2 Sheets—Sheet 1.

I. W. McGAFFEY.

EXERCISING-MACHINE.

No. 192,836. Patented July 10, 1877.

FIG. 1.

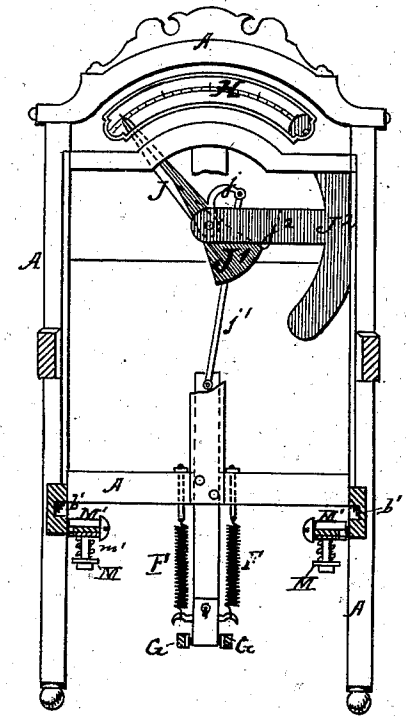


FIG. 2.

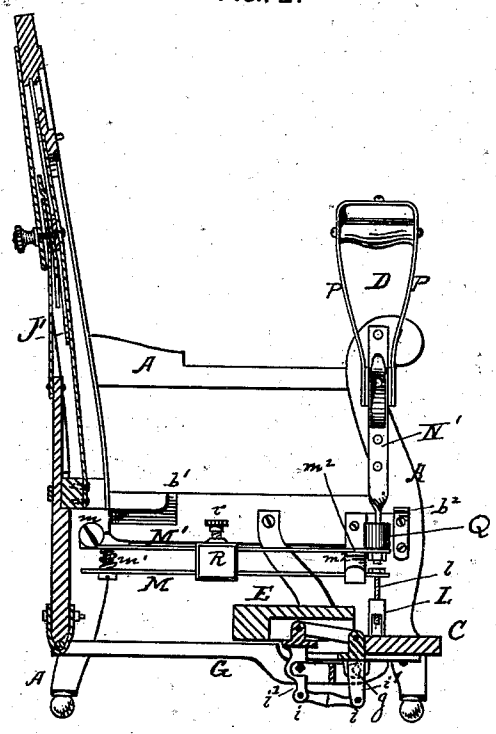


FIG. 11.

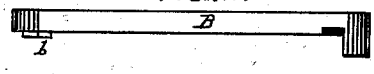


FIG. 7.

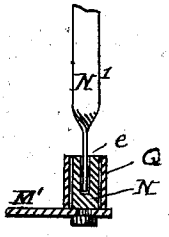


FIG. 8.

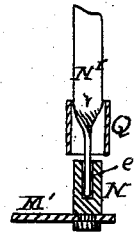


FIG. 6.

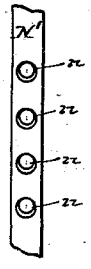


FIG. 5.



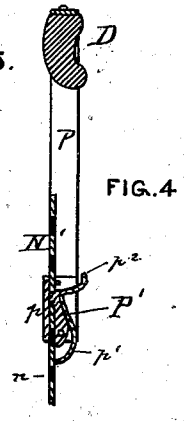


FIG. 4

FIG. 10.

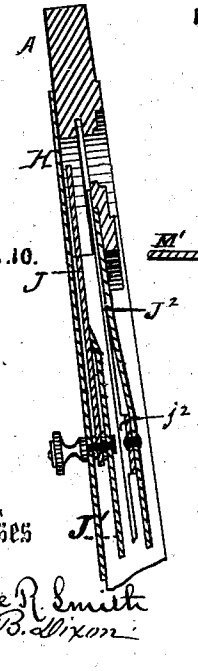
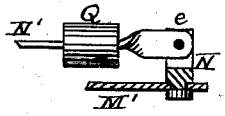


FIG. 9.



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FIG. 3.

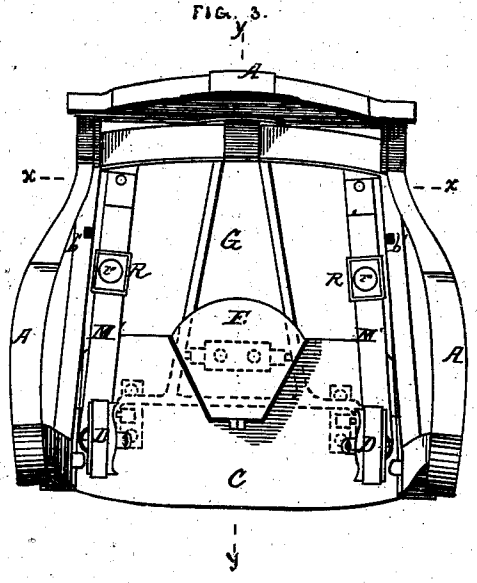
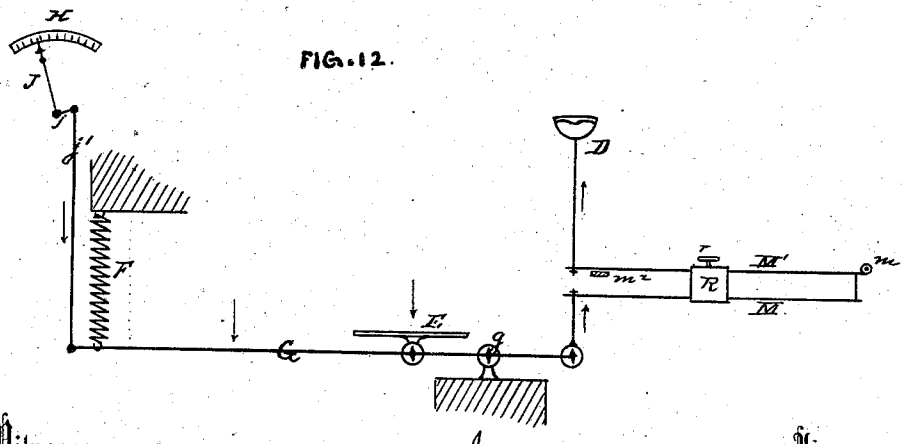


FIG. 12.



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IVES W. McGAFFEY, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN EXERCISING-MACHINES.

Specification forming part of Letters Patent No. **192,836**, dated July 10, 1877; application filed May 1, 1877.

To all whom it may concern:

Be it known that I, IVES W. McGAFFEY, of Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Health-Lift Apparatus, of which the following is a specification:

In the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section of the apparatus on the line *x x* of the plan. Fig. 2 is a similar section on the line *y y* of the plan. Fig. 3 is the plan view. Figs. 4, 5, 6, 7, 8, 9 are views of the lifting-handles. Fig. 10 is an enlarged section of the dial mechanism. Fig. 11 is a side view of the chair-seat removed. Fig. 12 is a diagram or displayed analysis of the lever mechanism.

Like letters of reference made use of in the several figures denote like parts.

In the said drawings, A is the frame-work of an arm-chair, which in practice may be suitably upholstered and cushioned. B is the removably-hinged seat-frame, provided at the sides with short lugs *b*, which enter the L-shaped slots b^1 in each side of the chair-bottom. The front end of the seat-frame is supported upon the cleats b^2. By this arrangement it will be seen that provision is made for turning up the seat of the chair readily, even when a thick cushion is built upon the seat-frame, and a heavy upholstering applied to the chair-back, because the seat-frame may be pulled to the front far enough in the slot, before being raised, to allow room for the cushions in turning up. It will be understood, of course, that the slot, when the seat is thus brought to the front, will permit of the entire removal of the seat bodily from the chair, if desired.

Below the seat of the chair, and between the front legs, is a platform, C, upon which it is intended that the person using the health-lift shall stand while lifting. The handles D D, which will be more particularly hereinafter described, rise from each side of this platform, and the levers for transmitting the lift to the resistance and registering device are located below said platform. A small platform, E, rises above the platform C, and occupies the space between the places of the lifter's feet on the platform C. This small platform is connected to the lever below the platform C in front of the main fulcrum, so that the lifting apparatus may serve as a weighing-scale, the small platform serving as the scale-platform.

The resistance against which the lift is made consists of a pair of coiled or spiral springs, F F, suspended from the chair-back, and connected to the long arm of a lever, G, which has a main fulcrum at *g*, supported by being hung from the platform C, and the short arm of said lever is connected to the lifting-handles. There are, of course, two lifting-handles, and in order to connect both to the lever the latter is made forked, as shown in dotted lines at Fig. 3 of the drawing, and the fulcrum *g* is doubled.

Between the fulcrum *g* and the resisting-springs is swung, upon the lever, the weighing-platform E, above adverted to. In order to produce a knife-edge bearing at the fulcrum *g* for both the lifting and weighing movement, I make the said fulcrum consist of a double knife-edge projection from the lever—that is to say, with an edge above and an edge below. This sets loosely in a metal ring secured to the platform. When the lever is lifted upon from the lifting-handles the upper knife-edge forms the bearing, and when the lever is used in weighing, the weight on the platform E brings the bearing upon the lower knife-edge.

The registration or indication of the lift or the weight is accomplished by an arc or dial, H, in the wood-work of the upper part of the chair-back. This arc is marked off into spaces to denote the amount weighed or lifted, and as the action of the lever is not the same in the one case as in the other, two sets of figures are necessary, one set to denote the pounds lifted and one set to denote the pounds weighed, although by proper adjustment of ratios one set of space marks will serve for both sets of figures. A pointer, J, is pivoted in the interior of the chair-back, and is provided with a crank, *j*, which connects to the pitman or connecting-bar j^1, which in turn connects with the end of the lever G. A second or dumb pointer, J^1, applied to the same pivot as the first-named pointer, serves to denote the farthest point reached in the manner of such pointers generally. In order to close

the dial from view an arc-shaped panel, J^2, with an extension, j^2, is pivoted to the same center as the pointers, and swings over the dial to close it, or down into the interior of the chair-back out of sight to open the dial to view.

In order that the weighing-platform may move up and down vertically, I apply to it a parallel-motion device, consisting of the ordinary bars *i i*, pivoted to the bars *i' i'*, one set standing upright, and connected, respectively, to both the platforms, and the other set lying in nearly a horizontal direction, and pivoted to the first-named sets at each end.

The handles for lifting are connected to the knife-edge pivots at the short-arm ends of the lever G by loops L, into which screws *l* set from the lower leaves of the intermediate springs.

As the handles at each side and all of the connections are duplicates, I will proceed to use the singular number in the further description.

The intermediate spring consists of two leaves, M M', lying parallel to each other, and extending from the back to the front of the chair, just below the seat. The upper one, M', is pivoted to the chair-frame at the back at *m*, and connected by a bolt to the lower one. A spiral spring, *m'*, on this bolt at the rear is for the purpose of giving an increase of elasticity; but said spring may be omitted, if desired. The lower leaf M, as above stated, is connected by screw *l* to the loop L, which encircles the knife-edge pivot of the short arm of the lever G. The upper leaf is secured to the piece N, to which is hinged, at *e*, the twisted bar N', to which is attached the handle. This bar N' is pierced with a number of holes, *n*, which are beveled away at their lower edges on one side of the bar. The strap P, which incloses the hand-grasp, extends down each edge of the bar, and below is united by a band, *p*. A pawl, P', held in by a spring, p^1, sets into the holes *n*, or one of them, and secures the grasp or handle from sliding upward along the bar; but, owing to the beveled edges of the holes, this pawl will permit the handle or grasp to be pushed down from hole to hole, as a ratchet would operate, and the grasp may be raised from hole to hole by detaching the pawl with a pressure on the spring from the lip p^2. This permits a ready and easy adjustment of the handles to any height required to suit different persons.

The handle, we will suppose, is drawn up to its highest position, and it is then unknown what height will be desired. Now, if the person intending to lift will mount the platform and take hold of the handles, he can adjust them instantly to suit himself by simply pushing them down to the proper place, at which they will lock themselves.

If this self-fastening adjustment is not desired, as may be the case sometimes, where only one person uses the lift and does not wish it to be changed, it is only necessary to turn the pierced bar N' around so that the bevel of the holes will be on the opposite side from the pawl-plug, and said pawl-plug will become simply a spring-plug, which cannot any longer act as a ratchet, but must be lifted out of the hole every time a change is made.

The whole handle swivels on the connection between the piece N and the upper leaf of the spring M M', and in order that the handles may turn down under the chair-seat out of sight, it is only necessary to raise the collar Q above the hinge *e*, when it may be folded, as shown at Fig. 9. When the handle is raised for use, this collar slides down of its own weight and locks the handle in an upright position.

The purpose of the intermediate spring M M' is to permit the apparatus to be adjusted so that either an exceedingly gradual yielding or elastic lift may be had, or a dead-weight of any amount, or any gradation between the two, produced.

The outer end of the upper leaf has below it a stop, m^2. A slide or cramp, R, with a compression-screw, *r*, surrounds the two leaves M M', and may be pushed forward or back along their length. Now, when this is pushed up to the front, and the compression-screw brought down, the tendency will be both to diminish the elasticity of the spring and, if carried beyond a certain point, to raise the lifting-lever and record a certain weight on the dial, so that in lifting, when so adjusted, this weight upon the dial must be overcome as a dead-weight before the pointer will move. The amount of this dead-weight may be still further increased by the screw *l*.

By the screw *l* also a certain dead-weight may be set on the dial, and at the same time a certain degree of elasticity given to the lift by simply setting back the cramp. In short, by these several adjustments, it will be possible to procure any kind of a lift desired.

All of the mechanism is concealed, in practice, by the upholstery of the chair, so that when the panel at the dial is closed, the lifting-handles turned down, and the seat lowered to place, the apparatus is an arm-chair, and presents the appearance of an ordinary piece of furniture, and may be used as such.

Having thus fully described the construction and operation of my improved apparatus, I claim—

1. The combination, with a chair capable of being used as a piece of furniture, of a health lift or scale, or both, the weighing or lifting apparatus being placed in or below the seat, and the indicator or dial being placed in the chair-back, substantially as specified.

2. The combination, with the lever of a health-lift, of a small platform mounted upon the lever on that side of the fulcrum opposite to the side at which the handles are attached, whereby the single lever is made to serve both as the lift-lever and as a scale-lever, substantially as specified.

3. The arrangement of the weighing-plat-

form upon the platform of a health-lift, said weighing-platform being placed so that it will come between the feet of the person lifting, substantially as specified.

4. The intermediate spring, consisting of two long leaves, to the ends of which the lifting-handle is attached, said spring being furnished with a sliding clamp for shortening or lengthening the elastic vibration, and being provided with compression and adjusting screws at the clamp, and at the connection with the handle, substantially as specified.

5. The construction of the lifting-handle, with a joint connection to a swivel-piece, and a sliding collar to cover the joint, so that the handle may be turned or folded, substantially as specified.

6. The combination of the handle or hand-grasp and the spring-plug with the lifting-bar, having a series of perforations, the lower edges of which are chamfered off on one side of said bar, substantially as described, and for the purpose set forth.

7. The combination of the grasp and vertical lifting-bar, the former being attached to the latter by a pawl, which will permit the grasp to be lowered on the bar as a ratchet, substantially as specified.

8. The sliding panel in the back of the chair, covering the dial, in combination with the dial in the back of the chair, substantially as specified.

9. The method of removably hinging the seat by means of L-shaped slots in the side pieces of the chair-frame, and lugs on the seat-frame, whereby the seat may be pulled forward before it is raised to accommodate the thickness of the upholstery, substantially as specified.

IVES W. McGAFFEY.

Witnesses:
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FORDE R. SMITH.