

Jan. 20, 1970

H. Q. MILLER
HOLDING APPARATUS FOR LOADS ADAPTED TO BE
STRAPPED TO THE BACK OF HUMANS

3,490,727

Filed Sept. 8, 1967

2 Sheets-Sheet 1

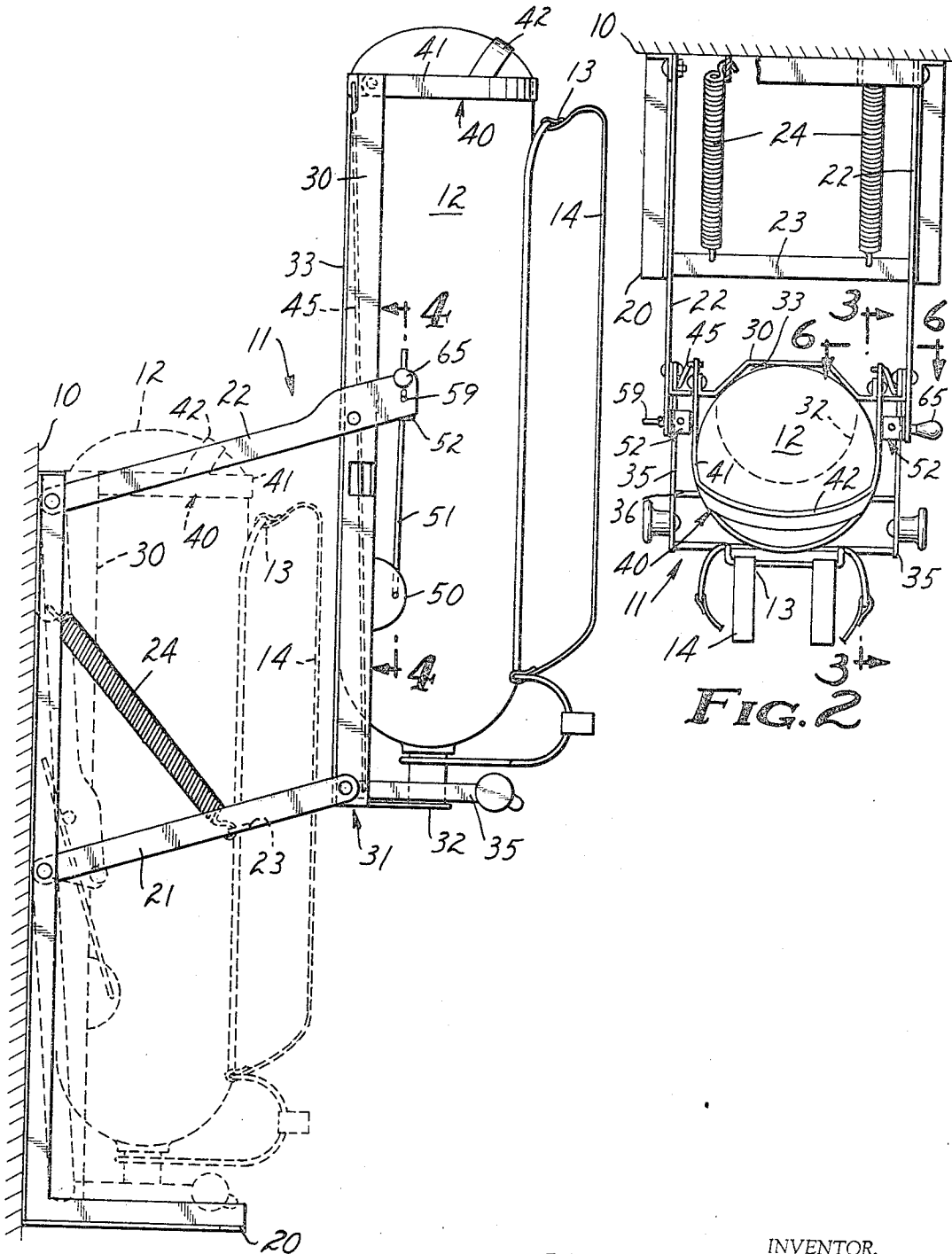


FIG. 1

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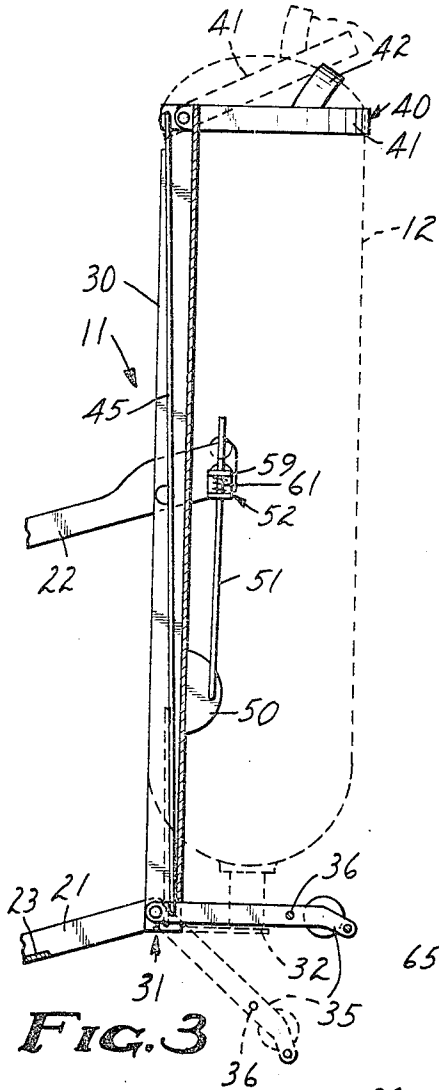


FIG. 3

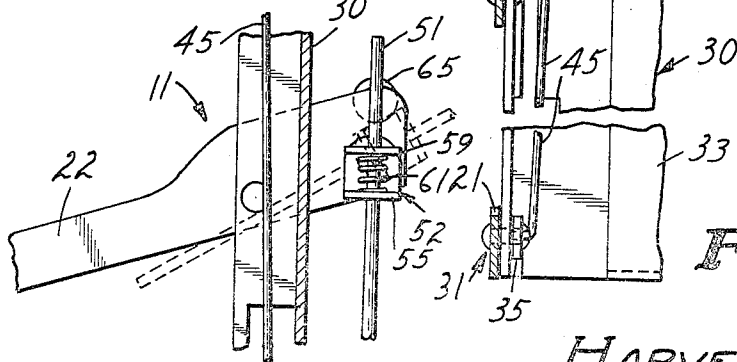


FIG. 5

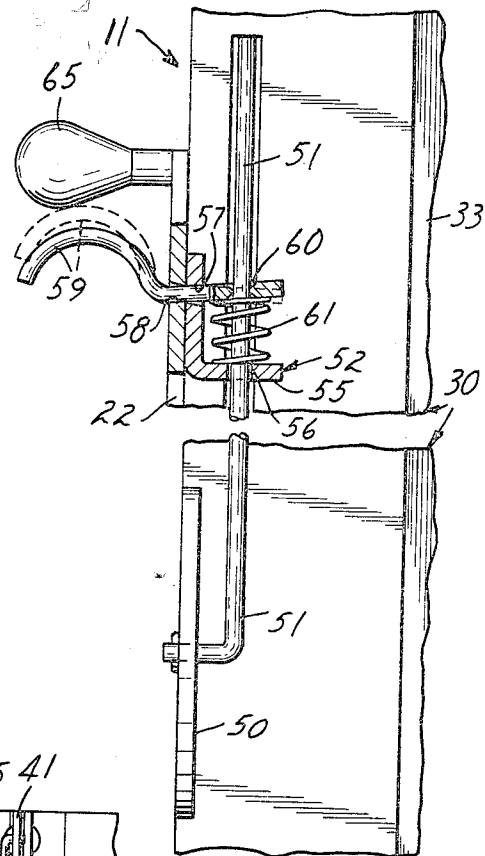


FIG. 4

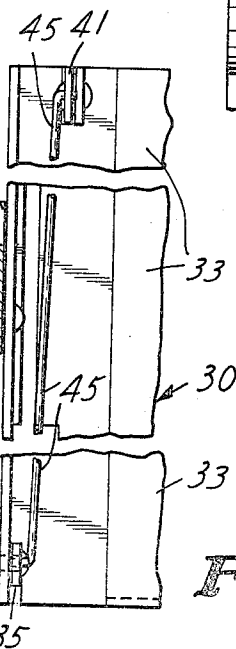


FIG. 6

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HOLDING APPARATUS FOR LOADS ADAPTED TO BE STRAPPED TO THE BACK OF HUMANS

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5 Claims

ABSTRACT OF THE DISCLOSURE

Vertically adjustable apparatus for holding a pack, such as an oxygen tank or the like, adapted to be strapped to the back of a human, including a base member adapted to be fixedly attached to a supporting structure, and a mounting structure, including releasable clamping means, for receiving the load thereon and holding it fixedly in position until the clamping means is released, and a plurality of arms pivotally mounted at one end to the base and at the other end to the mounting structure so that the mounting structure is vertically adjustable in a generally arcuate path about the base means while maintaining the axes of the mounting structure in the same general orientation relative to the axes of the base. The apparatus includes locking means for maintaining the mounting structure at any desired vertical position along the arcuate path, and means accessible to the human upon whom the load is placed for releasing the clamping means and, consequently, the load once it is correctly placed on the human's back.

BACKGROUND OF THE INVENTION

Field of the invention

In certain fields of endeavor it is still necessary for humans to have loads strapped upon their backs in order to perform certain tasks. This is especially true in fire-fighting and the like where it is frequently necessary to strap oxygen tanks, water tanks and various other equipment onto a firefighter's back. In such instances, speed is essential, and it is imperative that the load be conveniently located as well as quickly available to be strapped on the back.

Description of the prior art

It has been the custom in fields requiring humans to carry loads strapped to their back, for a second human to aid the first human by holding the loading at the approximate vertical height so that the first human can position the straps correctly. This method of donning the load requires two humans, and, therefore, is undesirable where manpower is at a premium, such as during fire-fighting and the like.

SUMMARY OF THE INVENTION

The present invention pertains to vertically adjustable holding apparatus and more specifically to apparatus which holds the load fixedly in place during storage or donning thereof, and which is vertically adjustable so that a human attempting to strap the load on his back can adjust the apparatus to his height so the load can be easily strapped upon his back after which the load is released from the apparatus.

It is an object of the present invention to provide a new and improved holding apparatus for loads adapted to be strapped to the back of a human.

It is a further object of the present invention to provide a new and improved holding apparatus which is vertically adjustable.

It is a further object of the present invention to provide a holding apparatus which may be utilized to store the load during non-use and which is quickly and easily

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releasable once the load is strapped to the back of a human.

These and other objects of this invention will become apparent to those skilled in the art upon consideration of the accompanying specification, claims and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the drawings, wherein like characters indicate like parts throughout the figures:

FIGURE 1 is a view in side elevation illustrating the present apparatus with an oxygen tank positioned therein; and illustrating the vertically extended position in full lines and the storage position in dotted lines;

FIGURE 2 is a view in top plan with the apparatus in the vertically extended position;

FIGURE 3 is a sectional view as seen from the line 3—3 in FIGURE 2 with the release position being illustrated in dotted lines;

FIGURE 4 is an enlarged sectional view as seen from the line 4—4 in FIGURE 1;

FIGURE 5 is an enlarged view similar to FIGURE 3, with parts thereof removed, illustrating the vertical adjusting mechanism in the vertically extended position in full lines and the storage position in dotted lines; and

FIGURE 6 is a sectional view as seen from the line 6—6 in FIGURE 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In the figures, the numeral 10 designates a supporting structure, such as a wall or the like, conveniently located so that the present apparatus, generally designated 11, can be permanently attached thereto for use and storage of a tank 12 engaged in the apparatus 11. The tank 12 is adapted to be strapped onto the back of a human by means of the harness 13, which includes a pair of vertical straps 14 adapted to encircle the shoulders of the bearer. The tank 12 is illustrated for convenience, and many other types of loads might be utilized in the apparatus 11, with slight modifications thereof, all of which will become apparent in the following description and are included within the scope of this invention.

The apparatus 11 includes a base 20 formed from a pair of L-shaped angle irons fixedly attached together in a generally parallel spaced-apart relationship with one leg of each parallel and in juxtaposition to the supporting structure 10 and the shorter leg extending outwardly from the lower end thereof. Each of the angle irons making up the base 20 are positioned with one side abutting the supporting structure 10 and the other side extending outwardly therefrom. A pair of elongated arms 21 are each pivotally attached adjacent one end to the vertical portion of each angle iron forming the base 20. Each of the arms 21 is attached to the vertical portions of the angle irons in the midsection thereof, a distance somewhat greater than the length of the arms 21 from the lower end of the base 20. A second pair of arms 22 are pivotally attached adjacent one end of the angle irons forming the base 20 adjacent their upper ends. A brace 23 is fixedly attached between the arms 21, and a pair of tension springs 24 are connected from the brace 23 to the base 20 somewhat above the arms 21 so as to provide an upward bias thereon, as will be explained in detail presently.

The arms 21 are pivotally attached adjacent their outermost ends to the lower end of a standard 30 of a mounting means generally designated 31. The standard 30 has a shelf-like portion 32 extending outwardly from the lower end thereof and adapted to receive the lower end of the tank 12 in supporting engagement thereon. The standard 30 is constructed with a longitudinal depression 33 therein to receive the tank 12 and substantially elim-

inate transverse movements thereof. The arms 22 are pivotally attached to the standard 30 so as to be parallel with the arms 21 and to allow movement of the standard 30 along a generally arcuate path while maintaining the axes of the standard 30 in the same general orientation relative to the axes of the base 20.

A pair of release levers 35 each have one end pivotally attached adjacent the lower end of the standard 30 on either side of the shelf-like portion 32, and a retaining member 36 fixedly attached to each of the release levers 35 and extending therebetween. The retaining member 36 extends across the outer end of the shelf-like portion 32 and prevents the lower end of the tank 12 from becoming disengaged therewith. The release levers 35 and the retaining member 36 along with an upper clamping portion 40 provide the means for releasably clamping the tank 12 fixedly against the standard 30. The upper clamping portion 40 includes a semi-circular band 41 pivotally attached to the upper end of the standard 30 adjacent either end of the band 41 so as to partially encircle the upper end of the tank 12 in the clamping position. An arcuate band 42 extends from either side of the band 41 over the top of the tank 12 to limit the downward movement of the band 41 over the tank 12. The ends of the band 41 extend rearwardly somewhat past the pivotal connection thereof with the standard 30, and a pair of rods 45 each have one end pivotally engaged in an end of the band 41 so that downward movement of the rods 45 produces pivotal movement of the clamping portion 40 about the upper end of the standard 30, as illustrated in dotted lines in FIGURE 3. Each of the rods 45 has the lower end thereof pivotally engaged in one of the release levers 35 between the pivotal connection thereof to the lower end of the standard 30 and the outer end thereof. Thus, downward movement of the release levers 35, as illustrated in FIGURE 3, produces downward movement of the rods 45 and, consequent upward movement of the upper clamping portion 40.

The angle which the arms 21 and 22 make with the base 40, and, thus, the height of the mounting means 31 and tank 12, is adjustable through the following means. A pair of outwardly extending metal tabs 50 are fixedly attached to either side of the standard 30 approximately midway between the arms 21 and 22. Each tab 50 has one end of a rod 51 pivotally attached therein. Each of the arms 22 extends outwardly a substantial distance past the pivotal connection thereof to the standard 30 and has a frictional locking device 52 pivotally attached adjacent the end thereof. The frictional locking devices 52 are illustrated in detail in FIGURES 4 and 5. The device 52 includes an L-shaped member 55 having holes 56 and 57 through either arm thereof and positioned against the inner wall of one of the arms 22 so that the hole 57 is coaxially aligned with a hole 58 through the arm 22. A second member 59 is pivotally engaged through the holes 57 and 58 so that a portion thereof extends outwardly from the outer surface of the arm 22 to form a slightly curved handle, while the other end of the member 59 extends outwardly in the opposite direction from the arm 22 and has a hole 60 therethrough which is in general alignment with the hole 56. The rod 51 is engaged through the hole 56 of the member 55 and the hole 60 of the member 59. A compression spring 61 is mounted coaxially over the rod 51 between the members 55 and 59 to urge the members apart. The edges of the hole 60 on either side of the member 59 are tapered slightly to form a sharp central portion within the hole 60 which frictionally engages the rod 51 as the member 59 is forced away from the member 55 by the spring 61, to prevent sliding movements of the rod 51 through the hole 60. That is, when the spring 61 forces the member 55 and the member 59 apart the holes 56 and 60 become misaligned axially, and there is a binding of the rod 51 which prevents the free movement thereof through the holes 56 and 60. A knob 65 is fixedly attached to the

outer surface of the arm 22 adjacent the handle portion of the member 59 so that an operator can grasp the knob 65 and the member 59 simultaneously and move the member 59 toward the knob 65, as illustrated in dotted lines in FIGURE 4, thereby aligning the hole 60 axially with the hole 56 and allowing free sliding movement of the rod 51 therethrough.

In the operation of the apparatus 11, the two frictional locking devices 52 are released, and the mounting means 31 with the tank 12 thereon is rotated downwardly into the storage position, illustrated in dotted lines in FIGURE 1. When an operator wishes to use the tank 12, the two locking devices 52 are again released and, with the aid of the springs 24, the mounting means 31, and the tank 12, is rotated upwardly to the desired height for the operator. The operator then straps the tank 12 onto his back by means of harness 13, and, reaching rearwardly with the tank 12 strapped to his back, pushes the release levers 35 downwardly to release the clamping means and disengage the tank 12 from the mounting means 31.

Thus, holding apparatus is described which releasably holds a load in a desired position for storage and which is adjustable vertically so that the load can be quickly and easily strapped onto the back of any size operator. The release mechanism for disengaging the load from the mounting means is easily accessible to the operator when the load is strapped onto his back. Also, the load can be quickly and easily placed back in the mounting means 31 after it has been used.

While I have shown and described a specific embodiment of this invention, further modifications and improvements will occur to those skilled in the art. I desire it to be understood, therefore, that this invention is not limited to the particular form shown, and I intend in the appended claims to cover all modifications which do not depart from the spirit and scope of this invention.

What is claimed is:

1. Holding apparatus for loads adapted to be strapped to the back of a human comprising:

- (a) a base adapted to be fixedly attached to a generally vertical supporting structure;
- (b) mounting means for receiving a load thereon in a generally upright position;
- (c) adjustable means connecting said mounting means to said base and adjustable for varying the vertical height of said mounting means relative to said base; and
- (d) clamping means affixed to said mounting means for engaging said load and maintaining said load substantially immovable relative to said mounting means, said clamping means being further characterized by including means accessible to a human having said load strapped to his back for releasing said clamping means from said load.

2. Holding apparatus as set forth in claim 1 wherein said adjustable means includes a plurality of elongated members each being pivotally attached adjacent one end to said base and pivotally attached adjacent the opposite end to said mounting means, and manually adjustable stop means attached to at least one of said members for preventing pivotal movement thereof relative to said base and said mounting means at substantially any desired angle.

3. Holding apparatus as set forth in claim 2 wherein said stop means includes an elongated rod engaged in friction locking means one of which is attached to said mounting means and the other of which is attached to one of said members.

4. Holding apparatus as set forth in claim 1 wherein said adjustable means is characterized by maintaining the axes of said mounting means in the same general orientation relative to the axes of said base means while allowing movement of said mounting means in a generally arcuate path about said base means.

5. Holding apparatus as set forth in claim 1 wherein said mounting means and said clamping means include a generally upright standard having outwardly projecting

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means mounted adjacent the lower end of said upright standard adapted to receive said load thereon and having at least a portion thereof pivotal and adapted to releasably engage the lower portion of said load, said pivotal portion being operatively linked to an upper clamping portion pivotally mounted adjacent the upper end of said upright standard and adapted to releasably engage the upper portion of said load and maintain it fixedly positioned relative to said upright standard.

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