

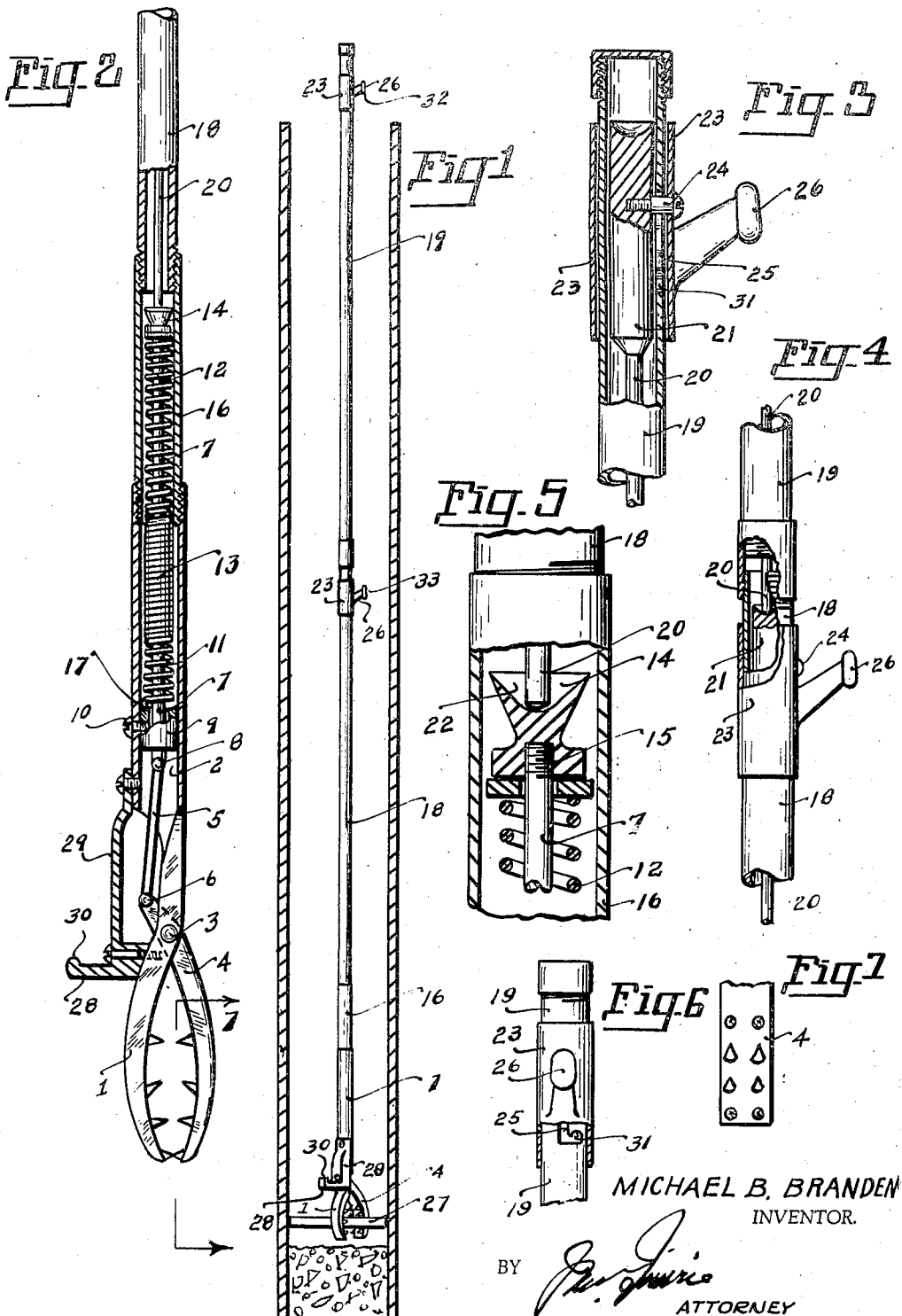
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GRAPPLE

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GRAPPLE

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9 Claims. (Cl. 294—104)

This invention relates to grappling devices, and the primary object of the invention is to provide a grappling tong that can be operated from a remote distance from the object to be grappled.

A further object of the invention is to provide means within the device for dislodging the object to be grappled by either a hammer action or by lifting.

Another object of the invention is to provide means for extending the operating handle to any desired length to meet different operating conditions.

And a still further object of the invention is to provide operating levers at different intervals of space throughout the length of the operating handle.

These and other incidental objects will be apparent in the drawing, specifications and claims.

Referring to the drawing:

Figure 1 illustrates my device in an extended assembly and being used in a typical concrete form for removing the spacer bars therefrom.

Figure 2 is an enlarged fragmentary sectional view of the grappling tongs and their operating mechanism.

Figure 3 is a fragmentary sectional detail of the operating lever for manipulating the grappling tongs.

Figure 4 is a fragmentary view of the operating lever mechanism illustrating the method of connecting the extension units, parts broken away for convenience of illustration.

Figure 5 is a fragmentary enlarged view of one of the joints between the extension units, illustrating the opening push rods in their relation to one another within the extension handle.

Figure 6 is a fragmentary broken away view illustrating the locking means for holding the tongs in open position.

Figure 7 is a fragmentary detail of one of the tongs, taken on line 7—7 of Figure 2.

In the drawing:

My new and improved grappling tong consists of a rigid tong 1, extending from the hollow shank 2. Pivotaly connected to the tong 1 at 3 is a movable tong 4. The tong 4 is operated by a connecting link 5 pivotaly connected to the lever arm of the movable tong 4 at 6, having its opposite end pivotaly connected to the plunger 7 at 8. The plunger 7 operates through the guide 9 longitudinally of the shaft 2. The guide 9 is fixedly secured within the shank by any suitable means, as a screw 10.

Surrounding the plunger 7 are two springs 11 and 12. The spring 11 rests upon the guide

bearing 9, having its upper end threaded through the lower end of the spring 12 at 13. The spring 12 has its upper end bearing against the cap 14, which is screwed, or otherwise fastened to the upper end of the plunger 7 at 15. The spring bears against the guide 9 and underneath the cap 14 pulling the plunger upward within the shank 2, pivoting the tong 4 about its pin 3, thereby closing the tongs 1 and 4 forceably together. The force applied to the tong 4 may be varied by threading the springs 11 and 12 relative to one another increasing or decreasing the length of the combined springs. In order to do this an extension 16 is removed from the upper end of the shank 2, giving access to the spring 12. The spring 11 is prevented from rotating by a suitable stop, as at 17, registering with a recess in the upper surface of the guide 9.

The device is made up in different lengths by the extensions 18 and 19, or more, in the following manner. Within the extensions is located a push rod 20, having a guide 21 secured to its upper end, and having its lower end registering with the cap 14 within the socket 22. The socket 23 providing a means of guiding the push rod to a central position within the extension. A sleeve 24 surrounds the extension and is connected to the guide 21 by a suitable fastening means, as a shoulder bolt 25. The bolt 25 operates within a slot 26 located in the extension.

In the operation of my device an operating handle 26, forming part of the sleeve 23, is pushed towards the grappling tongs by the operator. This forces the push rod 20 against the plunger 7, compressing the springs 11 and 12, forcing the connecting link 5 towards the tongs, pivoting the tong 4 about its pivot 3, which will open the tong 4 relative to the tong 1 so that the object, as for instance the spacer 27 in Figure 1, is engaged by the tongs, the handle 26 is then released by the operator allowing the tongs to be closed by the springs 11 and 12.

In order to dislodge objects, as the spacer 27, I provide a foot 28 which forms part of the cover plate 29 for pounding the object 27, dislodging the same. The cover plate 29 is removably secured in place as by the bolts shown in Figure 2. The upper side 30 of the foot 28 provides a hook for engaging the object and pulling upward against the object. The foot 28 provides an effective means for dislodging the object to be grappled. In the event it is desired to hold the tongs open, the handle 26 is rotated when pressed downward so that the pin 24 will engage the notch 31, holding the tongs in open position until released by the operator.

In the operation of my device, any length of tong extension can be assembled, and the tongs can be operated from one or more points 32 and 33 and so forth by the operator. One of the primary objects of my device is the operation of the same at different points throughout its entire length.

I do not wish to be limited to the particular mechanism illustrated, as other forms of embodiment may be employed, still coming within the scope of the claims to follow.

What is claimed as new is:

1. An extensible grapple, including independent sections provided for endwise removable connection, grapple tongs carried by one end of one section, a plunger in such section for moving the tongs relatively to open position, spring means for moving the tongs relatively to closed position, said spring means including independent springs formed for endwise inter-threading to vary the tension of the spring means at will.
2. An extensible grapple, including independent sections provided for endwise removable connection, grapple tongs carried by one end of one section, a plunger in such section for moving the tongs relatively to open position, spring means for moving the tongs relatively to closed position, the upper end of the plunger terminating in a socket, and an independent plunger in each of the remaining sections for operative contact only with such socket when the section is connected for use.
3. A construction as defined in claim 1, wherein the grapple means includes a fixed tong and a relatively movable tong.
4. A construction as defined in claim 1, wherein the tong-carrying section is provided with a cover plate to partly inclose the upper ends of the tongs, the lower end of the plate being formed with a lateral hook and driving projection.

5. A construction as defined in claim 2, wherein a guide block is connected to the upper end of one independent plunger, and wherein a sleeve encircles the section adjacent the guide block, a connection being provided to fix the sleeve and block together, and a handle for moving the sleeve and thereby the block.

6. A construction as defined in claim 2, wherein a guide block is connected to the upper end of one independent plunger, and wherein a sleeve encircles the section adjacent the guide block, a connection being provided to fix the sleeve and block together, and a handle for moving the sleeve and thereby the block, and means for securing the handle in operative position.

7. A construction as defined in claim 2, wherein a guide block is carried by the upper end of each plunger and movable in the section carrying that plunger, the upper end of each guide block being formed with a depression to operatively receive the lower end of the plunger of the superimposed section.

8. A construction as defined in claim 2 wherein a guide block is carried by the upper end of each plunger and movable in the section carrying that plunger, the upper end of each guide block being formed with a depression to operatively receive the lower end of the plunger of the superimposed section, the depression being formed to align the successive plungers in superimposed sections for effective endwise pressure.

9. A construction as defined in claim 1, wherein the tong-carrying section is provided with a cover plate to partly inclose the upper ends of the tongs, the lower end of the plate being formed with a lateral hook and driving projection, the cover plate, hook, and driving projection being separable from the section at will to permit access to the upper parts of the tongs.

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