E. H. PIPE.

PLASTER BLOCK MACHINE.

APPLICATION FILED JUNE 28, 1919.

1,337,618.

Patented Apr. 20, 1920.

4 SHEETS—SHEET 1.

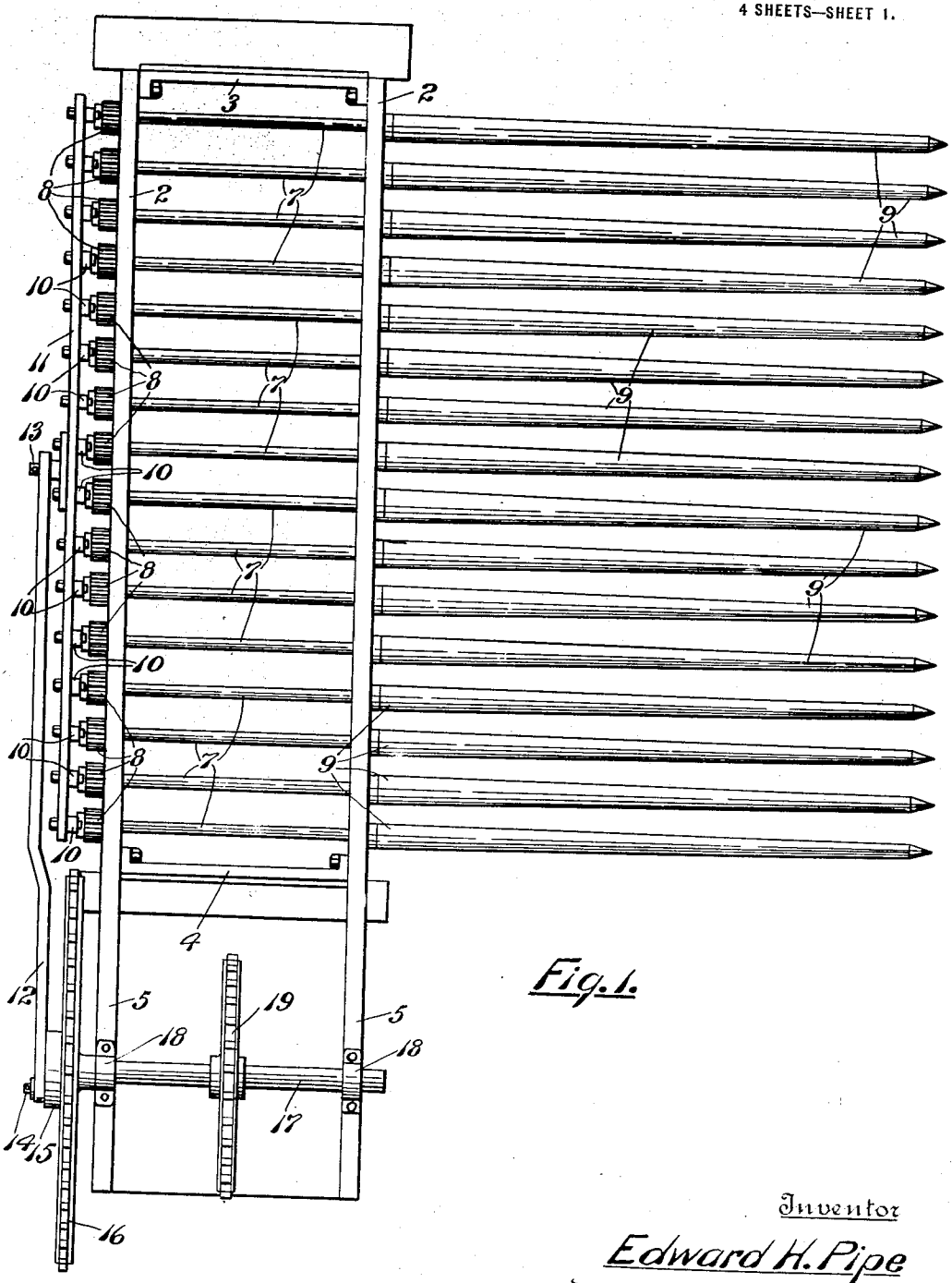


Fig. 1.

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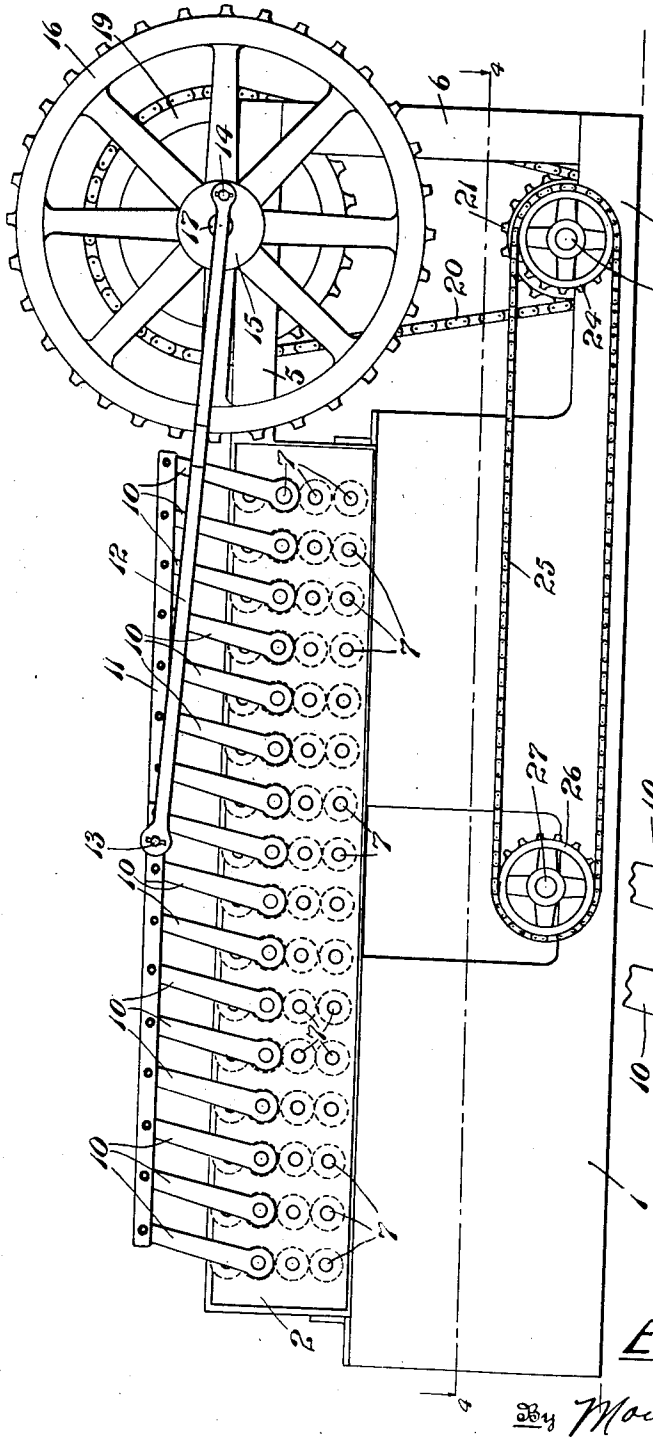


Fig. 2.

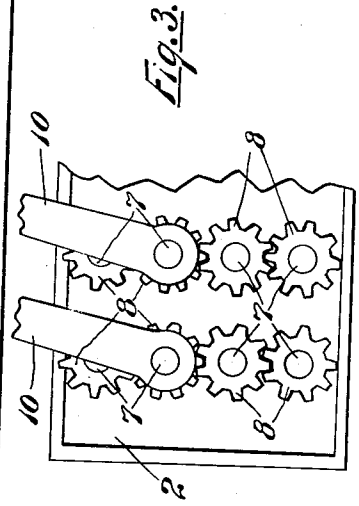


Fig. 3.

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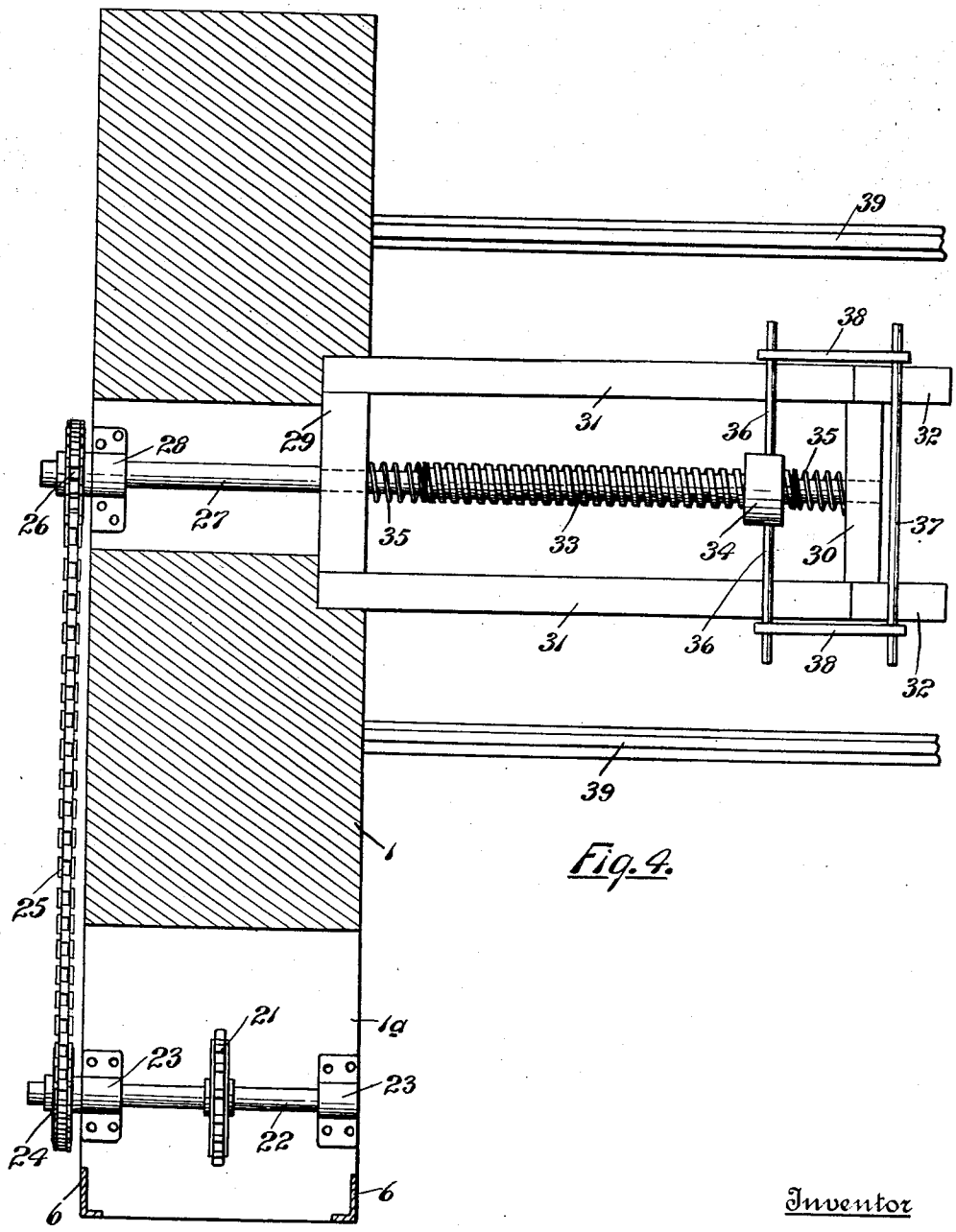


Fig. 4.

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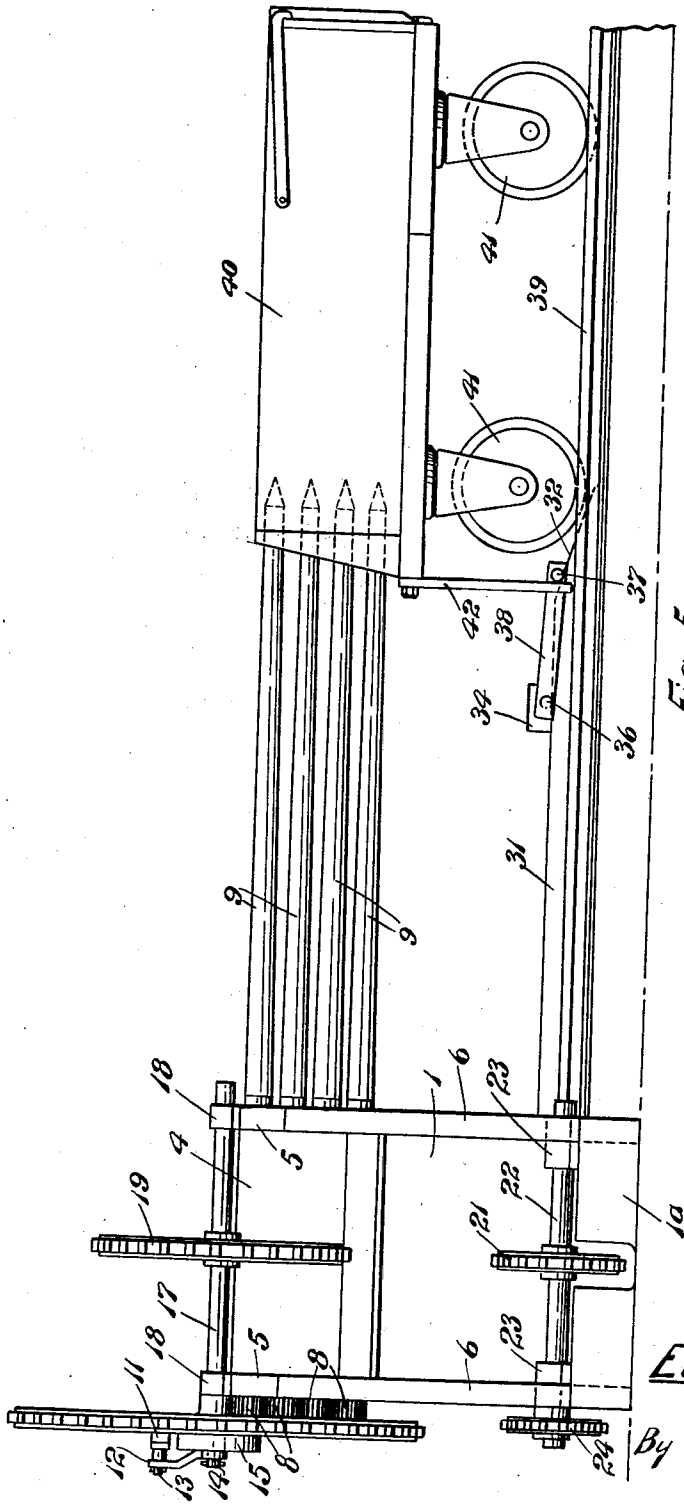


Fig. 5.

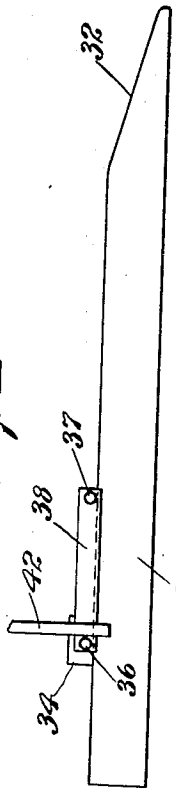


Fig. 6.

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UNITED STATES PATENT OFFICE.

EDWARD H. PIPE, OF ST. LOUIS, MISSOURI, ASSIGNOR TO ACME CEMENT PLASTER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF ILLINOIS.

PLASTER-BLOCK MACHINE.

1,337,618. Specification of Letters Patent. Patented Apr. 20, 1920.

Application filed June 28, 1919. Serial No. 307,451.

To all whom it may concern:

Be it known that I, EDWARD H. PIPE, a citizen of the United States of America, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Plaster-Block Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a machine for use in making building blocks or the like, particularly from a plaster of Paris composition, in which to save material openings or the like are made lengthwise of the blocks. With this invention it is designed that a form in which the blocks are to be made may be automatically brought toward the machine and a plurality of cores inserted through the form, the progress of the form toward the machine stopping automatically when a desired and predetermined position of the form with respect to the machine has been reached. Thereafter, the material is placed in the form and left to set for a short time and the machine then reversed so that the form is moved away from the machine, the cores all being turned about their longitudinal axes during said movement and for a short time previous to the beginning of the movement of the form to fully disengage the cores from the blocks which have been made in the form. It is a primary object and purpose of the invention to produce a machine of relatively simple character which will completely and practically attain the ends stated, as well as many others not at this time specifically enumerated but which will appear fully and in detail as the description progresses, reference being had to the accompanying drawings, in which,

Figure 1 is a plan view of the machine.

Fig. 2 is a rear elevation thereof.

Fig. 3 is a fragmentary enlarged view illustrating the gearing connection of the different series of cores.

Fig. 4 is a horizontal section taken on the line 4—4, of Fig. 2.

Fig. 5 is an end elevation of the machine showing the beginning of the movement of the form toward the machine, and

Fig. 6 is a fragmentary side elevation of the device used for moving the form.

Like reference characters refer to like parts in the different views of the drawings.

The machine may be carried in any suitable manner but I prefer to make a solid foundation 1, of concrete or the like which may have an extension 1^a at one end of less height than the main body of the foundation. This foundation extends a distance above the floor or ground and carries a frame made up of parallel plates 2 of metal which are connected by cross plates 3 and 4. At one end each plate has an extension 5 of less height than the plates but with the upper edges of the plates and extensions 5 in alinement. The ends of the extension 5 are supported by posts 6 which may rest on or be embedded in the part 1^a of the foundation. This completes the framework of the machine.

A plurality of series of shafts 7 are rotatably mounted in and between the plates 2. In the construction shown each series includes four shafts located one over the other and there are sixteen of said series of four shafts in the length of the plates 2. This number of series as well as the number of shafts in a series is subject to variation depending on the number and size of blocks to be made in a form. At the rear end of each shaft and back of the rear plate 2 a pinion 8 is secured, and the four pinions of each vertical series of shafts are in intermeshing engagement so that when any rotary movement is imparted to one shaft in a series all of the rest in the series have an equal movement though not in the same direction. At the front end of each shaft and in front of the front plate 2 an elongated and tapering core 9, having a pointed front end is attached to turn with its shaft. At the rear end of one shaft in each of the series an arm 10 is secured, all of the arms extending upwardly and having connection

at their upper ends to a horizontal bar 11, it being evident that on reciprocation of said bar 11 all of the cores 9 are oscillated back and forth at the same time, and equally as is obvious.

A connecting rod 12 has pivotal attachment near the middle of the bar 11, passing over a pin 13. At the opposite end the connecting rod has pivotal connection over a pin 14 with a disk 15 attached at the side of a large sprocket wheel 16 which in turn is fixed at the rear end of a shaft 17 located above the extensions 5 and mounted in bearings 18 secured to the said extensions. The disk 15 turns with the shaft 17 the pin 14 is located a distance from the shaft whereby it is clear that with every revolution of the shaft 17 the bar 11 is reciprocated back and forth. The wheel 16 is designed to be rotated through a sprocket chain which may be driven from any suitable reversible prime mover, such as an electric motor.

A second sprocket wheel 19 is secured to the shaft 17 between the parts 5 and around it a sprocket chain 20 is passed, it also passing around a sprocket wheel 21 fixed on a lower shaft 22 placed horizontally above and mounted in bearings 23 attached to the foundation 1^a. At its rear end shaft 22 has a sprocket wheel 24 secured thereto around which an endless sprocket chain 25 passes to drive a sprocket wheel 26 attached at the rear end of a shaft 27 located about the middle of the foundation 1 and carried in a bearing 28 at its rear end, said foundation being left with an open space for the passage of the shaft and insertion of the bearing. The shaft 27 extends forward through a frame member 29 and thence lengthwise of a frame completed by a front cross member 30 and two parallel side beams 31, the front end of the shaft having rotatable bearing in the front frame member 29. This frame is located in front of the foundation 1 below the cores 9 and the front ends of the sides 31 are cut at a downward and forward incline as indicated at 32.

In the length of the shaft 27 between the cross members 29 and 30 a screw 33 is formed, passing through a large nut 34. The screw is of larger diameter than the shaft at each end and the screw terminates at each end a distance from the cross members 29 and 30. In such spaces, coiled springs 35 of relatively light tension are placed around the shaft. It is apparent that whenever the shaft is rotated, nut 34 travels the length of the shaft, either to the front or rear depending on which direction that the shaft is turned and when the end of the screw is reached, one of the springs 35 is compressed and the nut carried off of the screw. The pressure of the spring thus compressed holds the nut against the end of the screw and on reversal of the turning movement of the screw, the nut again traverses the shaft in the opposite direction until the opposite end of the screw is reached.

Rods 36 extend laterally one to each side of the nut 34, being attached to and movable therewith. Another rod 37 is located in front of the rods 36 and parallels the same, being connected to said rods by bars 38. When the nut 34 is at its most forward position ahead of the screw 33, rod 37 has moved down the inclines 32 and is in a plane considerably lower than the upper surfaces of the beams 31.

Tracks 39 are located in front of the foundation 1 to serve as carriers for a form 40 which is mounted on wheels 41 running on the tracks. This form may be like that shown in my prior application for patent, Serial Number 289,728, filed April 12, 1919, patented August 26, 1919, No. 1,314,018, and equipped with downwardly extending bars 42 at its front end, the lower ends of which come below the upper surfaces of the beams 31, but which freely pass over the rod 37 when it is in its lowermost position on the inclines 32, whereby, with the nut 34 at its forward position at the front end of the screw 33, the form may be moved so that bars 42 pass over the rod 37, but as soon as the screw is turned to move the nut to the rear, the rod 37 riding up the inclines 32 engages behind the bars 42 and draws the form toward the machine. The form, as shown in my former application referred to, has openings in its front and rear for the passage of the cores. The screw is of such a length that by the time the cores are fully inserted, nut 34 has run off the front end of the screw, and thereafter no further movement of the form takes place no matter how long the screw is turned; and it is only with a reversal of the turning movement of the screw that any further movement of the form will take place, and this will then be away from the machine.

In practice the form is drawn to position with the cores passing therethrough and the motor then stopped. It is apparent that the cores are oscillated during the movement of the form but such oscillation has no particular function when the form is empty. After the form is in place the material, a plaster of Paris composition mixed with water is placed in the form until it is filled and allowed to stand for a short time. This time is very short as the material sets very rapidly. The motor is then reversed and the cores all oscillated with a simultaneous turning of the screw 33. Before the form starts to move away from the machine it is evident that the nut 34 must travel a dis-

tance sufficient to bring the ends of the rods 36 against the form bars 42, or a distance nearly equal to that between rods 36 and the rod 37. During this time the cores 9 are being continuously turned about their longitudinal axes, thereby freeing the same from any adhesion to the blocks so that when rods 36 engage against bars 42, the form is free to move away from the machine. This movement of the form continues until the nut passes from the screw 33 and with the rod 37 located low enough that the form may be then moved away without danger that the bars 42 will catch against the rod 37. The form may be switched on to a branch track and taken to any convenient place for removal of the blocks therefrom, and another form brought to place for repetition of the process. The quick setting of the plaster of Paris material makes it possible to run the machine continuously with but few forms and blocks may be made with great rapidity and a minimum of labor cost.

This machine is one of great value and utility in making building blocks from quick setting cementitious material such as plaster of Paris and the like. It has proven its worth in use over a period of time and is practical and efficient in all respects.

I claim:

1. A machine comprising a support, a plurality of cores mounted on and projecting horizontally in front of the support, a screw mounted below the cores and projecting in front of the support, a shaft on which the screw is mounted, a nut on the screw, rods extending laterally from the nut, another rod in front of the first named rods, bars connecting the rods, and means to simultaneously turn the shaft and all of the cores about their longitudinal axes, substantially as described.

2. In a machine of the character described, a support, a plurality of cores mounted on and projecting horizontally in front of the support, a frame located below the cores and likewise projecting in front of the support, said frame including two spaced apart beams paralleling the cores connected by front and rear cross members, said beams at their front ends being cut downwardly and forwardly at an angle to the horizontal, a shaft located between the beams and rotatably mounted on the cross members, said shaft having a screw thereon the threads of which have larger outside diameter than the diameter of the shaft, and said screw terminating at each end a distance short of the cross members, a coiled spring around the shaft at each end of the screw and between the ends of the screw and the cross members of the frame, a nut on the screw, rods attached one to each side of the nut and projecting laterally over the beams, another rod a distance in front of the nut, bars connecting the last rod to the first rods, and means to simultaneously rotate the shaft and turn all of the cores about their longitudinal axes, substantially as described.

3. In a machine of the character described, a support, a plurality of cores mounted on and projecting in front of the support, a form for receiving cementitious material adapted to be placed close to the support with the cores passing through the form, means to turn the cores about their longitudinal axes, and means to automatically move the form away from the support and thus withdraw the cores a short time after the oscillation of the cores has begun, substantially as described.

4. In a machine of the character described, an elongated support, a plurality of vertical series of cores mounted on the support and extending in front thereof, said series of cores being located in the length of the support side by side and spaced apart, a shaft attached to each core and rotatably mounted on the support, intermeshing gears on the shafts of each series of cores, an upwardly projecting arm connected to one shaft of each of the series, a bar connecting the upper ends of all of the arms, and means to reciprocate said bar, substantially as described.

5. In a machine of the character described, an elongated support, a plurality of vertical series of cores projecting in front of the support, a shaft to which each core is attached rotatably mounted on the support, intermeshing gears on the shafts of each series of cores, an upwardly projecting arm connected to one shaft of each of the series, a bar connecting the upper ends of all of the arms, a drive shaft, a connecting bar attached at one end to the first bar, and means connecting the other end of the connecting bar to the shaft at a distance from the center thereof, substantially as described.

6. In a machine of the character described, a machine containing the elements recited in combination in claim 5 combined with means to move a form toward or away from the support, said cores passing through the form, and means to drive said forming moving means from the drive shaft, substantially as described.

7. In a machine of the character described, a support, a plurality of series of shafts located leugthwise of the support, the shafts of each series being located one over the other, a gear at the rear end of each shaft, the gears of each series of shafts being in intermeshing engagement, a tapered core attached to the front end of

each shaft and projecting in front of the support, an upwardly projecting arm connected to the rear end of one shaft of each of the series of shafts, a horizontal bar connecting the upper ends of all of the arms, a drive shaft at one end of the support, means for reciprocating the horizontal bar with the rotation of the drive shaft, a second shaft below the drive shaft, means to drive the same from the drive shaft, a third shaft located below the support and extending forward in front of the support, and provided with a screw in a portion of its length in front of the support, means to drive the third shaft from the second shaft, a nut on the screw, means connected to and movable with the nut, and means for holding the nut against either end of the screw after it has moved off the end of the screw, said means movable with the nut being adapted to move a block form toward or away from the support with the operation of the machine in opposite directions, substantially as described.

8. In a machine of the character described, a support, a plurality of cores rotatably mounted on the support and projecting in front thereof, a frame formed of spaced apart forwardly extending beams and front and rear cross members located in front of the support and below the cores, said beams at their front ends having downwardly and forwardly inclined upper surfaces, a track at each side of the frame, a block form movably mounted on the track, a shaft having a screw threaded portion between the cross members of the frame rotatably mounted in and lengthwise of the frame, a nut on the said screw threaded portion of the shaft, front and rear rods connected together by spaced apart bars attached to and movable with the nut, downwardly extending bars on the form at the end thereof nearest the machine, said bars extending to a point between the upper and lower sides of the beams, means to simultaneously rotate the shaft and turn the cores about their longitudinal axes, said form in its front and rear sides having openings to pass the cores, and means to hold the nut against the end of the screw after it has passed therefrom, substantially as described.

In testimony whereof I affix my signature.

EDWARD H. PIPE.