(No Model.)

W. W. BIERCE.

STEAM HYDRAULIC COMPRESS.

No. 523,924. Patented July 31, 1894.

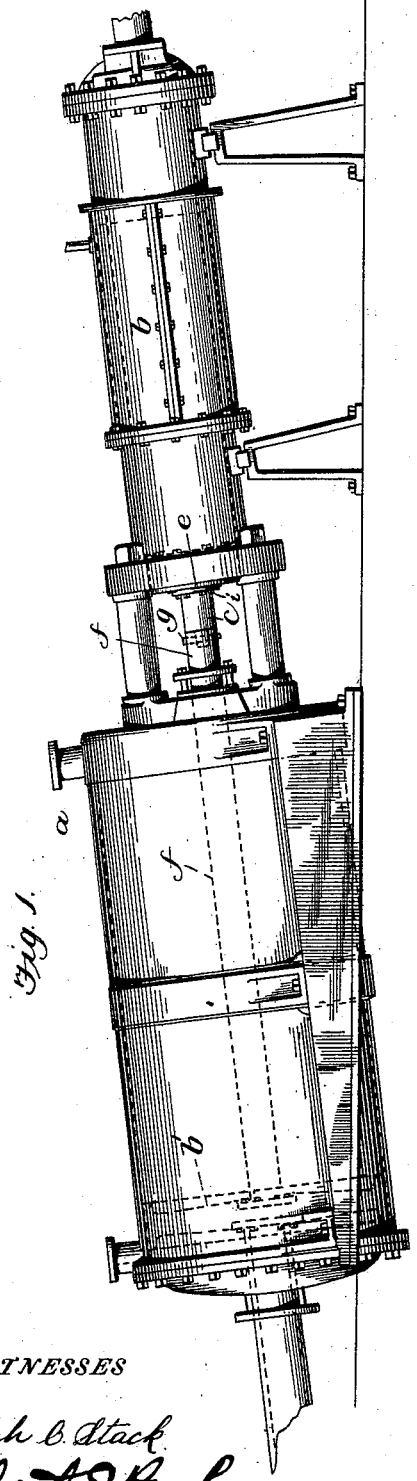

Fig. 1.

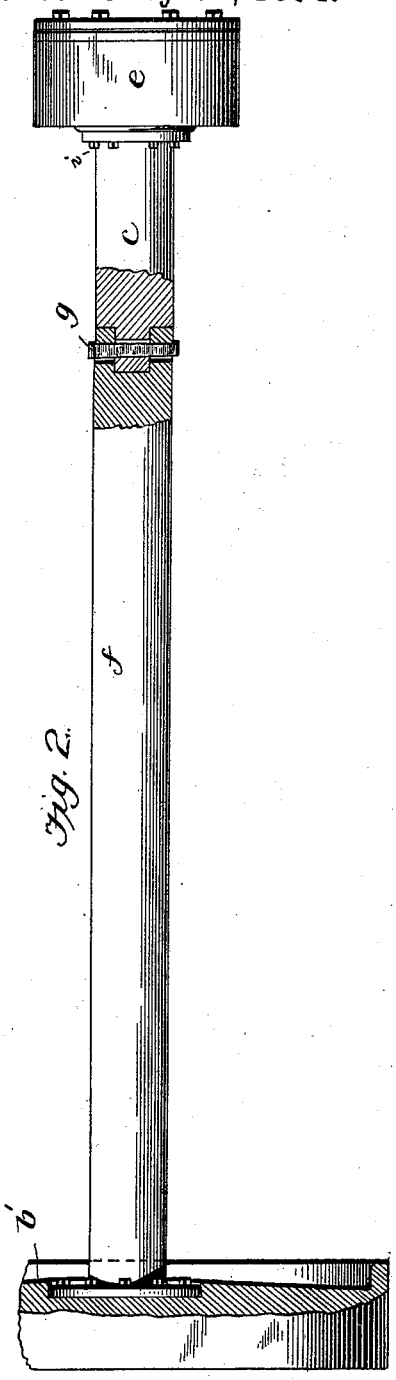

Fig. 2.

WITNESSES

Joseph B. Stack

Hubert E. Peck

INVENTOR

Wm. W. Bierce

per O. E. Duff

Attorney

UNITED STATES PATENT OFFICE.

WILL W. BIERCE, OF MONTGOMERY, ALABAMA.

STEAM HYDRAULIC COMPRESS.

SPECIFICATION forming part of Letters Patent No. 523,924, dated July 31, 1894.

Application filed July 26, 1893. Serial No. 481,497. (No model.)

To all whom it may concern:

Be it known that I, WILL W. BIERCE, of Montgomery, in the county of Montgomery and State of Alabama, have invented certain new and useful Improvements in Steam Hydraulic Compresses; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in "steam hydraulic compresses."

The object of the invention is to provide an improved steam hydraulic compress constructed and arranged in such a manner that the pistons of the hydraulic cylinders can be easily and quickly removed when desired and then replaced through the inner open ends of said cylinders, whereby the said pistons can receive proper attention and yet render the machine inoperative in but a comparatively short space of time.

The invention consists in certain novel features in construction and in combinations of parts more fully described hereinafter and particularly pointed out in the claim.

Referring to the accompanying drawings: Figure 1, shows in side elevation the steam and hydraulic cylinders of the compress. Fig. 2, is a detailed view with the parts broken away, showing the piston rod with its piston.

In the drawings the reference letter *a*, indicates the steam cylinder, and *b*, indicates the hydraulic or power cylinder located opposite and in continuation of the steam cylinder. These two cylinders are clamped or otherwise secured together in alignment and a suitable distance apart. The front end of the power or hydraulic cylinder is provided with the connections which carry the actuating fluid into the pressure cylinder of the press proper. The front end of one of the hydraulic cylinders carries the large heavy check or controlling valve. The rear ends of the hydraulic cylinders are open so that it is possible to slide the hydraulic pistons from the open ends of their cylinders.

b', indicates the piston in the steam cylinder and *e*, indicates the smaller piston in the hydraulic cylinder. These two pistons are connected to move in unison by the straight piston rod *f*, extending through the adjoining ends of said cylinders.

In operation, the steam in the steam cylinder forces the steam piston *b*, forward thereby forcing the hydraulic piston forward which moves the actuating fluid in the hydraulic cylinders to operate the press cylinders. The steam and hydraulic pistons are returned by steam admitted in front of the steam piston.

Heretofore in order to properly pack the hydraulic piston it has been necessary to remove the front head and the valves and connections therefrom of the hydraulic cylinder in order to remove and get at the pistons. This old method was very troublesome and required experienced help and consumed a great deal of time. The ordinary length of time required in carrying this old method of packing is about one day so that the use of the machine for an entire day is lost amounting to a very large money loss in a large machine. In order to obviate this difficulty and disadvantage the said piston rod is cut or formed into sections at a point *c*, near the piston in the hydraulic cylinder, thereby forming the piston rod in two sections and removably yet rigidly secure them together by means of a mortise in the squarely cut end of one section and a tenon on the squarely cut end of the other sections to enter said mortise; transverse holes being formed through the ends of sections which thus interlock (through the mortise and tenon) so that said holes register to receive the pin *g*. This pin is removable yet it holds the piston rod rigid as if unbroken.

When it is desired to remove the hydraulic piston, the steam piston is moved to the rear end of its cylinder, thereby bringing the joint in the piston rod to a position between the adjoining ends of the cylinders, the key pin *g* is removed, and the stud bolts *i*, securing the flanged end of the short section of the piston rod to the hydraulic piston are removed. This section of the piston rod can then be removed and the hydraulic piston pulled out of the open end of the hydraulic cylinder and repaired or properly adjusted in a comparatively short space of time and with little trouble. The piston can then be slipped into

the open end of the cylinder and the short piston rod section bolted thereto and locked to the other section of the rod and the pistons are connected and ready to operate. According to this method it takes but about one hour to properly pack the piston and the work can be done easily and economically and with little trouble.

The extreme simplicity, utility, and many advantages of this construction are obvious and it is evident that I do not wish to limit myself to a peculiar means or constructions for clamping the sections of the piston rod together and it is evident that various changes might be made in the forms, constructions and arrangements of the parts without departing from the spirit and scope of my invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

In a hydraulic compress, the combination of the hydraulic cylinder having a piston, the steam cylinder opposite the same and having a piston, the single piston rod directly and rigidly connecting and secured to said two pistons, said piston rod having a short removable transverse section, arranged, substantially as described, at the hydraulic piston end of the rod and removably secured to said piston and to the other rod section, so that when the pistons are moved to bring the hydraulic piston to the inner open end of its cylinder, and the removable section between the two cylinders, said section can be removed, and the hydraulic piston slipped out of the open end of its cylinder without affecting the cylinder or remainder of the rod or steam piston, as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILL W. BIERCE.

Witnesses:
FRANK DAVIES,
EDWARD C. LOWE.