

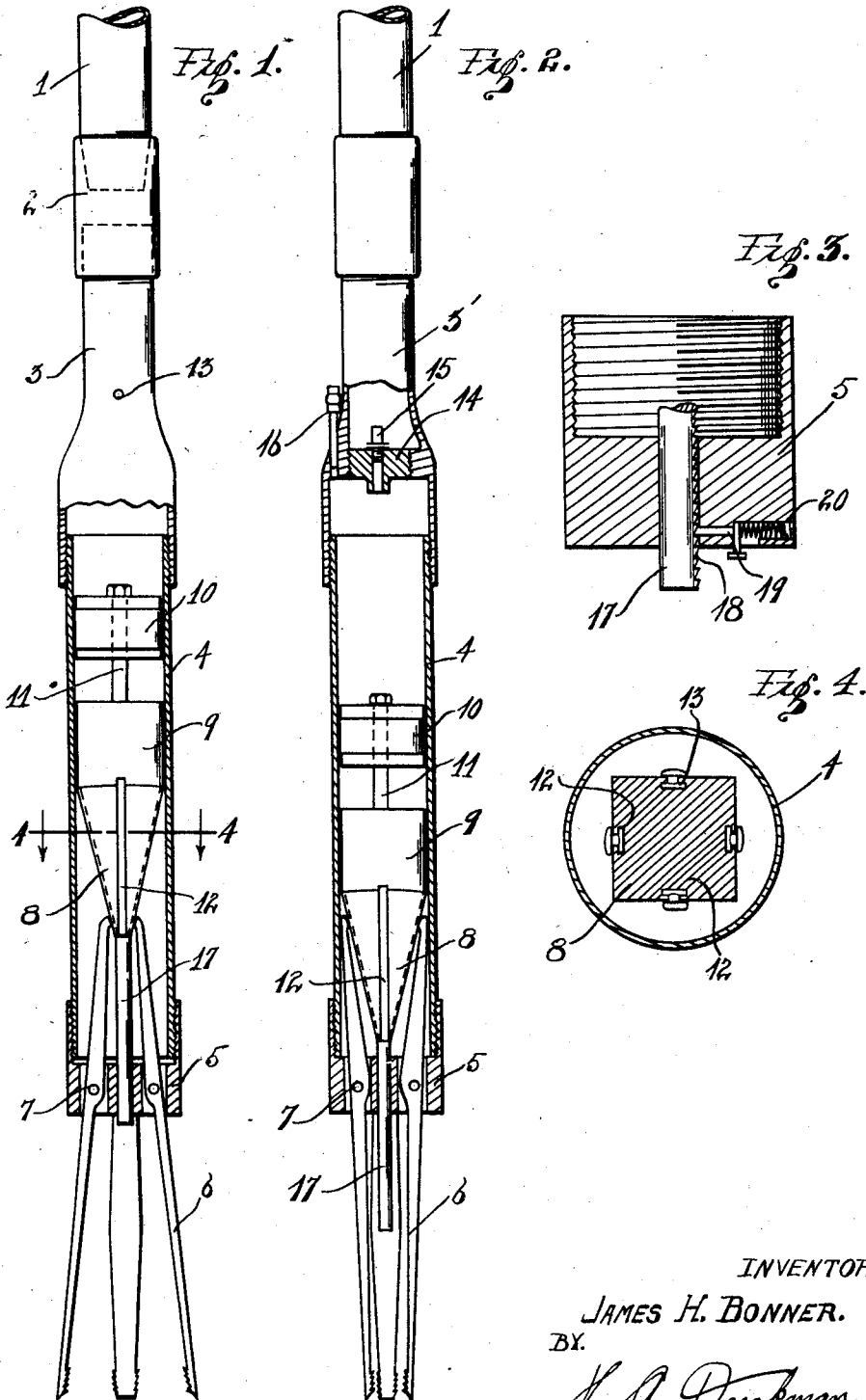
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HYDRAULIC GRAB

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HYDRAULIC GRAB.

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An object of my invention is to provide a hydraulically operated grab which grab is actuated by the usual mud pump in the drilling rig.

5 Another object is to provide means whereby the pressure may be maintained and the grab arms held in retaining position.

A further object is to provide a hydraulic grab of the character stated which is simple in construction and effective in operation.

10 Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description, and the appended claims.

15 In the drawing—

Fig. 1 is a side elevation partly in section of my hydraulic grab.

20 Fig. 2 is a side elevation similar to Fig. 1 showing a slightly modified form of construction.

Fig. 3 is a longitudinal sectional view of the head.

Fig. 4 is a sectional view taken on line 4, 4, Fig. 1.

25 Referring more particularly to the drawing:

The lower end of the usual tool string 1 is threaded into a box 2 and an expansion joint 3 also screws into the box 2 and depends therefrom. A barrel 4 screws into the lower end of the joint 3 and is provided with a head 5 secured to the lower end thereof. A plurality of grab fingers 6 are pivoted, as at 7, in the head 5, said fingers extending through the head.

35 A wedge block 8 is provided with a cylindrical guide section 9 at the upper end thereof, which guide section is slidably mounted in the barrel 4. A piston 10 is secured to a post 11 rising from the guide 9, said piston being provided with suitable packing to prevent the escape of pressure thereby. The wedge block 8 is preferably squared in cross-section as shown in Fig. 4, and is provided with longitudinally extending grooves 12 in each face thereof. The upper ends of the fingers 6 are provided with pins 13 which slide in the grooves 12, thus moving the fingers inwardly or outwardly as the wedge block is moved longitudinally. It will be evident that as the wedge block 8 moves downwardly the upper ends of the fingers 6 will be swung outwardly and the lower ends of the fingers will be swung inwardly to engage the object which is lost in the well.

When it is desired to extract an object which is lost in the well, my grab is lowered at the end of the tool string until the fingers 6 have passed over the object, then by operating the mud pump, or other hydraulic means, and forcing the fluid down through the tool string 1 which pressure acting upon the top of the piston 10 will cause said piston and wedge block 8 to move downwardly to the position shown in Fig. 2, and causes the lower ends of the fingers 6 to move inwardly and engage the lost object. Once it is engaged, the grab can be removed from the well carrying with it the article.

A circulation hole 13 is provided in the joint 3 to permit the escape of fluid, this being necessary to prevent collapse of the tool string tubing. When a very heavy object is being removed from the well it may be necessary to maintain a pressure on top of the piston 10. For this purpose I provide a plug 14 in the joint 3' which plug is provided with a check valve 15. A relief valve 16 extends into the chamber below the plug 14 to relieve the pressure therein when my tool has reached the surface.

A shaft 17 depends from the wedge block 8 and is guided in the head 5. This shaft is provided with teeth 18 on one side thereof and a pawl 19 is yieldably mounted in the head 5 and engages the teeth 18. Thus when the wedge block 8 is moved downwardly the pawl 19 engaging the teeth 18 prevents retraction of the wedge block. A spring 20 bears against the pawl 19 urging the same into the teeth 18.

Having described my invention, I claim:

1. A grab comprising a plurality of pivotally mounted fingers, and hydraulically actuated means adapted to swing said fingers into engaging position, and pressure check means adapted to maintain pressure on said hydraulically actuated means.
2. A hydraulic grab comprising a cylinder, a head on the lower end of said cylinder, a plurality of fingers pivotally mounted in said head, a wedge block adapted to engage the upper ends of said fingers whereby said fingers are operated, and a piston on said wedge block whereby hydraulic pressure from the surface serves to lower the wedge block and actuate said fingers, and means engaging the block whereby said block is held in lowered position.
3. A hydraulic grab comprising a cylinder,

a head on the lower end of said cylinder, a plurality of fingers pivotally mounted in said head, a wedge block adapted to engage the upper ends of said fingers whereby said fingers are operated, and a piston on said wedge block whereby hydraulic pressure from the surface serves to lower the wedge block and actuate said fingers, and means to hold said wedge block in lowered position, said means comprising a shaft depending from the wedge block, and yieldable means engaging the shaft to hold the same in lowered position.

4. A hydraulic grab comprising a cylinder, a head on the lower end of said cylinder, a plurality of fingers pivotally mounted in said head, a wedge block adapted to engage the upper ends of said fingers whereby said fingers are operated, and a piston on said wedge block whereby hydraulic pressure from the surface serves to lower the wedge block and actuate said fingers, a shaft depending from said wedge block, teeth in said shaft, and a yieldably mounted pawl adapted to engage said teeth to hold the shaft and wedge block in lowered position whereby the fingers are held in engaging position.

5. A hydraulic grab comprising a cylinder, a head on the lower end of said cylinder, fin-

gers pivotally mounted in said head and extending therethrough, a wedge block slidably mounted in said cylinder, a piston on said wedge block, said wedge block having grooves therein in which the upper ends of the fingers are adapted to fit, said piston and wedge block being adapted to be lowered by hydraulic pressure from the surface, and a check valve above said piston whereby hydraulic pressure is retained against the top of the piston, and a relief valve above the piston, a shaft depending from the block and yieldable means engaging the shaft whereby it is held in lowered position.

6. A hydraulic grab comprising a cylinder, a head on the lower end of said cylinder, fingers pivotally mounted in said head, and extending therethrough, a wedge block slidably mounted in said cylinder, a piston on said wedge block, said piston and wedge block being adapted to be lowered by hydraulic pressure from the surface, whereby the fingers are swung into engaging position, and a check valve above said piston whereby hydraulic pressure is retained against the top of the piston.

In testimony whereof, I affix my signature.
 JAMES H. BONNER.