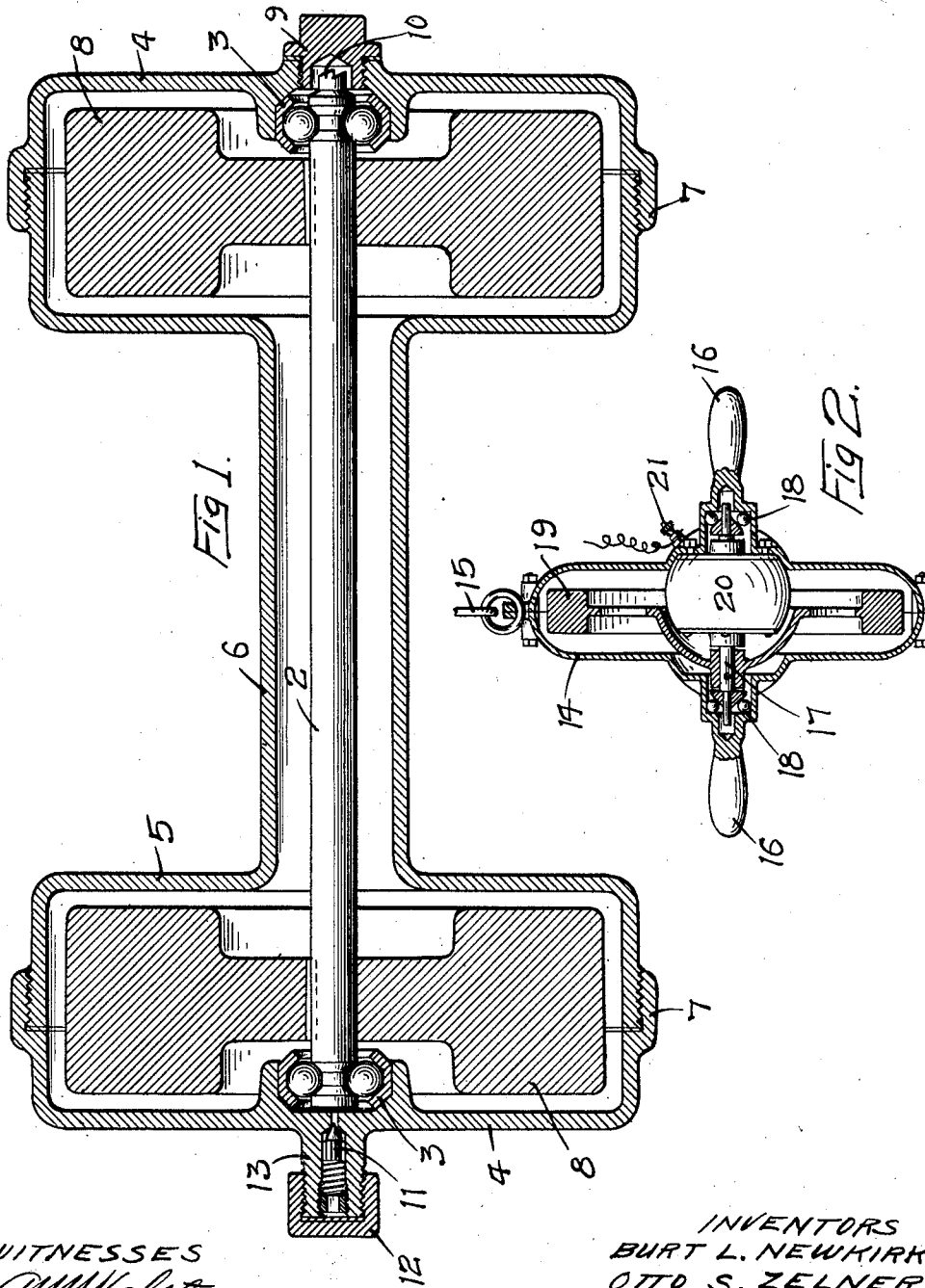


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 GYROSCOPIC EXERCISING DEVICE.
 APPLICATION FILED MAY 18, 1912.

1,058,786.

Patented Apr. 15, 1913.



WITNESSES
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UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, BURT L. NEWKIRK and OTTO S. ZELNER, citizens of the United States, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Gyroscopic Exercising Devices, of which the following is a specification.

Our invention relates to exercising devices involving the gyroscopic principle, and the object of our invention is to provide an exercising means held in the hands, free from attachment to any apparatus capable of offering resistance to motions made by the user whenever such motions would change the direction of the axle or axles of the rotating masses. The user will thereby obtain muscular exercise by combating the resistance to his motions. In the exercising device embodying the gyroscope, whenever the user of the device combats the resistance of the apparatus, unexpected motions will result, namely, precession and nutation. Both of these, especially the latter, are of such peculiar character that the user will not become accustomed to them so that he can automatically anticipate their action. He will, therefore, be compelled to cultivate alertness while exercising for the development of muscle and improvement of circulation.

A further object is to provide an exercising device which will be especially serviceable in the treatment of sprains and sore muscles, as it will call into active use muscles that the user of the device might neglect by reason of their soreness. If the design of the apparatus be such that the moment of inertia of the whole combined mass about an axis perpendicular to the axis of rotation of the rotating masses be comparatively small, the nutation is not pronounced and the phenomena are mainly due to gyroscopic resistance and precession. If, however, as in the case of the bar bell, the moment of inertia mentioned above be large as compared with the moment of inertia of the rotating masses about their axis, the phenomena of nutation become prominent and are of great advantage, since it produces motions in unexpected directions, calling into play muscles not usually used. The ordinary apparatus for vibratory massage mainly affects the surface of the skin. The very rapid and vigorous vibrations that occur when the heavy rotating masses are

slightly out of balance, will prove extremely beneficial in improving the circulation of the blood as well as exercising and strengthening the muscles of the hand, wrist and arm of the person using the dumb bell or other exercising device.

In the accompanying drawing forming part of this specification, Figure 1 represents a longitudinal sectional view of a gyroscopic dumb bell embodying our invention, Fig. 2 is a detail sectional view of a suspended exercising device with the source of motive power embodied in the casing inclosing the disk.

In carrying out our invention, we have applied it to an ordinary form of exercising dumb bell but do not wish to be confined to this use, as the principle may be embodied in various kinds of exercising devices adapted to be held in the hand.

In the drawing, 2 represents a shaft having ball bearings at 3 in the heads 4 of a casing 5, made of suitable material, preferably sheet metal, and having a hand grip 6 intermediate to the end portions thereof. The heads 4 may be secured to the casing by any suitable means, as by interiorly threaded flanges 7 engaging the exteriorly threaded surface of the casing 5. Any other construction that will insure an air-tight joint between the sections may be used.

Within the enlarged end portions of the casing, mounted on the shaft 2, we provide metal gyroscopic disks 8 which revolve freely in the casing with the shaft 2. A cap 9 is provided in one of the heads 4 and the end of the shaft adjacent to this cap has a connection 10 to which a flexible shaft or some other suitable means for transmitting power may be attached and the shaft 2 and the gyroscopic disks revolve until a high speed is attained. When this has been done the cap 9 is replaced and the person using the device will grasp the handle 6 and move the apparatus around in much the same manner as an ordinary dumb bell is manipulated. The disks 8, revolving at a high speed, will offer resistance to the movement of the dumb bell and any slight tilting of the axis of the disks will produce unexpected pulls or strains on the wrists and hands of the user, thereby subjecting the muscles to exercise and compelling the user to combat the resistance of the gyroscopic disks and be prepared for unexpected strains whenever the position of the dumb

bell is changed. The pull will frequently be so unexpected that considerable care must be exercised in the movement of the device.

5 If preferred, the disks may be mounted eccentric on the shaft so that the vibratory action will be produced during the revolution of the disks. This will have the effect of vibrating the hand of the person using the device and increasing the circulation through the hand and arm.

To insure the gyroscopic disks revolving for a considerable length of time, we prefer to provide a valve 11 in one of the heads 15 4, having a cap 12 that is adapted to be removed to allow a pump or other suitable device to be attached to the nipple 13 and the air exhausted from the casing, whereby the disks will run in a vacuum and will 20 revolve for a long time.

In Fig. 2 we have shown a modified construction which consists in a casing 14 adapted to be suspended by any suitable means, such as a chain 15, and having 25 handles 16 on each side which are gripped by the person using the device. A shaft 17 is journaled at 18 in the casing and a gyroscopic disk 19 is mounted on the shaft and driven by means of a motor 20 having 30 terminals at 21 in the casing.

In using this device, the operator will throw a switch to start the motor 20 and then grasp the handles 16, swinging the device around, the revolving disk combating 35 and resisting such movement. The tilting of the casing from side to side will result in a pull of the gyroscopic disk in some other direction so that when the disk is revolving it will constantly resist the efforts 40 of the user to tilt the casing or change its position. Evidently this gyroscopic disk may be of any suitable weight and may be mounted in various ways in the casing, the

manner shown being simply a convenient construction to allow the disk and source of 45 motive power to be compactly arranged in the casing.

We claim as our invention:—

1. An exercising device comprising a hand grip and a rotating gyroscopic mass 50 mounted upon each side of said hand grip.

2. An exercising device comprising a hand grip and a gyroscopic mass mounted to revolve thereon.

3. A gyroscopic dumb bell comprising a 55 hand grip, and gyroscopic disks mounted to revolve upon each side of said hand grip.

4. A gyroscopic dumb bell comprising a casing having a hand grip, a shaft journaled in said casing, gyroscopic disks 60 mounted on said shaft, said casing being air tight and having a valve through which the air may be exhausted, for the purpose specified.

5. A gyroscopic dumb bell comprising a 65 casing, a shaft journaled therein, gyroscopic disks mounted on said shaft to revolve in said casing, said shaft having means for attachment to a source of power, substantially as described. 70

6. An exercising device comprising a casing having a hand grip and a gyroscopic mass mounted to revolve within said casing.

7. An exercising device comprising a casing and a gyroscopic mass embodied therein. 75

8. An exercising device comprising a casing or guard adapted to be held in the hand and a rotating gyroscopic mass embodied therein.

In witness whereof, we have hereunto 80 set our hands this 14th day of May 1912.

BURT L. NEWKIRK.
OTTO S. ZELNER.

Witnesses:

EDWARD A. PAUL,
GENEVIEVE E. SORENSEN.