

April 10, 1956

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2,741,007

DEVICE FOR THE FORMATION OF COMPRESSED BUILDING
ELEMENTS BY MEANS OF THE EXPANSION OF TUBES
SACKS OR OTHER ELEMENTS MADE OF FLEXIBLE
MATERIAL WITHIN RIGID FORMS

Filed Nov. 9, 1949

2 Sheets-Sheet 1

FIG. 1

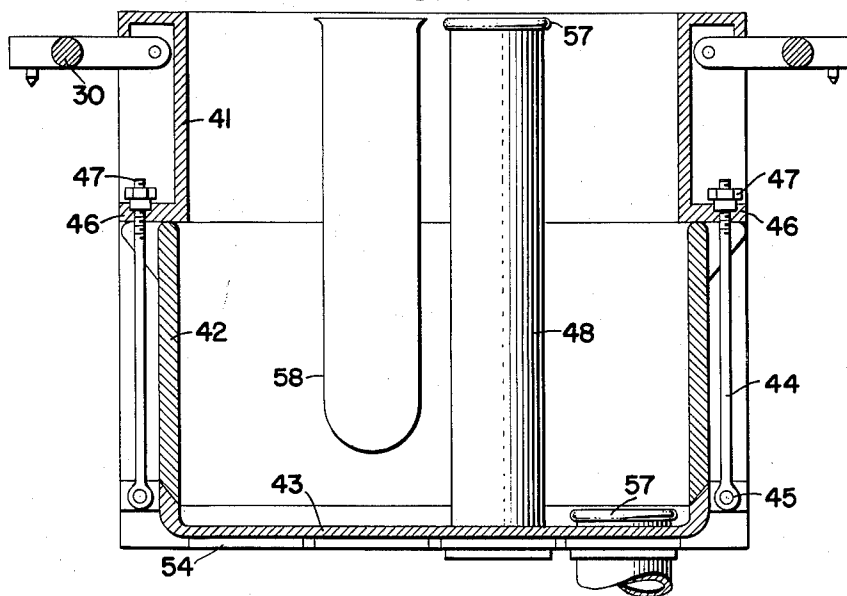


FIG. 2

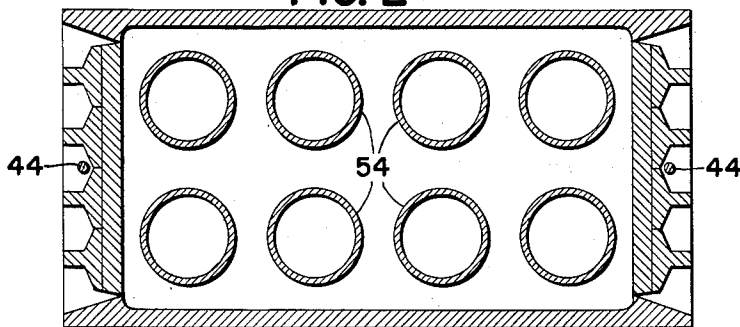
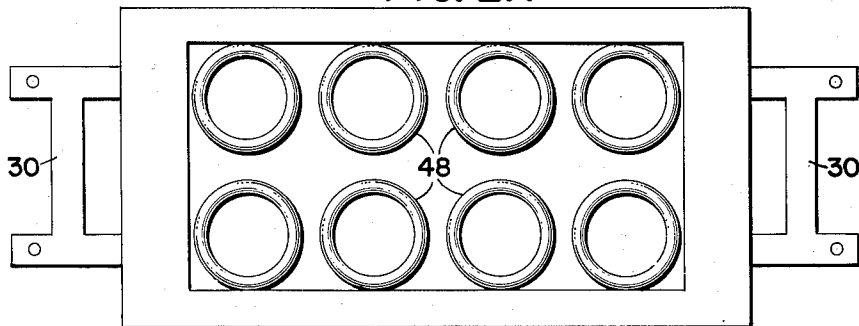


FIG. 2A



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FIG. 8

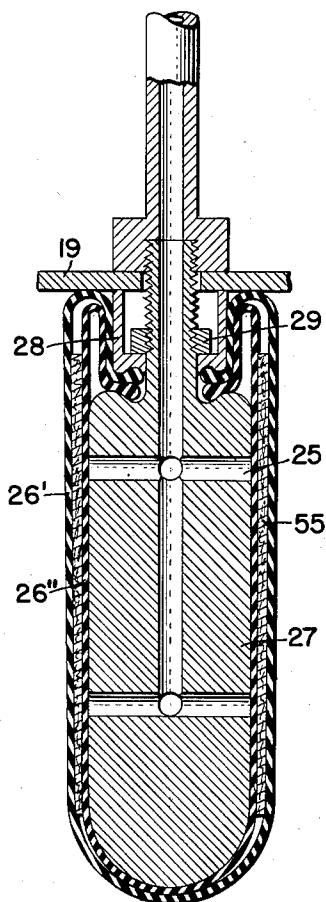


FIG. 3

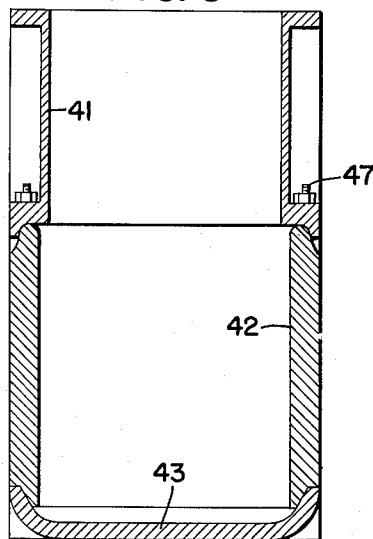


FIG. 4

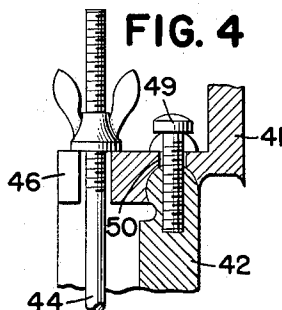


FIG. 5

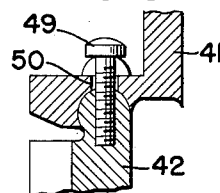


FIG. 6

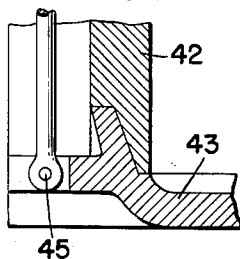


FIG. 7

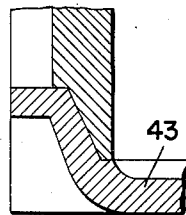
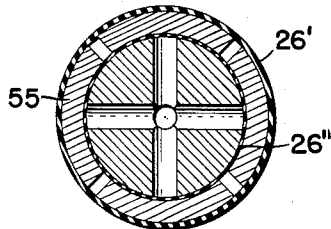


FIG. 9



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DEVICE FOR THE FORMATION OF COMPRESSED BUILDING ELEMENTS BY MEANS OF THE EXPANSION OF TUBES, SACKS OR OTHER ELEMENTS MADE OF FLEXIBLE MATERIAL WITHIN RIGID FORMS

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Application November 9, 1949, Serial No. 126,411

Claims priority, application Italy November 16, 1948

3 Claims. (Cl. 25—45)

The present invention concerns improvements in mechanical devices used in carrying out the procedure of forming building elements by means of the expansion, within rigid forms, of tubes, sacks or other elements made of flexible materials.

To be more exact, said improvements refer in particular to the construction of the rigid form into which the powdered materials, capable of agglomerating under strong pressures, are poured, and these improvements in the construction of the rigid forms have the object of making extraction of the block of material easier, since said material, due to the pressure undergone, adheres strongly to the walls of the form from which, therefore, it is difficult to remove.

Said improvements also refer to the construction of the pressing punches which must penetrate within the material contained in the rigid form and then compress said material by expanding, and these improvements tend to make it easier to introduce said punches into the mass to be compressed, as well as extraction from said mass when compression has been effected, and also to render the effect of compression more regular and effective.

One form which the aforesaid device may take is shown as an example in the attached drawings, in which the matrix is shown in vertical longitudinal section in Fig. 1, in horizontal section in Fig. 2 and in plan in Fig. 2-A, while a vertical transverse section of the same matrix is shown in Fig. 3.

Figs. 4 to 7 inclusive give construction details of the same.

Figs. 8 and 9 show the punch, seen respectively in longitudinal section and in a cross horizontal section.

In order to better understand the relation between these new forms of construction and those previously described in my co-pending United States Letters Patent No. 2,542,874, issued February 23, 1951, the same reference numbers have been employed to indicate parts corresponding to those in the said patent.

In order to facilitate extraction of the compressed block from the matrix in which it is contained, the rigid form in which compression has taken place has been made in two distinct parts: the upper part 41, which has no molding function, like a box without a bottom or cover and unchangeable in shape, and a lower part 42, forming an extension downwards of the upper part, but consisting of four independent walls which are capable of oscillating slightly outwards around their edge which is articulated with the upper part 41.

The part 42 is closed underneath by a removable bottom 43 which is connected to the upper part 41 by tie rods 44. These tie rods are articulated, at their lower ends, on pins 45 (Fig. 1) which are held by the edge of the bottom 43, and their upper threaded ends pass through corresponding holes in the lower edge 46 of the upper part 41 of the form, where they are held and tightened by tightening nuts 47.

The bottom 43 is provided with holes 54 for the passage of the heads of the punches and tubes 48 which can slide

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in the form so as to maintain free passage for the punches through the mass of material to be compressed.

The folding handles 30 which serve to handle and transport the matrix are also attached to the upper part 41.

In order that the walls 42 may open sideways, their attachment to the edge 46 of the upper part 41 is made as shown, in a greater scale, in Fig. 4. As will be noted in this figure, the walls 42 have rounded tops which go into corresponding grooves in the edge 46, in which there is a hole 50 slightly larger in diameter than the bolt 49, for the passage of said fastening bolt, so that walls 42 are allowed to open sideways.

The method in which the walls 42 join the bottom 43 along their lower edge is shown in Fig. 6. As will be noted in this figure, walls 42 and the bottom 43 are joined together in such a manner that when the bottom 43 is tightly secured to upper part 41 by rods 44 and nuts 47 the sideways opening of walls 42 is impossible. To make the opening possible it is necessary to loosen nuts 47 and let bottom 43 descend for a little along rods 44. This will be done after each compression operation to extract the compressed block from part 42.

Fig. 5 shows how the front and back walls 42 are attached to part 41, and Figure 7 shows how the same front and back walls are joined to bottom 43. To get the compressed block out of the matrix it is necessary, after having lowered bottom 43 as explained above, to remove bolt 49, pull the front wall 42 out and then pull the compressed block.

With regard to the punch, this is constructed and operates like the punch described in my said patent. Instead of having a bullet-shaped metallic head, it has a rounded end of rubber in the form of a semi-spherical head 58, Fig. 1, which is made possible by the insertion of metal tubes 48 (Fig. 1) which are pushed ahead by the punch as it advances through the material and travel downwards until their upper rims 57 come to rest on the edge of the holes in the bottom 43.

Instead of rigid metal tubes 48, flexible rubber tubes can be employed. These latter are closed at their lower ends and are stretched downwards during the advance of the punches. In this latter case, holes 54 are no longer necessary.

Between the two rubber tubes 26' and 26'', which form the double covering of the internal metallic core 27, Fig. 8, which are expanded by means of water under high pressure introduced through channels 25, a third tube is inserted, this is made of stout material such as leather, rubberized fabric or similar materials, and is divided into four cylindrical segments 55, Fig. 9, so that it may expand under the pressure of the two rubber tubes 26' and 26'', without losing its shape. The function of this third tube is to obtain a greater regularity in the formation of the hole in the compressed block.

What I claim is:

1. In combination in a molding press, a matrix adapted to be filled with a compressible substance, punches insertible and then expandable in said matrix, and a set of expansible elastomeric tubes located in the matrix in alignment with the punches prior to insertion of the punches into the matrix, said tubes being closed at their lower ends and being engaged by the punches when the latter are expanded.

2. A combination as set forth in claim 1 wherein the end of the punch which faces the matrix is provided with an elastomeric head.

3. An expansible pressing punch for use in compressing compressible material in a matrix, said pressing punch comprising an internal elongated cylindrical metal core having passageways therethrough which terminate at the cylindrical surface and an end of the core, two

elastomeric tubes forming a double cover for the core, a third tube of non-elastomeric stout material intermediate said elastomeric tubes and having a diameter less than the expanded diameter of the elastomeric tubes, said third tube constituting a plurality of separate elongated segments of arcuate cross-section. 5

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