Mar. 6, 1923. 1,447,469

O. HERMOYE ET AL.

TAMPING PRESS FOR HOLLOW CONCRETE AND OTHER BLOCKS AND FOR THE LIKE OR OTHER PURPOSES

Filed June 1, 1920 3 sheets-sheet 1

FIG. 4.

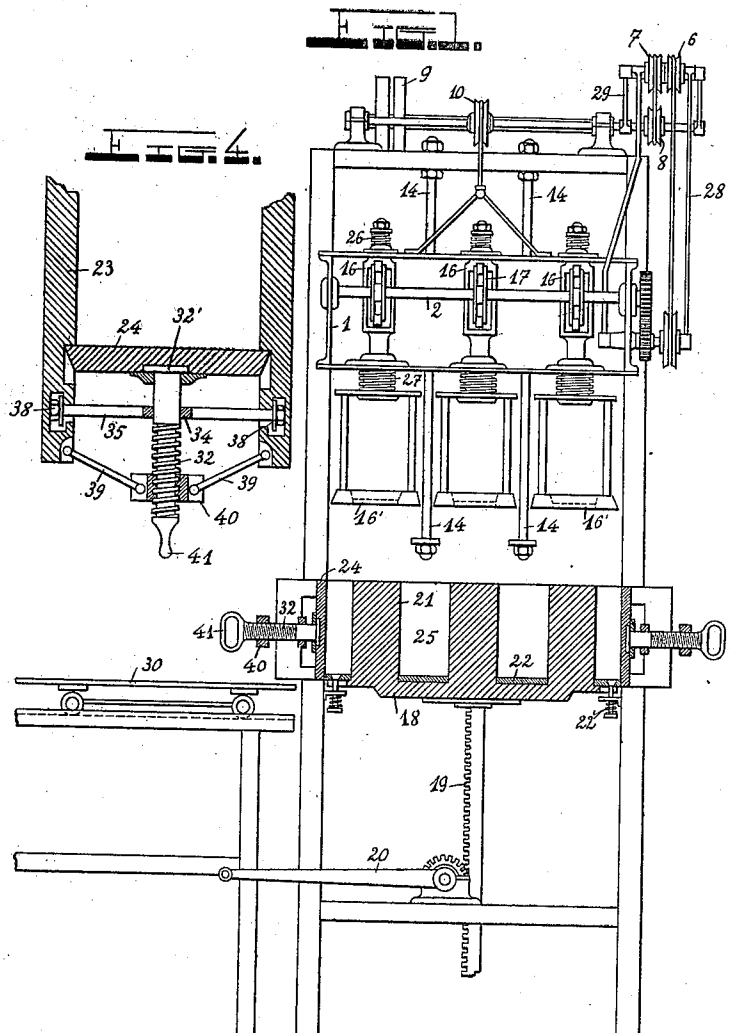
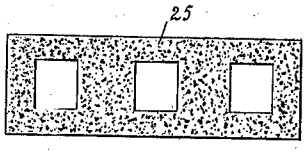


FIG. 5.



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FIG. 2.

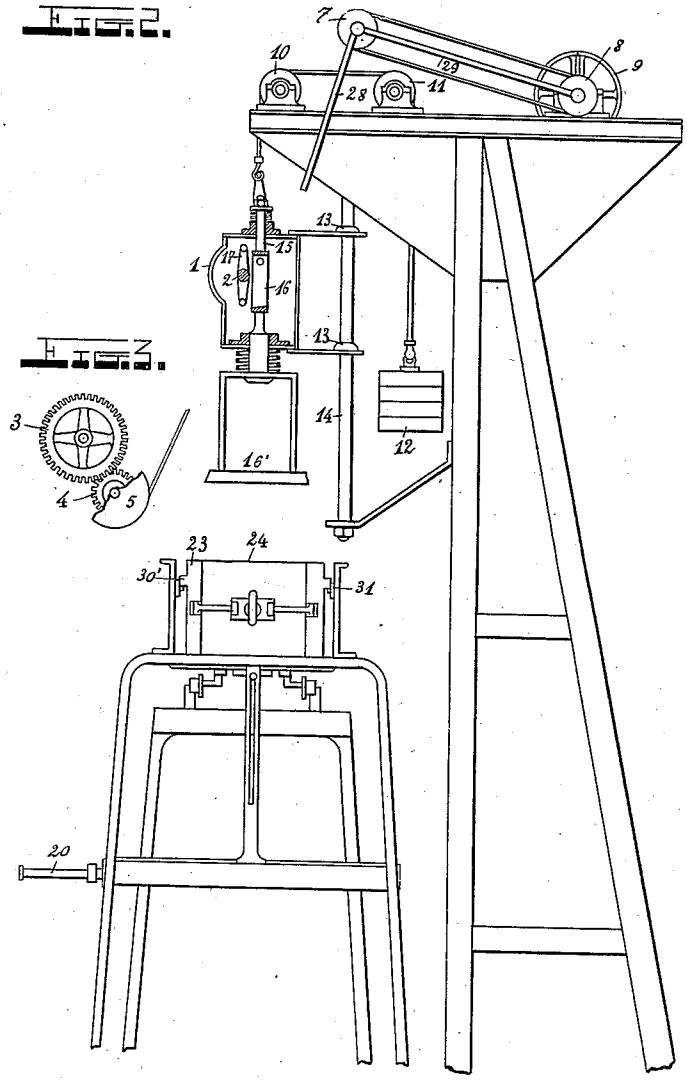


FIG. 3.

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FIG. 6.

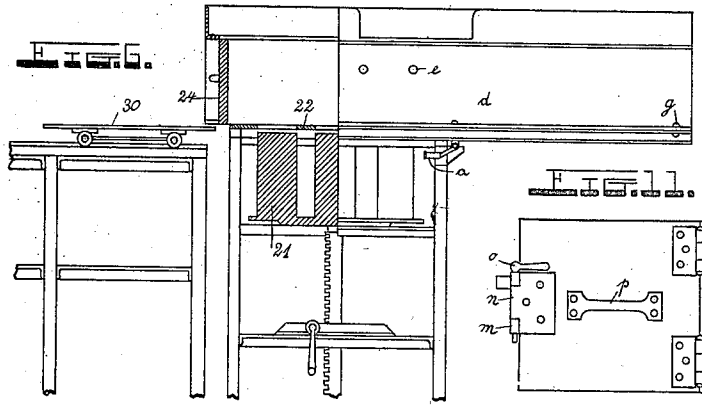


FIG. 11.

FIG. 8.

FIG. 7.

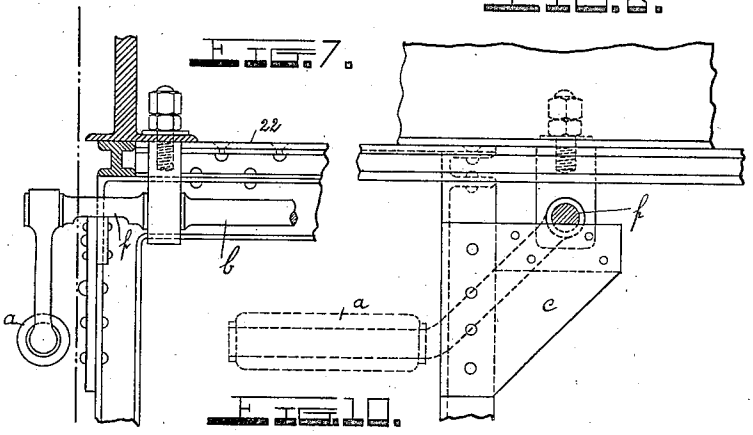
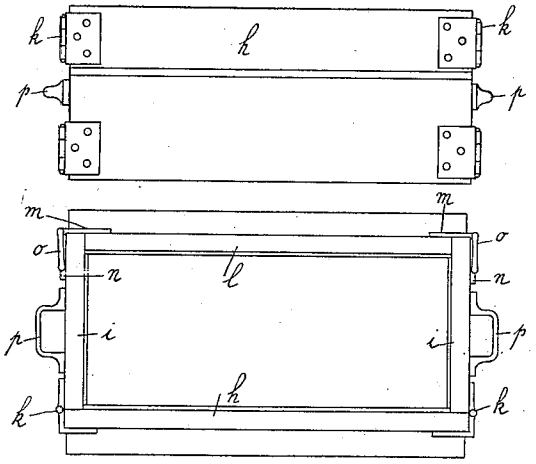


FIG. 10.

FIG. 9.



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UNITED STATES PATENT OFFICE.

OSCAR HERMOYE AND CHARLES GLORIAN, OF IXELLES-BRUSSELS, BELGIUM.

TAMPING PRESS FOR HOLLOW CONCRETE AND OTHER BLOCKS AND FOR THE LIKE OR OTHER PURPOSES.

Application filed June 1, 1920. Serial No. 385,809.

To all whom it may concern:

Be it known that we, OSCAR HERMOYE, a subject of the King of Belgium, and CHARLES GLORIAN, engineer, a citizen of the French Republic, residing at Ixelles-Brussels, Belgium, have invented new and useful Improvements in or Relating to Tamping Processes for Hollow Concrete and Other Blocks and for the like or Other Purposes; and we do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a tamping press for hollow concrete blocks, which press is also suitable for pressing other kinds of blocks in other kinds of material.

The press has for its characteristic feature that it is so constructed as to operate in an uninterrupted manner, the mould being adapted to be removed from the press on a carriage, or otherwise to a suitable place, for the purpose of removing the block, said mould being replaced by another mould, and another block is pressed in this latter, whilst the first block is being removed from its mould.

The press forming the subject matter of the present invention is further characterized by the fact that the mould comprises an outer shell, a series of cores, the number of which corresponds to the hollow portion of the block to be formed, and a perforated or apertured plate serving for the base of the shell, the apertures in such plate corresponding to the said cores and to the said hollow portions. These three elements of the mould are independent of one another, the result being that by drawing down the cores they can be disengaged from the shell, and that by restoring them to position they pass up through the apertures in the perforated plate, and in conjunction with this latter and with the walls of the shell complete the mould in which the blocks are tamped, so that after the descent of the cores the block remains supported upon the perforated plate, the outlines of which correspond to the contours of the substance of the pressed block. After the cores have been drawn downwards as before explained, the shell with the blocks contained therein can be slidden on a carriage or otherwise removed to some suitable place, so that the mould can be removed and replaced by another one without interrupting the operation of the press.

An important feature of the invention consists in the fact that the shell which constitutes the outer portion of the mould, consists of a hinged system, thus facilitating the removal of the mould and the disengagement of the pressed block therefrom.

Another characteristic feature in the construction of the mould is that its sides, which are independent of the base constituted by the aforesaid apertured plate, are so constructed and arranged that they can be opened by means of mechanism provided at each end of the shell.

The press also comprises, in addition to the extensible, removable and interchangeable mould, having movable cores as before described, controlling mechanism for the said cores, and a series of tamping plungers, the number of which corresponds to the solid portions or sections of the block to be obtained, a shaft carrying cams which control the said tamping plungers, stirrups operated by the said cams and connected to rods carrying the plungers, and a casing for the said cam shaft and stirrups, in the upper and lower portions of which are guides for the rods: means of suspension comprising pulleys and a counterbalance weight for the said casing and associated parts, and controlling means for the cam shaft, so pivoted as to move with the casing and the rods as they descend during the operation of pressing and tamping or as they are drawn up after these operations.

The press comprises further a cam mechanism controlled by an operating handle, which mechanism after the tamping of the block has been completed, and after the cores have been lowered, enables the block to be disengaged from the apertured plate, to facilitate the removal of the said block without in any way damaging it.

The invention is represented, by way of example, in one method of carrying the same into effect, in the annexed drawing, in which:

Fig. 1 is a front elevation of the machine constructed according to the invention with the casing removed and showing the mould in section.

Fig. 2 is a corresponding side elevation to Fig. 1 with the casing in section.

Fig. 3 is a view of a detail showing the control of the cam shaft, which is omitted in Fig. 2 for the sake of clearness.

Fig. 4 is a top plan of one of the two operating mechanisms for opening the walls of the shell, a portion of the side walls being shown in section.

Fig. 5 is a plan of a block for the manufacture of which the moulding and tamping portions of the particular machine are adapted.

Fig. 6 is a front elevation, partly in section, showing the lower portion of the press with the mechanism for disengaging the block before its removal.

Figs. 7 and 8 are details; Fig. 7 being a side elevation, and Fig. 8 a front elevation illustrating the disengaging mechanism shown in Fig. 6.

Figs. 9, 10 and 11 show respectively plan, front elevation and end elevation of the shell of the mould.

1 is a casing, adapted to be filled with lubricant. 2 is a cam shaft rotatable therein, and controlled by gear wheels 3 and 4, and transmission pulleys 5, 6, 7 and 8, from the driving pulley 9.

The casing 1 is suspended, so that it is counterbalanced, from the pulleys 10 and 11, supported by the framework of the machine. 12 is the weight which is adapted to counterbalance the weight of the casing and the parts carried thereby.

The casing is guided in its vertical movement by collars 13 sliding on guide rods 14 fixed to the framework of the machine.

15 are rods, which are spring controlled as shown and which slide vertically through the upper and lower portions of the casing, and carry a series of stirrups 16 equal in number to the cams 17 on the shaft 2. The cam 17 and the shaft 2 are located in front of the plane in which the rods 15 and the connected stirrups 16 move, and the shaft 2, around which the two equal arms of the cams 17 turn, is on a higher level than the middle of the stirrup, in such a way that only the upper extremity of each stirrup is influenced or struck by each extremity of the cam during its rotation.

Each of the rods 15 carries at its lower extremity a tamping plunger or block 16′, and the base of these plungers corresponds in plan to the solid portion of the block to be pressed (see Fig. 5).

The plate 18, which is adapted to be moved in the vertical direction by the rack 19, and the handle 20, or in any other suitable manner, carries the cores 21, of the mould, which cores form a portion of the body thereof.

22 is a perforated or apertured plate, the openings in which correspond to the greatest section of the cores 21, and this plate constitutes the bottom of the mould, which latter is completed by the walls 23 and the extremities 24.

Supposing that the casing with the blocks or cores is in the position shown in the drawing. After the workman has filled the spaces 25 with concrete, he lowers the casing with the tamping plungers until these latter rest upon the concrete. The machine being then set in motion, the shaft 2 commences to turn, and at each half turn one of the extremities of the cams 17 strikes against the upper portions of the corresponding stirrups, raising these latter and with them the rods 15 and the tamping plungers 16′. These are immediately brought back by the action of the springs 26 and 27, and by the weight of the plungers themselves. The rods and the blocks again descend to be again raised when the other end of the cam pushes against the top of the corresponding stirrup. At each blow the tamping plunger 16′ strikes the concrete and presses it into the mould, and it will be obvious that this operation takes place for each rotation of the cam shaft.

In order to reduce the friction, the extremities of the cams may be provided with rollers. Rollers can also be provided for the same object at the top of each of the stirrups.

As the concrete is pressed down by the tamping, the tamping plungers can descend further and further, owing to the fact that the casing and the controlling mechanism 2, 3, 4 and 5, are movable in the vertical direction. This movement of the casing is ensured owing to the way in which it is suspended from the counterbalance weight, and the controlling mechanism is enabled to move owing to the fact that the axle of the pulley 3 is connected to the axle of the driving pulley by means of a pivotal connection, with rigid bars 28, 29 and through the intermediate pulleys 6 and 7.

When the first charge of concrete has been sufficiently tamped or pressed, the tamping plungers are raised together with the casing, and a second charge is added to the first, whereupon the process of tamping and pressing is again commenced. The operation is repeated until a block of the required height has been attained.

When the tamping is finished the plate 18 is lowered, together with the cores 21 by means of the handle 20 and the rack 19. The block remains in the shell on the plate 22. Then the shell together with the block is removed to a carriage 30 or to some other position for the purpose of removing the mould.

With this object in view, the shell may be provided with two rails 30′, one on each side, whilst the framework of the apparatus carries two rollers 31, or vice-versa.

The first block having been removed from

the press, a new shell is substituted and placed in the machine, upon the bottom plate and the cores are again raised and the operation recommences.

It will be seen from the proceeding that the operation of the press is uninterrupted.

In order to facilitate the removal of the cores before they are lowered by means of a handle, a pressure in the opposite direction is exerted on the latter. This, owing to the conicity of the cores, causes the hollows in the blocks to be slightly enlarged, thus facilitating the extraction of the said cores. To this end, a certain amount of play is allowed for the apertured plate. For instance it may be attached to the framework of the machine by means of spring bolts.

The walls of the shell, which form with the perforated plate and the cores, the mould for the block which is to be manufactured are independent of those parts, and in order to facilitate the removal of the mould from the finished block they are made extensible in the following manner.

As the outer side of each of the end walls 34 of the shell is attached the extremity of a screw threaded rod 32, the attachment being such that the rod is rotatable. This may be effected by the provision of an enlarged end 32′ held in position by a ring or washer 33 connected to the wall.

The portion of the screw threaded rod not provided with the screw thread is guided in a collar 34 on a strut 35, which is again connected at its outer ends to the longer sides 23 of the shell. The rod 35 is provided with lock nuts which form stops and which work in grooves in the said sides 23, in such a way as to allow these latter to open to a limited extent.

The sides 23 are interconnected by means of a jointed mechanism comprising symmetrically arranged levers 39, forming with the screw 32, an angle of about 45°, and the collar is provided on the interior with a female screw thread, the whole arrangement being such that when the screw 32 is turned by means of an operating handle 41, the levers 39 are brought towards a position in which they are perpendicular to the screw threaded rod and push the walls 23 apart to the limit allowed by the stop nuts 38. From that time, the end walls 24 alone continue to open, until they too have reached the end of their path of travel.

Referring to Fig. 6 of the drawings, in order to avoid damaging the bottom of the block through friction or contact with the perforated plate, when placing the shell on the carriage 30 with the block enclosed in the shell for the purpose of removing the same, a handle a may be provided which is located within easy reach of the workman, and connected to an axle b upon a bracket or the like c on the framework d. This framework d carries the shell through the intervention of pulleys e.

The axle b is provided with two cams f so located that when the workman presses upon the handle a, represented in the position of rest at Figs. 6 and 8, the said cams raise the framework d which is only connected to the lower portion of the apparatus at g.

In this way when the framework is raised, the shell 24 is also raised, as well as the block 26 therein contained, so that this latter is disengaged from the perforated plate and can be thereafter removed without its lower portion being damaged by the perforated plate.

Fig. 6 shows the cores 21 in the lowered position, after the tamping.

Referring to Figs. 9, 10 and 11, in order to further facilitate the removal from the mould, the shell of the mould may be formed from a lateral portion h and two end portions i connected by hinges k, as indicated in the drawing. In that constructional form of the shell, the other lateral side l is provided with hinge plates m, so constructed and arranged as to cooperate with corresponding plates m located upon the free ends of the parts i. The plates m and n are connected by a hinge pin o, so that the shell is closed when pressing is taking place.

When the block is to be removed from the mould the hinge pins o are withdrawn, and the side l is thus separated from the shell. By means of the handles p, the sides h and i hinged together are removed and the block 25 which is completely separated from the mould rests upon the carriage 30.

Claims:

1. A concrete block forming machine, comprising a framework, a perforated plate carried by the framework, a separable mold carried by the framework fitting around the perforated plate and removable from said framework, core members movably mounted on the framework and adapted to extend thru the perforations in the perforated plate, whereby the mold, perforated plate and core members cooperate to receive material for forming a block, a casing movably supported by the framework, a plurality of rods mounted in the casing for reciprocating movement, tamping members mounted on the rods, and means for reciprocating the rods, the tamping members being adapted to compress the material in the mold during the reciprocating movement.

2. A concrete block forming machine, comprising a frame, a plate mounted on the frame formed with openings, movable cores adapted to extend thru the openings in the plate, a mold adapted to removably fit around the plate, said mold, plate and cores being adapted to receive material for forming a hollow block, means carried by the frame for removing the mold from the plate,

and tamping members adapted to reciprocate for compressing the material which forms the block.

3. A concrete block forming machine, comprising a frame, a plate mounted on the frame formed with openings, movable cores adapted to extend thru the openings in the plate, side members and end members adapted to fit around the plate, the plate, side and end members, and movable cores forming a mould for the block, and securing means mounted on the end members, said means including rods rotatably mounted in each end member, collars threaded on said rods having levers pivoted thereto and to the side members and stop members, the collars and levers being moved in the rotation of the rods to move the side members toward or away from each other and the stop member limiting the outward movement of the said members, further rotation of the rods producing a movement of the end members relative to the side members.

4. A concrete block forming machine, comprising a frame, a plate mounted on the frame formed with openings, movable cores adapted to extend thru the openings in the plate, side members and end members adapted to fit around the plate, the plate, side and end members, and movable cores forming a mould for the block, securing means adapted to secure the end and side members together and to the plate, and cam members mounted in the frame adapted to engage and move the side and end members above the plate after a block is moulded therein.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

OSCAR HERMOYE.
CHARLES GLORIAN.

Witnesses:
H. MORGHAN,
CUGOACREN.