This invention relates to an improved exercising device, and more particularly to a novel combination exerciser and strength tester.

It is generally acknowledged that although Americans love and excel in competitive sports, and other physical activities, the average American's hand, shoulder, and arm muscles are not as fully developed as is desirable and, unfortunately, our over-all physical condition is not as good as it should be. For this reason, there has been considerable concern and publicity in the past few years concerning the beneficial effects of a regular program of physical conditioning, and with particular emphasis on the advantages of isometric and isotonic exercises. With these considerations in mind, the principal objects of the present invention are to provide a unique exerciser which employs isometric and isotonic principles to strengthen the user's hand, arm and upper torso muscles, and which device is also designed to indicate each user's strength, thereby permitting an element of competition and incentive in the exercising program, as well as allowing the users to determine their progress.

A further object of the present invention is to provide an exercising device which is designed for performing three separate and distinct exercises, involving different sets of muscles.

A further object of the invention is to provide a novel exerciser which can be adjusted and set to vary the difficulty and strength required to manipulate the same, as well as the grip size, to correspond to the size and strength of the user, and which is simple to operate, which is relatively inexpensive in design, and which device is rugged and durable in construction.

With the above and other objects in view, which other objects and advantages will appear hereinafter, the invention comprises the novel exercising device described in the following specification, and all modifications or equivalents thereof as may come within the spirit of said invention and within the scope of the appended claims.

In the accompanying drawing, wherein there is illustrated one preferred form of the invention, and wherein the same reference numerals designate the same parts in all the views:

FIG. 1 is an elevation view of the novel exerciser comprising the invention;

FIG. 2 is an enlarged transverse sectional view through said exercising device, taken along line 2-2 of FIG. 1;

FIG. 3 is a fragmentary elevational view showing said device used for one type of exercise;

FIG. 4 is a fragmentary view showing the use of said device for another exercise;

FIG. 5 is a similar fragmentary view showing said device used for still another exercise;

FIG. 6 is an elevational view of the exerciser illustrating one possible spring arrangement for setting the tension and grip size to correspond to the strength and size of a user;

FIG. 7 is a view similar to FIG. 6 illustrating another spring arrangement;

FIG. 8 shows another possible spring arrangement; FIG. 9 shows another spring arrangement; and FIG. 10 illustrates still another spring arrangement which can be obtained with the present exerciser.

With reference now more particularly to FIG. 1 of the drawing, the novel exercising device comprising the present invention includes a first elongated lever 10 formed of tubular stainless or plated steel or other suitable stock, and a second identical tubular arm member 11. As will be seen, each of said elongated levers is bowed inwardly toward the other at a point spaced somewhat below its longitudinal midpoint, the apex of the inwardly-curved portion of the arm 10 overlapping the corresponding portion of the opposite arm 11, and said arms being pivotally connected at said point by means of a rivet, screw, or bolt, or other connecting means 12 to form a reverse, compound lever assembly. The upper terminals or ends of said elongated arms are provided with handle grips 13 and 13', formed of plastic or other suitable material, and the lower ends of said arms are provided with similar grips 14 and 14'.

In FIG. 2 of the drawing, which is a transverse sectional view through the interconnected lever arms 10 and 11 at a point adjacent their pivot connection, it will be seen that said tubular arms are flattened somewhat for a substantial distance on both sides of said pivot connection, as designated by the numerals 15 and 16. Said overlying flattened portions are of a combined width equal to the normal diameter of said individual tubular arms, and it was found that without said flattened portions said tubular members were likely to be forcibly biased relative to each other during pivotal movement of the same by a user, rather than moving in parallel planes. The result was that considerable stress was created on the connecting rivet 12, and which occasionally caused a shearing of said rivet.

In accordance with the preferred form of the present invention, a pair of aligned apertures 17 and 17' are formed in and through the upper ends of the arms 10 and 11, immediately below the grips 13, 13' thereon, there being a second set of apertures 18 and 18' spaced therebelow, and spaced a similar distance below said intermediate apertures is a third pair of aligned apertures 19 and 19'.

As is shown in FIG. 1, a first coil expansion spring 22 having a projecting hook member 23 formed on each end thereof is removable carried in one pair of the aforementioned aligned arm apertures, and a second shorter coil spring 25 having end hooks 26 is adapted to be removable mounted in another, lower pair of said apertures. As will be hereinafter described in greater detail, in the use of the present invention either one or both of said springs are mounted in selected pairs of said apertures depending upon the desired tension and grip size for the particular user. As mentioned, said springs 22 and 25 are provided with hooked outer end portions 23 and 26, respectively, and to install one of said springs in the unit it is merely necessary to insert one hook completely through one of said tubular arms, and to insert the other hook into the aligned hole in the other arm. The user then presses inwardly at the center of said spring with his thumb to snap the latter hook into place. To remove a spring, the user presses inwardly with his thumb on the center of said spring, and simultaneously pulls outwardly adjacent the spring end with his forefinger, thus causing the hook at said end to be withdrawn from its mounting hole. The hook at the opposite end of said spring can then be easily removed.

With respect now to the lower portion of said exercising device, mounted on and extending between the arms 10 and 11 above the lower grips 14, 14' is an elongated plate 28 which is secured to the member 10 by
means of a screw 29 or the like. Said plate is provided with an elongated central cut-out portion or slot 30, and the plate in the arm 11 is a screw 31 or the like which projects outwardly through said slotted opening, said elongated cut-out forming a slot bearing permitting relative movement of said plate 28 and screw 31 when the lower ends of the arms 10 and 11 are urged toward each other, as will be seen. Marked on and along said plate 28 adjacent the elongated cut-out 30 therein is a series of enumerated calibrations 32.

In the use of the present invention, the exercising device may be adjusted and set to correspond to the general strength and hand size of the particular user merely by mounting the spring 22, or both of said springs 22 and 25, in particular pairs of the aforementioned aligned holes in the upper ends of the elongated arms 10 and 11, thus varying the tension and resistance which the user must overcome in order to squeeze the lower handle portions 14, 14' together. The setting of said springs also affects the distance between said lower handle grips to automatically adjust the same to correspond to the general hand size of the user. When a relatively young child desires to use the exerciser, for example, the smaller spring 25 is removed from the unit, and the larger spring 22 is mounted in the lowermost holes 19, 19', as is illustrated in FIG. 6 of the drawing. As will be appreciated, the mounting of said large spring close to the pivot point 12 functions to spread the upper portions of said arms 10 and 11 away from each other, while simultaneously drawing the lower portions 14, 14' of said arms closer together, and thus permitting a relatively small child to grasp said lower grips in one hand. In the illustrated exerciser, when the larger spring 22 is mounted in said lowermost holes 19, 19', a gripping pressure of approximately 20 lbs. is required to overcome the tension of said spring and to move said lower handles completely together.

If a bigger, stronger child desires to use the exercising device, the long spring 22 may be mounted in the intermediate arm holes 18, 18', as shown in FIG. 7, thus drawing the upper portions of the lever arms 10 and 11 closer together and simultaneously spreading the lower handles 14, 14' farther apart to correspond to the larger hand size of the user. The shifting of said spring farther from the pivot point 12 also reduces the mechanical advantage of said pivotal levers 10 and 11 and, moreover, because the lever arm upper portions are drawn closer together, the spring therebetween must be expanded farther when the lower handles are urged together. The tension of said springs is measurable in pounds per linear expansion inch, and the greater the distance a spring must be expanded the greater the force required, of course. With the spring 22 mounted in the holes 18, 18', the gripping pressure required to close said lower handles is increased to approximately 45 lbs. A still wider grip and increased tension can be obtained by mounting said long spring 22 in the uppermost holes 17, 17' (FIG. 8), a gripping pressure of approximately 70 lbs. then being required.

For stronger persons, the larger spring 22 may be mounted in the intermediate arm holes 18, 18', and the shorter spring 25 is mounted in the lowermost holes 19, 19' (FIG. 9), thus increasing the tension to approximately 80 lbs. For men of considerable strength, the spring 22 may be mounted in the uppermost apertures 17, 17', and the shorter spring 25 mounted in the apertures 18, 18' (FIG. 10), thus obtaining a wide grip and a tension of approximately 130 lbs.

The particular spring sizes and combinations hereinafter described are merely illustrative of one embodiment of the invention which has been found to provide a very satisfactory and versatile unit, but the invention is by no means to be limited in this respect. Numerous other spring sizes and combinations could, of course, be utilized, and it is contemplated that other types of tension devices could be used in lieu of said expansion springs.

In the use of the novel exerciser comprising the present invention, three basic exercisers, involving different sets of muscles, may be performed. After the springs 22 and 25 have been mounted in and extending between the upper portions of the lever arms 10 and 11 to correspond generally to the strength and hand size of the user, as hereinabove described, the user may perform the right or left hand grip squeeze. In this exercise the grips 14, 14' with one hand, in the manner illus-

inated in FIG. 3, and he tries to squeeze said grips together against the tension exerted by the expansion spring 22, or by the two springs 22 and 25 if they are used conjointly, said springs progressively increasingly resisting the closing of said handles.

Ordinarily, the springs are intentionally arranged so that it is impossible for the particular user to squeeze the grips 14, 14' completely together. As he urges said handles toward each other, however, the aforementioned rivet 31 on the arm member 11 (or any other comparable indicator device) is shifted relative to the calibrated scale 32 on the plate 28 to visually indicate the proximity of said handles while the user is exerting maximum gripping pressure, said arm and indicator returning to its initial position, of course, when the user relaxes his grip. Said scale is preferably numerically progressive in inverse ratio to the distance between said handle grips. A relatively weak gripping pressure, for example, would result in the indicator 31 reaching the calibration designated by the numeral 2, whereas a stronger person might squeeze said grips together to the point where said indicator reaches the numeral 5 on said scale. After testing his strength with both hands, the user may repeat the exercise with his other hand. This exercise is designed to strengthen the user's hand and finger muscles, wrists, and forearms, and it has been found that in this and all of the exercises performed with the present device, the advantages of isometric and isotonic exercises are best obtained if the user maintains maximum gripping pressure for at least six seconds.

The second type of exercise permitted with the present invention is the two hand squeezing grip, which is designed to strengthen and condition the user's upper torso muscles, as well as his hands and arms, and which is illustrated in FIG. 4 of the drawing. In this exercise the user grasps the long spring 14' with both hands, with his fingers overlapping as shown, and attempts to squeeze said grips together by pressing inwardly with his palms, the indicator 31 again showing how much strength has been exerted by means of the indicator position on the calibrated scale 32.

The third basic type of exercise which can be performed with the present invention is the two hand pull. In this exercise the user inverts the exercising device and grasps the upper handle grips 13, 13', one in each hand, in the manner shown in FIG. 5. He then attempts to pull said handles apart, and the maximum separation obtained between said handles is again shown by the position reached by the indicator 31 on the scale 32. The fact that the present exerciser can be inverted so that the user can perform the two hand pull, in addition to the squeezing or pressing exercises which are performed with the device in its upright position, is an important feature of the invention since it permits the strengthening of a completely different set of muscles, in order to achieve a balanced muscle conditioning program. This is also a critical structural distinction between the present invention and prior exercisers designed for the same general purpose. While there are a number of prior handle type exercising devices wherein the user either pushes or pulls said handles against spring tension, none of said devices includes handles at both ends of the unit, and wherein said unit can be inverted.
In addition to the three basic exercises described, numerous variations may also be performed. For example, the user may start the two hand pull with the exerciser extending downwardly adjacent his knees, and he then continuously exerts as much pulling force as possible while simultaneously raising said exerciser upwardly to a position above and behind his head. As another alternative, the user can cross his hands over prior to gripping the upper handles, and then spread the same by a pushing action, thus simulating and testing his prowess in so-called Indian hand wrestling. Moreover, while it is suggested that each exercise be done for approximately six seconds in order to obtain maximum muscle conditioning, some users may prefer to see how many times they can compress and release the handles without stopping, or some other variation in the above-described routines.

In order to introduce the element of competition and added incentive into an exercising program, it is recommended that a group of persons, such as a family or school class, exercise together and regularly record their strength rating in each of the exercises, in order to determine their progress. Thus the persons in the group will not only be competing against each other, but each person will also be competing against himself in an effort to better his previous record. A regular, systematic program of exercise with the present device will quickly strengthen the user's hand, arm and shoulder muscles, and it has been found that the average increase in strength in the first month is about 40%. The use of the invention is recommended particularly for persons who engage in golf, baseball, football, bowling or tennis.

From the foregoing detailed description it will be seen that the present invention provides a combination exerciser and strength tester which is not only designed to condition and strengthen those muscles which are most frequently underdeveloped, but which novel device can be adjusted and set to correspond to the hand size and strength of the user. Further advantages of the present invention are that it is relatively simple to use, it is inexpensive in design, and it is extremely rugged and durable in construction.

While a preferred form of the present invention has been illustrated and described herein, it is to be clearly understood that numerous modifications or variations therein are possible. It is contemplated, for example, that other gauge or indicator devices could be substituted for the illustrated calibrated plate and indicator rivet assembly, and other resistance or tension means could be used in lieu of the expansion springs. Moreover, various coating, pivoted lever assemblies could be placed in place of the reversely pivoted lever arms to employ the illustrated form of the invention. In short, what is intended to be covered herein is an exercising device substantially as described, and also any and all modifications or variations therein as may come within the spirit of said invention, and within the scope of the following claims.

What I claim is:

1. An exercising device comprising: a pair of pivotally-connected lever arms having upper and lower ends, the lower ends of said arms normally being close enough to each other to permit the same to be grasped in one hand by a user; hand grips on the upper and lower ends of each of said lever arms; a plurality of pairs of aligned apertures formed in and through the upper portions of said lever arms, said pairs of aligned apertures being adapted to progressively increasingly resist movement of the upper arm portions away from each other and the simultaneous movement of the arm lower portions toward each other, the mounting of said springs in said selected pairs of said apertures varying the spring tension and also the proximity of the hand grips; a gauge on one of said arms having a calibrated scale thereon; and an indicator on the other of said lever arms and movable therewith relative to said calibrated scale when a user grasps the lower grip elements and pushes the same toward each other, or he grasps the upper grip elements on said pivot lever arms and pulls the same away from each other against the tension of said spring, thereby providing a visual indication on said scale of the relative strength exerted by said user.

2. An exercising device comprising: a pair of tubular lever arms having upper and lower ends, said arms being bowed inwardly toward each other and pivotally connected at a point spaced below their longitudinal midpoints, the lower ends of said arms being positionable close enough to each other to permit the same to be grasped in one hand by a user, and said tubular arms including substantially flattened portions adjacent said pivot connection; hand grips on the upper and lower ends of each of said lever arms; an upper pair of aligned apertures formed in and through the upper portions of said tubular lever arms immediately below said upper hand grips; an intermediate pair of aligned apertures in said upper arm portions spaced below said upper apertures; a lower pair of aligned apertures formed in said upper arm portions below said intermediate apertures; a first elongated expansion spring removably mountable in and between the upper portions of said lever arms, said spring having hooks formed on its outer ends removably insertable in a selected pair of said aligned apertures; a second, shorter expansion spring removably mountable in and between said arm upper portions below said first spring, said spring having end hooks removably insertable in selected pairs of said arm apertures, said first and second springs providing tension means adapted to progressively increasingly resist movement of the upper arm portions away from each other and the simultaneous movement of the arm lower portions toward each other, the mounting of said springs in selected pairs of said apertures varying the spring tension and also the proximity of the hand grips; an elongated gauge plate extending between the lower portions of said arms and secured to one of said arms above the lower hand grip thereon, said plate having a longitudinal slot therein, and said plate having a calibrated scale thereon adjacent said longitudinal slot; and an indicator member mounted in and projecting from the lower portion of the lever arm which is not secured to said gauge plate, said indicator member projecting through said plate longitudinal slot and being movable longitudinally therein along said calibrated scale when a user grasps the lower grip elements and pushes the same toward each other, or he grasps the upper grip elements on said pivot lever arms and pulls the same away from each other against the tension of said springs, thereby providing a visual indication on said scale of the relative strength exerted by said user.

References Cited

UNITED STATES PATENTS

1,623,869 4/1927 Giraldi 272-56
1,529,347 11/1950 Mohler et al. 272-53

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