No. 804,218. PATENTED NOV. 14, 1905.

R. FIEDLER.

GYMNASTIC APPARATUS.

APPLICATION FILED DEC. 21, 1903.

2 SHEETS—SHEET 1.

Fig. 1.

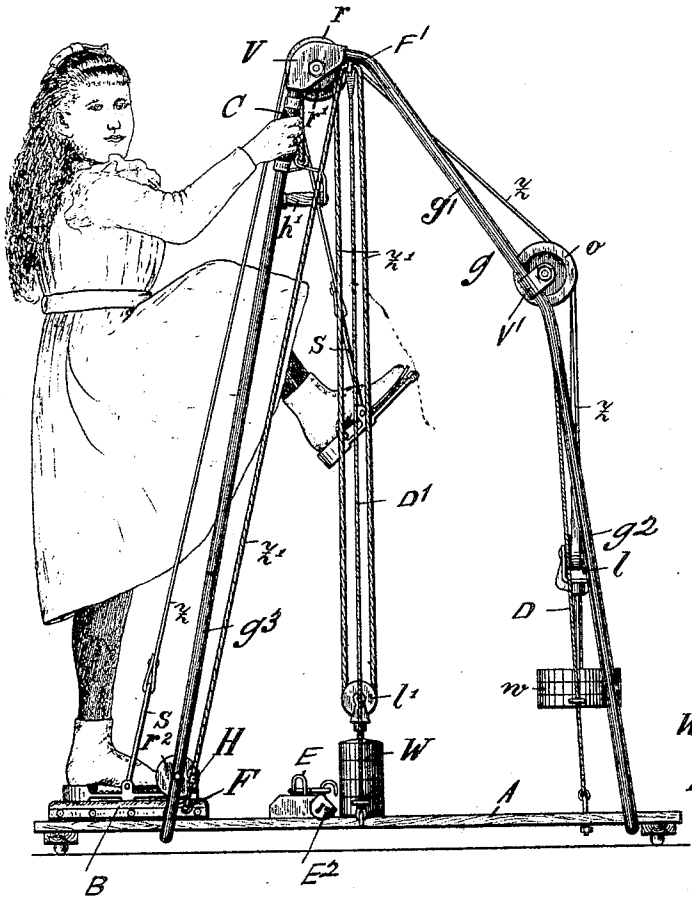
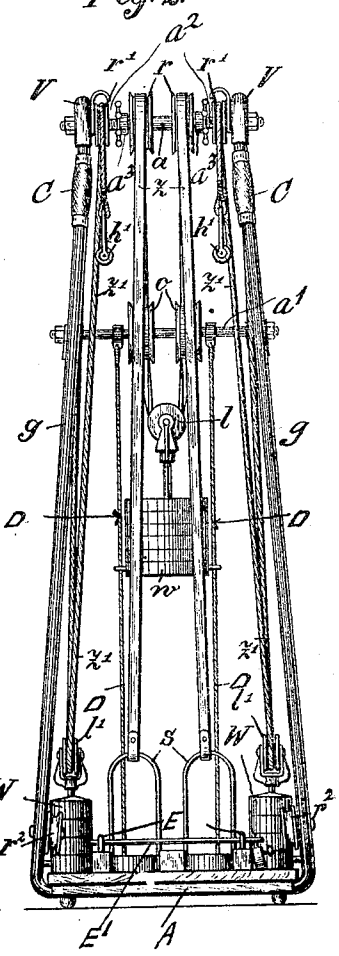


Fig. 2.



Witnesses

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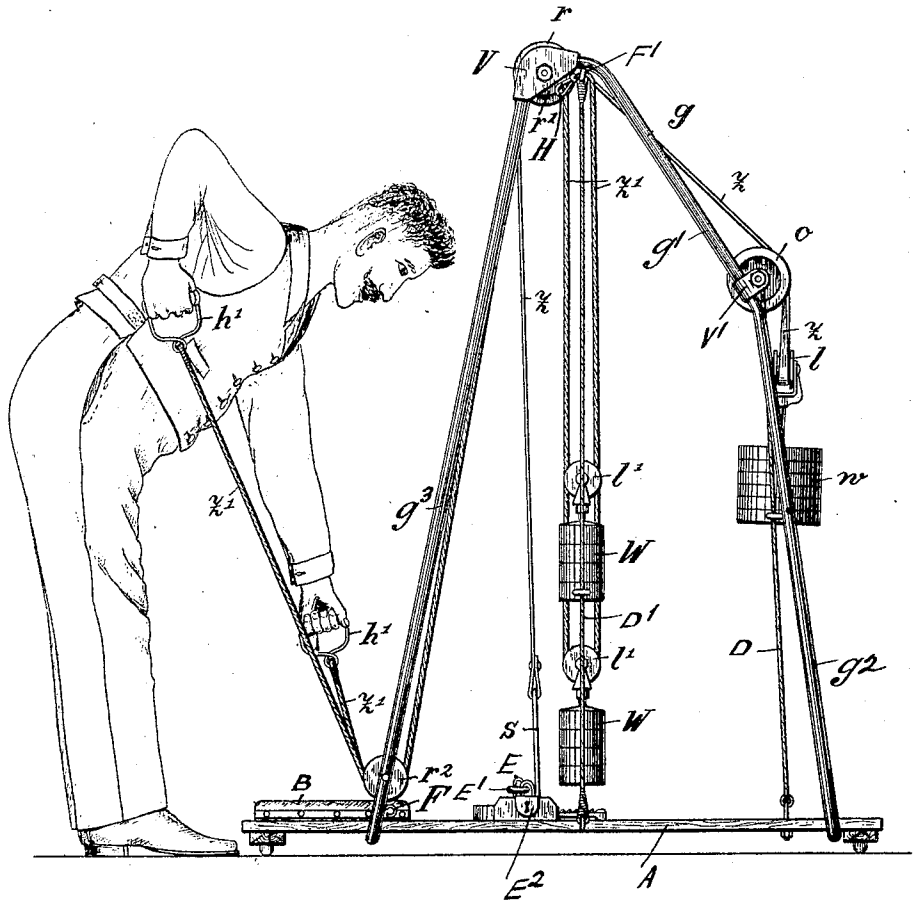
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2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

RICHARD FIEDLER, OF BERLIN, GERMANY.

GYMNASTIC APPARATUS.

No. 804,218. Specification of Letters Patent. Patented Nov. 14, 1905.

Application filed December 21, 1903. Serial No. 186,066.

To all whom it may concern:

Be it known that I, RICHARD FIEDLER, a subject of the German Emperor, residing at Berlin, Germany, have invented certain new and useful Improvements in Gymnastic Apparatus, of which the following is a specification.

This invention relates to gymnastic apparatus of that class intended to produce alternate bending of the legs at the knees, the stirrups or shoes for the feet of the user being suspended from cords or the like which run over pulleys and at the other ends of which a pull is exerted by weights or by the arms of the user.

In the present invention a single cord connects and terminates at the two stirrups and after passing over controllable pulleys passes over guide-pulleys arranged farther at the rear of the frame and lower down and then underneath a weighted pulley, which is thus freely suspended in the loop of this single cord. The object of this arrangement is to considerably reduce the descending and ascending velocity and inertia of the weight on the two stirrups, and thus to reduce the jerk exerted on the muscles at the end of the leg stretching and bending movements which take place when two weights are used.

The present invention also comprises, besides the leg-cords, cords or the like with regulatable weights and handles to be used solely for stretching the arms. The free ends of these cords are detachable, so that they can be attached to the upper or lower part of the frame, as desired, the ends with the handles being accordingly carried either round pulleys below or else direct from pulleys above.

In the annexed drawings, Figure 1 is a side elevation, and Fig. 2 a front elevation, of this apparatus, illustrating also in Fig. 1 the method of use. Fig. 3 is a side elevation of the apparatus arranged for arm exercise.

A is a platform; B, a padded or covered foot-plate thereon.

$g\,g$ are two frames made, preferably, of metal tubing carrying bearing-plates V for the fixed axle a and lugs V′ for the fixed axle a', on which pulleys o freely turn. The pulleys r and r' turn freely on the axle a; but parts of said axle are screw-threaded, as at $a^2\,a^2$, to engage screw-threaded nuts $a^3\,a^3$, by which frictional pressure may be given laterally to the pulleys $r\,r$ to vary the resistance given by the apparatus to tractive effort on the cords or bands. The cord on band z has at each end a stirrup s. From the one stirrup s the band z passes upward over one pulley r, rearward over one pulley o, downward and under the free pulley l, to which the sectional weight w is attached, up over the other pulley o, over the other pulley r, and down to the other stirrup s.

C C are handles on the frames $g\,g$, respectively.

D D are guide-cords for the weight w to prevent it swinging.

The eyebolts E E, with cross-bar E′, (which may be secured by a padlock E^2,) hold the stirrups S when they are not in use.

$z'\,z'$ are two cords having each at one end a hook H and at the other end a handle h'. Two pulleys $r^2\,r^2$ are journaled on studs near the foot of the frames $g\,g$ at the front. $l'\,l'$ are free pulleys suspended in loops of the cords $z'\,z'$, respectively.

W W are weights on the pulleys $l\,l'$, and D′ D′ guide-cords for these weights.

F F are hooks at the base of the frame, preferably on the foot-plate B.

F′ represents hooks on the frames $g\,g$ near their apices. The cords $z'\,z'$ may be attached by the hooks H to the hooks F, Figs. 1 and 2, pass upward through the hooks F′, downward under the free pulleys l', upward over pulleys r', so as to leave their handles h' hanging from the pulleys r', or they may be attached to hooks F′, pass downward under free pulleys l', upward over pulleys r', downward under pulleys r^2, so that the handles h' are adapted for upward pull, as shown in Fig. 3.

With this invention, in which only one weight w is required for both feet, the said weight must be double as heavy as if used for separate feet. The kinesipathic effect of the load on the bending and stretching muscles of the legs and loins is, however, the same. Besides this, however, a further very important kinesipathic effect is obtained which is not obtained with apparatus having separate weights for each foot. As is the case in all machines, the kinetic energy of the moving mass in this machine equals $\frac{1}{2} m\,v^2$. Where comparatively heavy weights travel the same distance in unit time as the stirrups, their velocity is comparatively high and the kinetic energy, of which the second power of v is a factor, will only be slightly reduced by reducing the mass. At the end of the leg bending and stretching movements the kinetic energy produces in proportion to its value a very considerable and sudden strain on the bending and stretching muscles. This strain can only

be endured without injury by healthy or convalescent persons. To invalids in the first stages of the kinesipathic treatment it is prematurely tiring, and therefore injurious. It is impracticable to reduce these separate weights so considerably that the injurious effect of the kinetic energy would be obviated, since that would considerably reduce the kinesipathic value of the apparatus; but with the present invention the mass can be considerably increased without injurious effect, provided that the velocity is reduced in order to avoid sudden strain. In the apparatus illustrated the kinetic energy is reduced to a quarter even when the mass is doubled, since by reducing the distance by half the velocity of the mass is halved. Consequently the full general effect of the apparatus is retained in this form; but the injurious effect of the kinetic energy is so reduced that it can no longer interfere with the desired course of the treatment.

For the purpose of better adapting the apparatus for manual or pedal exercise, the upper parts of the rear members of the frame are inclined downwardly, as at g', to approximately where the rearmost pulleys o are arranged. Beneath this point the said members are nearly vertical, as at g^2. The front members g^3 are inclined throughout their length. With this construction the center of gravity of the apparatus is considerably lower down and the weights, tending to oscillate under the effects of rapid motion, do not strike the legs of the user if the said legs are extended too far to the front.

A further and no less important advantage of the apparatus is that it can be used in its entirety or only in part. For using it in part the user can support himself by holding the frame and exercising his legs only, or he can stand farther back without placing his feet in the stirrups and exercise his arms only, moving the handles backward and forward. To use the apparatus in its entirety—that is to say, for arms and legs simultaneously—the hooks H of the cords z' z' are disengaged from F, and the handles are pulled until the hooks H become engaged at the upper part of the frame at F'. Thereupon the parts of the cords to which the handles are attached are placed round the pulleys r^2 at the lower part of the frame, and the user can bend and stretch his arms vertically while he is standing in the stirrups and exercising his legs.

The user can at any time change the time or rythm of his motions—that is to say, he can, for instance, for a time bend and stretch his right arm and right leg together and then immediately change, so that he bends and stretches his right arm and left leg together without it being necessary to cross the cords for that purpose. The user can also use the apparatus by exercising his arms without exercising his legs. He can also bend and stretch either arm alone.

I declare that what I claim is, in gymnastic apparatus—

1. The combination with two frames, of pulleys r r journaled on the same axis near the apex of said frames, guide-pulleys o o thereon on the same axis rearward and beneath said pulleys r r, a band z passing over said pulleys r and o, a loose weighted pulley suspended in the loop of said band intermediate of the pulleys o o and stirrups attached respectively to the two extremities of said band z.

2. The combination with two frames comprising inclined forward members g^3 and rearward members having inclined portions g' and substantially vertical portions g^2, of pulleys r r journaled in the same axis near the apex of said frame, guide-pulleys o o thereon on the same axis rearward and beneath said pulleys r r a band z passing over said pulleys r and o, a loose weighted pulley suspended in the loop of said band intermediate of the pulleys o o and stirrups attached respectively to the two extremities of said band z.

3. The combination with two frames of pulleys r r journaled on the same axis near the apex of said frames guide-pulleys o o thereon on the same axis rearward and beneath said pulleys r r, a band z passing over said pulleys r and o, a loose weighted pulley suspended in the loop of said band intermediate of the pulleys o o and stirrups attached respectively to the two extremities of said band z, together with two independent cords z' z' having hooks at one end and handles at the other, loose weighted pulleys suspended in loops of said cords z' z' and pulleys for said cords.

4. The combination with two frames of pulleys r r journaled on the same axis near the apex of said frames, guide-pulleys o o thereon on the same axis rearward and beneath said pulleys r r, a band z passing over said pulleys r and o a loose weighted pulley suspended in the loop of said band intermediate of the pulleys o o and stirrups attached respectively to the two extremities of said band z together with two independent cords z' z' having hooks at one end and handles at the other, loose weighted pulleys suspended in loops of said cords z' z' and pulleys for said cords, comprising a pair r' r' on the same axis as pulleys r r and a pair r^2 r^2 at the base of the frames.

In witness whereof I have signed this specification in the presence of two witnesses.

RICHARD FIEDLER.

Witnesses:
EDUARD ZIMMER,
ELISE BREDON.