the drawing, Fig. 3, that the rear end of the locking-lever *g* is pointed, and that spring *h* also has a corresponding prominent point when the lever is brought to a horizontal position, so as not to engage either with pin *h''* or with arm *f*. The point of the lever stands exactly upon the point of the spring; but, when the lever is raised so as to engage upon pin *h''* to lock the swing, the point of the lever falls below the point on the spring and so holds the lever firmly upon the pin *h''*, and so, also, when the lever is depressed to engage upon arm *f*, the point of the lever rises above the point on the spring and in the same way holds the lever firmly locked upon the arm. The locking-lever or bolt *n* and spring *o* operate in the same manner. When this lever is engaged upon the foot-rest the point of spring *o*, bearing upon one side of pin *o'*, keeps the lever firmly in place; and, when the tongue *r* is in the notch *r'*, the point of the spring *o*, bearing upon the other side of pin *o'*, keeps the spider firmly locked to the adjustable head *e''*. Both of the locking-levers are shown in the drawing in intermediate positions, which leaves all parts free to move.

I have selected as a universal joint, to join the arm of the foot-rest to the pitman, what is known as the ball-and-socket joint; but, to save expense, I construct it by making half a socket for the ball in the lower end of the pitman, then nailing onto one side of the pitman the leather strap *e'*, bringing it around and under the ball, fasten it upon the other side of the pitman by a screw and washer *e''*. The upper end of the pitman is fastened to the crank-pin in a similar manner. By this improvement I obtain a cheap, perfectly noiseless, and easily adjusted universal joint. The same passes through an oblong hole in the strap, and to tighten the joint it is only necessary to loosen the screw, draw the strap tight, and bind it again.

By my improved treadle I am able to bring

into use the ankle-joints and the muscles that control them by locking the swing to the frame and the foot-rest to the spider; the foot-rest then tilts upon the axis of the spider *e'*. This movement has generally been adopted for sewing-machines.

To bring into use the hip-joints and their muscles I lock the swing in its forward position by lever *g*, and, by moving lever *n* to the right, I lock the spider to the swing and leave the foot-rest free to tilt upon its axis *i'*. The feet, resting upon the raised surfaces *i''*, rock from side to side upon them as the foot-rest tilts up and down upon its axis, and as one foot rests upon one side and the other foot upon the other side of axis *i'*, the legs balance each other, which makes this movement exceedingly easy. The raised surfaces *i''* may be made in separate pieces, and pivoted at each end to the foot-rest so as to roll or tilt upon axes parallel with the axis *i'*. In this case they should be made to fit the bottom of the foot. These surfaces would thus tilt upon their own axes instead of rolling under the feet. They should each have an arm projecting down from their under sides two or three inches in length, the lower ends of which should be connected together by a rod, and the rod pivoted at its center to the spider. By these devices the surfaces *i''* would always be kept in a horizontal position in the same manner that the platform of counter scales are held level. By locking the swing in its rear position a combined movement of the hips and knees is produced, while in both cases the ankles remain motionless.

To bring into use the knee-joints and their muscles I lock the arm *f* to the frame by lever *g*, and the foot-rest to the spider by lever *n*. The swing is thus caused to move back and forth by the foot upon the auxiliary foot-rest *d'*. By this arrangement the spider with its arm *f*, and the foot-rest with its arm *k*, becomes a lever of the third order, the fulcrum being at the end of arm *f*, while its power is in the axis *e'* and its weight at *k'*.

While these devices are operating as a lever between the swing and pitman the foot-rest *i* is making a combined movement, caused by swinging back and forth upon the axis of the swing, and by being tilted upon the axis of the spider by the arm *f*; and, if the feet be placed upon the foot-rest *i* instead of upon the auxiliary foot-rest *d'*, there would be a combined movement of both the ankle and knee joints.

By supporting the spider upon the frame *a*, and dispensing with the swing-arm *f* and locking-lever *g*, the foot-rest would still have the two first movements, viz., one upon the axis *e'* and one upon the axis *i'*. The adjustable head *e''* would in that case be supported by the frame *a* instead of one of the brackets; the other end of the spider would also have a bearing in the other side of the frame. By this arrangement the most valuable part of the invention would be retained at a comparatively

small addition to the cost of treadles in common use. The universal joint k' accommodates the universal movement of the foot-rest upon the axes i' and e' .

Having described my invention, I desire to have secured to me by Letters Patent of the United States the following claims, viz.—

1. The axes or bearings i' and e' and the locking lever or bolt n , in combination with the foot-rest i , substantially as set forth.

2. A universal joint k' , in combination with the foot-rest i and its two axes i' and e' , substantially as herein specified.

3. The locking-lever g , in combination with frame a and swing d , substantially as and for the purpose specified.

4. The method of constructing a universal joint, substantially as shown and described.

5. The arrangement of the universal joint k' in relation to the two axes e' and i' , as specified.

WM. H. ELLIOT.

Witnesses:

C. L. OSGOOD,

D. LEWIS.