F. QUARTIERI.

MOLDING PRESS FOR EXPLOSIVES.

APPLICATION FILED SEPT. 1, 1914.

1,200,982.

Patented Oct. 10, 1916.

2 SHEETS—SHEET 1.

FIG. 1

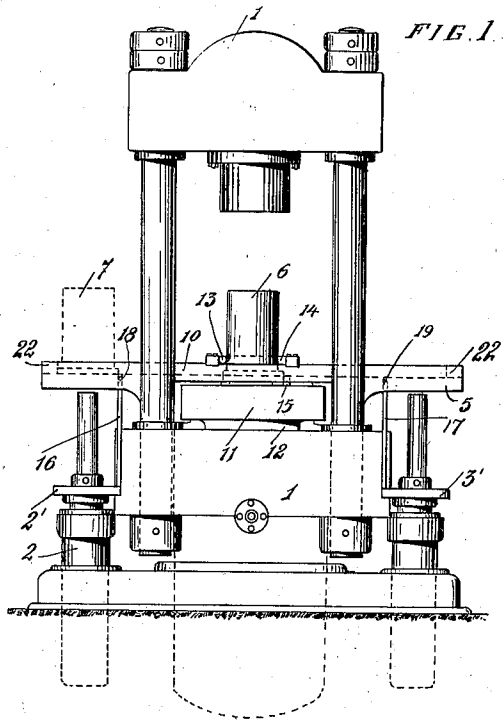
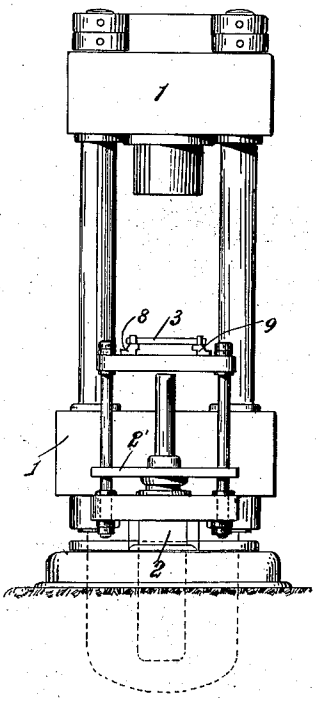


FIG. 2.



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2 SHEETS—SHEET 2.

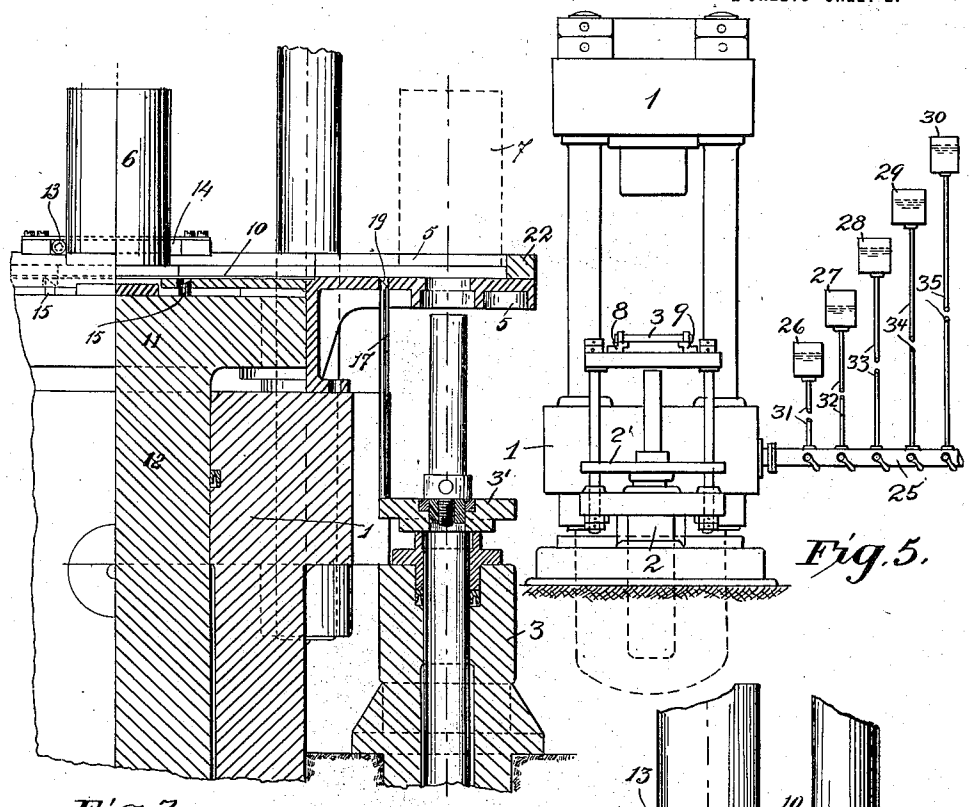


Fig. 5.

Fig. 3.

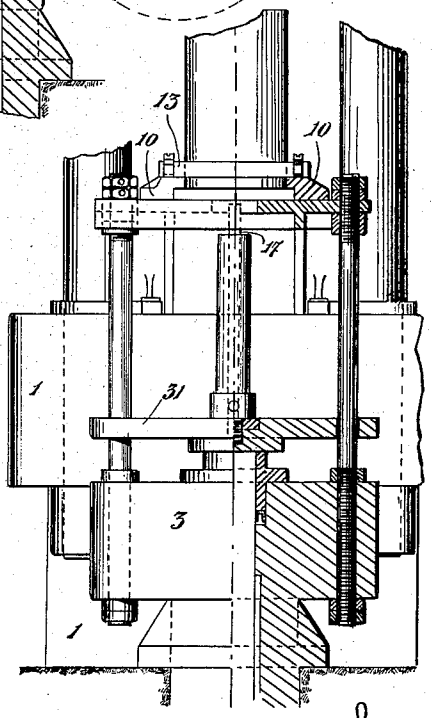


FIG. 4.

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UNITED STATES PATENT OFFICE.

FERDINANDO QUARTIERI, OF MILAN, ITALY.

MOLDING-PRESS FOR EXPLOSIVES.

1,200,982. Specification of Letters Patent. Patented Oct. 10, 1916.

Application filed September 1, 1914. Serial No. 859,696.

To all whom it may concern:

Be it known that I, FERDINANDO QUARTIERI, engineer, subject of the King of Italy, resident of No. 17 Via Principe Umberto, Milan, in the Kingdom of Italy, have invented new and useful Improvements in Molding-Presses for Explosives, of which the following is a specification.

It is well known that one of the greatest difficulties met with in the manipulation and especially in the compression of explosive substances is due to the danger that they present in extracting the compressed blocks out of the corresponding molds. Other difficulties, of no less gravity, are met with in placing the molds under the hydraulic press to obtain the perfect alinement of the cylinder, containing the explosive, with the compressing plunger because the slightest difference in alinement may give rise to friction or shocks which may bring about irreparable consequences.

The improvements forming the object of the present invention aim at avoiding the dangers above mentioned and to this end I have designed a very simple mechanism, which is sure in action as hereinafter described with reference to the annexed drawings.

Figures 1 and 2 show a hyraulic press furnished with two extractors intended to insure a prompt and sure extraction of the compressed explosives from the corresponding molds. Figs. 3 and 4 show details of the mechanical devices intended to rapidly aline the molds before submitting them to the pressure. Fig. 5 is a front elevation of the hydraulic press, showing somewhat diagrammatically, the means for initiating compression with a moderate pressure and gradually increasing the pressure.

The apparatus comprises a hydraulic press 1 (see Figs. 1, 2, 3 and 4) at whose sides are placed one or more hydraulic extractors 2 and 3 having their axes in a plane which includes the axis of press 1, and serving, in their turn, to carry the molds 6 and 7 which can freely slide into the corresponding guides 8 and 9 provided in the said plane or applied to the same in a manner as to make them correspond to the guide pieces 10 situated above the platen 11 on the top of the piston 12 of the press 1. The said platen is exactly guided by the columns of the press and the same happens to the guide pieces 10 above it. The latter is provided with a cross-piece 13 sliding into the grooves 14, the purpose being to obtain very simply the stoppage of the mold in the desired position, it being pushed under the press either on one side or the other of it. Upon the platen 11 of the same press is also fixed the rod 15 whose upper end is beveled in the same manner as the two rods 16 and 17 applied to the pistons 2′ and 3′ of the two extractors 2 and 3. In the upward movement of the pistons themselves the said rods slide vertically into the openings 18 and 19 thus causing the mold, should the latter not have reached the exact point of stopping, to be displaced horizontally until it has reached the exact position of centering.

The operation is as follows: When the mixture to be compressed has been introduced into the mold 6, the latter is pushed horizontally into the guides 8 and 9 until it has been carried as far as the guide piece 10, in a way that it stops in the position limited by the sliding crosspiece 13. At the same time the mold 7, containing the explosive, shall have been drawn against the stop 22 destined to fix the exact position for the extraction of the explosive from the mold. When these operations have been performed it only remains to bring the extracting cylinder into action, thereby obtaining at the same time the pressing of the mixture to be compressed and the extraction of the compressed explosive. During the upward movement of the pistons, the controlling rods 15 and 16 perform their function intended to correct any misplacement of the molds, should the same by possible negligence, not have been pushed into accurate position.

Another important detail in compressing the explosives is the application of progressive pressure to bring them gradually to the desired compactness and homogeneity. To this end the press 1 is fed by three or more water reservoirs maintained at a pressure always different, in such a manner that the compression may be initiated with a moderate effort and ended with a maximum pressure. At first it may seem that this graduation of pressure which differs from that generally in use, may have no great importance, but practically the matter is of

great consequence, because to reduce suddenly with a great initial pressure a long column of mixture to a much smaller volume gives rise to the danger that the lower layers, nearer to the pressing piston, which rises in the inner part of the mold, may have a much different compactness and homogeneity from those of the upper and further layers. In other words it may happen that the lower layers, on account of the friction which they meet against the walls of the mold, will assume a decreasing density from the periphery to the center with the danger that vaults may be formed within the mass hindering the transmission of the pressing effort to the upper layers of the substance to be compressed. The graduation of the pressure avoids the danger that an excessive velocity of translation of the mixture in the interior part of the mold may give rise to abnormal and dangerous conditions of temperature within the explosive on account of the friction excessively sudden along the walls of the mold.

Having now described my invention and how the same is to be carried out, what I claim as my invention, is:

1. The combination with a press embodying a mold for explosives to be compressed, of a piston for compressing explosives in said mold, hydraulic reservoirs exerting step by step increasing pressures on said piston, and automatic means for concentrically alining said mold and piston.

2. The combination with a press comprising a mold for explosives to be compressed, of a piston for compressing explosives in said mold, of hydraulic reservoirs exerting step by step increasing pressures on said piston, another piston for extracting the compressed explosive from the mold, and automatic means for concentrically alining said pistons with the mold.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

FERDINANDO QUARTIERI.

Witnesses:
B. CARLO SALVOTTI,
LYLE ROBB.