J. B. UNDERWOOD.

Combined Chair and Treadle Power.

No. 209,842. Patented Nov. 12, 1878.

Fig. 1.

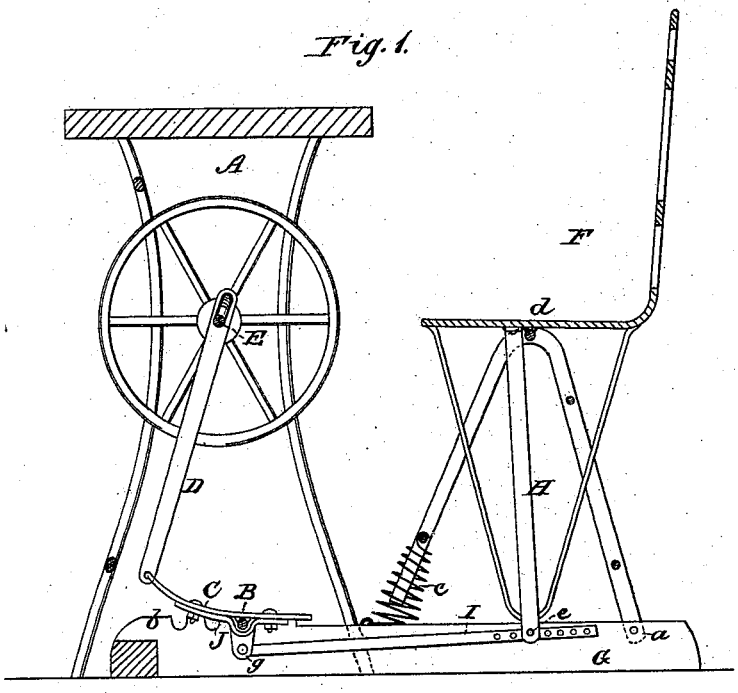

Fig. 2.

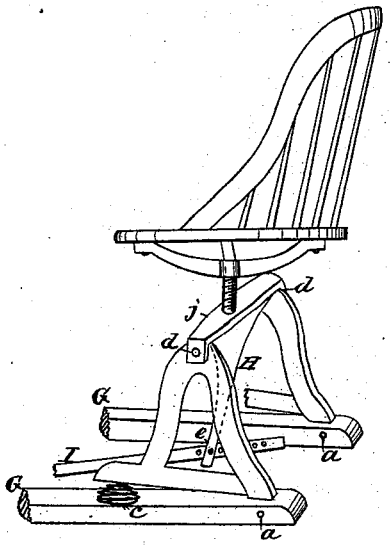

Fig. 3.

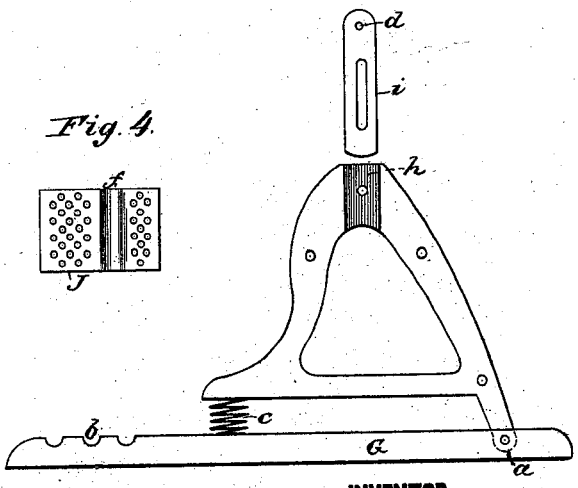

Fig. 4.

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JOSEPH B. UNDERWOOD, OF FAYETTEVILLE, NORTH CAROLINA.

IMPROVEMENT IN COMBINED CHAIR AND TREADLE-POWER.

Specification forming part of Letters Patent No. **209,842**, dated November 12, 1878; application filed July 27, 1878.

To all whom it may concern:

Be it known that I, JOSEPH B. UNDERWOOD, of Fayetteville, in the county of Cumberland and State of North Carolina, have invented a new and Improved Combined Chair and Treadle-Power; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation of the chair applied to the frame-work of a sewing-machine. Fig. 2 shows, in perspective, a modification of the invention with means for adjusting the chair vertically. Fig. 3 is a detail of the chair-frame, showing another arrangement for adjusting the chair vertically. Fig. 4 is a detail of the saddle.

The object of my invention is to reduce the muscular force exerted in running a sewing-machine or other device operated by a treadle, and to transfer the strain from the muscles of the abdomen and other parts which are injuriously affected thereby to other muscles which are better able to exert the power and withstand the fatigue, thus confining the work to the lower part of the legs, and converting a laborious and injurious operation into one of healthful exercise.

In securing this result my invention consists in so pivoting the chair and arranging it upon springs that it shall have a compound vibratory motion, which adapts it to the movement of the operator, and utilizing this movement by connecting with the chair a pendent lever-frame projecting from and rigidly attached to the chair, which frame converts the movement of the chair into a reciprocating movement of the treadle through a connecting-rod, and operates in conjunction with the natural foot movement upon the treadle, as hereinafter more fully described.

In the drawing, A represents the frame, B the treadle-rod, C the treadle, D the pitman, and E the crank-shaft, of an ordinary form of sewing-machine, to which my invention is shown applied. F is the chair, and G G base-bars, to which the hind legs of the chair are pivoted at *a*, which base-bars are extended in front beneath the treadle-rod, and provided with notches *b* to receive the treadle-rod and hold the chair in the desired proximity to the treadle. Beneath the front legs of the chair are placed springs *c c*, which permit the chair to rock on its pivots *a* in supplying one of its movements. The chair seat and body are also pivoted at *d* to the upper portion of the chair legs or frame, which gives to the seat of the operator a second point of oscillation. Projecting downwardly from the chair-seat, and rigidly connected therewith, is a stiff lever-frame, H, the lower end of which descends to the level of the treadle, and is provided with adjusting-holes.

I is a horizontal connecting-rod, secured adjustably to the lower end of the lever-frame by means of holes and a bolt, *e*, and fastened at its forward end to a projection from the lower side of the treadle.

In adapting this connection-rod I for easy attachment to the treadles of various machines, I employ a saddle-plate, J, which consists of a plate arched at *f* to pass around the treadle-rod, and provided with flat bearing-faces upon opposite sides of said arched portion, which faces are perforated with numerous holes to permit the saddle to be bolted to the under side of the treadle. The numerous perforations in this saddle-plate and the open character of most treadles permit a binding-place for a bolt to be easily formed. From the under side of this saddle depends a projection, *g*, to which the front end of the horizontal connecting-rod is loosely pivoted.

Now, the operator being seated in the chair and the point or front end of the treadle being elevated, as shown, the operation of the devices would be as follows:

When seated in the chair the center of gravity of the operator is in the rear of the chair-pivots *d*, and the chair-seat, by its lever-connections with the projection on the bottom of the saddle, transmits its lifting force to the front side of the treadle, lifting up the toe of the foot at the same time. It will thus be seen that no muscular effort whatever is required to depress the heel of the treadle. As soon as the operator presses with the toe upon the treadle this pressure has a tendency to depress the outer end or toe of the treadle. At the same time, also, this muscular exertion throws the weight of the body upon the thighs

and shifts the center of gravity to the front of the pivots *d*, causing a compression of the springs, a rocking forward of the chair upon its leg-pivots *a*, and also a rocking forward of the chair upon its seat-pivots *d*. This action causes the lower end of the lever-frame and the connecting-rod to be drawn back, and produces an effect upon the treadle, in conjunction with the toe-pressure, to bring the toe of the treadle down.

In depressing the heel of the treadle the weight of the body is again shifted to the rear of the pivots *d*, the chair moves backward on its pivots *d* and *a*, and the lower end of the lever-frame, in moving forward, produces an effect upon the treadle in harmony with the downward movement of the heel portion.

It will thus be seen that the chair moves in accordance with the natural and easy movement of the lower part of the body in operating the treadle, and not only automatically adjusts itself to the motion, but co-operates to drive the machine by its own movement. The chair is also so constructed that the great weight and powerful leverage of the body is kept in nice balance, so that the machine runs not only easier, but more uniformly and without jerks. It will also be seen that the legs of the operator are not lifted up and down at an expense of muscular power from the seat of the chair, as is the case in driving the treadle when the chair is rigid and stationary; but the chair follows and supports the legs with an easy rocking movement, which reduces the strain upon the abdominal muscles and distributes it throughout the muscles of the legs.

While the foregoing advantages are secured, the motion of the chair is not sufficient to affect the position of the upper portion of the body at the table, a very slight movement of the seat of the chair being sufficient, when multiplied by the lever-frame beneath, to produce the desired effect.

In order to make the seat of the chair adjustable as to height for different operators, the chair-frame may be provided with a vertical groove or guide, *h*, (see Fig. 3,) on each side, in which a sliding and slotted bar, *i*, may be adjustably secured by a bolt passing through the slot and a perforation in the chair-frame, the chair-seat having its pivot *d* at the top of this slotted and adjustable bar *i*.

As a further means of adjustment, the arrangement shown in Fig. 2 may be used, in which the lever-frame is rigidly attached to a cross-bar, *j*, pivoted at *d* to the chair-frame, and the seat of the chair is provided with a screw-stem, which turns in a female-screw in the said cross-bar after the manner of the ordinary adjustable office-chair.

The springs of the chair, instead of being placed beneath the front legs, as shown, may be placed at any point when they tend to rock the chair back on its pivots *a*.

I am aware of the patent to E. J. Leyburn, No. 94,618, in which a sewing-machine frame is mounted upon a rocking-chair, so as to be inseparable therefrom. This device, however, is not applicable to and detachable from all kinds of treadle sewing-machines, and I therefore disclaim it.

Having thus described my invention, what I claim as new is—

1. A chair having a compound rocking movement, connected to and combined with the treadle of a sewing-machine or other mechanism, for the purpose of utilizing the movement of the body to assist in driving the treadle.

2. A rocking-chair having its seat pivoted to its legs, its front legs held up by springs, and provided with a connection for the treadle of a machine, substantially as described.

3. A chair arranged to rock on its hind legs, and having a second set of pivots for the seat, combined with the treadle, a connecting-rod, and a frame or projection rigidly attached to the chair-seat, and connected with said treadle by the connecting-rod, substantially as described.

4. The base-bars G G, having notches *b* to receive the treadle-rod, in combination with the chair and sewing-machine, as described.

5. The saddle J, having in the middle an arch, *f*, with pendent projection *g*, in combination with the treadle and a connecting-rod for operating the same, as described.

6. The chair-seat pivoted at *d* to a rocking-frame, and made vertically adjustable, substantially as described.

7. The chair-seat pivoted at *d*, and having a pendent frame or projection, in combination with the frame pivoted at its rear upon its legs and sustained in front upon springs *c c*, together with the connecting-rod I and the treadle C, substantially as and for the purpose described.

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Witnesses:

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