

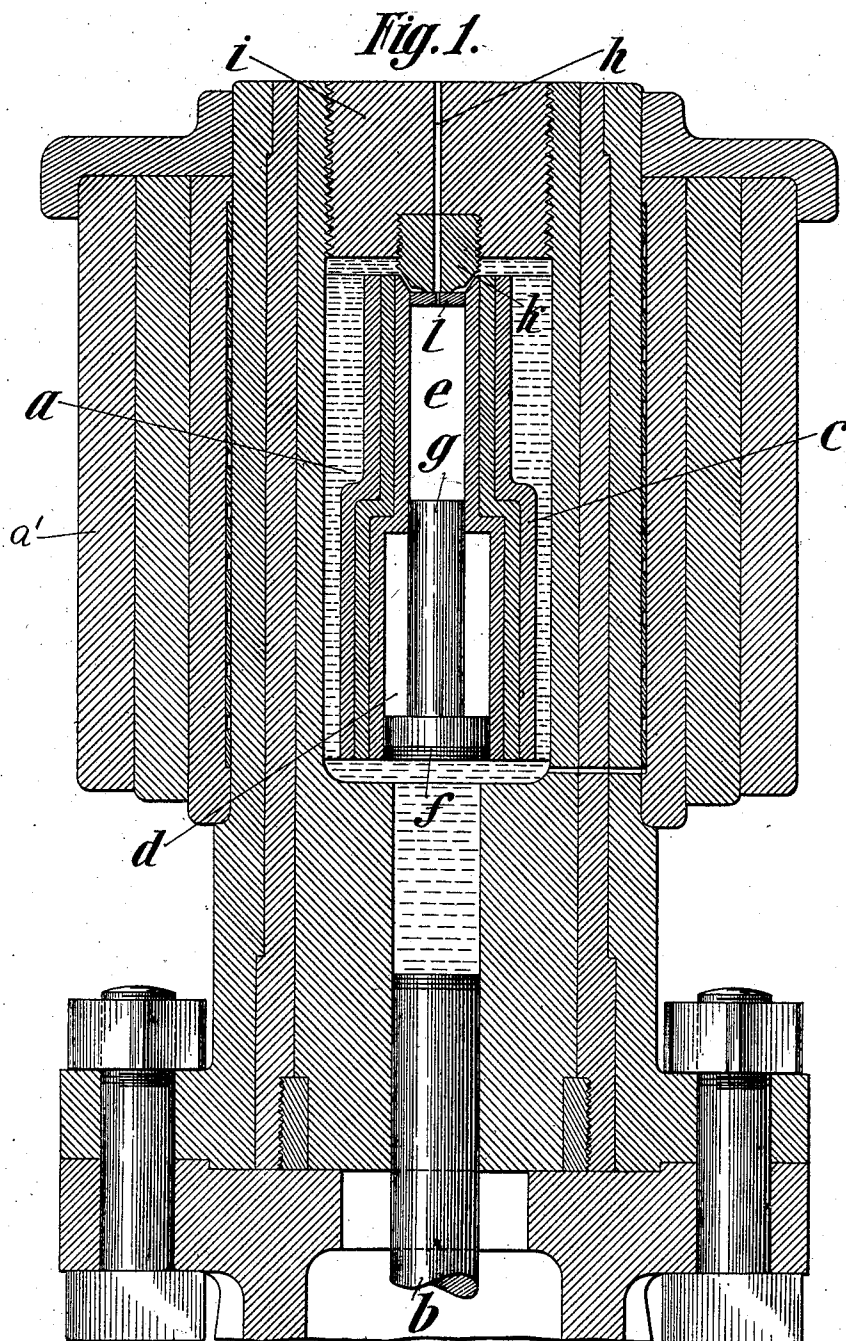
No. 841,972.

PATENTED JAN. 22, 1907.

C. HUBER.
HYDRAULIC PRESS MULTIPLICATOR.

APPLICATION FILED DEC. 27, 1905.

2 SHEETS—SHEET 1.



Witnesses:

J. B. Keefe
C. D. Keefe

Inventor

Carl Huber
By *James L. Norris*
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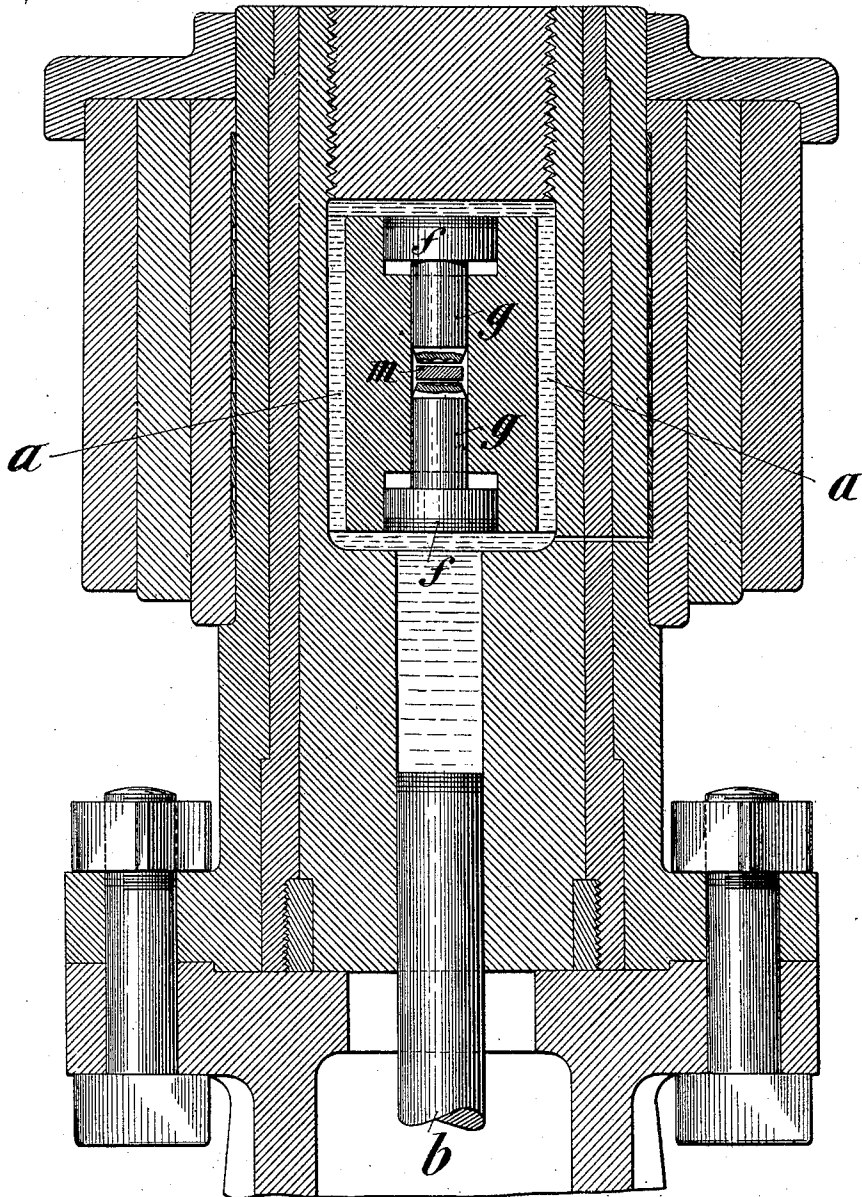
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

CARL HUBER, OF BERLIN, GERMANY.

HYDRAULIC-PRESS MULTIPLICATOR.

No. 841,972.

Specification of Letters Patent.

Patented Jan. 22, 1907.

Application filed December 27, 1905. Serial No 293,511.

To all whom it may concern:

Be it known that I, CARL HUBER, engineer, a subject of the German Emperor, and a resident of No. 16 Friedrichstrasse, Berlin, in the Empire of Germany, have invented certain new and useful Improvements in Hydraulic-Press Multipliers, of which the following is a clear, full, and exact description.

This invention relates to a hydraulic press multiplier which has for its object to attain in the press-cylinder of a Huber hollow press constructed for high pressure a multiplication of the pressure of, for instance, five thousand atmospheres to ten thousand to twenty thousand or still more atmospheres in the ordinary pressure-chamber, said pressure being sufficient for ordinary high pressures.

According to this invention the press-multiplier is so mounted in the high-pressure receiver of the press, whose casing is constructed for the highest attainable pressure, that its outer casing is surrounded by the water under pressure of the pressure-chamber of the press. The pressure contained in the main receiver and acting on the large piston surface or area of the press-multiplier thus produces a multiple maximum pressure in the inner cylinder of the press-multiplier and at the same time relieves the outer casing of the inner cylinder.

Referring to the accompanying drawings, Figure 1 shows the arrangement of the multiplier in a press for making copper tubes or copper rods, and Fig. 2 shows the arrangement of the multiplier in an embossing-press.

The casing *a'* of the pressure-chamber *a* of the press shown in Fig. 1 is constructed in the usual manner of such a thickness that it can withstand and the highest attainable pressure—namely, up to seven thousand atmospheres. The water in this pressure-chamber is, as is usual in such hydraulic hollow presses, placed under pressure by a piston *b*, and thus adapted for pressing hollow bodies.

For the purpose of multiplying the pressure of, say, five thousand atmospheres produced in the pressure-chamber *a* there is provided in the latter the press-multiplier *c*, which is provided with a wide bore *d* and a narrow bore *e*. The piston *f* is slidably arranged in the wide bore *d*, and the piston *g*, which is connected to the piston *f*, is slidably arranged in the narrow bore *e*. The ratio

of the diameters of the pistons *f* and *g* is such that the pressure of about five thousand atmospheres bearing on the piston *f* is multiplied by the piston *g* in the chamber *e* to twenty thousand or more atmospheres.

The press-multiplier *c* is so arranged in the chamber *a* that besides the full surface or area of the piston *f* the total outer surface or area thereof is surrounded by the water under pressure in the chamber *a*. As this water under pressure forms *per se* a non-compressible body the casing of the press-multiplier *c* cannot be deformed, notwithstanding the comparatively thin casing of the press-multiplier *c* and the high pressure (twenty thousand atmospheres) in the cylinder *e*, as the surrounding water under pressure of five thousand atmospheres in the chamber *a* relieves such casing. The upper end of the pressure-chamber *e* of the press-multiplier communicates with a passage *h*, which is located in the end screw *i*, as well as in the connecting-pieces *k* and *l*. If, for instance, copper, brass, or any other medium hard metal is brought into the pressure-chamber *e* and the necessary pressure is produced by means of the piston *g*, the metal located in the chamber *e* leaves the same through the matrix *h*. The cross-section of the passage may be of any desired form.

According to the constructional form shown in Fig. 2 the press-multiplier arranged in the pressure-chamber has two pairs of pistons *f g f g*, which operate axially with respect to each other and emboss the intermediate blank (medal) in the desired form. It is possible by this press-multiplier to emboss medals of the largest size on both sides in one to two operations.

Having now particularly described and ascertained the nature of this said invention, I declare that what I claim, and wish to secure by Letters Patent, is—

1. In a hydraulic press, the combination of a casing, cylinders within said casing having piston areas of varying diameters, coöperative pistons in said cylinders, and means for producing pressure in the casing.

2. In a hydraulic press, the combination of a casing inclosing main and auxiliary cylinders, the said cylinders having piston areas of varying diameters, coöperative pistons in said cylinders, and means for producing pressure in the casing.

3. In a hydraulic press, the combination of a casing inclosing main and auxiliary cyl-

inders, the said cylinders having piston areas of varying diameters, coöperative pistons in said cylinders, and means for producing pressure in the casing and relieving the pressure in the main and auxiliary cylinders.

4. In a hydraulic press, the combination of a casing inclosing main and auxiliary cylinders, the said cylinders having piston areas of varying diameters, means for producing pressure in the casing, and coöperative pistons in said cylinders, the said auxiliary cylinder being totally surrounded by liquid under pressure.

5. In a hydraulic press, the combination of a casing inclosing main and auxiliary cylinders, said auxiliary cylinder having a reduced bore, pistons in said cylinders arranged in opposition to each other, and means for producing pressure in the casing.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

CARL HUBER.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.