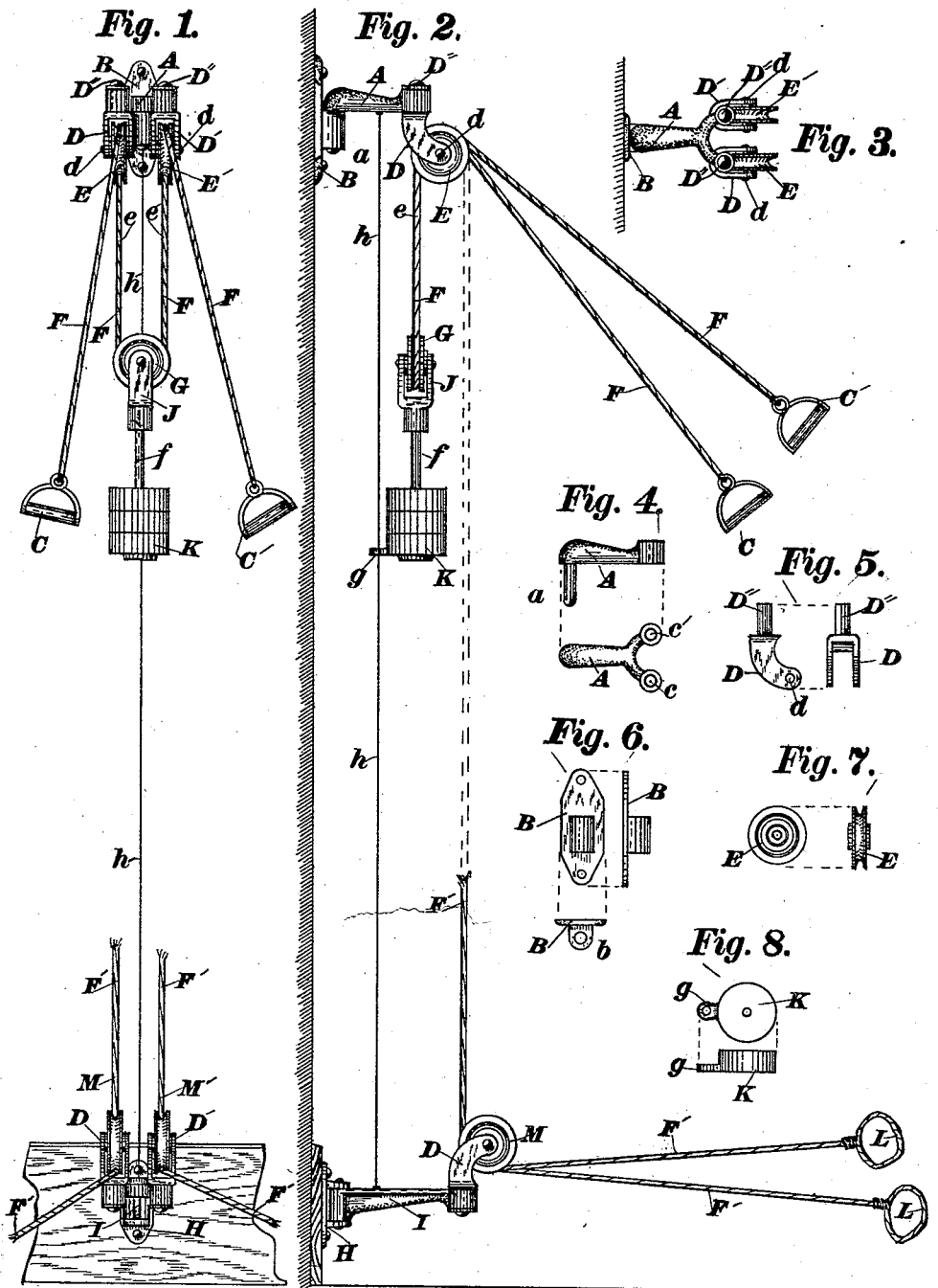


(No Model.)

J. E. DOWD.
EXERCISING APPARATUS.

No. 457,400.

Patented Aug. 11, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

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EXERCISING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 457,400, dated August 11, 1891.

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To all whom it may concern:

Be it known that I, JOHN E. DOWD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Exercising Apparatus, of which the following is a specification.

My invention relates to apparatus for exercising the muscles of the human body, the strength of the muscles being resisted by the action of weights operated vertically by the attraction of gravitation.

My objects are to provide an apparatus for exercising purposes which can be used in place of the ordinary duplex exerciser, and which is much more simple in construction, much more comfortable to operate, requires less room when in position for action, and costs considerably less to manufacture. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front view of the apparatus together with the attachment for leg movements. Fig. 2 is a side view of Fig. 1. Fig. 3 is a top view of the upper bracket and pulleys. (Ropes and balance of apparatus not shown.) Fig. 4 is respectively a detached side and top view of bracket; Fig. 5, respectively a detached side and front view of vibrating pulley-frames which are pivotally attached to bracket, Fig. 4; Fig. 6, respectively front, side, and top views of wall-plate to which bracket, Fig. 4, is pivotally attached; Fig. 7, side and edge views of the kind of pulleys employed; Fig. 8, respectively top and edge views of the lowest weight detached from weight-holder, which will be more fully explained hereinafter.

Similar letters refer to like parts throughout the several views.

The principal parts of the apparatus consist of a bracket A, which is provided with a projection *a* at its rear end, this projection being fitted to operate in a hole *b* of the wall-plate B, so that the bracket A can easily vibrate from side to side. The wall-plate B is secured in place on the side of a wall or door-jamb at a height to suit the requirements of the operator. The front end of bracket A

has two arms, near the end of which are vertical holes *c* and *c'*, and into these holes are loosely fitted the stems *D''* of vibrating pulley-frames D and D', thus permitting the frames to have a partial rotary motion laterally for the purpose as will be explained.

It will be seen that the pulleys E and E' are journaled at centers *d*, not in line vertically with the center of motion of pulley-frame stems *D''*. The amount of distance from the center of pulleys E and E' and the center of motion of stems *D''* of frames D and D' is the same as the distance from the center of motion of pulleys E and E' and the centers of rope F at *e* and *e'*; also, the distance apart from center to center of stems *D''* of the two pulley-frames D and D' is the same as the distance apart from center to center of the two parts of rope F at *e* and *e'*. The rope F passes from handle C over pulley E, thence downward and around pulley G at the weight-holder, thence up at the rear and around pulley E', and thence outward to handle C'. It will be noticed that the pulley-frames D and D' hang downward from their attachment to bracket A.

Near the floor, and usually attached to the base-board, is a plate H, to which is pivoted to swing in a lateral direction a bracket I. This bracket in general form is the same as bracket A, except that it is longer. The pulley-frames are pivoted to the end of the bracket and stand above it, as shown in Figs. 1 and 2. Bracket I is the same in principle of operation as bracket A.

In exercising-machines of the ordinary kinds either two weights are employed—one for the rope of each of the handles C and C'—or if one weight is employed the changes in the ropes and attachments of the apparatus require considerable time when it is to be transformed from an arm to a leg exerciser; but in this my new invention I combine all the valuable features of a duplex machine without its complicated parts, extra friction, cost, &c.

The weight-holder in my machine has but one pulley G, pivoted in a bifurcated frame J, as shown, and to the lower end of the frame is secured a rod *f*, and to the lower end of

this rod is secured a weight K, Figs. 2 and 8, which has a small perforated lug *g*.

Attached to and extending vertically between brackets A and I is a small wire *h*, which passes vertically through the perforation in lug *g* of weight K, the wire acting as a guide to prevent the weights and holder from vibrating when violent movements are made with the exerciser. The guide-wire *h*, being attached to both brackets A and I, moves laterally with the brackets, thus always holding the weight-holder in proper relative position.

In operation for arm movements the handles C and C' are grasped by the hands of the person exercising and given a reciprocating movement. If both handles are pulled outwardly at the same time, the weight will be raised the same amount as the distance moved by the handles; but if the handles are pulled out and released alternately the weight will be raised or fall but one-half the distance moved by each handle. If, however, one outward and one inward motion be made with the handles at the same time, the weight will remain almost stationary.

The important principle of operation in my exerciser, and the great improvement over the double-weight machines, is that when the operator is moving but one arm in any given direction the weight can exert but one-half as much force as when moving both arms in such directions simultaneously, the weight traveling but one-half the distance vertically in the one-arm movement as when both arms are used. When a reversal of movement of each arm is made at the same time back and forth, the weight maintains an almost stationary position, as described, but one-half of the weight acting to resist each arm, a feature not found in any double-weighted machine for the purpose; and since a weight descends but about sixteen and one-half feet per second by gravity it is obvious that in ordinary machines for this purpose the movements can be so rapidly made that the weight has but very little or no action whatever upon the muscles when inward movements of the arms are made at a rapid rate, while in my system the inward motion of the arm can be made at a much higher rate of speed than that attained by a falling weight, the muscles being under a constant strain.

In my exerciser it makes no difference whether the operator stands directly in front or to one side of the apparatus; nor does it make any difference in the efficiency of the machine how far apart the handles C and C' or foot-loops L and L' are separated laterally or vertically. When movements are made, the vibrating pulley-frames attached to brackets A and I by the action of the ropes instantly turn in line with the direction of the ropes, and thus prevent the rapid abrasion of the ropes and

reducing friction to the minimum. The diameter of pulleys E and E' being such that the vertical portions of rope F at *e* and *e'* fall in line under the center of the stems D'' of pulley-frames D and D', the pulley-frames may take any angle in relation to each other without changing the parallelism of the ropes at the portion named.

Those skilled in the art will readily understand the use of the ropes F' near the floor, which have loops L at their ends for engaging the feet of the operator, for whenever it is necessary to take the ordinary leg exercise the top ends of rope F' (dotted line, Fig. 2) are secured to the ends of rope F, where handles C and C' are secured, the ropes F and F' falling from pulleys E and E' vertically down to and around pulleys M and M' of bracket I, when, by the feet being engaged in the loops L and L' and reciprocated the upper part of the apparatus will operate similar to what it does when operated by the arms by pulling the handles C and C'.

The brackets A and I are shown in the drawings as pivoted to wall-plates, so as to have a lateral motion; but this is not necessary with the use of the laterally-vibrating pulley-frames D and D', pivoted to the frames and operating as shown. Stationary brackets can be provided; but laterally-swinging brackets can be quickly turned around to the wall, when not in use, and the apparatus will not take up so much room, and on this account are preferable.

What I claim as my invention is—

1. In an exercising apparatus, a bracket A, having one end attached to a wall or other similar support, the other end of said bracket having two laterally-swinging pulley-frames pivoted thereto, one independent of the other, the axis of motion laterally of said frames to be substantially vertical, and a pulley pivoted to each of said frames, each having a substantially horizontal axis of motion, said pulleys' axes of motion eccentric to the axis of vibration of said pulley-frames, for the purpose and operating in the manner as shown and described.

2. In an exercising apparatus, a bracket A, having one end attached to a wall or other similar support, the other end of said bracket having two laterally-swinging pulley-frames pivoted thereto, one independent of the other, the axis of motion laterally of said frames to be substantially vertical, a pulley pivoted to each of said frames, grooved peripherally to receive a rope for the purpose described, each pulley having a substantially horizontal axis of motion, said axis of motion eccentric to the axis of vibration of said pulley-frames, and a rope F, operating over said pulleys, thence downward and operating under and in contact with a pulley G, said pulley pivotally attached to the weight-holder in the manner described, the whole operating in combina-

tion by force being applied to the ends of rope F, in the manner and for the purpose described. and moving in unison with said brackets when said brackets are movable laterally.

3. In an exercising apparatus, a wire or
5 guide *g* for holding weight K from undue vibration, said wire being attached at the top to bracket A and at the bottom to bracket I

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