No. 881,438. PATENTED MAR. 10, 1908.

G. NOHL.

DUMB BELL FOR PHYSICAL EXERCISES.

APPLICATION FILED MAY 20, 1907.

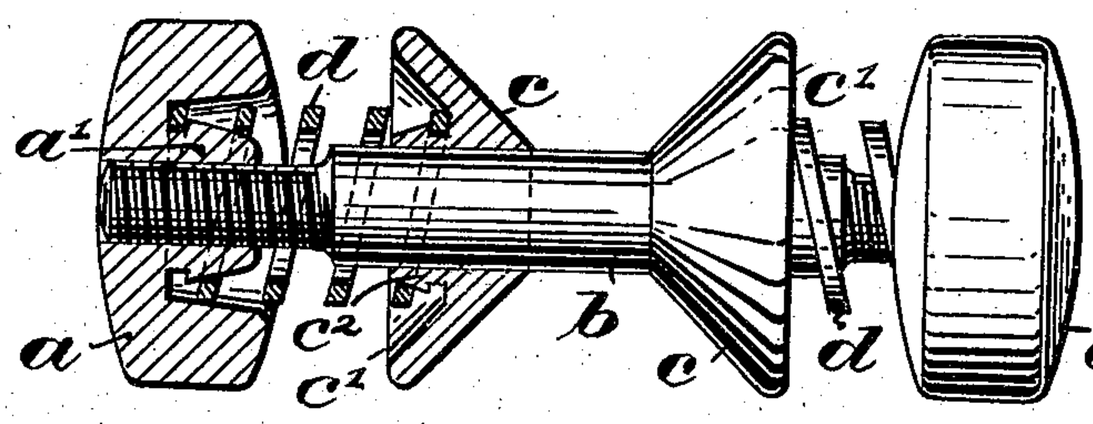



Fig. 1.

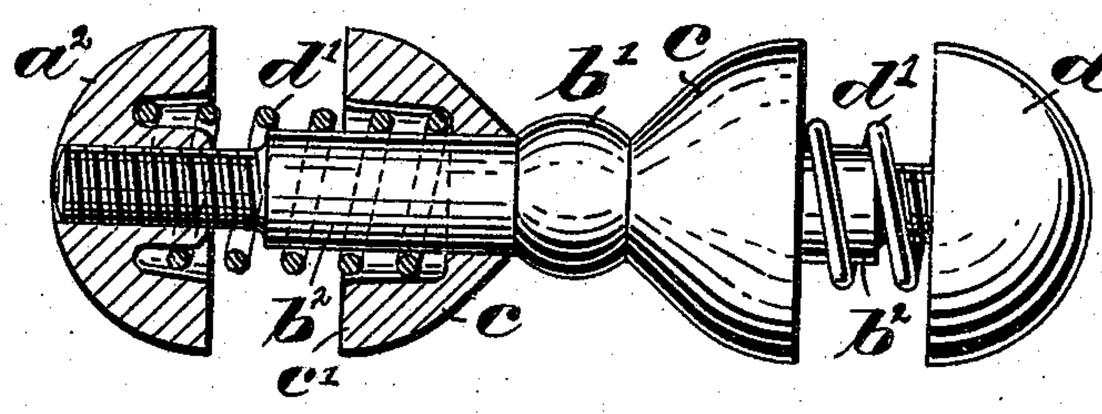



Fig. 2.

Fig. 3.

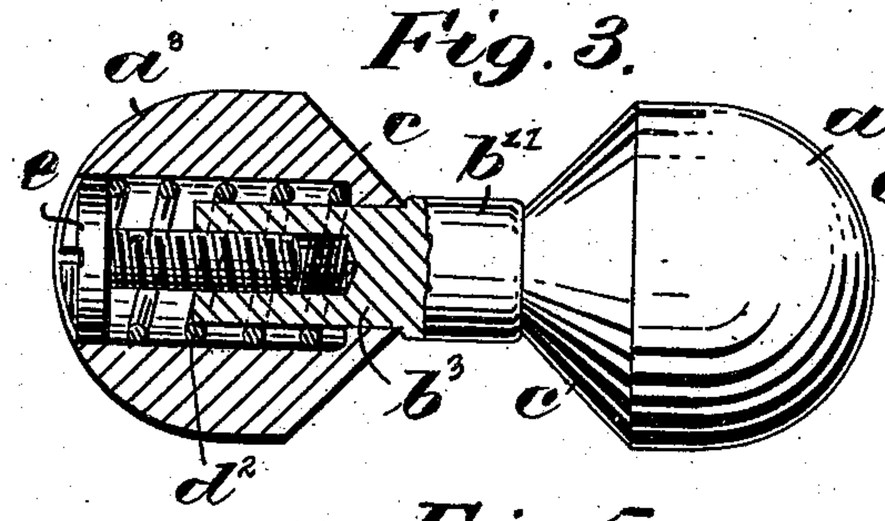



Fig. 4.

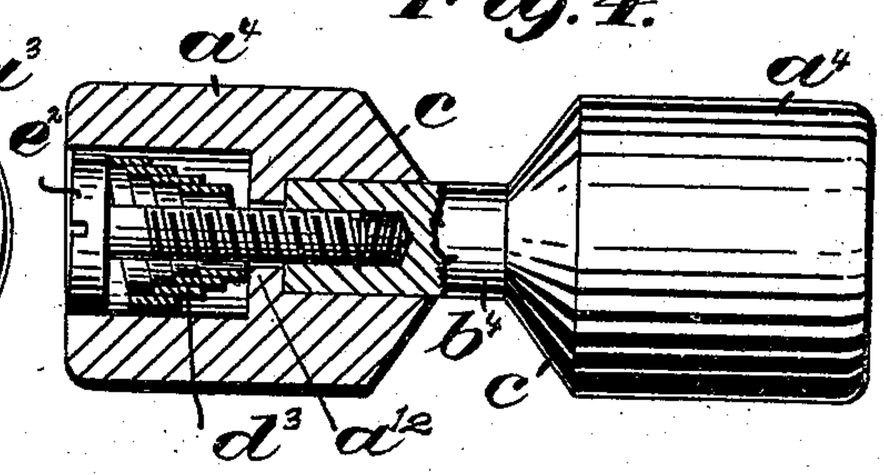
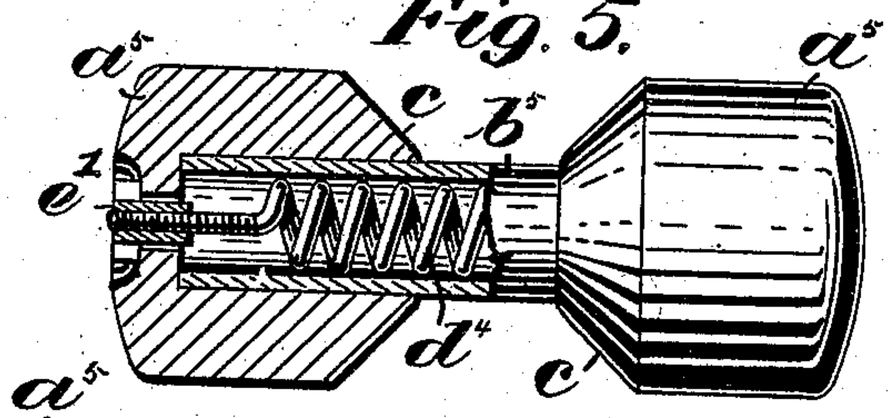



Fig. 5.



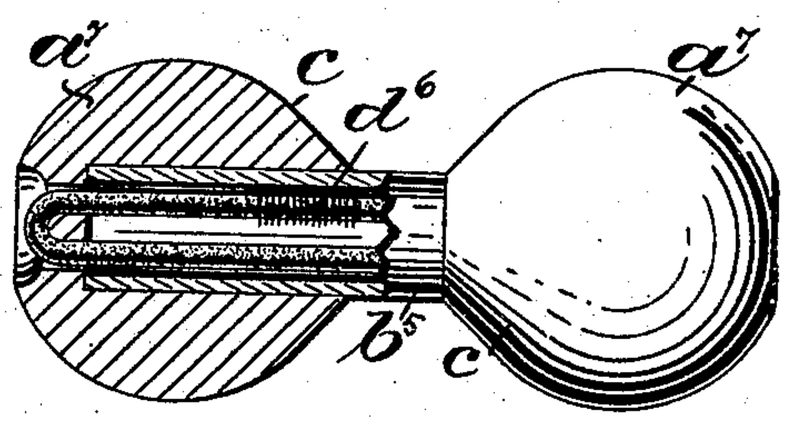




Fig. 8.

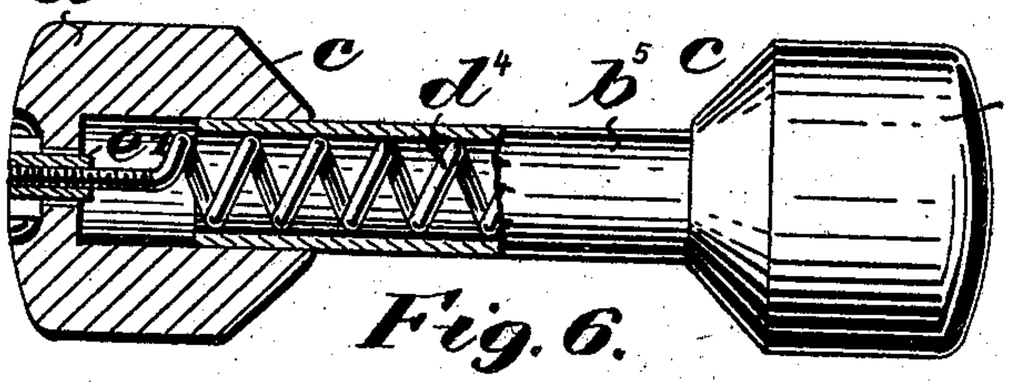



Fig. 6.

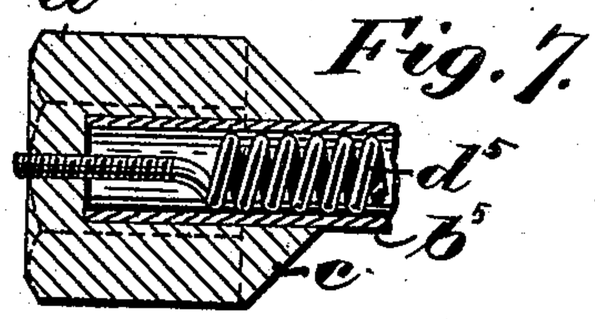



Fig. 7.

Witnesses:

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# UNITED STATES PATENT OFFICE.

GEORG NOHL, OF MANCHESTER, ENGLAND, ASSIGNOR TO HUGO SCHULTZ, OF PLAUEN, GERMANY.

## DUMB-BELL FOR PHYSICAL EXERCISES.

No. 881,438. Specification of Letters Patent. Patented March 10, 1908.

Application filed May 20, 1907. Serial No. 374,753.

*To all whom it may concern:*

Be it known that I, GEORG NOHL, a subject of the German Emperor, residing at Manchester, county of Lancaster, England, have invented new and useful Improvements in Dumb-Bells for Physical Exercises, of which the following is the specification.

My invention relates to dumb-bells for physical culture exercises and the object of my improvements is to render a tension of the muscles of the hand, wrist and arm necessary before the handle is made accessible and can be grasped. When the handle has been ultimately grasped a tight grip and a continuous tension of the muscles is necessary in order to maintain the hold on the handle. A considerable expenditure of will power is thus necessary when using the dumb-bells and great benefit is derived by the user, as it is well known that the benefit derived from any exercise is proportionate to the expenditure of will power. I attain this object by disposing upon the handle near its middle oppositely inclined planes, faces or the like in the form of converging truncated cones, the said cones being arranged so close together as to render the handle inaccessible to the hand before lateral displacement in opposite directions of the inclined planes which are capable of sliding on the handle from the middle outwards against the action of resilient means.

In order to grasp the handle the hand is introduced into the space between the converging cones and the grip is gradually tightened whereby the cones are laterally displaced and uncover the handle which is ultimately firmly grasped by the hand. The resilient means in compression or tension have the tendency to return the cones to their original positions and to remove the hand from the handle by pushing the cones or tubular wedges between them from both sides, a constant tension of the muscles being required to prevent this and to maintain the hold on the handle, a firm grip being thus made compulsory.

The cones may either be additional pieces, parts of the "bells" or weights or integral with the latter in which case the bells themselves are adapted to slide upon the handle.

Means are provided to regulate the compression or tension of the springs as the strength of the user increases.

The improved dumb-bells may be made from the usual materials such as iron, wood or the like and the angle of inclination of the cones may be slightly varied according to the material used but an angle from 45°–60° will generally be found to give satisfaction. With such an angle of inclination of the cones a space of about ¾ inch between the narrow ends has proved convenient.

It is not necessary that the inclined planes should be straight-lined and the cone may be replaced by the end part of a spheroid, paraboloid, or hyperboloid. For the sake of clearness only "cone" will be mentioned hereafter but it must be understood to include the before mentioned shapes.

Figure 1 shows a sectional elevation of a dumb-bell in which the cones are additional pieces. Fig. 2, a sectional elevation of a dumb-bell in which the cones are part of the bells so modified as to serve the new purpose. Figs. 3–8 represent sectional elevations of dumb-bells in which the cones are integral with or attached to the bells themselves. Similar parts are indicated by the similar letters in the various figures.

Referring to the Fig. 1 of the drawings, *b* is the usual solid or tubular handle made in one part and connecting the bells, knobs or weights *a*, the ends of the handle, for example, being preferably screwed into the bells. Mounted on the handle near the middle and adapted to slide thereon in opposite directions from the middle outwards are the truncated cones $c^1$ with the inclined planes or faces at *c*.

Between the base of the truncated cones which preferably does not exceed the largest diameter of the bells helical or volute springs *d* of any suitable cross-section, are coiled around the handle, the ends of the springs being attached respectively to the cones and the bells in any suitable manner so as to limit the inward motion of the cones in order to leave sufficient space between them for the introduction of the hand. As shown in the drawings this may be done by providing coned hubs $a^1$, $c^2$ on the two parts to be con-

nected by the springs and forcing the ends of the springs on these cones or screwing them into screwthreads provided thereon.

In order to vary the resistance of the springs it is only necessary to turn the weights in one direction or the other. Stronger or weaker springs may easily be inserted as required in accordance with the strength of the user.

Referring to Fig. 2, spherical bells $a^2$ are divided at right-angles to the handle, each inner part being provided with the necessary inclined planes $c$ by tangential extensions and adapted to slide on the handle. A helical spring $d^1$ is coiled around the handle and abuts at one end on the fixed part of the weight and at the other on the movable or cone part, both being preferably recessed or grooved to receive the ends of the spring. The inward movement of the cones is in this case limited by a swelling $b^1$ provided at the middle of the handle. As an alternative to this construction the handle may be provided with grooves extending from both ends till near the middle and corresponding projections in the bore of the cones may engage therewith.

Referring to Fig. 3, the cones are made integral with or attached to the bells $a^3$ or the bells may be considered to be beveled at their inner ends. In this case the bells themselves are, of course, adapted to slide on the handle, their inward movement being, for example, limited by a swelling $b^{11}$ of the handle or by slightly increasing the diameter of the handle at the middle.

Into tapped holes in the ends of the handle screws $e$ are screwed between the heads of which and the bottom of the weights helical springs $d^2$ are provided within a recess of the weights. By turning the screws $e$ in one direction or the other the springs may be tightened or relaxed or the screw may be taken out altogether and the spring replaced by a stronger or weaker one.

Fig. 4 shows a similar dumb-bell to the one shown in Fig. 3. In this case the inward movement of the weights $a^4$ is limited by a partition $a^{12}$ dividing the central recess in the weights in two compartments, the inner one serving for the reception of the handle $b^4$ and the outer one being destined for the reception of a volute spring $d^3$, which abuts at one end on the partition $a^{12}$ and at the other on the head of a screw $e^2$ passing through a bore in the partition into a tapped hole in the end of the handle.

Referring to Figs. 5 and 6, the handle $b^5$ is made tubular and a helical spring $d^4$ in its interior keeps the weights as close together as possible. The inward movement of the weights $a^5$ is limited by the bottom of their recess coming in contact with the ends of the handle. The ends of the spring pass through holes in the bottom of the recess in the weights and are provided with screw threads on which nuts with enlarged heads fit, the springs thus constituting a resilient connection between the weights. By turning the nuts $e^1$ in one direction or the other the spring may be tightened or relaxed. When the hand is introduced into the space between the beveled ends of the bells and gradually closed, the latter slide outward on the handle and the spring is strained, as shown in Fig. 6.

In Fig. 7 the weights $a^6$ themselves serve as nuts for the right-handed and left-handed screw-threaded ends of the spring $d^5$. By turning the weights in opposite directions or holding one stationary and turning the other, the spring joining them may be tightened or relaxed.

In Fig. 8 a double elastic cord or fine helical spring $d^6$ is shown joining the weights $a^7$. The variation in the resistance to the lateral displacement of the weights is effected by shortening or lengthening the elastic cord or spring.

It will be understood that the weights may be of spherical, cylindrical, hexagonal or any other shape and any number of springs of other shapes or material than those shown, as for instance, flat steel or whalebone springs, india-rubber or pneumatic cushions, may be used.

It will also be understood that the means for limiting the inward motion of the cones shown and described with reference to one construction may be applied to any other modified construction.

The improvements may also be applied to handles of other exercising apparatus.

The construction of the dumb-bells embodying my improvements may, as a matter of course, be altered in various ways without departing from the spirit of my invention and therefore I do not confine myself to the exact forms shown and described.

I claim:—

1. In a dumb-bell for physical culture exercises, the combination of two converging truncated cones slidably mounted upon the handle, and resilient means mounted thereon for resisting their outward displacement and for normally maintaining them near the middle thereof, substantially as described.

2. In a dumb-bell for physical culture exercises the combination of two converging truncated cones slidably mounted upon the handle, with means for limiting the inward movement of the cones, and resilient means mounted on the handle for resisting their outward displacement, and for normally maintaining them near the middle thereof.

3. In a dumb-bell for physical culture exercises the combination of two converging truncated cones slidably mounted upon the handle, with means for limiting their inward

movement, resilient means mounted on the handle for resisting their outward movement and for normally maintaining them near the middle thereof, and means for regulating the resistance.

4. A dumb-bell for physical culture exercises, having the weights adapted to slide on the handle, the said weights being provided with conical faces at their inner ends, means for limiting the inward movement of the weights, resilient means for resisting their outward displacement and for normally maintaining them near the middle of the handle and means for regulating the resistance, substantially as described.

GEORG NOHL.

Witnesses:
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