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BARBELL WEIGHT

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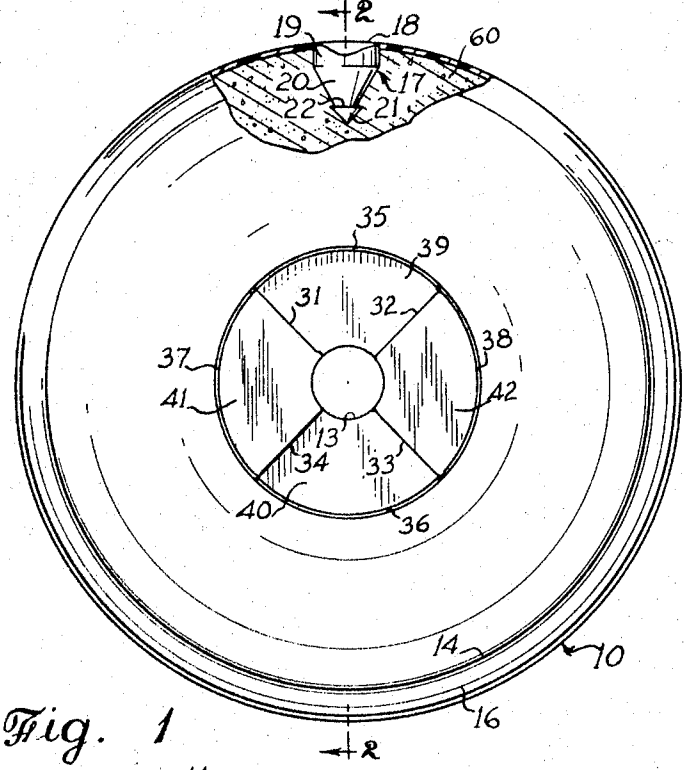


Fig. 1

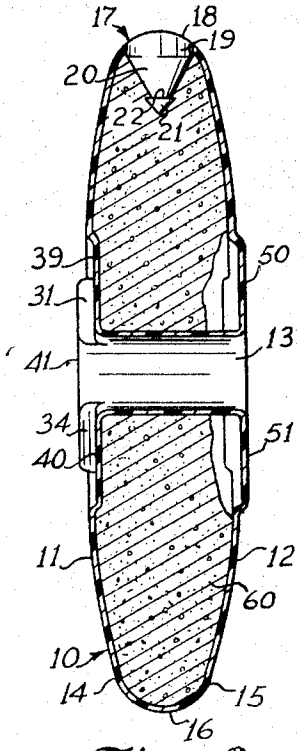


Fig. 2

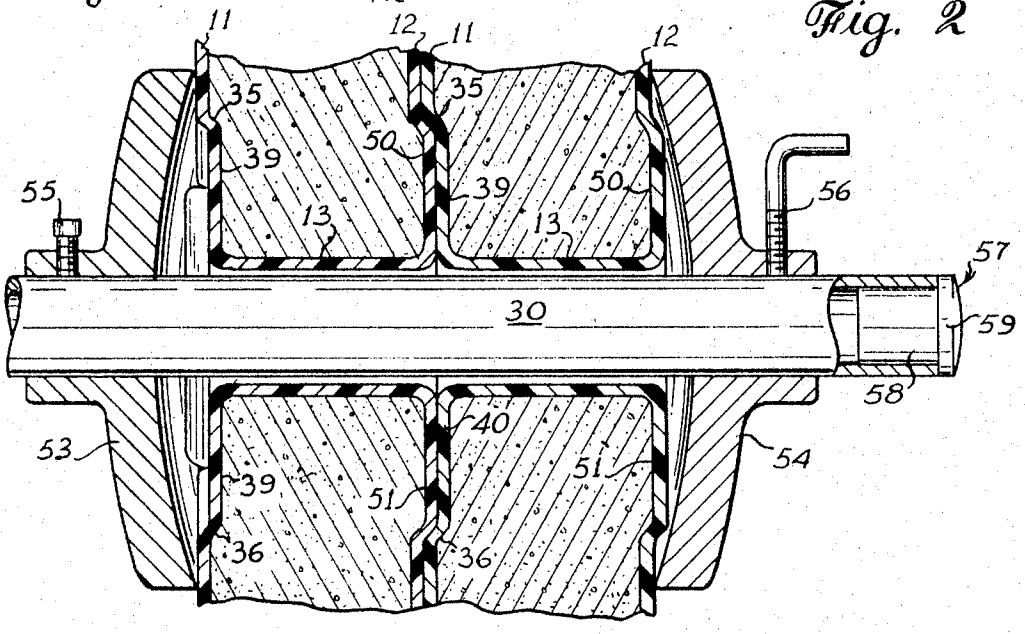


Fig. 3

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BARBELL WEIGHT

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Int. Cl. A63b 13/00
U.S. Cl. 272—84 8 Claims

ABSTRACT OF THE DISCLOSURE

A hollow housing formed of resilient shock resistant plastic is used as a barbell weight. It is generally disc shaped and has a cylindrical transverse sleeve with a pair of opposed confronting side walls extending generally radially from the sleeve and joined by a rim. The side walls have a generally uniform thickness and have a series of complementary lands and grooves radially extending along the sidewalls from the sleeve toward the rim, but terminating intermediate the sleeve and rim in the central portion of the side walls. A cementitious material is inserted into the housing through a hole in the rim which is closed by a plug.

This invention is a continuation of copending application Ser. No. 307,964 filed Sept. 10, 1963 and now abandoned.

This invention relates to a barbell and is more particularly concerned with a barbell and a weight for use in a barbell set or a dumbell set, the weight being of the type which may be slid onto the end portion of a bar to increase the amount of weight carried by the bar.

In the past, concrete filled barbells have been suggested. To the best of my knowledge, these concrete filled barbells have not been successful because the concrete for filling the weight has been of low specific gravity, the concrete being difficult to pack uniformly into a small space so as to produce a uniform weight. Furthermore, the material forming the casing of the weights have not been particularly suitable in that the casing tends to damage material when the weight is dropped and the weight is not easily handled in inserting the weight on a bar and when removing the weight. These prior art composite weights also had no means for interlocking, one weight to another.

Briefly, the present invention which overcomes the disadvantages described above, includes a polyethylene disc shaped casing, the interior of which is hollow. A hole along the rim of the casing is utilized for filling, the hole being closed by a plug which is of a particular configuration so that it may be held in place by the material filling the hollow portion. The material consists of a high specific gravity aggregate in admixture with or dispersed in cement and water. Adjacent the hub of the weight, there are a plurality of evenly spaced radially extending lands, separated by valley portions so that one weight may be interlocked with an adjacent weight to prevent relative rotation of the adjacent weight.

Accordingly, it is an object of the present invention to provide a weight for barbell which is of high specific gravity and yet includes a resilient, shock resistant outer surface which retards damage to objects when the weight is dropped.

Another object of the present invention is to provide a barbell and weight therefor which is inexpensive to manufacture, durable in structure, and efficient in operation.

Another object of the present invention is to provide a composite weight which may be interlocked with juxta-

posed weights to prevent relative rotation of the weights with respect to each other.

Another object of the present invention is to provide a weight for barbell, the weight being relatively noiseless when coming in contact with other weights on the barbell and being easily lifted and inserted or removed from the bar.

Another object of the present invention is to provide a weight which will not rust or readily deteriorate and may be readily and easily cleaned.

Other objects, features and advantages of the present invention will become apparent from the following description when taken in conjunction with the accompanying drawings wherein like characters of reference designate corresponding parts throughout the several views and wherein:

FIG. 1 is a side elevational view of a weight constructed in accordance with the present invention, a portion of the weight being broken away to illustrate the interior and plug of the weight.

FIG. 2 is a cross sectional view, partially broken away, taken substantially along line 2—2 in FIG. 1.

FIG. 3 is an enlarged fragmentary side elevational view of a barbell constructed in accordance with the present invention and having the weight illustrated in FIGS. 1 and 2 inserted thereon, together with another like weight, the weights being interlocked and held in place by collars.

Referring now in detail to the embodiment chosen for the purpose of illustrating the present invention, it being understood that in its broader aspects, the present invention is not limited to the exact details herein depicted, numeral **10** denotes generally the hollow casing or housing of the weight of the present invention. Housing **10** is integrally formed from resilient shock resistant plastic, preferably polyethylene which is blow-molded to provide a pair of spaced, opposed, side walls **11** and **12**, each of which is circular in shape and provided with a central hole. The holes in side walls **11** and **12** are aligned with each other and secured to the ends of a hollow, cylindrical, sleeve **13**, one end of which is joined to the inner peripheral portion of side wall **11** and the other end of which is joined to the inner peripheral portion of side wall **12**. Thus the sleeve **13** spaces the central portions of side walls **11** and **12** apart.

It will be observed that side walls **11** and **12** are generally perpendicular to the axis of sleeve **13** and taper outwardly, terminating in peripheral outer edges **14** and **15** which are joined by a continuous, circumferentially extending, rim **16** defined by the generation of an arc about the axis of the weight i.e., the axis of sleeve **13**. In cross section, as seen in FIG. 2, rim **16**, along its outer surface is convex, its edges merging with the outer peripheral edges **14** and **15**, respectively. The inner surface of rim **16** is, of course, concaved since the thickness of walls **11** and **12** and rim **16** are uniform.

A portion of rim **16** is provided with a radial hole, within which is received a plug **17**. The hole is circular, when viewed along the axis of the hole, and its transverse extremities extend to positions adjacent the outer peripheral edges **14** and **15**.

The plug **17** is formed of polyethylene and is hollow, having an outer surface **18** which conforms to the surface configuration of the outer surface of rim **16** so as to be flush therewith when the plug **17** is inserted into the hole. The body **19** of the plug **17** is cylindrical in shape, being of approximately the same outside diameter as the inside diameter of the hole receiving the plug **17**.

The shank **20** of the plug **17** is frustoconical in shape, tapering inwardly toward the axis of the weight to terminate in a cone shaped tip **21**, the base of which is attached to the end of the shank **20** and is of larger diameter than

the end of the shank **20** to provide a radial shoulder **22** which, as will be described more fully hereinafter, prevents the plug **17** from being inadvertently removed from the casing **10**.

To prevent relative rotation of one weight with respect to a juxtaposed, coaxially disposed, similar weight, such as when the weights are disposed side-by-side on a bar **30**, as illustrated in FIG. 3, the hub portion of each side wall **11** or **12** is provided with an interlock mechanism, so arranged that the interlock mechanism of one side wall will interengage with the interlock mechanism of the side wall of another weight.

In the present embodiment, the interlock mechanism of side wall **11** includes four radially extending, shoulders **31**, **32**, **33** and **34**. Shoulders **31**, **32**, **33** and **34** are equally spaced from each other by approximately 90° circumferentially with respect to sleeve **13** and extend from the inner peripheral edge of side wall **11** to terminate at an intermediate portion of side wall **11**. All radial shoulders **31**, **32**, **33** and **34** are disposed in the same radial plane and are partially recessed in the hub of side wall **11** while protruding slightly beyond the outer surface of wall **11**. The inner portions of the ends of adjacent pairs of shoulders, namely the inner end portion of shoulders **31** and **32** are joined by a curvilinear recessed flange **35** and the inner end portions of shoulders **33** and **34** are joined by a curvilinear recessed flange **36** opposed to and complementary with flange **35**. The outer end portions of shoulders **31** and **34** are joined by outwardly protruding curvilinear flange **37** and the outer end portions of shoulders **32** and **33** are joined by a curvilinear flange **38** opposed to and complementary with flange **37**.

Flanges **35**, **38**, **36** and **37** define, as viewed in FIG. 1, a circle concentric with sleeve **13**, the sleeve **13** being indented opposite flanges **35** and **36**. A pie shaped recessed, web **39** joins the inner edges of shoulders **31**, **32**, flange **35** and the outer edge portion of sleeve **13**. A similar pie shaped, recessed, web **40** joins the inner edges of shoulders **33**, **34** flange **36** and the outer edge portion of sleeve **13**.

In like manner outwardly offset, pie shaped, web **41** joins the outer edges of shoulders **31**, **34** and flange **37** and an edge portion of sleeve **13** while outwardly offset, pie shaped, web **42** joins the outer edges of shoulders **32**, **33** and flange **38** and an edge portion of sleeve **13**.

It is now seen that the diametrically opposed webs **39** and **40**, with their associated flanges and shoulders, define recesses or valleys between which, circumferentially, are lands defined by webs **41** and **42** and their associated flanges and shoulders.

In like manner, the hub of side wall **12** is provided with alternate circumferentially disposed valleys (not shown) and lands **50** and **51**, rotated 90° with respect to the valleys and lands of the side wall **11**.

As seen in FIG. 3 the lands **50** and **51** of side wall **12** of one weight are adapted to be received in the valleys defined by webs **39** and **40** of an adjacent similar weight, the shoulders, such as shoulders **31** and **34**, tapering axially and the shoulders **32** and **33** tapering axially so as to mate releasably with similar shoulders, the mating engagement preventing relative rotation of one weight with respect to an adjacent weight when clamped in abutting relationship on bar **30** by collars, such as collars **53** and **54** on opposite sides of the weights, collar **53** being held in place by a set screw **55** and collar **54** being held in place by a set screw **56**.

The bar **30**, as seen in FIG. 3, is a hollow, tubular, cylindrical, member, closed at both ends by resilient ferrels such as ferrel **57**, the ferrel **57** having a reduced diameter body **58** which is received within the end portion of bar **30** and a head **59** which abuts the end of the bar **30**.

Casing **10** is filled with aggregate material **60** which includes, preferably, a mixture of 400 pounds of aggregate to 94 pounds of Portland cement and 4 gallons of water. It will be understood that the ratio by weight aggregate to cement may vary between 3:1 to 5:1 parts aggregate to parts cement and that from 2 to 6 gallons of water may be used per sack (94#) of cement.

The aggregate is a dense, fine, granular, material for example, mill scale (the scale particles from the hot rolling of steel and iron) or Wyoming magnetite or Quebec ilmenite or a mixture of the same. The aggregate should have a size distribution such that it may be tightly compacted so as to provide an aggregate material **60** having a specific gravity of from approximately 3 to approximately 7.

The aggregrate should be sufficiently small that 100% passes through a ½ mesh. The following Table I defines the size distribution for typical aggregates.

TABLE I

Mesh size	Percentage passed through	
	Magnetite	Ilmenite
⅜	100	100
4	100	100
8	90	86
16	62	56
30	35	24
50	18	13
100	10	5.5
200	5	

Table II defines the fineness modulus and specific gravity of the typical aggregates.

TABLE II

	Magnetite	Ilmenite
Fineness modulus	3.0±0.2	3.4±0.2
Minimum specific gravity	4.50	4.60

There are several tolerances which should be observed when producing a weight according to the present invention. For instance, the inside diameter of the hole in sleeve **13** should be from ¾ to 1½ inches, the diameter of plug **17** should be from ½ to 1 inch the wall thickness of casing **10** should be from 1/32 inch to 3/32 inch and preferably 1/16 inch.

The following Table III defines the maximum and minimum sizes of the various weights.

TABLE III

Size Weight	Width	Outside Diameter
2½ pounds	½ inch–1¼ inches	4 inches–6 inches.
5 pounds	¾ inch–1½ inches	6 inches–8 inches.
10 pounds	1 inch–1¾ inches	8 inches–11 inches.
25 pounds	1¼ inches–2½ inches	11½ inches–14½ inches.

When producing the weight of the present invention, the aggregate material **60**, in a fluid condition, is premixed and then rammed or vibrated through the hole in rim **16** so as to become compacted into the hollow portion within the casing **10**. When the casing **10** is filled, the aggregate material **60** is to within a short distance of the hole in rim **16**. Next the plug **17** is inserted in the hole and driven flush with the rim **16** by using a rubber mallet. Hence, some of the aggregate material **60** seeps around the shoulder **22** and when aggregate material **60** becomes solidified, prevents the plug **17** from being removed.

In use, the weight shown in FIGS. 1 and 2 is inserted, with or without similar weights, onto the bar **30**, the bar **30** projecting through sleeve **13** and receiving the weight or weights. Collars **53** and **54** clamp the weights in place, it being understood that the collar **53** is installed and locked in place on bar **30**, before the weights are installed, and collar **54** is installed and locked in place after the weights are installed. If more than one weight is employed between the collars **53** and **54**, one weight should be rotated on bar **30** with respect to the other until the lands, such as lands **50** and **51** on one weight are aligned and are mated with the recesses of an adjacent side wall of an adjacent weight.

The aggregate material **60**, when dry is very hard and dense; however, casing **10** forms a resilient, shock resistant

coating surrounding the aggregate material **60**, thereby protecting furniture, the floor and other objects which may be struck with the weight.

It will be obvious to those skilled in the art that many variations may be made in the embodiment chosen for the purpose of illustrating the present invention without departing from the scope thereof as defined by the appended claims.

I claim:

1. A barbell and dumbell weight comprising:

(a) a hollow housing formed of resilient shock resistant plastic, said housing including a cylindrical transverse sleeve, a pair of opposed, confronting side walls extending generally radially from said sleeve, said side walls being circular and concentric with respect to the axis of said sleeve, and said side walls terminating in outer peripheral edges;

(b) a rim joining the peripheral edges of said side walls;

(c) side side walls having generally uniform thickness and having a series of lands and grooves radially extending along said side walls from said sleeve toward said peripheral edges, said lands and grooves terminating in the central portion of the side walls intermediate said sleeve and said peripheral edges, the lands and grooves of one of said side walls being complementary with the lands and grooves of the other of said side walls whereby a plurality of such similar weights may be received on a bar in juxtaposition with the lands and grooves of one of the weights intermeshing with the lands and grooves of an adjacent weight; and

(d) a substantially rigid cementitious material filling said housing.

2. The structure defined in claim **1** including weighting metallic particles disposed in said cementitious material.

3. A barbell and dumbell weight comprising:

(a) a hollow housing formed of resilient shock resistant plastic, said housing including a cylindrical transverse sleeve, a pair of opposed, confronting side walls extending generally radially from said sleeve, said side wall being circular and concentric with respect to the axis of said sleeve, and said side walls terminating in outer peripheral edges;

(b) an arcuate rim joining the peripheral edges of said side walls;

(c) said side walls having generally uniform thickness and having a series of lands and grooves radially extending along said side walls from said sleeve toward said peripheral edges, said lands and grooves terminating in the central portion of the side walls intermediate said sleeve and said peripheral edges, the lands and grooves of one of said side walls being offset with respect to the lands and grooves of the other of said side walls so that cross sectional thickness of said housing is substantially uniform throughout its central portion; and

(d) a substantially rigid cementitious material filling said housing.

4. The structure defined in claim **3** including weighting metallic particles disposed in said cementitious material.

5. The structure defined in claim **4** wherein said weighting metallic particles are mill scale.

6. The structure defined in claim **3** wherein said rim is provided with a hole and including a plug projecting through said hole, the inner portion of said plug being imbedded in and retained in place by said cementitious materal.

7. The structure defined in claim **6** wherein said rim is convex in cross section and the outer end of said plug is convex for conforming to the curvature of said rim.

8. The structure defined in claim **3** wherein said side walls are provided with radially extending shoulders between said lands and grooves, said lands an grooves terminating in concentric shoulders.

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