

No. 786,533.

PATENTED APR. 4, 1905.

W. SUTTON, S. LORD & W. S. KERR.

ELECTRIC EXERCISING APPLIANCE.

APPLICATION FILED JULY 11, 1904.

5 SHEETS—SHEET 1.

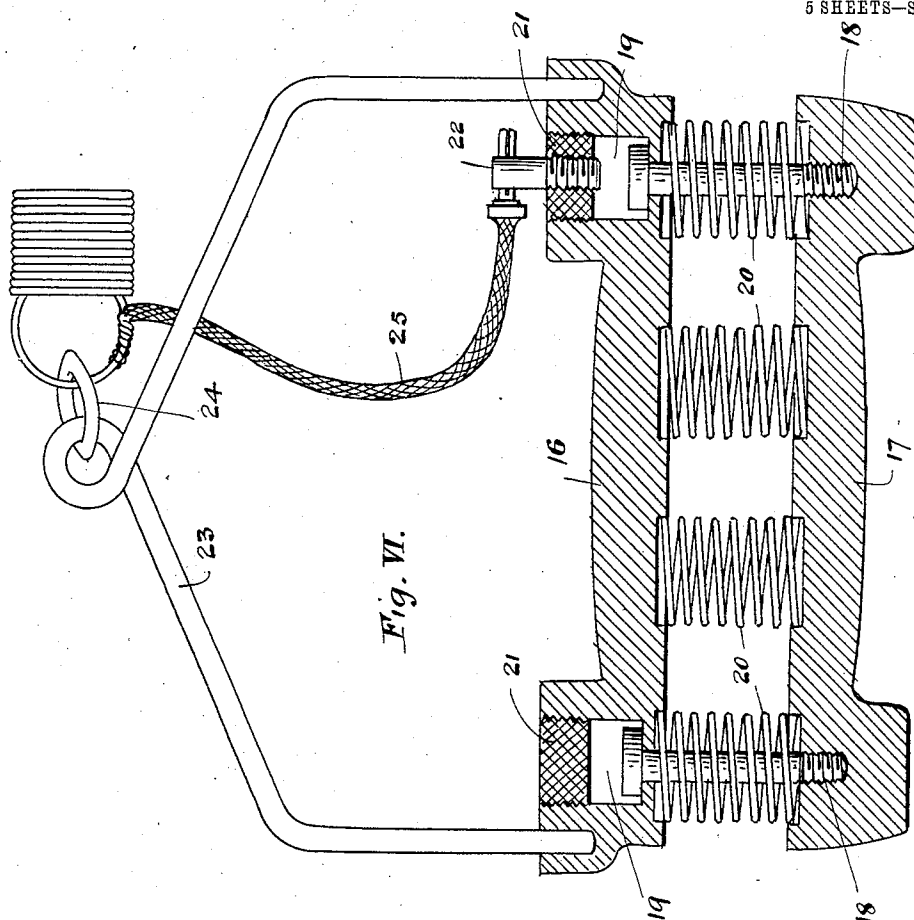
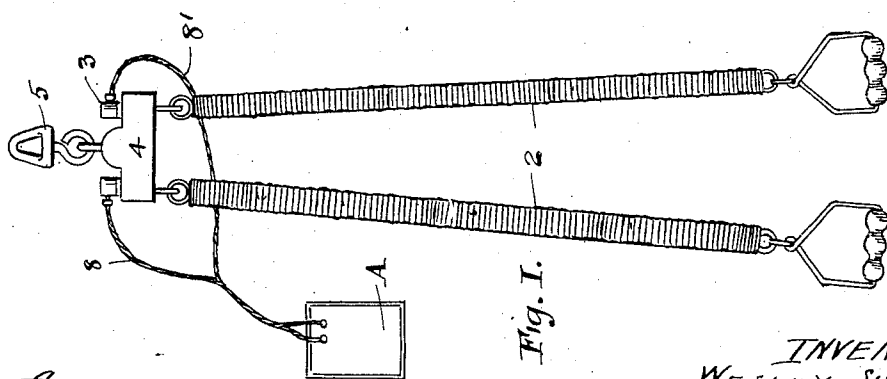


Fig. I.

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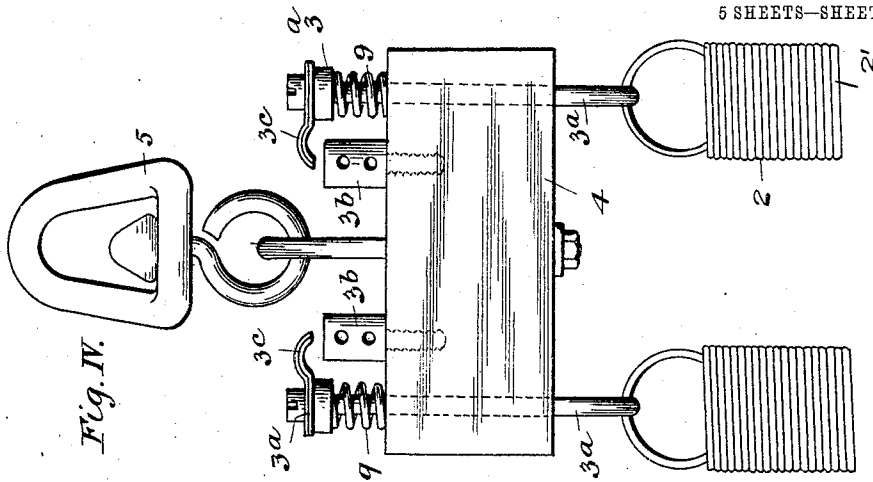


Fig. IV.

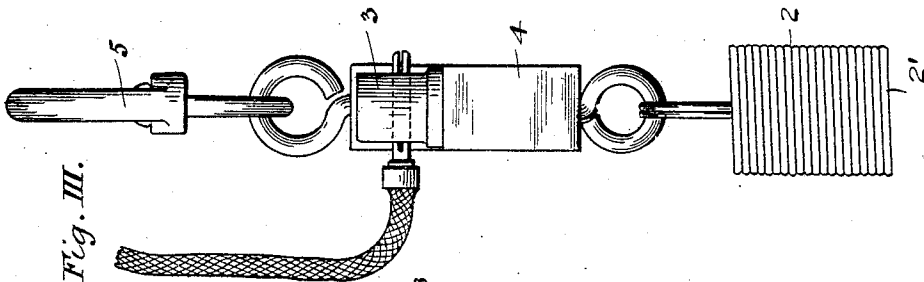


Fig. III.

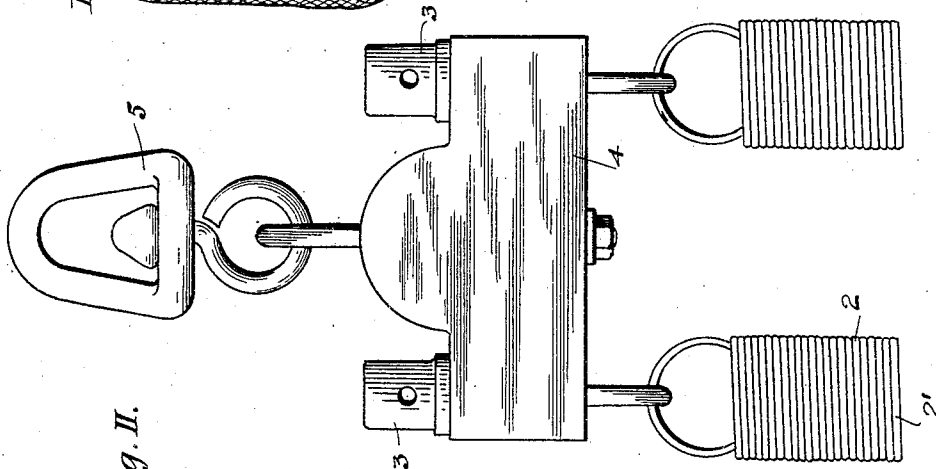


Fig. II.

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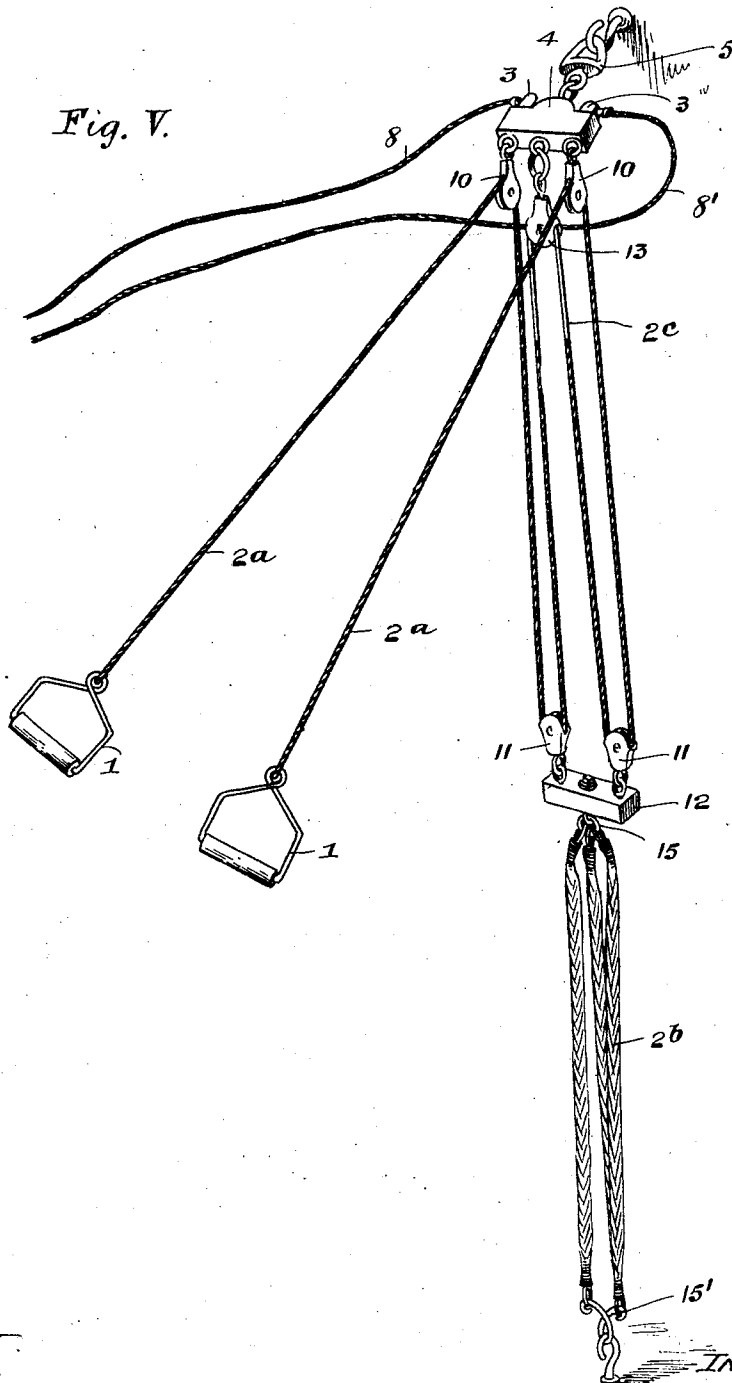
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5 SHEETS—SHEET 3.

Fig. V.



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Fig. VII.

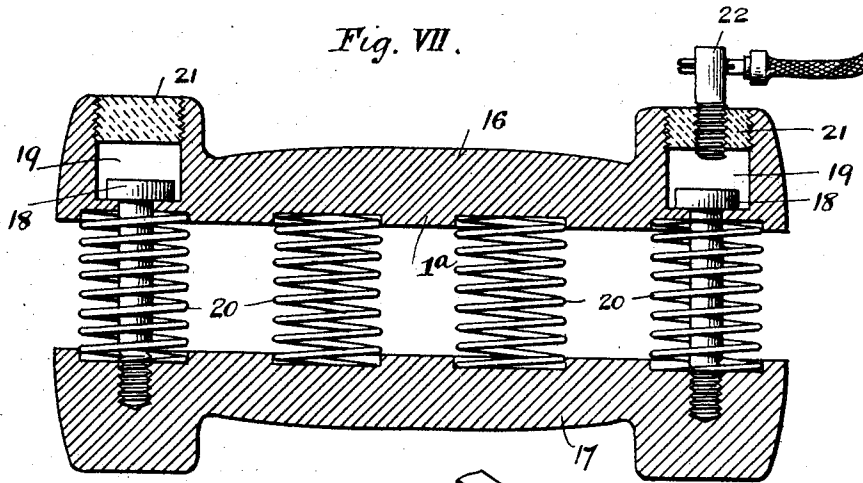
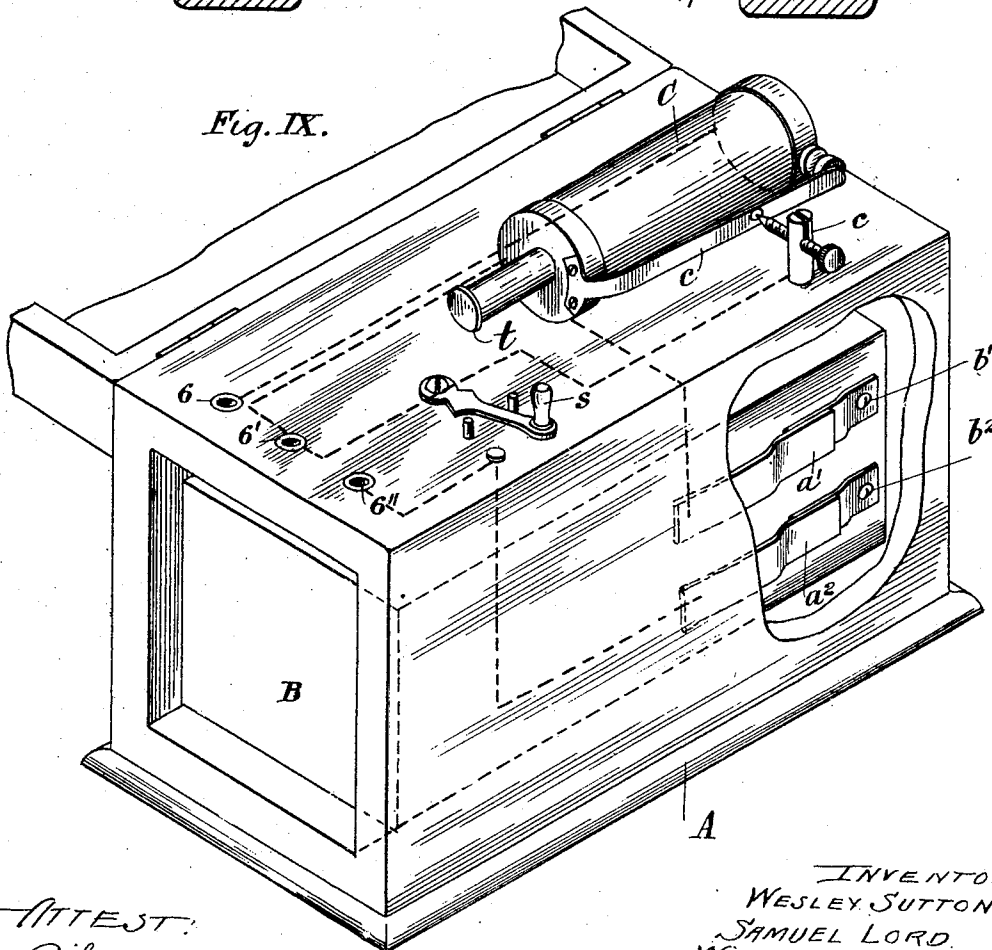


Fig. IX.



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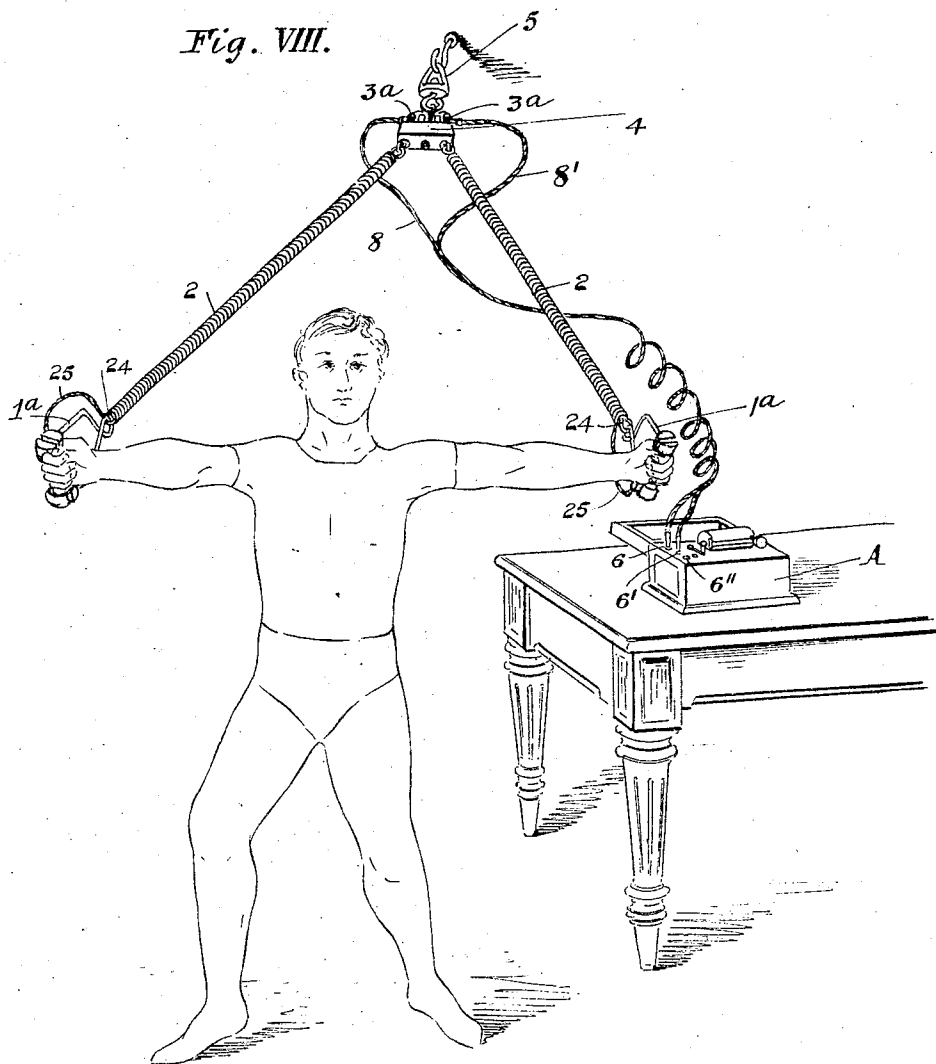
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

WESLEY SUTTON AND SAMUEL LORD, OF LIVERPOOL, AND WILLIAM
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ELECTRIC EXERCISING APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 786,533, dated April 4, 1905.

Application filed July 11, 1904. Serial No. 216,126.

To all whom it may concern:

Be it known that we, WESLEY SUTTON and SAMUEL LORD, residing in Liverpool, and WILLIAM SUNDERLAND KERR, residing in Southport, in the county of Lancaster, England, subjects of the King of Great Britain, have invented certain new and useful Improvements in and Relating to Exercising Appliances, of which the following is a specification.

This invention relates to exercising appliances adapted when used to exercise the muscles and to also simultaneously subject the user to electrical treatment.

We find that if while the muscles are being exercised by overcoming resistance in the usual and well-known manner in exercising appliances currents of electricity be passed through the parts exercised or through the body generally the exercise is much more effective and that the curative effects of the combined electrical and exercising treatment are very marked; and the object of our invention is to provide exercising appliances specially adapted to convey to the parts exercised or to the body generally simultaneously with the exercising electrical currents the magnitude and character of which can be varied as required.

We have illustrated our invention in the accompanying drawings, in which—

Figures I, II, and III illustrate our invention applied to an exerciser comprising two elastic members provided with handles adapted to be grasped in the hands, as illustrated in Fig. VII and used in a variety of ways now well known in connection with this class of exerciser to exercise the different muscles of the body. Fig. IV illustrates a modification of our invention as applied to an exerciser, as illustrated in Figs. I, II, and III. Fig. V illustrates our invention as applied to an exerciser in which the handles grasped by the hands instead of being attached directly to the elastic members, as in Figs. I, II, and III, are connected thereto by non-extensible cords or bands passing over guide-pulleys. Figs. VI, VII, and VIII illustrate our invention as applied to exercisers adapted to exercise the muscles brought into play by the gripping

action of the hand, and Fig. IX shows a convenient form of the means for producing electrical currents of the kind required.

Referring in the first instance to Figs. I to III in this application, the handles 1 are attached directly to the two elastic members 2 of the exerciser, and we prefer usually to make the elastic members of metallic springs, in which case they conveniently form the electrical conductors. The elastic members are connected to two terminal pieces 3, the connection serving to mechanically attach the two members to the terminals and also to effect an electrical connection between them. The terminal pieces 3 are carried in an electrically-insulating piece 4, to which also the attachment-shackle 5 is attached, the terminals being thus insulated from each other and from the shackle. The parts of the handles gripped by the hands are of metal or other good conductor or are coated with metal or other good conductor, so as to provide good electrical contact-surface between them and the hands, and they are flexibly and electrically connected to the conducting part of the elastic members. The exerciser is attached to a hook in a wall or to other suitable attachment, and the terminals 3 are connected, respectively, to the opposite poles 6 and 6' of the electrical supply means A by suitable conductors 8 and 8', which are preferably made up in the twin form, as shown in Fig. I.

In a modification as shown in Fig. IV the terminals 3^a may be carried in the insulating-piece 4, so as to have limited movement relatively to the terminals 3^b, and are provided with contact means, such as the brushes 3^c, adapted to make contact with the terminals 3^b, and these contact means are normally held away from contact by elastic means, such as the springs 9. In this modification, therefore, the current does not pass to the user until the force transmitted to the contacts is sufficient to overcome the springs which hold the contacts apart.

As stated, we prefer to make the elastic members 2 in the form of spiral springs composed of wire 2', wound in a spiral. They may, however, be of any other suitable elastic ma-

terial—such, for example, as india-rubber; but when the material is electrically non-conducting, as in the case of rubber, a conductor must be provided to connect the handles to the terminals. The mode in which we prefer to do this in the case of such substances as rubber of a non-conducting character is to provide the conductor in the form of fine strands of elastic conducting material, such as fine brass or copper wire, which strands are woven on the exterior of the rubber or laid on in spiral manner, the ends of the strands being connected to the handles and to the terminals, respectively, and the manner in which they are woven permits the stretching of the rubber without subjecting the wire conductors to tension. In Figs. I to IV we have shown the elastic members as consisting of spiral springs 2, made up of wire 2', wound spirally; but elastic members of rubber or the like, each having an extensible electric conductor attached thereto in the manner described or otherwise connecting the handles to the terminals or to the source of electricity, may be used, as stated.

In Fig. V we have shown the application of our invention to that class of exerciser in which non-extensible bands or cords 2^a are connected to the elastic member 2^b. In this case the non-extensible bands or cords (which are either electric conductors or have an electric conductor attached to them, as described) pass over two pulleys 10, connected one to each of the terminals 3, attached to the insulating-piece 4. Thence they pass over pulleys 11, attached to the insulating-piece 12, and are finally joined together by a non-conducting band or cord 2^c, passing round a pulley 13, attached to the insulating-piece 4 and insulated from the terminals 3 and the shackle 5. The elastic member 2^b may consist of single or multiple springs formed either of spiral springs or of an elastic substance, such as rubber. These are connected at one end to the insulating-piece 12 by an eyepiece 15 and at the other end by a shackle 15' to a hook in the ground or other convenient attachment. A weight may be attached to the insulating-piece 12 as an equivalent to the elastic member 2^b.

The insulating-piece 4 is attached by its shackle 5 to a hook in a wall or other convenient attachment, and the terminals 3 are connected by the conductors 8 and 8' to the poles of the electrical-supply means. The current passes from the terminals 3 to the pulleys 10, thence to the conducting bands or cords 2^a, and then to the user through the handles 1. Instead of plain terminals 3 contact-terminals, as illustrated in Fig. IV, may be used.

Fig. VI illustrates a form of handle 1^a which may be used as a handle in the forms of apparatus described. The handle 1^a comprises two metallic parts 16 and 17, connected together by screws 18, fixed to the one part 17 and having heads which loosely fit in recesses 19 in the part 16. Springs 20 tend to separate

the two parts. The recesses are closed by caps 21, one of which is an insulator and carries a terminal 22, which when the two parts of the handle are gripped with the necessary force makes contact with the head of the screw 18. The handle has a cross-piece 23, which is either an insulator or is provided with an insulating-link 24, to which the elastic members 2 or the non-extensible members 2^a are attached. There is therefore normally no electrical connection between the handle 1^a and the conducting part 2 or 2^a; but connection is made between the said conducting part and the terminal 22 by the flexible conductor 25. When the exerciser with the handles 2^a is used, the electrical connection is not made until the handle is gripped with the necessary force, and when the handle 2^a and the contact-terminals 3^a, as shown in Fig. VII, are used the current-circuit is only made when the handles are gripped with the necessary force and the elastic members extended by the necessary amount. The handles 1^a may alone be used if the terminals 22 are connected to the battery or other means of electric supply, as shown in Fig. VIII, in which case the muscles brought into use by a gripping action may be exercised and subjected to electrical treatment.

We have illustrated in Fig. IX a convenient means for producing the electric current when it is desired that this should be of an intermittent character. A box A is designed to carry a battery B, preferably of one or more dry cells. The poles of the battery are connected to springs b' b'', and these when the battery is inserted make contact with the springs a' and a''. On the top of the box is an induction-coil C, having a contact-breaker c in the primary circuit, which circuit is connected, through a switch s, to the battery B. The secondary of the coil is connected to the two terminals 6 and 6'. A third terminal 6'' may be fitted, and to 6' and 6'' the ends of the primary may be connected. The induction-coil is provided with suitable means, such as a tube t, to vary the mutual induction of the primary and secondary coils. The conductors 8 and 8' are provided with split connectors, which make good contact when placed in the eyes of the terminals, as shown.

Any suitable means for producing the current may be used, and in some cases instead of attaching the two terminals of the exerciser to the two poles of the current-producing means they may both be attached to the one pole and the other pole connected to any desired part of the body of the user, or, say, to a conducting-mat, on which he may stand.

Having now fully described our invention, we declare that what we claim, and desire to secure by Letters Patent, is—

1. In an exerciser, in combination, a pair of handles, spiral springs having one end fixed and the other end attached to said handles, said

5 springs being insulated from each other, a supply of electricity and means for connecting said supply with the springs, said springs being also electrically connected with the handles.

10 2. In an exerciser, in combination: a pair of handles, two spiral springs adapted to be respectively electrically connected to said handles, an insulating-block provided with a shackle and two insulated terminals, a supply of electricity, and means adapted to connect said supply to said terminals; substantially as described.

15 3. In an exerciser, in combination with elastic members and a supply of electricity; two handles consisting of two parts pressed apart by springs, one part of each handle being provided with a terminal adapted to be connected to the said supply and to make electrical contact with the handle when the two parts are pressed together; substantially as described.

20 4. In an exerciser, in combination with the handle, the elastic members and a supply of electricity; two terminals electrically connected to said supply, two contact-pieces adapted

to make contact with said terminals but held away from contact with said terminals by springs, connections between said contacts and the handles in which tension is produced, when the elastic members are strained by said handles, sufficiently to overcome said springs; substantially as described. 30

5. In an exerciser, in combination; the two-part handles, the elastic and electrically conducting members connected to the insulated terminal in one part of said handles, an electrical supply connected to a pair of insulated terminals, a pair of spring-contacts connected to and operated by the said elastic members; substantially as described. 35 40

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

WESLEY SUTTON.

SAMUEL LORD.

WILLIAM SUNDERLAND KERR.

Witnesses:

JOSEPH E. HIRST,

H. WATSON.