

No. 650,755.

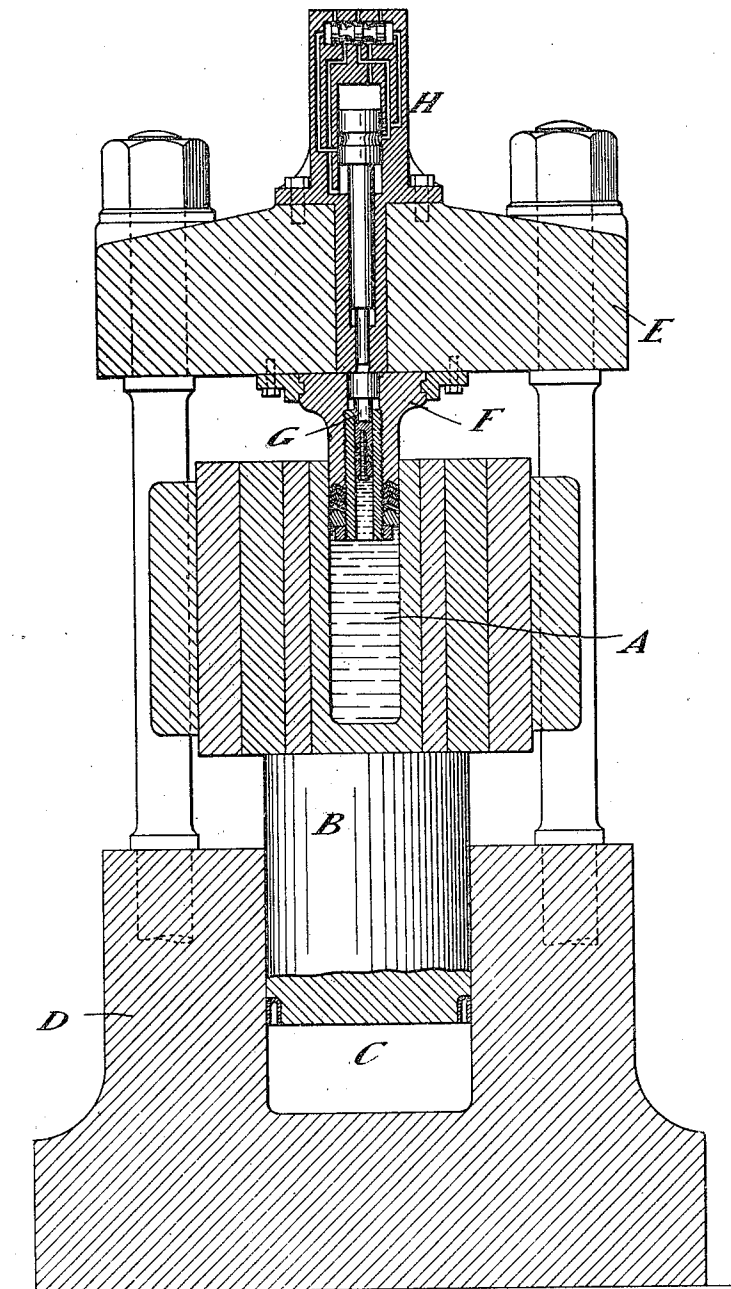
Patented May 29, 1900.

C. HUBER.

APPARATUS FOR SHAPING METAL OBJECTS BY MEANS OF FLUID PRESSURE.

(Application filed Mar. 6, 1900.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

CARL HUBER, OF CARLSRUHE, GERMANY.

APPARATUS FOR SHAPING METAL OBJECTS BY MEANS OF FLUID-PRESSURE.

SPECIFICATION forming part of Letters Patent No. 650,755, dated May 29, 1900.

Application filed March 6, 1900. Serial No. 7,545. (No model.)

To all whom it may concern:

Be it known that I, CARL HUBER, a citizen of Austria-Hungary, residing at 38 Breiertheimer Allee, Carlsruhe, Baden, in the Empire of Germany, have invented a certain new and useful Apparatus for Shaping Metal Objects by Means of Fluid-Pressure, (for which application has been made for a patent in Great Britain, dated January 29, 1900, No. 1,819,) of which the following is a specification.

My invention relates to pressure-chambers the interiors of which are subjected to a high degree of fluid-pressure and into which are introduced metal objects combined with molds so arranged that both the exposed surfaces of the metal object and of the mold are subjected to the pressure of the fluid in the chamber, whereby the metal object is made to assume the configuration of the mold. A method of operating for this purpose was described in my application for Letters Patent filed January 29, 1900, Serial No. 3,206.

I have discovered that in operating upon the bodies to be shaped according to the above process a greatly-increased effect is produced if at the same time that the body is subjected to the statical pressure of the fluid the latter is subjected to a series of rapidly-repeated concussions, whereby its pressure is momentarily increased to a certain extent, which concussions are consequently transmitted by the fluid to the object and its mold. I have found that by such concussive action superadded to the statical pressure of the liquid the body to be shaped is much more readily made to assume the configuration of the mold, particularly if this be formed with more or less finely recessed parts, than if it be subjected only to the statical pressure of the liquid.

For carrying out my said invention there is combined with any suitable apparatus whereby the liquid in a pressure-chamber is subjected to a high degree of pressure an auxiliary apparatus consisting of a small plunger which is made to enter or is in communication with the pressure-chamber containing the object to be molded and which when the liquid therein has been raised to the required high degree of pressure is subjected by a suitable percussion device to a succession of

sharp blows, whereby it is made to produce the before-described concussions in the liquid.

The accompanying drawing shows a vertical section of a hydraulic apparatus constructed according to the above-described invention.

The apparatus consists of a strong pressure-chamber A, filled with water or other suitable non-compressible liquid, into which are introduced the objects to be acted upon combined with their molds, preferably in the manner described in my said application filed January 29, 1900, Serial No. 3,206. This chamber is formed or fixed on the upper end of a plunger, B, working in a hydraulic cylinder C, formed in the lower part of the framing D. The cross-head E of the framing carries a plunger F, adapted to fit with suitable packing into the upper end of the chamber A, so that on forcing this up by the admission of water under pressure into the cylinder C the plunger F will enter chamber A and will exercise a pressure upon the water therein which will be as many times greater than the pressure exercised in C as the sectional area of C is greater than the sectional area of F. The plunger F has a central channel in which fits a small plunger G, having an enlarged head at the upper end. On the top of the cross-head E is fixed an atmospheric hammer H, of any known construction, adapted to exercise blows in rapid succession and the piston-rod of which passes through a channel formed in the cross-head, so that its lower end can bear upon the head of the plunger G. Thus, assuming the water in chamber A to be subjected to the required high pressure by the forcing up of the plunger B, the atmospheric hammer is then put in operation, so as to effect a rapid succession of strong blows upon the plunger G, which in its turn transmits a corresponding series of concussions to the water in the chamber A, and thereby momentarily raises the pressure therein, whereby the above-described effect is produced of causing the objects to assume more rapidly and effectually the configuration of the mold than would be the case if they were only subjected to the statical pressure exerted by the plunger F.

In place of the atmospheric hammer H may be employed any other known apparatus that can exercise a series of rapid strong blows.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim—

1. In apparatus for subjecting objects to a high degree of liquid-pressure the combination of a pressure-chamber containing liquid and the objects to be treated means for exercising a high degree of statical pressure upon such liquid and means for subjecting the said liquid to a series of rapidly-repeated concussions while it is subjected to the statical pressure, substantially as described.

2. Apparatus for subjecting objects to a high degree of liquid-pressure, the combination of a pressure-chamber containing liquid and the objects to be treated, a plunger adapted to close the open end of said chamber and to subject the contents thereof to high statical pressure; a second smaller plunger also in contact with the liquid in the chamber, and a hammering device adapted to subject such second plunger to a series of rapidly-repeated sharp blows, substantially as and for the purposes described.

3. In apparatus for subjecting objects to a high degree of liquid-pressure the combina-

tion of a pressure-chamber containing liquid and the objects to be operated upon, a large plunger carrying such pressure-chamber and working in a hydraulic cylinder, a small stationary plunger held immediately above the open upper end of the pressure-chamber so that when the latter is raised by the liquid-pressure beneath its plunger, said second plunger will enter the pressure-chamber and will subject its contents to pressure, a channel formed longitudinally through such second plunger containing a third plunger, and a percussion device adapted to effect a series of rapidly-repeated blows upon such third plunger whereby the latter is made to transmit to the liquid in the pressure-chamber a corresponding series of concussions, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CARL HUBER.

Witnesses:

H. W. HARRIS,
J. ADRIAN.