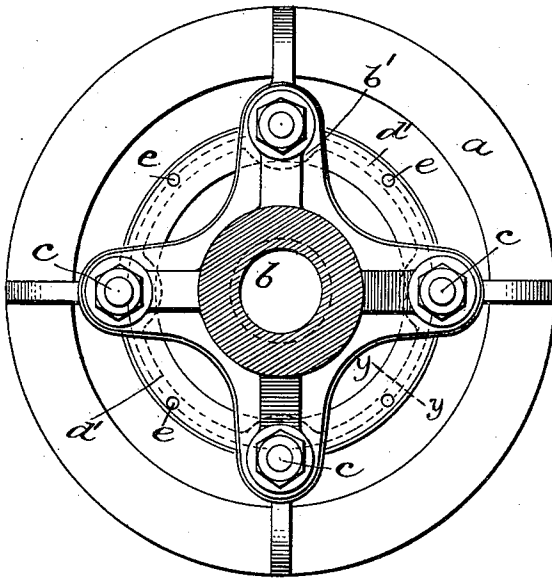
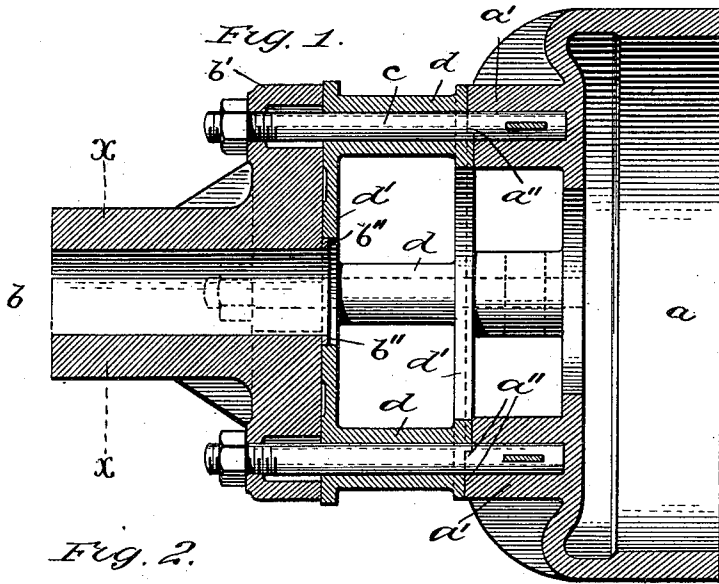


(No Model.)

L. & L. J. MILLER.
HYDRAULIC PRESS.

No. 466,176.

Patented Dec. 29, 1891.



Witnesses
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UNITED STATES PATENT OFFICE.

LEWIS MILLER AND LEWIS J. MILLER, OF PHILADELPHIA, PENNSYLVANIA.

HYDRAULIC PRESS.

SPECIFICATION forming part of Letters Patent No. 466,176, dated December 29, 1891.

Application filed August 31, 1891. Serial No. 404,339. (No model.)

To all whom it may concern:

Be it known that we, LEWIS MILLER and LEWIS J. MILLER, citizens of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Presses, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 represents a longitudinal sectional view of the adjacent connected ends of the steam and water cylinders of a hydraulic press; Fig. 2, a vertical sectional view on the line *xx* of Fig. 1, looking in the direction of the arrow; and Fig. 3, a detail sectional view on the line *yy* of Fig. 2.

This invention relates to certain improvements upon that class of hydraulic presses wherein the respective ram or water cylinders are connected strongly to the adjacent ends of the large steam-cylinders, the pistons working in the former being connected by piston-rods to pistons in the latter, as is well known. The difficulty in setting and connecting these cylinders heretofore has been in placing them in perfect alignment with each other and keeping them in such position during the vibration and jarring consequent upon the operation of the press; and it is the object of the present invention to overcome those drawbacks by providing means whereby when the bolts connecting the adjacent ends of the cylinders are drawn up tightly the cylinders shall always be brought in alignment and shall be held in such position during the operations of the press.

In the drawings, *a* designates a steam-cylinder, and *b* a water-cylinder, the respective pistons of the cylinders and the connecting piston-rod being omitted from the drawings. The rear end of the water-cylinder is provided with the usual integral radial arms *b'*, through which the connecting-bolts *c* pass, and the forward end of the steam-cylinder is provided with sockets *a'*, in which the rear ends of the bolts *c* are keyed in the usual manner, the sockets being connected together by an annular rib on the cylinder. The forward ends of the connecting-bolts are provided with the usual tightening-nuts. Spacing sleeves or columns *d* surround the bolts between the cylinders and serve to properly space the cylinders

when the bolts are drawn tight. The respective ends of these sleeves are connected together by integral rings *d'*, which fit against the adjacent ends of the cylinders, these two rings serving to rigidly connect and space the sleeves and form a rigid cast frame. An annular shoulder *b''* is formed on the rear end of the water-cylinder and abuts against a shoulder formed on the adjacent ring, and a similar annular shoulder *a''* is formed on the rib on the end of the steam-cylinder and abuts against a shoulder on the adjacent face of the ring, as shown. Bolts *e* may be passed through the rings and tapped into the cylinders at intervals to further guard against displacement or loosening. The rings, connecting the sleeves rigidly together and abutting against annular shoulders on the cylinders, serve to not only insure the proper alignment of the latter in setting them, but also to prevent them being jarred out of alignment by the continual operation of the press.

Having thus fully described our invention, what we claim is—

1. The combination of the steam and water cylinders and the bolts connecting their adjacent ends, the spacing-sleeves *d*, surrounding the bolts between the cylinders, a ring *d'*, rigidly connecting the forward ends of the spacing-sleeves and bearing against the adjacent end of the water-cylinder, and another ring *d'*, rigidly connecting the rear ends of the spacing-sleeves and abutting against the adjacent end of the steam-cylinder, substantially as described.

2. The combination of the water and steam cylinders, bolts *c*, connecting the adjacent ends of the cylinders, sleeves *d*, surrounding the bolts between the cylinders, and two rings *d'*, formed integral with the respective ends of the sleeves and bearing against the adjacent ends of the cylinders, said rings being provided with annular shoulders abutting against annular shoulders on the adjacent ends of the respective cylinders.

In testimony whereof we affix our signatures in presence of two witnesses.

LEWIS MILLER.
LEWIS J. MILLER.

Witnesses:

W. R. P. ROBERTS,
WM. F. MAC CALLUM.