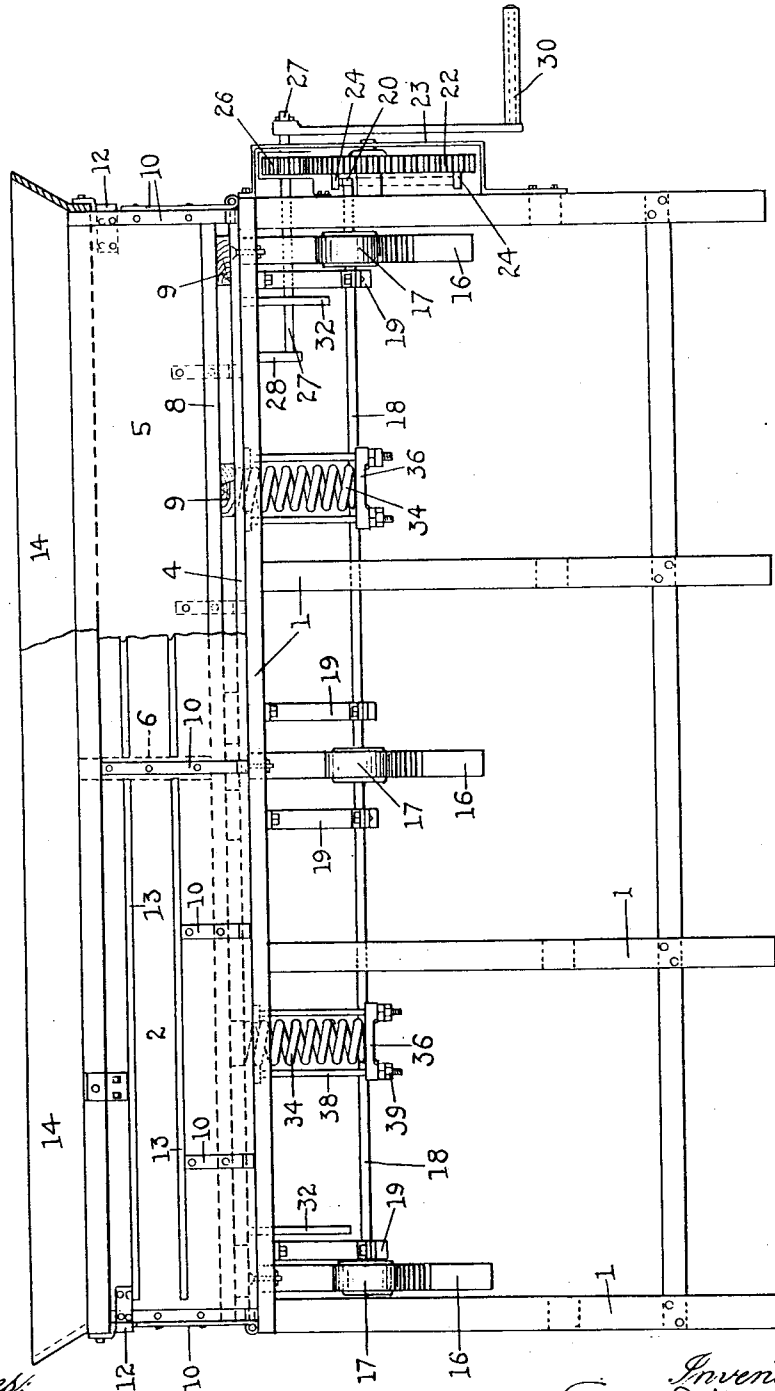


F. B. WILLIAMS.
 MACHINE FOR MAKING CONCRETE BLOCKS.
 APPLICATION FILED MAR. 7, 1910.

1,004,327.

Patented Sept. 26, 1911.

2 SHEETS—SHEET 1.



Witnesses:
 W. E. Rennie
 C. F. Dumas.

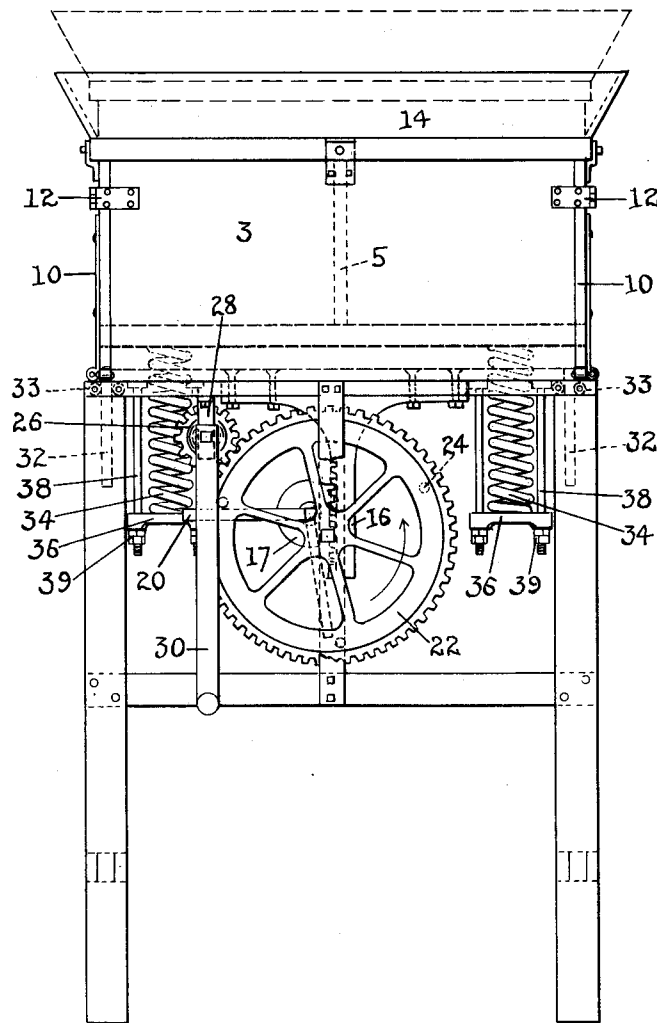
Inventor:
 Frank B. Williams
 By Francis J. Dakin
 His Atty

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11/11/2

Witnessed:
R. E. Remick
E. F. Dniac

Inventor:
Frank B. Williams
By Francis J. Dakin
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UNITED STATES PATENT OFFICE.

FRANK B. WILLIAMS, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO CHARLES J. OUELLET, OF CAMBRIDGE, MASSACHUSETTS.

MACHINE FOR MAKING CONCRETE BLOCKS.

1,004,327.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed March 7, 1910. Serial No. 547,758.

To all whom it may concern:

Be it known that I, FRANK B. WILLIAMS, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Machines for Making Concrete Blocks, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to machines for making concrete blocks and the like.

In the manufacture of concrete blocks it is essential that suitable forms or molds be provided to receive the concrete while in a plastic state and to form and to hold the blocks intact until they have dried sufficiently to permit the removal of the forms. There are three well known methods employed and these methods vary as to the consistency of the concrete when molded and the treatment of the concrete while in the forms. One of these methods consists in mixing a concrete which is comparatively dry, filling the form with successive layers and tamping each layer in turn to condense the mass. When finished the form is removed and the block allowed to dry gradually. From time to time during the drying process the block is sprinkled with water to facilitate the setting of the cement in the concrete. This process is open to the objection that the tamping of the concrete in successive layers causes lines of cleavage to be formed throughout the block and it is thereby greatly weakened and liable to split on these lines of cleavage when subjected to strain. Another method consists in using concrete comparatively dry and then subjecting it to pressure when in the form or mold. The resulting block, however, is not of uniform density for the pressure causes the outer portions to be compressed to a greater degree than the inner parts. The third method has been to fill the mold with a liquid concrete and to allow it to dry and set in the mold. This method gives the best result for the blocks are of uniform and even structure, homogeneous and without lines of cleavage but it is expensive. The blocks must remain in the molds for a day or two and to manufacture any considerable number of blocks requires an immense number of expensive molds.

The object of my invention is to provide

a machine of simple construction for making concrete blocks of uniform density and free from lines of cleavage.

A further object is to do away with a multiplicity of forms or molds and thereby reduce the cost of the blocks.

A third object is to secure a machine which may be operated efficiently and rapidly.

Briefly my invention resides in a machine consisting of a suitable frame, a molding box supported on said frame and means for raising said molding box and dropping it on said frame in rapid succession to cause the concrete in the molding box to be settled or condensed uniformly.

In the accompanying drawings illustrating the preferred embodiment of my invention, Figure 1 is a side elevation of the machine a portion of one side of the molding box being broken away to show the interior thereof, and Fig. 2 is an end elevation of the machine, the dotted lines showing the position of the molding box when raised and before it is dropped.

In the drawings illustrating the preferred embodiment of the invention is shown a frame 1 which may be of any suitable form so long as it is strong and adapted to withstand the shocks incidental to the operation of the machine. Upon the frame 1 but not attached to it rests a molding box comprising sides 2, ends 3 and a base 4. The molding box may be of any form or size to suit the shape of the blocks desired and may be divided into various compartments to permit a plurality of blocks to be molded at one time. The molding box shown in the drawings is divided into four compartments by a central longitudinal partition 5 and a central transverse partition 6. Within the molding box is a false bottom or pallet 8 upon which the concrete blocks rest and to facilitate the removal of the pallet and the blocks from the molding box after the blocks have been formed, transverse strips 9 are interposed between the base 4 and the pallet 8. The sides 2 and ends 3 of the molding box are connected by hinges 10 or in any other suitable manner to the base 4 to allow the box to be opened by swinging the sides and ends outwardly and downwardly. When closed as illustrated, the sides and ends are held together by hasps 12. The

sides 2 are strengthened by reinforcing strips 13.

Around the top edges of the molding box fits a hopper 14 which is supported by brackets 15 mounted on the sides and ends of the molding box and is secured in place by pins 11. The hopper serves as additional means to retain the sides and ends in a closed position. The main purposes of the hopper 14, are, however, to facilitate the loading of the molding box with concrete and to allow the concrete to be heaped up above the top edges of the said box. As the machine is operated the concrete settles and unless an excess amount of concrete is placed in the beginning of the operation, it will be necessary to add further concrete to make up the loss due to the settling. This would require stopping the machine in the midst of the operation and might result in a line of cleavage in the finished block. The hopper obviates this difficulty and any excess of concrete can be scraped from the top of the molding box after the operation of forming the blocks is finished and the hopper removed.

To raise the molding box and drop it in rapid succession, I provide the following means. Secured to the bottom or base 4 of the molding box and centrally located, are depending racks 16 which mesh with segment pinions 17 mounted on a shaft 18 extending lengthwise of the machine and supported in hangers 19. At one end the shaft 18 is provided with a fixed arm 20 and when this arm is turned, the shaft and segment pinions are rotated and the racks and the molding box reciprocated. Rotatably mounted at the same end of the machine as the arm 20 on a shaft 21 is a gear-wheel 22. The shaft 21 is arranged on one side of and slightly below the shaft 18 and is supported at one end by the frame 1 and at the other and outer end by a bracket 23 secured to the frame 1. The gear wheel 22 is provided on its inner side adjacent to its circumference with a plurality of laterally projecting pins or rolls 24 arranged at equal intervals and the gear wheel is so arranged with reference to the arm 20 that when the former is rotated one of the pins or rolls 24 strikes the arm 20 and carries it downwardly thereby turning the shaft 18. Owing to the facts that the gear-wheel is mounted eccentrically with respect to the shaft 18 and that the arm 20 is of a specified length, the particular roll 24 which happens to be in contact with the arm 20 slips off the arm when it reaches a lowermost position thereby releasing the arm and permitting it to swing back to be caught by the next succeeding roll or pin. The turning of the arm 20 as above described, rotates the shaft 18 through the medium of the segment pinions 17 and racks 16 and raises the

molding box. When the pin 24 slips off the end of the arm 20 the latter is released and the molding box drops causing the shaft 18 to be turned back and the arm 20 returning to a normal horizontal position to be caught by the succeeding roll or pin. The gear wheel 22 is turned by a pinion 26 mounted on a small shaft 27 supported in hangers 28. In the drawings the machine is shown as operated by hand, the pinion being turned by a hand lever 30 but the machine may be operated by power if desired.

The molding box is also provided with depending guides 32 passing between rolls 33 in the top of the frame to obviate lateral movement as the molding box reciprocates.

In order to adjust the force of the blow received by the molding box as it falls on the frame, a series of coiled springs 34 supported by plates 36 on hangers 38 are arranged on the frame 1 under the molding box. The hangers 38 are screw threaded at their lower ends and nuts 39 are provided by the adjustment of which the springs may be raised to break the fall of the molding box. These springs are not, however, an essential feature of the invention and may be omitted if preferred, as it is possible to regulate the drop of the molding box by increasing or diminishing the length of the arm 20. The height to which the molding box is raised before it is dropped depends upon how far the arm 20 is carried by the pins 24 and if the arm is shortened or lengthened the amount of the drop is correspondingly decreased or increased.

In the use of the machine, the concrete is prepared in a partially dry state; that is, with sufficient water to give it the consistency of moist sand in order that it will retain its form when removed from the molding box. The molding box is then entirely filled with the concrete which is heaped up to a level with the top of the hopper. The hand lever 30 is then turned thus rotating the gear-wheel by means of the pinion 26. As the gear-wheel rotates, a pin 24 contacts the arm 20 carrying it downwardly and turning the shaft 18 and segment pinions 17 and raising the racks 16 and the molding box. Owing to the pivotal location of said arm 20 the pin 24 slides along the arm as it is turned and finally slips off the end. The arm is thereby released and the molding box falls on the frame returning the racks, segment pinions and arm to their normal position. The next pin then catches the arm and repeats the operation. The effect of these repeated shocks is to cause the concrete in the molding box to be condensed and compacted and after the machine has been operated a short time, the hopper is removed, the surplus concrete removed and the blocks leveled. The ends

and sides of the molding box are next un-
fastened and opened out and the pallet
with the molded blocks on it is removed
from the molding box and set one side to
cure. Another pallet is placed within the
box, the sides and ends closed and fastened,
the hopper readjusted and the machine is
ready to be again filled with concrete.

It is to be observed that by the use of this
machine concrete blocks can be molded with
great rapidity and with very little expense.
It dispenses with a multiplicity of forms,
requiring pallets only and at the same time,
produces blocks of uniform density and
structure free from lines of cleavage.

My invention is not limited to the embodi-
ment hereinbefore described and illustrated
in the accompanying drawings, but may be
embodied in various forms within the na-
ture of the invention and the scope of the
following claims.

What I claim is:—

1. In a machine for tamping plastic ma-
terials, the combination of a frame, a mold-
ing box secured thereon but not attached
thereto, a plurality of depending racks se-
cured to the base of said molding box, a
shaft mounted on one side of the frame and
provided with a plurality of segment pin-
ions meshing respectively with said depend-
ing racks, a lever secured on one end of said
shaft whereby said shaft is turned to lift
and to drop said molding box on said frame,
said lever being adjustable on the end of
said shaft to lengthen and shorten the
same, and a wheel mounted eccentrically
with respect to said shaft and provided with
laterally extending rolls or projections to
successively engage and disengage said le-

ver intermittently to operate the same when
said wheel is rotated.

2. In a machine for tamping plastic ma-
terials, the combination of a frame, a mold-
ing box mounted thereon, a plurality of de-
pending racks secured to the base of said
molding box, a shaft mounted under said
molding box and provided with a plurality
of segment pinions meshing respectively
with said depending racks, a lever secured
on one end of said shaft whereby said shaft
is turned to lift said molding box in said
frame and permit it to drop, said lever be-
ing adjustable on the end of said shaft to
regulate the amount of the lift and drop
of said molding box, and means adapted to
successively engage and disengage said arm
intermittently to turn said shaft to lift and
to permit to drop the said molding box on
said frame.

3. In a machine for tamping plastic ma-
terials, the combination of a mold box, a
toothed member depending therefrom, a
shaft mounted below said molding box hav-
ing a segmental toothed portion meshing
with said depending toothed member, means
at one end of said shaft for operating the
same to lift said mold box and permit it to
drop, and coöperating means for causing
successive and intermittent actuations of
said last mentioned means.

In testimony whereof, I hereunto set my
hand, in the presence of two subscribing
witnesses, this the 21st day of February,
1910.

FRANK B. WILLIAMS.

Witnesses:

CHARLES F. RICHARDSON,
E. F. MIAL.