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M. GARVEY.
HYDRAULIC SAFETY CLAMP.
APPLICATION FILED FEB. 17, 1909.

965,807.

Patented July 26, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

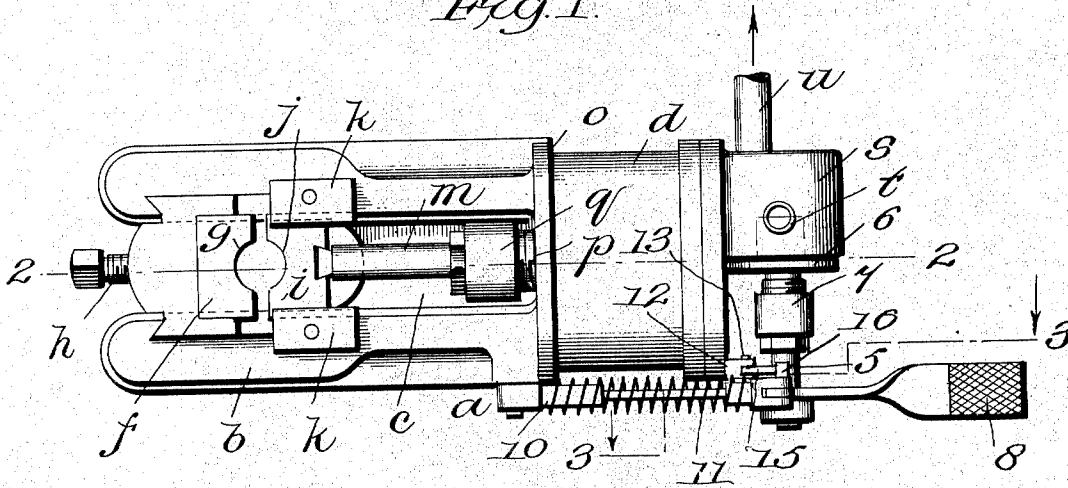


Fig. 2.

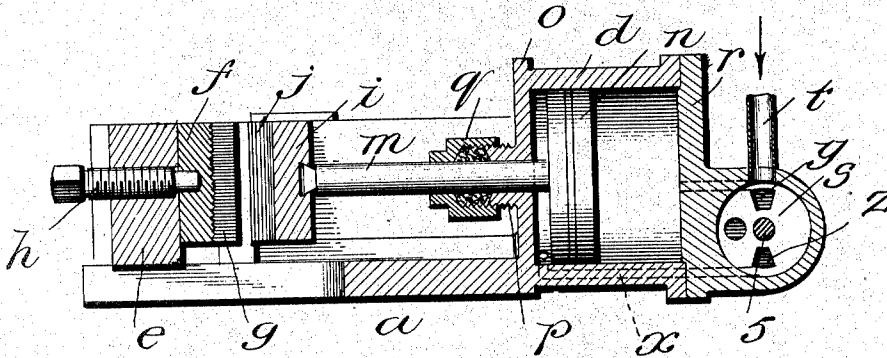
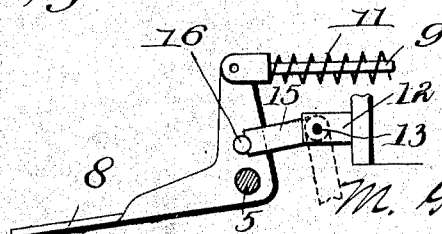


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

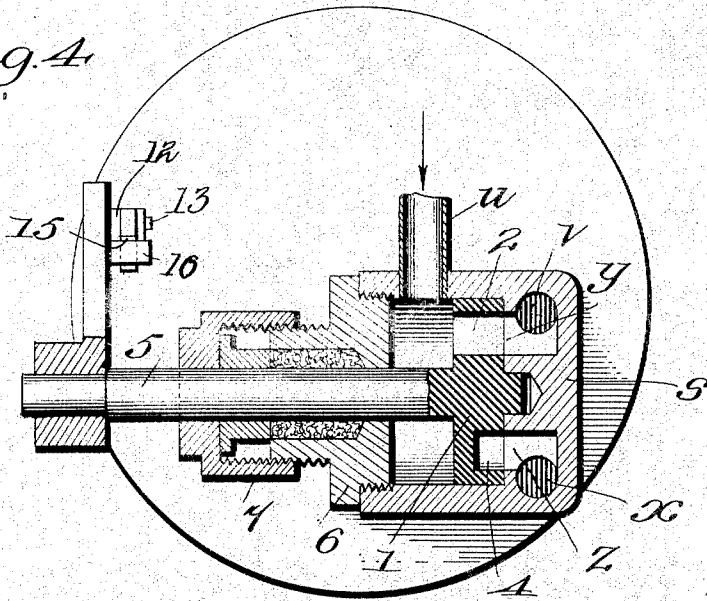


Fig. 5.

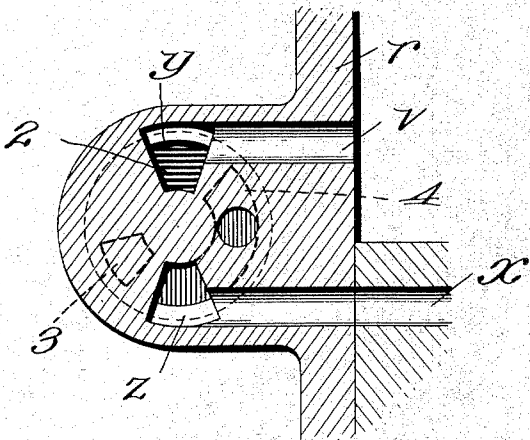
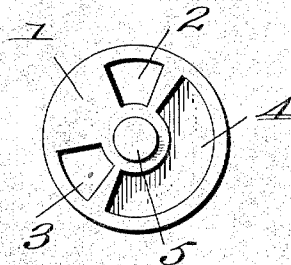


Fig. 6.



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UNITED STATES PATENT OFFICE.

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HYDRAULIC SAFETY-CLAMP.

965,807.

Specification of Letters Patent

Patented July 26, 1910.

Application filed February 17, 1909. Serial No. 478,509.

To all whom it may concern:

Be it known that I, MATTHIAS GARVEY, a citizen of the United States, residing at Mineville, in the county of Essex and State of New York, have invented certain new and useful Improvements in Hydraulic Safety-Clamps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in hydraulic safety clamps, and is intended especially to be used with diamond drill rods, though it is not restricted to such use.

The object of my invention is to provide a simple and powerful power safety clamp for diamond-drill rods. It is, of course, impossible to lift or feed these rods all at once. They are usually made in sections of thirty feet each, and in withdrawing the drill rod from the hole, the rod is lifted thirty feet, clamped, one section unfastened, and the operation repeated indefinitely. Heretofore, so far as I am aware, such drill rods have been clamped by hand-operated machines.

With these objects in view, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a top plan view of my invention. Fig. 2 is a longitudinal section thereof, on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a longitudinal central section through the valve and valve-chamber. Fig. 5 is a section through the valve-chamber and cylinder-head. Fig. 6 is a view of the valve, detached.

a represents the base of the machine cut away centrally, leaving a space through which the drill-rod may pass. This base is provided with two horizontal arms *b* united together by the web *c*, and on the base is mounted a cylinder *d*, which may be made integral with the base or separate therefrom or attached to as desired. To the arms *b* is fixed an abutment *e*, which carries one jaw *f* of the clamp, the inner face of which is curved and preferably roughened, as shown in *g*. This jaw is adjustably held by means of a set screw *h*.

i represents the movable jaw of the clamp,

which is cut away on one face, said cut away portion being preferably provided with vertical corrugations *j*. This jaw is adapted to slide back and forth over the arms *b*, being held in position by guides *k*.

Attached to the jaw *i* by dove-tailed joint or other fastening means is a piston-rod *m*, which is connected with the piston *n* in the cylinder *d*. The piston *n* tightly fits the cylinder *d*, being provided with a suitable packing, so that fluid pressure cannot escape around the edge of the piston. One side *o* of the cylinder is provided with a screw-threaded extension *p*, over which fits a hollow nut *q*, packing being placed between said nut and said extension, making a stuffing-box through which the piston-rod *m* works.

r represents one head of the cylinder, which is provided with an extension *s*, forming a valve casing. *t* represents the feed pipe entering the top of said casing, and connected to a fluid pressure pump or compressed-air tank or hydraulic pressure main (not shown). To the casing *s* is also attached a discharge pipe *u*. Through the valve casing runs a passage *v*, through which fluid pressure may be supplied to one side of the piston, and the valve casing and one side of the cylinder is provided with a similar passage *w*, leading to the other side of the piston. The valve-casing is also provided with enlarged ports *y* and *z* respectively.

In Fig. 4, 1 represents a valve, which is simply a flat disk provided with ports 2 and 3 running through said disk, and a cut away portion 4 extending about halfway around the valve, but not passing through it. The valve is rotatably mounted upon a shaft 5, carried in suitable supports (not shown), and the valve-casing *s* is provided with a head 6, having a stuffing-box 7, through which the shaft 5 passes.

Fixedly mounted upon the shaft 5 is a foot lever 8, bent at right angles, as shown in Fig. 3. To the top of this lever is connected a rod 9, which slides loosely in a guide 10 carried by the main frame. A spring 11 surrounds the rod 9 and normally holds the treadle 8 up, in which position the port 2 registers with the port *y* of the valve-casing, as shown in Fig. 5.

In Figs. 3 and 4, 12 represents brackets

projecting from the cylinder head and in these brackets is mounted a rod 13, having a spring 14 and a latch 15 secured thereto. The spring 14 normally holds the latch 15 in the position shown in Fig. 3. To the vertical arm of the foot lever 8 is attached a pin 16, which is adapted to mesh with the latch 15 when the latter is thrown up into the position indicated in full lines in Fig. 3, which may be done by hand. The result is that after the foot lever is pressed down, to open the port *z* of the valve casing, it can be locked in that position, as shown in Fig. 3, until by further pressure upon the treadle 8, the pin 16 is disengaged from the latch 15, whereupon the spring 14 returns the latch to its normal position, shown in dotted lines in Fig. 3.

The operation is as follows:—The drill rods, ready for hoisting, are between the jaws of the clamp. The foot lever 8 is held in position by means of the locking mechanism, as shown in Fig. 3, leaving the jaw *i* disengaged. Having hoisted the drill rods the operator, by pressing his foot upon the treadle 8, releases the latch 15 from the pin 16, whereupon the spring 11 lifts the foot-lever 8, which turns the valve into the position shown in Fig. 5. Fluid under pressure from the tank or pump enters in through the pipe *t*, passes through the opening 2 in the valve-casing, and strikes the piston *n*, forcing said piston to the left, as shown in Fig. 2, thereby forcing the jaw *i* toward the drill-rod, and holding the latter firmly. At the same time the fluid behind the piston is allowed to escape. It passes out through the passage *x*, through the opening *z* into a shallow groove 4, and finally out through the pipe *u*. The parts remain in this position until a section of the drill rods has been removed, whereupon the operator presses his foot upon the treadle 8, bringing the valve back into its original position. The fluid from the pump then flows in through the opening 3 into the passage *x*, which registers therewith, and returns the piston *n* to its original position, disengaging the jaw *i* from the drill-rod. Meantime the fluid which had been used to force the piston *n* over to clamp the drill-rod is allowed to escape, passing through the passage *v*, the shallow groove 4, and out through the escape-pipe *u* into the atmosphere. In ordinary work the operation is repeated as often as desired without using the locking mechanism shown in Fig. 3.

By means of the set screw *h* and an abutment (not shown) inserted back of the jaw *i*, the machine may be used as an ordinary clamp.

While I have thus described my invention, I wish it to be distinctly understood that I do not limit myself to the exact de-

tails shown and described, as these might be varied widely without departing from the spirit of my invention, the broad idea of which is to use a power clamp for drill-rods and for similar purposes, which automatically locks itself when the power is thrown on, and by which as great a pressure as is desired can be maintained upon the drill-rod or similar part.

I claim:—

1. In a safety clamp, the combination of a base, a fixed jaw and a movable jaw mounted on said base, a fluid-operated piston for moving said movable jaw, a valve for controlling the supply of fluid which operates said piston, and means for holding said valve against movement when the movable jaw has been moved to clamp a drill rod, substantially as described.

2. In a safety clamp, the combination of a base, a fixed jaw, a movable jaw, and a cylinder, mounted on said base, a piston in said cylinder, a piston rod connecting said piston with the movable jaw, a valve casing connected to the cylinder head, a rotatable valve mounted in said casing, means for operating said valve, and means for holding said valve in one position when the drill rod has been moved to clamp a drill rod, substantially as described.

3. In a safety clamp, the combination of a base, a fixed jaw, a movable jaw, and a cylinder, all mounted on said base, a piston in said cylinder, a piston rod connecting said cylinder and the movable jaw, a valve casing connected to said cylinder and provided with inlet and outlet means, said cylinder and valve casing being provided with passages leading, respectively, to each end of the cylinder, a valve mounted in said valve casing, means for operating said valve, and means for preventing the motion of said valve when the drill rod is clamped, substantially as described.

4. In a safety clamp, the combination of a base, a jaw normally fixed but adjustably mounted thereon, a movable jaw on said base, a cylinder mounted on said base, a piston in said cylinder, a piston rod connecting said piston with the movable jaw, a valve casing connected to said cylinder, said cylinder and valve casing being provided with passages leading to each end of said cylinder, a valve mounted in said valve casing, means for operating said valve, a spring normally holding said valve in an operative position, and means for holding said operating means stationary, in spite of the tension of said spring, substantially as described.

5. In a safety clamp, the combination of a suitable base, a fixed jaw, a movable jaw, and a cylinder, all mounted on said base, a piston in said cylinder, a piston rod connecting said piston with the movable jaw, a valve casing secured to said cylinder and

provided with an inlet pipe and an outlet
pipe, said valve casing and cylinder being
provided with passages leading to each end
of said cylinder, a valve rotatably mounted
5 in the valve casing, a lever for operating
said valve, a spring normally resisting said
operation, and means for holding said lever,
despite the tension of said spring, after it

has been operated and until released, sub-
stantially as described.

In testimony whereof, I affix my signa-
ture, in presence of two witnesses.

MATTHIAS GARVEY.

Witnesses:

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W. G. COFFEY.