

No. 657,950.

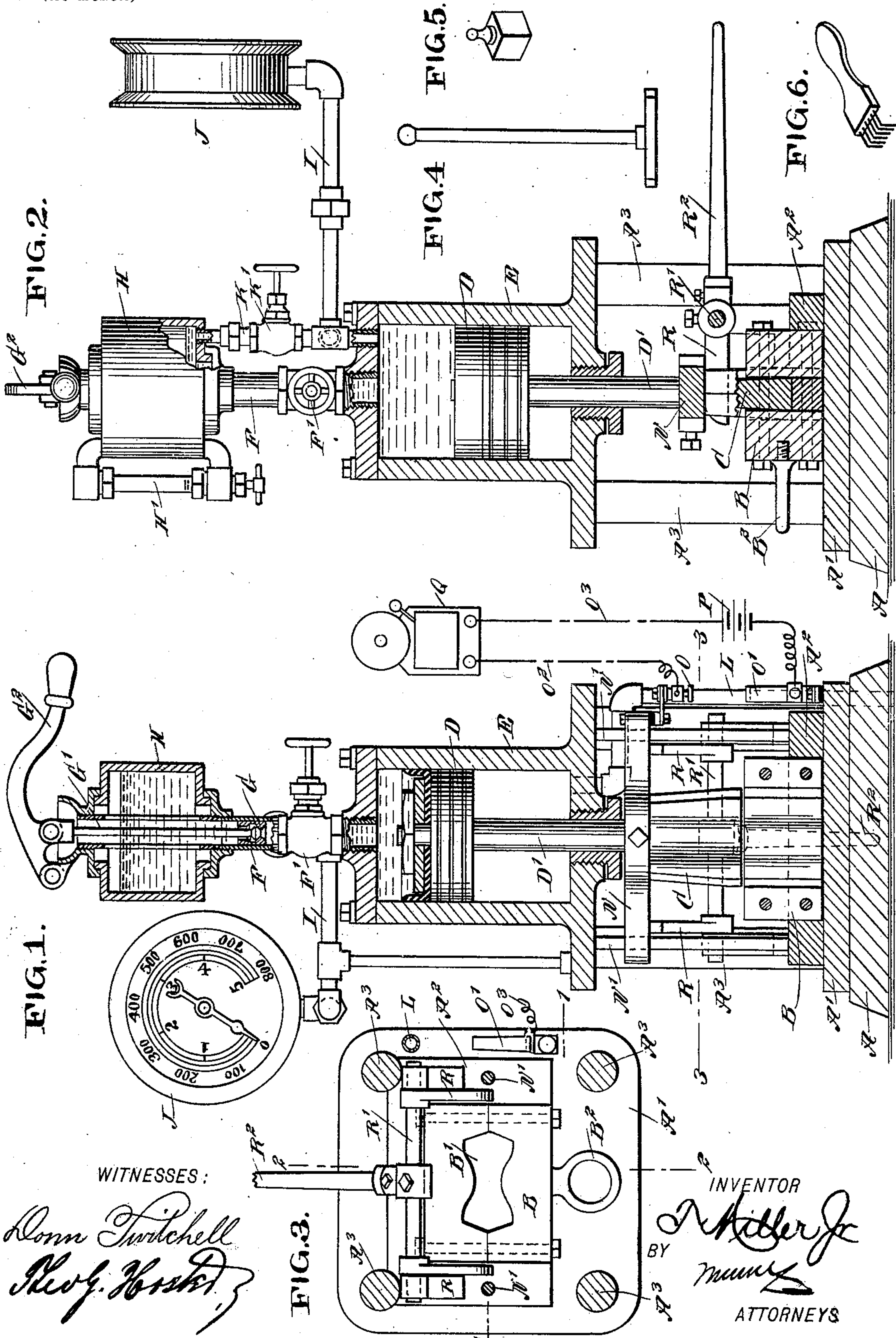
Patented Sept. 18, 1900.

T. MILLER, JR.

MACHINE FOR MAKING BRIQUETS FOR TESTING PURPOSES.

(Application filed June 5, 1899.)

(No Model.)



WITNESSES:

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FIG. 3.

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THOMAS MILLER, JR., OF NEW YORK, N. Y.

MACHINE FOR MAKING BRIQUETS FOR TESTING PURPOSES.

SPECIFICATION forming part of Letters Patent No. 657,950, dated September 18, 1900.

Application filed June 5, 1899. Serial No. 719,379. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MILLER, Jr., of the city of New York, borough of Manhattan, in the county and State of New York, have
5 invented certain new and useful Improvements in Machines for Making Briquets for Testing Purposes, of which the following is a full, clear, and exact description.

The object of the invention is to provide
10 certain new and useful improvements in making briquets from cement, plaster, or other material for testing purposes, whereby briquets of uniform size, form, density, moisture, and strength are obtained to permit of
15 accurately determining the breaking strain or the crushing resistance of different brands of cement material or the relative breaking strains and crushing resistances of different materials.

20 The invention consists of a machine for forming the briquets, as hereinafter more fully described, and pointed out in the claims.

A practical embodiment of my invention is represented in the accompanying drawings,
25 forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the hydraulic briqueting-machine, the section being taken on the line 1 1 in Fig. 3. Fig. 2 is a transverse section of the same on the line 2 2 in Fig. 3. Fig. 3 is a sectional plan view of the same on the line 3 3 in Fig. 1. Fig. 4
35 is a side elevation of a tamping-tool for the mold, used when making briquets to be tested for tensile strength. Fig. 5 is a perspective view of a tamping-tool for the mold, used when making briquets to be tested for compression strength; and Fig. 6 is a like view
40 of a distributing-tool used for evening the material in the mold.

The machine used for forming the briquets is mounted on a suitable base A, supporting a table A', formed with a U-shaped guideway A² for receiving and retaining the mold B, preferably made in two parts bolted together, as illustrated in Fig. 3, and formed with a mold-opening B', preferably of the shape indicated in said Fig. 3, the width of
45 the middle or narrow portion being, say, one inch, the ends being beveled, so that the briquet formed according to this shape can be

readily subjected to breaking strain in a testing-machine.

Into the mold B is adapted to pass a plunger C, of a similar shape at its lower end to that of the opening B' in the said mold B, and said plunger C is secured at the lower end of the piston-rod D' of a piston D, mounted to reciprocate in a cylinder E, supported
55 on standards A³ from the table A' and the base A. The upper end of this cylinder E is connected with the barrel F of a pump for forcing water or other liquid into the cylinder to move the piston D downward therein, and consequently the plunger C into the registering opening B' of the mold B to press the material in the mold, as previously explained.
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In the barrel F operates a valved plunger G, connected by its plunger-rod G' with a lever G² under the control of the operator for manually reciprocating the said valved plunger to pump water into the cylinder E from a reservoir H, containing water and opening into the barrel F. The latter is provided in
70 its lower portion with a valve F' for disconnecting the cylinder E from that part of the barrel containing the plunger G whenever it is desired so to do.

Into the upper end of the cylinder E extends a pipe I, connected with a pressure-gage J for indicating the pressure in the cylinder and also for indicating the pressure to which the material has been subjected in the mold B. The pipe I is also connected by a
85 pipe K, having a valve K', with the reservoir H, so as to allow a return of the water from the cylinder E back to the reservoir H at the time the piston D moves upward back to its former position and lifts the plunger C out of the mold B. When the pump is used for forcing water into the cylinder E, the valve K' is closed, and when the water is returned from the cylinder to the reservoir H then the valve K' is opened and the valve F'
90 may be closed. The lower end of the cylinder E is provided with a pipe L for carrying off any water that may leak past the piston D into the lower end of said cylinder.

On the piston-rod D', directly over the mold B, is secured an arm N, mounted to slide on vertically-disposed guide-rods N', extending from the guideway A² to the cylinder, as is plainly shown in Figs. 1 and 3. On the arm
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N is secured a contact-point O, adapted to engage a contact-point O', carried by the table A', and the said contact-points O O' are connected by wires O² O³ with a battery P and an electric alarm Q of any approved construction. Thus when the piston D is forced downward upon the operator working the pump, as above described, then the arm N brings its contact-point O finally in contact with the contact-point O', so that an alarm is sounded about at the time when final compression takes place.

In order to enable the operator to quickly return the piston D to its uppermost position, as previously mentioned, I provide arms R, engaging the under side of the arm N, and said arms R are fastened to a shaft R', journaled in suitable bearings carried by the guideway A², and on said shaft R' is secured a hand-lever R², adapted to be taken hold of by the operator to enable the latter to press on the hand-lever and impart a swinging motion to the shaft R', so that the arms R lift the arm N, and consequently the piston-rod D', the piston D, and the plunger C to move the latter out of the mold B and to force the water out of the upper end of the cylinder E back into the reservoir H, as above described.

In filling the mold with material the mold is usually placed on a plate-glass slab.

In order to conveniently move the mold B from the plate-glass slab to the table A' and from the latter back to said slab, I prefer to provide the mold with a handle B², adapted to be taken hold of by the operator. When the mold is filled with dry material and the latter has been evened off by the tool shown in Fig. 6 and then tamped by the tool shown in Fig. 4, the mold is placed in the machine, and then the operator actuates the pump by working the lever G² to force the plunger C into the mold for a first or dry compression of the material. When this has been done, the valve F' may be closed and the valve K' is opened, and then the hand-lever R² is pressed downward, so as to lift the plunger C out of the mold and to return the piston D to its former position. The mold is then removed from the machine, and a predetermined amount of water is now placed in the mold to saturate the material therein, after which the mold is again returned to the machine and the above-described operation is repeated—that is, the operator actuates the hand-lever G² to again force the plunger C back into the mold for final compression, according to a predetermined pressure indicated on the pressure-gage J. It is understood that the valves K' and F' are alternately opened and closed to allow of the above-described manipulation.

For forming briquets to be subjected to compression strain or crushing resistance I provide a mold having a square opening and a cube tamping-tool, as shown in Fig. 5, and which tamping-tool is left in the mold, the handle being removed, and the said tamping-

tool is then engaged by the lower end of the plunger C to use the said cube tamping-tool as a follower for pressing the material into the mold in cube form. Thus by this arrangement it is not necessary to change the shape of the plunger C when the machine is used for forming briquets to be subjected to tensile strain or to compression strain.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for forming briquets, a mold for containing material, a reciprocating plunger for said mold, a cylinder containing a piston carrying on its piston-rod said plunger, a pump for pumping a liquid into the cylinder against the piston, a reservoir surrounding the pump-barrel and opening into the same, the lower end of said pump-barrel projecting from the reservoir and connected with the top of said cylinder, a valve in said barrel for closing communication between the barrel and cylinder and a pipe leading from the upper end of the cylinder and connected with a pressure-gage, the said pipe being also connected by a valved pipe with the lower part of the reservoir, for the purpose set forth.

2. In a machine for forming briquets for testing purposes, a removable mold for containing material, a reciprocating plunger for said mold, a cylinder containing a piston carrying on its piston-rod said plunger, a pump for pumping a liquid into the cylinder against the piston, a valved return connection between the cylinder and the reservoir for the pump, and a manually-actuated return device for moving said plunger out of the mold and moving the piston back to its former position, the said device comprising an arm secured on the piston-rod, arms engaging the under side of said arm, a shaft journaled in suitable bearings and to which the said arms are secured, and a hand-lever secured to said shaft, as set forth.

3. A machine for forming briquets for testing purposes comprising a mold for containing material, a reciprocating plunger for said mold, a cylinder containing a piston carrying on its piston-rod said plunger, a pump for pumping a liquid into the cylinder against the piston, the barrel of the pump being connected with the upper end of the cylinder, a reservoir adapted to contain liquid and opening into the barrel of the pump, a valved pipe leading from the cylinder to the reservoir to allow of a return of liquid from the cylinder to the reservoir, and a manually-actuated return device for moving said plunger out of the mold and moving the piston back to its former position, the return movement of the piston forcing the liquid from the cylinder back into the reservoir, substantially as described.

4. In a machine for forming briquets for testing purposes, a reciprocating plunger for compressing the material, a cylinder, a piston in said cylinder provided with a piston-rod

connected with said plunger, a pump for
pumping liquid into the cylinder against the
piston, a water-reservoir located above the
cylinder, the said reservoir surrounding the
5 pump-barrel and opening into the same, the
lower end of the pump-barrel projecting be-
low the reservoir and connected with the top
of the cylinder, a valve in the pump-barrel
between the reservoir and cylinder and a
10 valved pipe extending from the top of the
cylinder to the bottom of the reservoir and
connecting the same substantially as set
forth.

5. In a machine for forming briquets, a
15 mold for containing material, a reciprocating
plunger for said mold a cylinder containing
a piston carrying on its piston-rod said plun-

ger, a pump for pumping a liquid into the
cylinder against the piston, a reservoir sur-
rounding the pump-barrel and opening into 20
the same, the lower end of said pump-barrel
projecting from the reservoir and connected
with the top of said cylinder, a valve in said
barrel for closing communication between
the barrel and cylinder, a valved pipe lead- 25
ing from the cylinder to the reservoir to al-
low of a return of liquid from the cylinder to
the reservoir, and an electric alarm controlled
by the movement of said plunger, substan-
tially as set forth.

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Witnesses:

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