

A. MATHIESON.
MOLDING MACHINE.
APPLICATION FILED MAY 7, 1910.

989,170.

Patented Apr. 11, 1911.

2 SHEETS—SHEET 1.

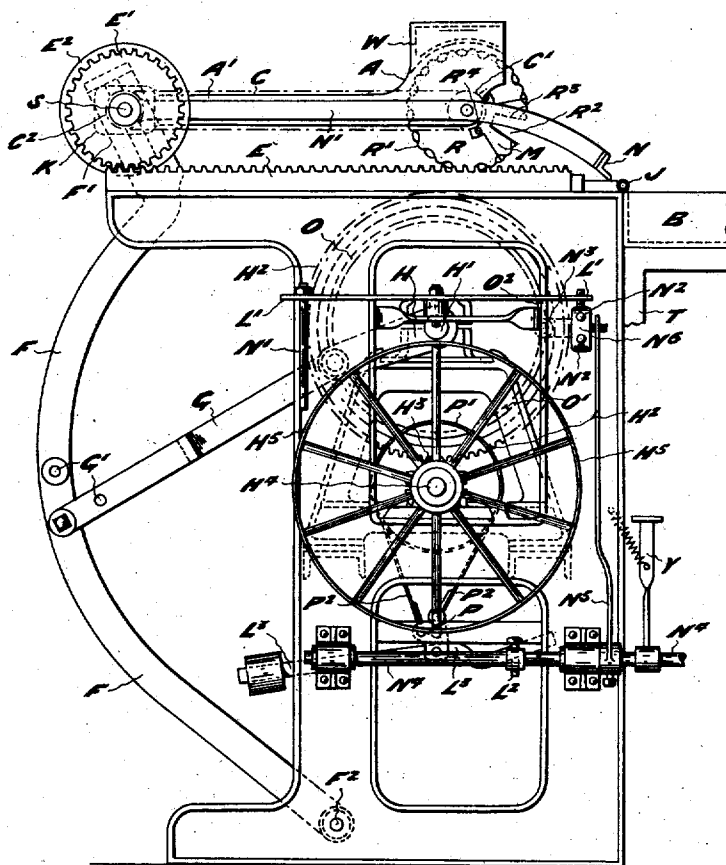


Fig. 1.

WITNESSES

W. P. Burke

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INVENTOR

Alexander Mathieson

By *Am. M. Co.*

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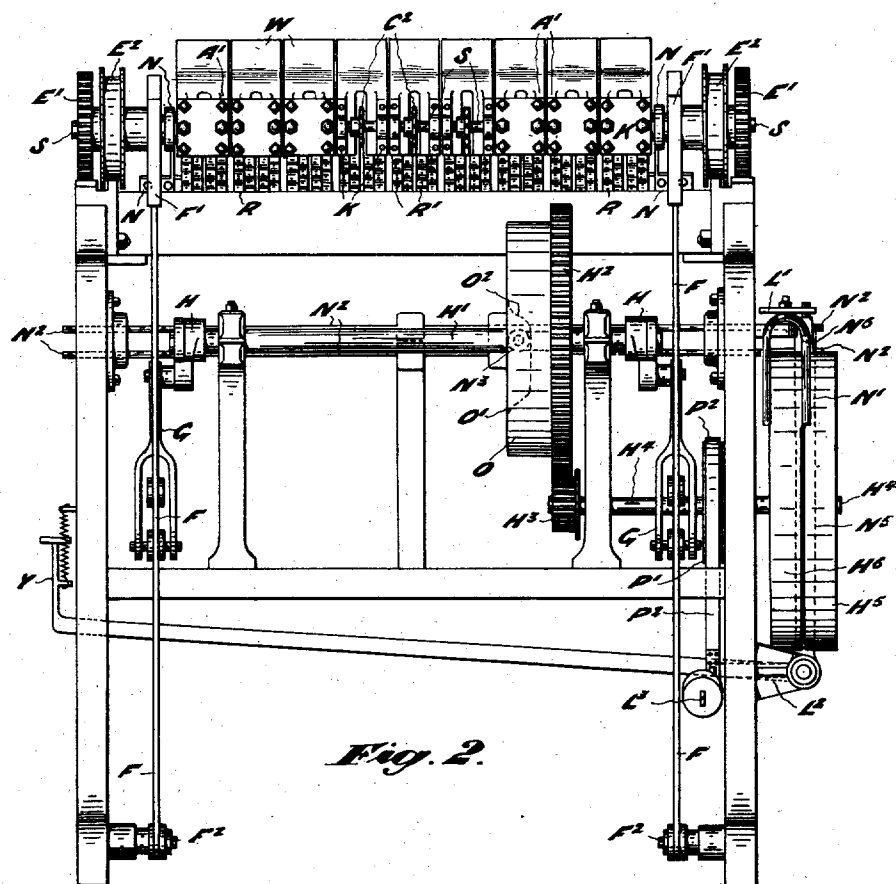


Fig. 2.

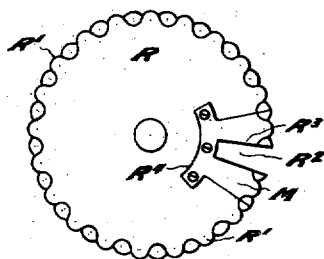


Fig. 3.

WITNESSES

W. P. Burns
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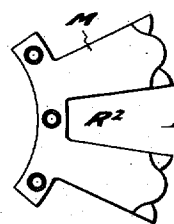


Fig. 4.

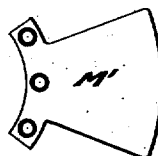


Fig. 5.

INVENTOR

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UNITED STATES PATENT OFFICE.

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MOLDING-MACHINE.

989,170.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed May 7, 1910. Serial No. 559,875.

To all whom it may concern:

Be it known that I, ALEXANDER MATHIESON, of Scotch Foundry, Armley, near Leeds, in the county of York, England, founder, subject of the King of Great Britain and Ireland, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

This invention relates to improved means of and apparatus for the pressing or molding sand or the like into molding boxes and the like, and has for its object the arrangement and construction of a roller or series of rollers, whereby the sand or the like is rolled in the molding boxes, as against the usual method of "ramming" the sand into place by direct pressure, either from above or below, or both.

As is well known where patterns vary considerably in thickness owing to the nature of the design, it is difficult to evenly ram the sand into the boxes on to the pattern by the machinery now in use, even and cleaner molds being made by hand than by power, owing to the small hand rammers being able to press the sand evenly and regularly on to a mold of varying thickness. Where power is used the pressure is generally even over the whole surface of the box, although in some cases spring rammers have been used, but same have not in practice proved entirely successful. It is also known in some machines to use rollers curved to suit the configuration of the pattern plate, therefore the hereinafter described method and apparatus has been devised, whereby the sand or the like may be evenly pressed into the box and in contact with the pattern plate or the like, by the operation of the apparatus either by hand or power, the latter method being preferred.

In describing my invention in detail, reference is made to the accompanying sheets of drawings, similar letters indicating similar parts, in which—

Figure 1, represents a side elevation of one form of apparatus embodying my improvement. Fig. 2, represents an end view of same. Fig. 3, represents a detail of roller, hereinafter referred to, and Figs. 4 and 5 represent details in connection with the rollers.

In carrying out my invention, in place of pressing the sand into the box by pressure from above (or below or both) I use rollers such as R, either plain or fluted, or having

an otherwise broken surface, the fluted form shown in the drawings being the preferred one, as the corrugations R¹ tend to leave a roughened surface in the sand after rolling, to which additional sand will easily bind in further rolling. The movement of the rollers R will be, in the form shown, substantially horizontal across the box B, which is mounted on any suitable table T, and which is placed the pattern plate on which the sand is to be rolled. It will however be obvious to those skilled in the art, that in place of moving the rollers across the box, the box may be actuated to move under the rollers.

The rollers R may be single or mounted in pairs and the more rollers there are, the more readily can same be adapted to roll the sand in one or more boxes, or in different sized boxes, the said rollers as hereinafter described, being so mounted as to be readily removed and adjusted as to distance apart. Each roller or pair of rollers R is mounted in its own bracket or brackets A and such brackets are provided with means whereby weights W may be added thereto, or taken therefrom, depending on the hardness the sand is required to attain owing to the action of the rollers, and each roller is driven by means of a chain C and chain wheel C¹ mounted on the roller or its shaft. Each of the said brackets A have arms A², which are pivoted or fulcrumed on what may be termed the main shaft S, on which are also mounted chain wheels C² to drive the rollers. Bands, belts or the like may be substituted for the chains C, or other suitable driving means may be adopted.

On the main shaft S are carried one or more gear wheels E¹ which are in engagement with a rack, such as E, guide wheels such as E² are also provided and a pivoted arm or arms F is connected adjustably to shaft S (Fig. 1) the end F¹ being free to slide somewhat around shaft S. Arm F is pivoted at F² to a suitable portion of the frame of the machine, and to arm F is pivoted one end of a connecting rod G, adjusting means such as shown at G¹ may be used when it is desired to alter the length of the stroke. The connecting rod G is attached to a crank H mounted on a shaft H¹, carrying a gear wheel H² which engages a pinion H³ on shaft H⁴, which is provided with fast and loose pulleys H⁵ and H⁶.

In the normal position the rollers R will

rest as shown in Fig. 1, away from the box B, and the gear wheel E¹ will be practically at the commencement of rack E, thus the position of the roller will not interfere with the putting together of the box and pattern plate, and sand or the like may be fed to the table by means of a hopper or the like above the same. As the machinery is set in motion, the shaft S will, through arm or arms F, be pressed toward the machine, this will cause wheel E¹ to travel on rack E and turn shaft S and consequently the rollers R. At the edge of the apparatus nearest the box B is a rubber roll or the like J for the rollers R to travel over. As the said rollers approach the box, same being carried on pivoted arms or the like A¹, they will drop into the box and will move forward over the sand or like in same, and the sand will be rolled with an even pressure, whatever the irregularities of the pattern or pattern plate.

In order to insure the even rolling of the sand at the edges of the box, each roller will be provided with a gap (or gaps) R² in its periphery, such gap (or gaps) being so arranged as to cause a flat side R³ thereof to enter the box at the edge, immediately such edge is reached, and the roller will be of such a diameter as to, in ordinary sized boxes, allow of one revolution of the roller to bring the gap to the other side or edge of the box, at the completion of the travel and thus insure even pressure right across the box and at the same time prevent over running, although a clutch lever motion or the like may be arranged in connection with the mechanism, to accomplish the same purpose, *i. e.* over running. A means to accomplish this is hereinafter described.

When the boxes are very long or very wide, two or more revolutions of the rollers may be made by the rollers, and the rolling operation may be repeated as many times as is desired. In order to make the rollers somewhat adjustable as to size of box, a gap R⁴ may be formed in each roller, in which will be secured making up pieces M. In Figs. 3 and 4 is shown one form, having one gap R², and when a smaller box is in use a piece such as M¹ (Fig. 5) may be used, any convenient shape of making up piece may be employed. The rollers and their brackets are mounted on shaft S by means of a plate such as K, so that same may be removed to allow a gap, when say two boxes side by side are on the table, and in order that more rollers may be added to the shaft when wider or larger boxes are in use.

A view of a roller is shown in Figs. 1, 2 and 3 in which same is provided with double flutes or the like R¹, such fluting being alternate and slightly taper in order to prevent the sand from adhering thereto and to form a surface on the sand in the box to which fresh sand will readily bind, but it must be

understood we do not confine ourselves to this style of roller. The roller brackets A may carry a scraper which will project in front of the rollers, in order to level the sand somewhat in the box. A scraper N is shown in Fig. 1, and same is carried by arms N¹, pivoted on shaft S, such scraper will, as is shown, be in advance of the rollers R. The rollers being independent one with another insure independent action and the rolling of the sand in the box is thus even over the pattern plate, however uneven the latter may be, and the pressure on the sand and plate is equal, or substantially so, over the whole surface. The arms A¹ may be made adjustable on shaft S, as may the chains or like C, and all portions of the apparatus that require guards may be provided with same in any suitable manner.

A means for operating the mechanism is shown in Figs. 1 and 2, same comprising a spring foot lever Y which is connected to shaft N⁴ as to be capable of oscillating same. Attached to this shaft is a lever N⁵ which in turn is suitably connected to a link N⁶ to which is attached rods N². The before mentioned link N⁶ operates a pivoted lever L¹ which carries a belt fork lever N¹, whereby the belt can be moved from the loose pulley on to the fast pulley. The before mentioned sliding rods N² carry between them a roller N³ which is normally in engagement with cam O mounted on shaft H¹. The operation of the foot lever Y therefore, moves the belt on to the fast pulley, through the oscillation of shaft N⁴ and movement of lever N⁵, the movement of this lever N⁵ also moving the rods N², therefore bringing the cam roller N³ on to the face of cam O, and so long as the foot lever is depressed the rollers will move to and fro across the box. Further, as the foot lever Y is depressed and the mechanism operated, the cam O at O¹ engages the roller N³ and the foot lever may be then released, as the roller N³ is on the outer portion of the cam O. As cam O travels around, the roller N³ enters the same at O² and through the before mentioned mechanism the foot lever and the belt fork are brought to their former position, thus causing the belt to travel back on to the loose pulley, and to insure the mechanism stopping, a lever L² suitably mounted on shaft N⁴ operates a weighted lever L³ which has connected therewith band brake mechanism P, which is normally held hard on drum P¹, but the movement of the belt fork to place the belt on the fast pulley causes the band P² to be slackened owing to the actuation of the lever L³.

I have only shown and described one method of carrying out my invention, but to those skilled in the art, it will be obvious that same may be carried out in other ways and forms.

What I claim as my invention is:—

1. A molding machine comprising a pivoted arm, a roller carried thereby and adapted to extend within the mold box, means for actuating said arm to cause the roller to pass over the sand in the box, and means for positively rotating said roller during its passage over the sand, said roller being free from means limiting its downward movement within the mold box whereby said roller will rest upon the sand within the box irrespective of the depth of the sand therein.

2. A molding machine comprising a series of rotatable rollers carried on pivoted arms and provided with adjustable weighting means, said rollers not being shaped to the configuration of the pattern plate, means for rotating said rollers and means for reciprocating said arms, said rollers comprising a gap whereby the sand is evenly rammed at the front and back edges of the box, substantially as described.

3. In means for pressing sand into molding boxes, a pair of rollers positioned in juxtaposition to one another, each of said rollers being provided with alternately disposed circumferentially arranged raised and depressed portions, the raised portions of

each roller registering with the depressed portions of the other roller.

4. In machinery for molding or pressing sand on to pattern plates in boxes, the fluted roller R provided with a gap to insure the sand toward the edges of the box being evenly pressed, substantially as described.

5. In machinery for molding or pressing sand on to pattern plates in boxes, a roller provided with a gap to insure the sand toward the edges of the box being evenly pressed, and means adapted to be removably secured to said roller for varying the size of the gap, substantially as described.

6. In machinery for molding or pressing sand on to pattern plates in boxes, a roller provided with a gap to insure the sand toward the edges of the box being evenly pressed, and a member adapted to be removably secured to said roller to register with said gap, said member being provided with a gap of less width than the gap formed in the roller, substantially as described.

In witness whereof, I have hereunto set my hand, in the presence of two witnesses.

ALEXANDER MATHIESON.

Witnesses:

CLIVE WAUGH,
JAS. F. WHITAKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."