

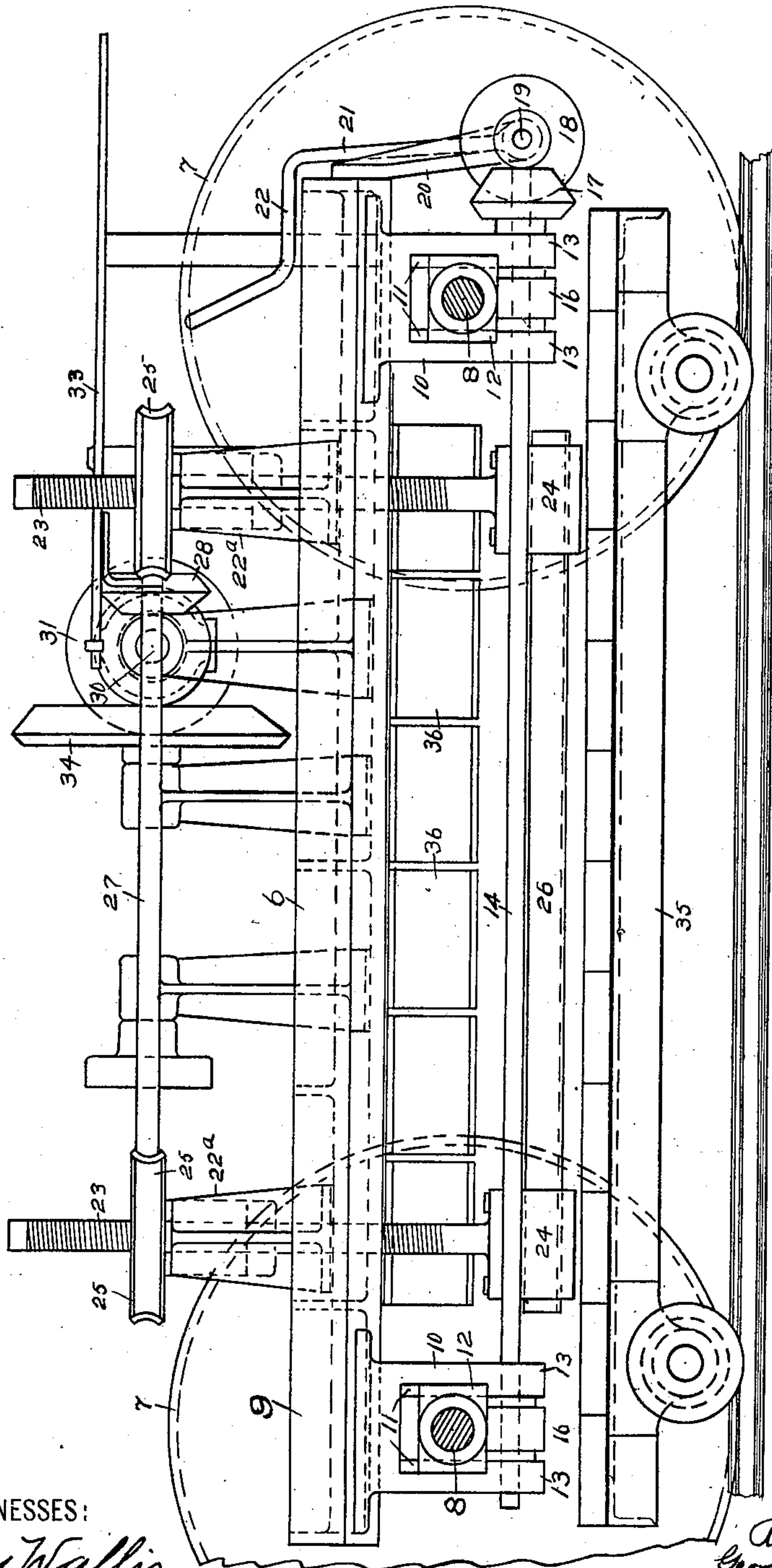
No. 862,259.

PATENTED AUG. 6, 1907.

R. E. & G. F. LAUGHRAY.
BRICKMAKING MACHINE.

APPLICATION FILED JULY 14, 1906.

5 SHEETS—SHEET 1.



WITNESSES:

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Ray Abbey

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Robert Laughray
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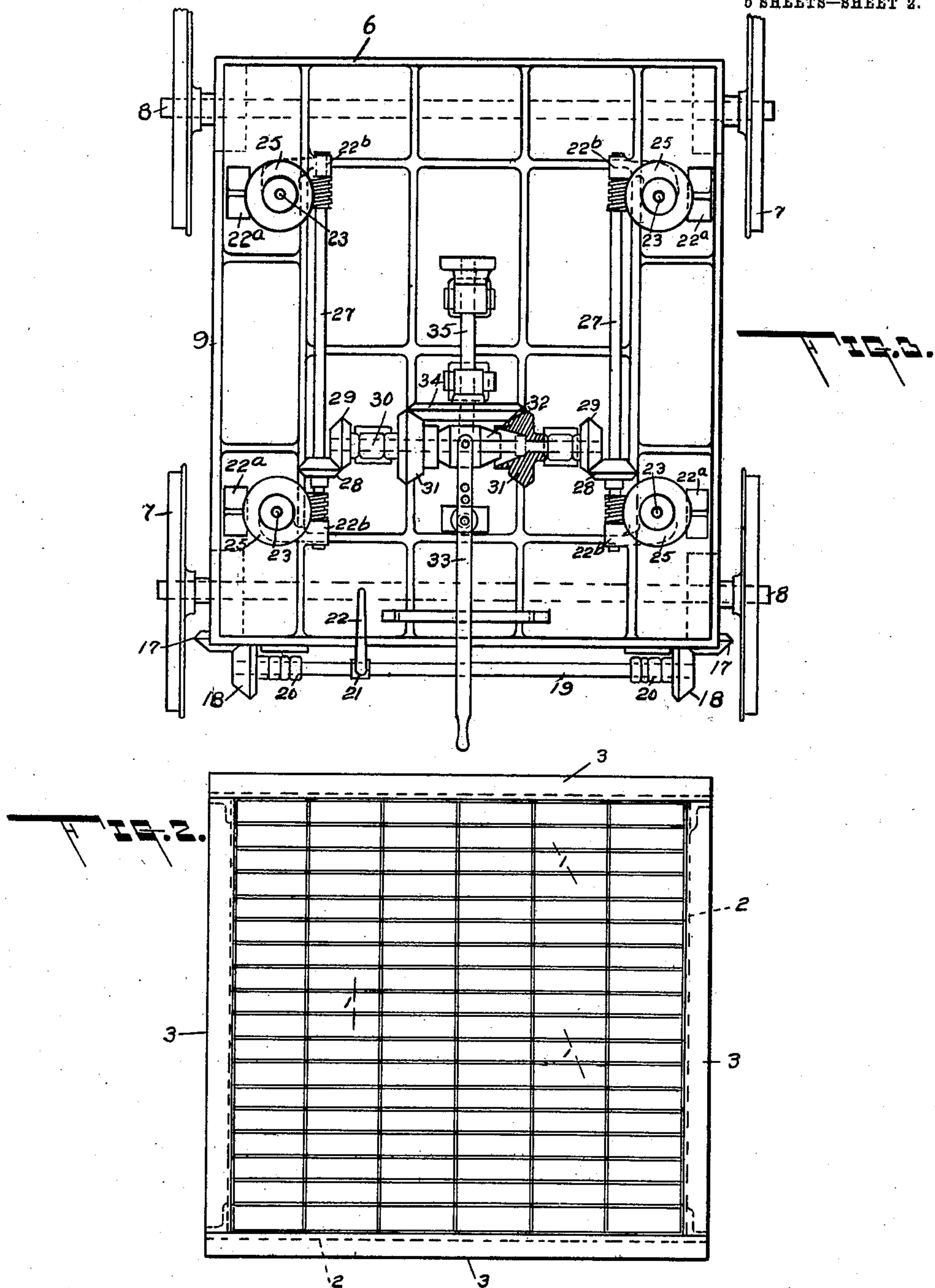
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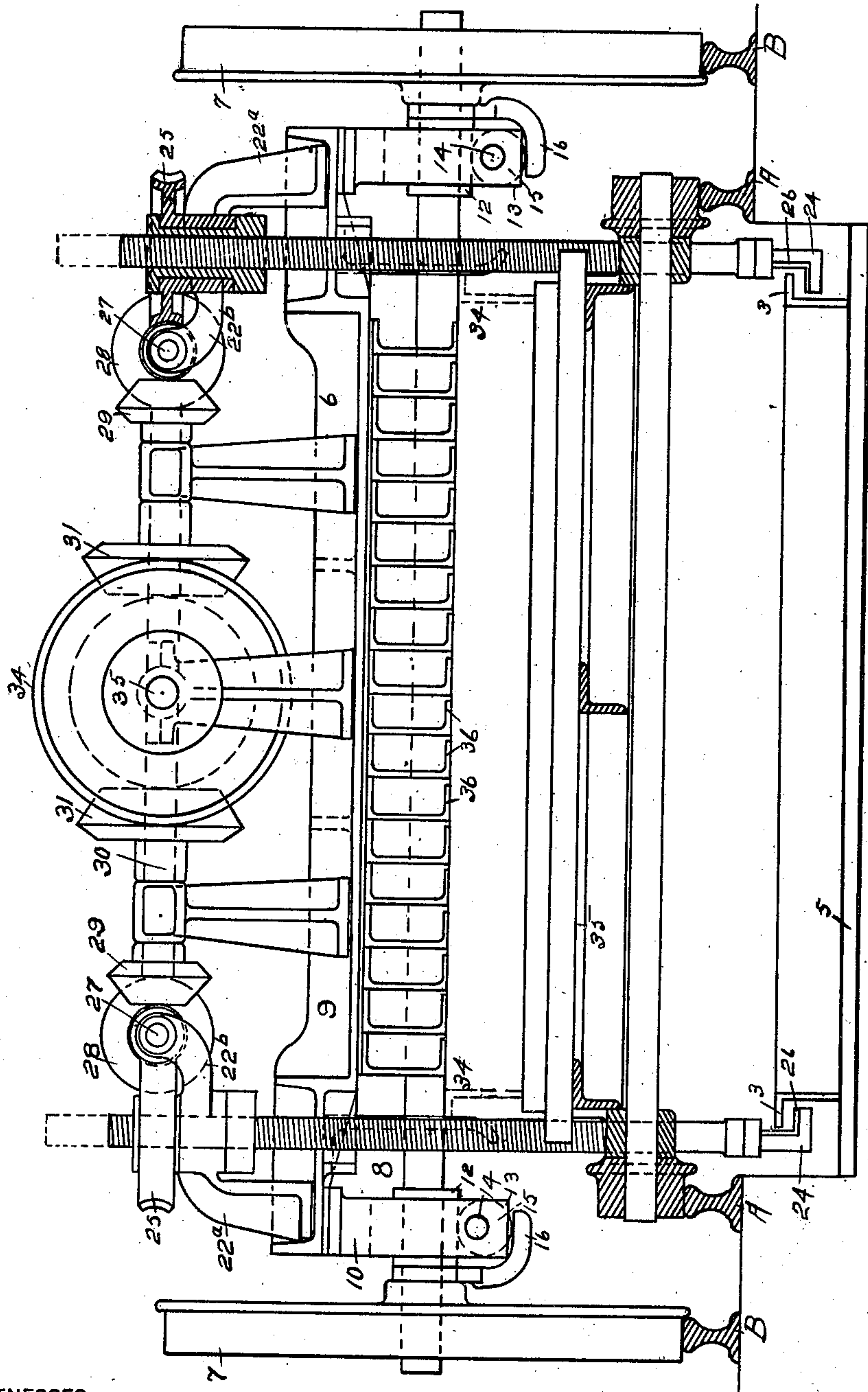
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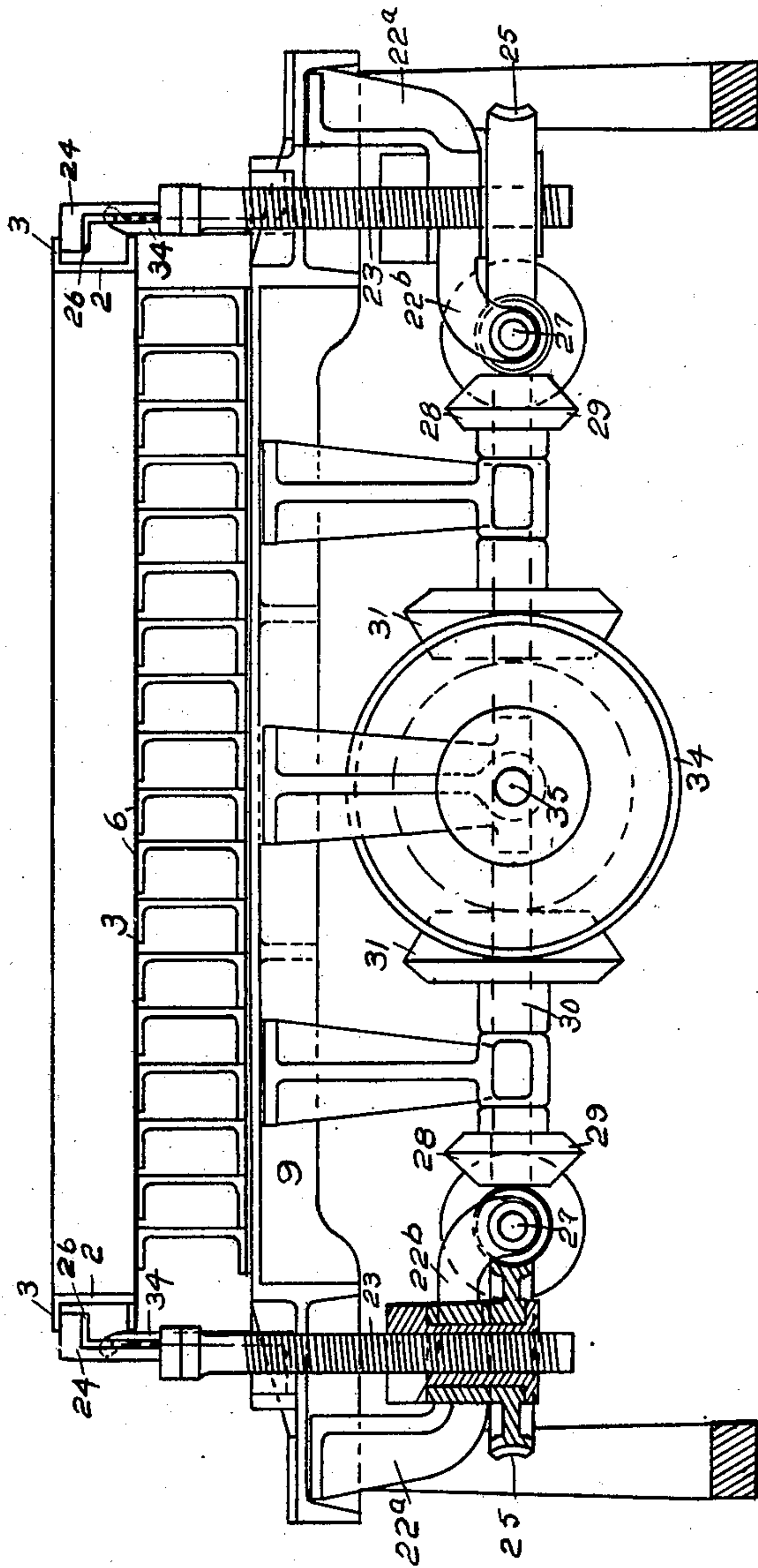
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5 SHEETS—SHEET 4.

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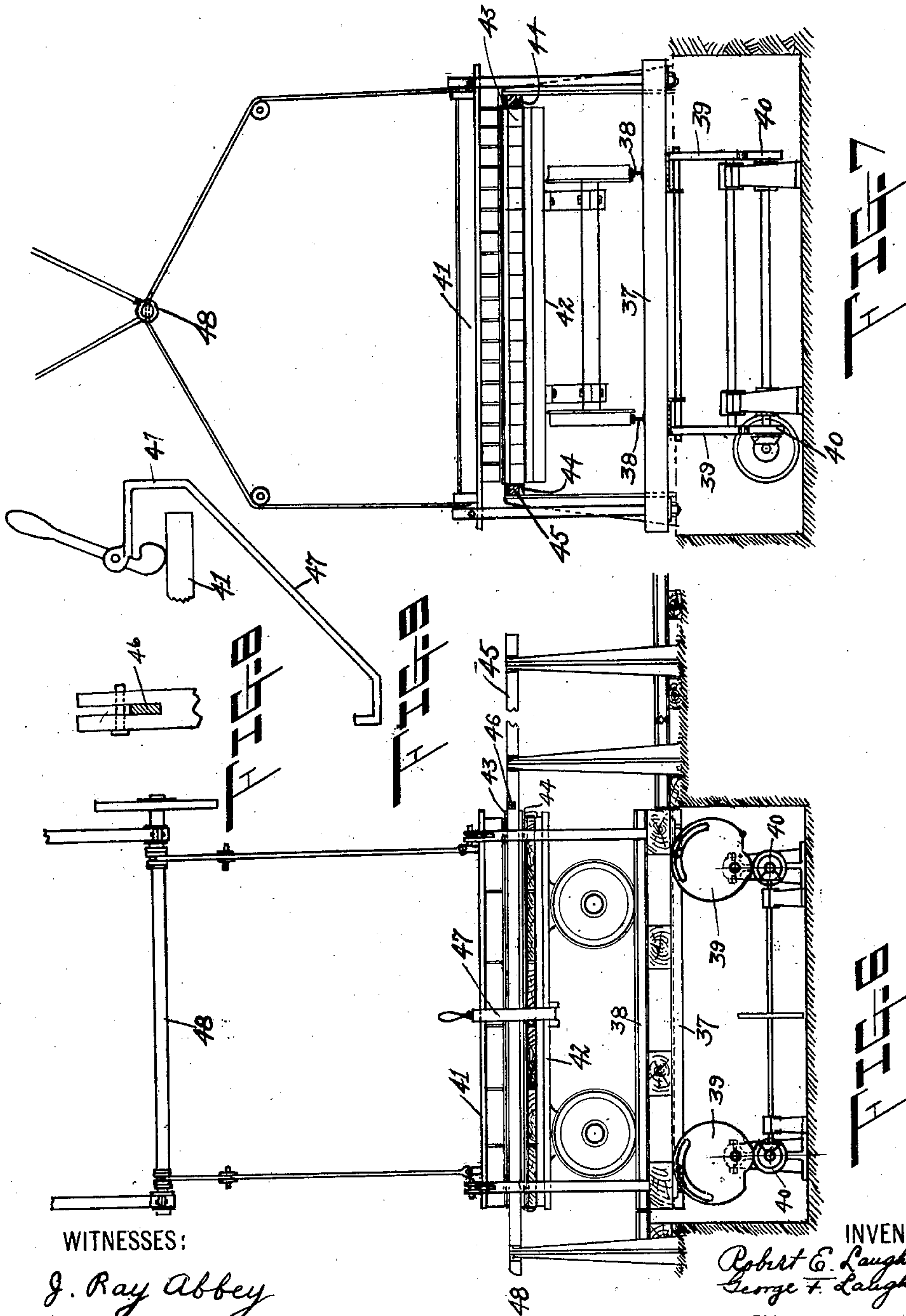
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

ROBERT E. LAUGHRAY AND GEORGE FREDRICK LAUGHRAY, OF BAY CITY, MICHIGAN

BRICKMAKING-MACHINE.

No. 862,259.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed July 14, 1906. Serial No. 326,272.

To all whom it may concern:

Be it known that we, ROBERT E. LAUGHRAY and GEORGE FREDRICK LAUGHRAY, citizens of the United States, residing at Bay City, in the county of Bay and State of Michigan, have invented certain new and useful Improvements in Brickmaking-Machines; and we 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 brick making machines, one object of which is the provision of means for quickly molding or casting bricks from liquid or cementitious material in a creamy state.

Another object of the invention is the provision of means whereby the bricks after being molded are automatically deposited upon suitable carriers to avoid unnecessary handling.

A further object of this invention is the provision of means whereby the brick is stripped from the mold by a movement of the mold relative to the plunger, or vice versa, by a movement of the plunger against the brick supported in a mold held stationary during the ejection of the brick therefrom. In any event however, we find it necessary to avoid injuring the brick, to provide a support for the brick as they are being ejected from the mold, which support engages that face of the brick opposite the plunger and may be stationary, as where the mold moves relative to the plunger, or yielding as where the plunger moves relative to the mold, the main idea being to support the brick throughout the process of removing them from the mold. The mechanism herein shown is designed to move the molds, after the material has set therein, towards stationary strippers or plungers registering with the bricks whereby the bricks are ejected from the mold by a movement of the mold relative to the strippers, but the same result may be effected by moving the plungers against the mold so long as the faces of the brick opposite those engaged by the plunger are supported as the brick are ejected.

The operation of ejecting the bricks from the molds by means of either of the relative movements above set forth can be accomplished in many ways as will be more fully described hereinafter and to these and other ends, therefore the invention consists of certain novel features and combinations of parts, together with their equivalents, such as will be more fully disclosed hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side view of one embodiment of which the invention is susceptible, Fig. 2 is a detail top plan view of a mold, Fig. 3 is a top plan view of one mechanism for ejecting the brick from the mold, Fig. 4 is an end view of the same, Fig. 5 is a side view of a slight modification. Fig. (6) is a side view of a device showing means for plunging the

brick from a stationarily supported mold. Fig. (7) is an end view thereof, and Figs. (8) and (9) are details.

At the outset it should be understood that while the accompanying drawings illustrate two apparatus for ejecting brick by means of a relative movement of the mold, and brick, we do not wish to be restricted to the mechanism or parts thereof herein shown, since it is possible to perform the same operation by the use of different mechanism, and hence the present description and drawings are merely intended to disclose one or two of a number of constructions for attaining the desired end through the manipulation of the mold. Therefore, A and B indicate two tracks, the first A being of, say, standard gage, while track B is of a wider gage, say six feet. The molds are conveniently disposed between the rails of the track A, said molds preferably consisting of a series of cells, 1, 1, inclosed for convenience in a frame 2 of angle iron, the flanges 3 of which project outwardly from the upper edges of the mold. The cells may be of any desired area dependent upon the size of the bricks or blocks to be manufactured and the cells may be made adjustable in size if desired. This feature, however, forms no part of the present invention and need not, therefore be entered into. The cells composing the mold and inclosed by the frame are rigid with the frame and are uncovered at their upper and lower ends, the molds preferably resting upon suitable pallet boards or bases 5.

A suitable mixing and feeding machine (not shown) travels on the track A and supplies liquid material to the molds, a number of which may be disposed between the rails of each track. As the idea of a traveling mixer and feeder for supplying molds is old and forms no part of the present invention, no further description thereof need be given. It is perfectly obvious that these molds may be supported on cars or conveyers and may be run beneath a stationary mixer and feeder to receive the creamy "wet mix" instead of providing a stationary mold and a traveling mixer.

The track B is located preferably though not necessarily on a plane with track A and a carriage 6 is shown as traveling over the track B, such carriage carrying the stripping mechanism for delivering the bricks from the cells. Right here it may be advisable to state that while the present illustration and description shows a stationary mold or series of molds and a traveling ejecting means, it is quite within the scope of this invention that the ejecting means may be stationary and the molds brought thereto on cars. Resuming, therefore, the carriage comprises preferably, front and rear wheels 7, 7, connected by axles 8, 8, adapted to support the body 9, which may conveniently consist of a suitably ribbed plate from which the four hangers 10, 10, depend, the hangers having the ways, 11, 11, formed therein adapted to receive the boxes 12, 12,

relative to which the hangers slide vertically; the axles being received in the boxes. The lower end of the hangers which depend beneath the axles are journaled at 13, 13, to receive the longitudinally extending shafts, 14, 14, which bearings 13, extend beneath the boxes to limit the movement of the body portion in one direction. Secured to the shafts 14, and between the bearings 13, 13, of the hangers, are the eccentric cams 15, 15, which may engage the lower ends of the boxes to raise and lower the body of the carriage.

A curved wing or bracket 16, is suitably supported on the axle, the free end of which wing extends to a point beneath each box and cam 15, which latter engages the inner curved surface of the wing.

The weight of the carriage, of course, forces the hangers downward until the cams are brought into contact with and rest upon the inner curved surfaces of the wings, the opposite edges of the cams engaging the boxes. Hence, as the cams are rotated in one direction or the other, the lower edges of the cams bearing against the wings will operate to raise or lower the hangers and carriage.

It is obvious that the upper edge of the cam need not engage the box as the point of support is between the lower edge of the cam and the inner curved surface of the wing, nor need such surface be curved, and it is further apparent that other constructions besides the one described might be employed to raise and lower the carriage without departing from this invention.

As one means for rotating the cams and shafts, we provide the shaft with suitable gears 17, 17, adapted to mesh with gears 18, 18, carried by an end shaft 19, extending between shafts 14, 14, and supported in brackets 20, depending from the frame or body 9, the rotation of which shaft 19 will actuate the cams and as one means for affecting such rotation, we secure a lever 21 to the shaft, the lever preferably being crooked as at 22 to engage the body 9 of the carriage when the latter is in raised position and thereby limit a further movement of the shaft as well as locking the same in position to prevent an accidental rotation, the lever when in such position lying a little off the vertical toward the carriage.

It will be understood that in that form of mechanism now being described and containing one embodiment of the invention, it is necessary to raise the molds with the bricks therein from off the pallet boards between the track, or if the molds are supported on the cars then they may be raised therefrom. In so doing it has been ascertained that the brick will be retained in the molds without injury, and by raising the brick-containing molds from their pallet-boards, running in a truck on the track A beneath the raised molds and ejecting the brick directly on the truck, the lower faces of the brick being constantly supported during the ejecting process, the labor incident to picking up the brick and piling them on a truck is wholly avoided as well as the danger of breaking or otherwise injuring the brick.

As one means for lifting the full molds from their pallet-boards, the following mechanism may be provided: The body 9 is provided with four standards, 22^a, 22^a, the free ends of which are adapted to receive the threaded vertically extending rods 23, 23, which project through suitable apertures in the body and at their lower ends are equipped with hooks 24, 24.

Worm gears 25, are supported on the standards and engage the threaded rods to raise and lower them. It is obvious that other raising or lifting and lowering means might be used in place of the threaded rods. The rods are adapted to depend beneath the carriage, the hooks taking beneath the flanges 3 on the mold and preferably we secure an angle iron 26 to each pair of hooks which is adapted to engage beneath opposite flanges on the mold. It is, of course, desirable that the rods be raised or lowered simultaneously to retain the mold preferably horizontal and to this end, the standards 22^a, 22^a, are provided with extensions 22^b, 22^b, in which are journaled worm shafts 27, 27, the worms of which mesh with the worm gears 25, the shafts 27 preferably extending parallel with the shafts 14, 14, though this is not necessary. Gears 28, 28, on the shafts 27 mesh with gears 29 on a suitably supported counter shaft 30, which is provided with a pair of opposing clutch gears 31, loose on the shaft 30, a clutch 32 sliding keyed on the counter shaft between the gears, and being controlled by a suitably pivoted clutch lever 33, the clutch gears meshing with a drive gear 34 mounted on a drive shaft 35 to which power is imparted in any suitable manner. The clutch is operated to throw in one or the other of the gears 31, the rotation of which will rotate the countershaft in one direction or the other to impart movement to the shafts 27 and raise or lower the threaded rods.

It is plain that any other suitable driving mechanism or arrangement might be employed in place of that disclosed, without departing from the invention.

In the particular form herein illustrated, the molds after having been filled with the liquid plastic material, are allowed to set for twenty-four hours, whereupon the carriage traveling on tracks B is brought over the molds, the angle irons 26 taking under the opposite flanges 3 of the molds, the rods 23 depending beneath the carriage so that the angle iron rest slides beneath the flanges. Motion is then simultaneously imparted to any suitable lifting mechanism to raise the mold, the carriage being provided with depending outwardly curved guides or leaders, 34 for centering the mold as it is raised, and after the molds have been raised, a suitable distance, as hereinafter more fully stated, a truck 35 traveling on tracks A is rolled to a point directly beneath the mold to receive the bricks as they are ejected, the bottom faces of the brick resting upon the truck at all times during the ejecting process and supporting the brick during such ejection.

Many ways of ejecting brick from their molds have been tried. In some constructions, the ejector in the form of a plunger, is moved against the brick, the mold being held stationary, but in so doing there exists great liability of injuring a large proportion of the newly made brick unless the opposite face of the brick is yieldingly supported, and therefore we may provide the following mechanism, which by actual test has been proven that it will not injure the most delicate brick. The lower face of the carriage is provided with a series of depending strippers 36, 36, the ends of which are just the size and shape of the brick in the cells, the strippers being spaced apart from each other a distance equal to the thickness of the blades or partitions forming the cells of the mold.

Now when the mold is raised, the guides 34 operate

to center the mold so that the strippers will register the cells and thus bring the blades or partitions in line with the spaces between the strippers. In practice we find it desirable, though not at all necessary perhaps to stop the upward movement of the mold just as the strippers have engaged the brick in the mold. In this position the lower surface of the mold rests upon the truck 35 while the upper surfaces of the brick are just about in engagement with the strippers. The carriage occupies its lowest position, the mean diameter of the cam being approximately vertical, during the upward movement of the molds. Everything being in readiness, therefore, and the truck being beneath and supporting the brick in the mold, the driving mechanism is again started up, whereby the lifting mechanism will pull the mold upwardly, the stationary strippers engaging the bricks to prevent them from being raised off the truck, and the blades or partitions of the mold being received between the strippers, the length of which approximates the thickness of the brick, and the brick rest directly on the truck in readiness to be hauled away after leaving the truck. By this arrangement it will be seen that the bricks after being ejected from the mold occupy the place of the mold and have no drop from the mold, the lower surfaces of the brick resting on the truck through the ejecting process, which we have found a most essential feature in preserving the brick from injury by supporting their lower or outer faces during their ejection from the molds. It is now desirable to raise the carriage in order to avoid contact with the brick on the truck when they are hauled away, wherefore the operator swings the lever 21 into the position shown in Fig. 1 whereby to rotate the shafts 14, 14, and the eccentrics 15, to cause the latter to bear against the wings 16, and raise the carriage, strippers and mold a suitable distance above the deposited brick on the truck, which latter can then be hauled away, the carriage lowered and the mold replaced between the rails of track A, where upon the machine is pulled over the next full mold, or if the machine is stationary the mold may be brought to and carried from the machine in any suitable manner.

The construction above set forth for manufacturing brick is much to be preferred but it is possible to devise an operative machine working on the same principle but arranged in a slightly different manner, as shown in Fig. 5, wherein the carriage body 9 is reversed so that the strippers 36, project upwardly, the body being stationary and constituting a base for the strippers which latter constitute the bottom of the cells of the mold which is suspended above the strippers, and is filled with plastic material by any suitable means, the material being allowed to set, whereupon the mold is drawn down over the strippers until the brick are forced out into a position where they may be picked up by hand or otherwise and piled up. It is evident, therefore, that the brick may be ejected from the mold by moving the latter in either direction against a series of stationary strippers.

To the best of our knowledge and belief, we are the first to fill a series of molds with a liquid creamy material, which we have called a "wet mix" as distinguished from the merely moist plastic compositions heretofore used, and which have to be tamped down in the mold. Heretofore a "wet mix" composed of a fine material

like sand and a binding agent may have been used for filling molds but we do not know of any process whereby the ordinary pit run of gravel containing coarse material has been combined with a binding agent as cement to form a liquid creamy composition, which when poured into molds is firm and dense and needs no tamping, such composition completely coating the walls of the mold and preventing the contact of the coarse material therewith so that when complete, the article possesses a smooth even surface, the coarse filling material not being present at the surface. The plastic material referred to is deposited into the molds in a creamy state, the material consisting of a suitable binding agent commingled with a coarse material as crushed rock, broken stone, pebbles or gravel. The faces of the mold are perfectly smooth and the filling material is so thoroughly covered with the binding agent that when the bricks are completed they exhibit an even unbroken smooth face, the binding agent flushing to the sides and bottom of the mold to form a facing between the surface of the mold and the pebbles or stones so that no portion of the stones or other coarse filling material is visible in the completed article. So to, by manufacturing brick by what we term the "wet process" we are enabled to produce a very strong dense brick which will not absorb moisture and which will not contain air holes. Also we avoid the necessity of tamping or compacting the material when in the molds as the air can work its own way out. All this is impossible where the mixture used is only moist, or what is technically known as "dry mix." Furthermore, we can obtain bricks of an even color throughout and each one perfect in shape and size, since we do not expose them to heat, which warps and burns brick made under the old process.

From the foregoing, it is evident that the machine is simple yet highly efficient and economizes both time and labor in the manufacture of brick.

It is also possible to provide a vertically movable truck or platform for supporting the filled molds, such support adapted to yield as the brick are forced out by a plunger moving relative to the mold which latter is fixed so that the plunger engages one face of the brick while the yielding support contacts with the opposite face of the brick to prevent injury to the latter. It is even possible to convert the foregoing mechanism shown in Figs. 1 to 4 into such a plunger by providing eccentrics having a sufficient throw. In such case the mold which may be brought to the plunger, is stationary supported beneath the plunger, the latter being in its raised position owing to the eccentrics which latter, when the mold is in position beneath the plunger, are rotated to force the plunger down, the brick being forced out of the stationary mold and against the yielding support which moves with the plunger and when the brick have been ejected from the mold and the plunger raised, the yielding support conveys the brick away and the device is made ready for another filled mold. Another way in which to accomplish this, however, is to provide a yieldingly supported platform 37 which may conveniently carry a pair of rails, 38, 38, the platform being allowed to yield in any suitable manner. As one means for arranging this, we may cause the lower face of the platform to rest upon a plurality of eccentrics 39, 39, so arranged as to be simultaneously rotated and

to afford a steady support for the platform. The eccentrics can be rotated in any suitable manner as by means of wheels 40, 40, located beneath and supporting the eccentrics, the peripheries of the wheels and eccentrics engaging so that when the wheels are rotated the eccentrics will also rotate.

Supported above and sustained by the platform in any suitable manner is the plunger mechanism 41. A car 42 carrying a filled mold 43 is run upon the platform when the latter is in its raised position, the flanges 44 of the mold being engaged by or threaded upon stationarily supported guides or ways 45, as soon as the car passes upon the platform. Means (46) and (47) for respectively positioning and retaining the car and mold relative to the plunger and platform, and for connecting the car and plunger may be provided and as soon as the mold is in position, relative to the plunger, the mold being held against vertical movement by the ways, the eccentrics are caused to rotate thereby simultaneously lowering the plunger, car and platform relative to the stationarily supported mold, the car supporting the lower faces of the brick as the plunger engages and presses down upon the upper faces of the brick whereby the brick are ejected from the mold and are constantly supported during the process of ejection by the car. When the platform is about to or has reached its lowest limit of movement, means 48 may be provided for raising the plunger partly or entirely independently of the platform to permit the car and ejected brick to pass off from the platform, the mold being separately removed along its ways after which the platform is raised to await the next filled mold.

Obviously the plunger instead of moving downwardly might be arranged to move upwardly if desired, a support for the brick during their ejection being provided.

It is evident that the above described mechanism discloses a method for ejecting bricks by a movement of the plunger relative to a stationary mold, the bricks being yieldingly supported on those faces opposite the plunger, as they are being ejected from the mold. Thus we desire to protect ourselves in the use of a stationary mold and movable plunger in combination with a yielding support for the opposite faces of the brick, as well as in the use of a stationary plunger and movable mold with or without a support for the opposite faces of the brick.

Many changes might be made in the form and arrangement of the parts described without departing from the spirit and scope of this invention and hence, we do not wish to limit ourselves to the exact construction herein set forth.

Having thus fully disclosed my invention what I claim as new is:—

1. The combination with a mold, of strippers adapted to register therewith to eject the article in the mold, a stationary support for one face of the brick means for imparting vertical movement to the mold toward the members and a single means for adjusting the strippers toward the mold prior to the ejection of the molded article and for simultaneously moving the strippers and mold away from the article subsequent to its ejection from the mold.

2. The combination with a mold, received between the rails of a track, of a stripper adapted to eject the contents of the mold, means moving the mold toward the strippers and a vehicle traveling on the track and placed

beneath the mold after the mold has been partially raised to receive and support the contents as it is discharged.

3. A brick ejector comprising a stripper, a mold movable toward and from the stripper and with which the stripper registers, the mold adapted to telescope over the stripper, and movable means receivable directly beneath the mold when in raised position and prior to the ejection of the brick to support the contents of the mold during its ejection.

4. A brick making machine comprising a mold containing one or more cells, strippers with which the cells are adapted to register, means for moving the cells and contents against the strippers, a support removably received beneath the cells during their progress toward the strippers, to receive and support the contents of the mold as it is ejected and a single means for simultaneously causing the mold and strippers to clear the ejected contents deposited on the support.

5. A brick making machine comprising a frame containing a series of cells, a series of strippers with which the cells are adapted to register, a suitable supporting member, threaded rods carried by the support and adapted to removably engage the frame, worm and gear mechanism connected with the rods for causing them to move the frame toward and from the strippers and reversible mechanism for driving the worm and gear mechanism.

6. A brick making machine comprising a mold receivable between the rails of a track, a wider gage track between the rails of which the mold track is located, an ejector mechanism on the wider gage track, means for raising and lowering the mold toward and from the ejector mechanism and a support traveling on the mold track and receivable beneath the mold when it is raised in position to receive and support the material as it is ejected from the mold.

7. The combination with a series of molds, of a traveling carriage adapted to move from mold to mold, strippers mounted on the carriage and means for moving the mold toward and from the strippers.

8. The combination with a series of molds, of a traveling ejector adapted to move from mold to mold, and means for moving the mold toward and from the ejector.

9. The combination with a mold, of an ejector mechanism with which the mold is adapted to register, means for moving the mold and its contents toward the ejector, a suitable support removably located beneath the mold to receive and support the contents as it is ejected, and mechanism for raising and lowering the ejector and mold, said mechanism comprising a set of eccentrics, stationary wings with which the eccentrics engage to raise and lower the ejector and means for actuating the eccentrics.

10. The combination with a mold, of an ejector comprising a body, a stripper depending therefrom, and with which the mold is adapted to register, hangers depending from the body, supporting boxes on which the hangers are adapted to slide, eccentrics journaled in the hangers beneath the boxes, a stationary curved wing depending to a point beneath the eccentrics, the eccentrics adapted to engage the curved wings to raise and lower the body, means carried by the body for moving the mold and its contents toward and from the stripper and means removably located beneath the mold when in engagement with the stripper, for receiving and supporting the contents during its ejection.

11. A traveling ejector comprising a support, a body portion slidably mounted on the support, a stripper carried by the body portion, eccentrics journaled in the body portion, wings carried by the support and engaged by the eccentrics to raise and lower the body portion relative to the support and means for actuating the eccentrics.

12. A traveling ejector comprising a support, a body portion slidably mounted on the support, a stripper carried by the body portion, eccentrics journaled in the body portion, wings carried by the support and engaged by the eccentrics to raise and lower the body portion relative to the support, a shaft for actuating the eccentrics and a cranked lever for actuating the shaft, the lever adapted to engage the body portion when the latter is in raised position, to limit further rotation of the eccentrics.

13. The combination with a mold, of an ejecting mechanism

anism, a stripper fixedly carried thereby, means for moving the mold linearly toward and from the stripper and outwardly curved leaders projecting from the ejecting mechanism for guiding the mold in its travel.

5 14. An ejecting mechanism comprising a suitable support, hangers slidably engaging the support, a body portion to which the hangers are secured, strippers carried by the body portion, shafts journaled in the hangers, eccentrics mounted on the shafts, stationary members carried
10 by the supports and with which the eccentrics engage to move the body portion relative thereto, and means for actuating the eccentrics.

15 15. The combination with a suitable support, of a mold resting on the support which constitutes a pallet board therefor, an ejecting mechanism movable from mold to mold, the ejecting mechanism comprising a carriage, a stripper mounted on the carriage and registering with the mold and a single means for lowering the stripper to the upper face of the mold contents, the lower face of the
20 mold contents resting on its support, and for raising the mold and strippers above the upper face of the mold contents subsequent to its ejection from the mold.

25 16. The combination with a mold and a suitable support constituting a pallet board and on which the mold rests, of an ejecting mechanism movable from mold to mold, the mechanism comprising a carriage, a stripper movably mounted on the carriage, means for moving the mold toward the stripper and means for actuating the stripper prior to the engagement of the mold contents therewith to
30 adjust the stripper relative to the mold contents.

35 17. The combination with a mold and a suitable support constituting a pallet board therefor, of an ejecting mechanism comprising a frame, strippers carried by the frame and registering with the molds, means for grasping the mold and telescoping it over the strippers, and a single means for simultaneously raising the strippers and the mold grasping means relative to the frame.

40 18. In a device for making concrete brick, the combination with a suitable support, of a mold formed of a plurality of cells, means removably attachable to such mold to raise and lower it, a plurality of strippers, each adapted to register with one of the cells and vertically movable relative thereto, and means for supporting the mold and strippers above the level of the completed brick.

45 19. The process of casting cementitious articles comprising the preparation of a liquid wet mix composed of a stony material, cement and water beaten to a creamy consistency, pouring the wet mix into a mold, permitting the mixture to attain its initial set in the mold without the
50 application of pressure, subjecting one face of the molded article to pressure to cause its ejection from the mold subsequent to its obtaining its initial set and yieldingly supporting the opposite face of the molded article during such ejection.

55 20. The process of casting cementitious materials comprising the preparation of a liquid wet mixture composed of stony material, cement and liquid commingled until the mass attains a creamy consistency, pouring such mixture into a mold, permitting the mixture to attain its initial set in the mold without the application of pressure, and
60 finally subjecting one face of the molded article to pressure after it has attained its initial set, to cause its ejection from the mold.

65 21. The process of casting cementitious materials comprising the preparation of a liquid wet mixture composed of stony material, cement and liquid commingled until the mass attains a creamy consistency, pouring such mixture into a mold, permitting the mixture to attain its initial set in the mold without the application of pressure, subjecting one face of the molded article to pressure after it
70 has attained its initial set, to cause its ejection from the mold, and supporting the article during such ejection.

75 22. The process of casting cementitious materials comprising the preparation of a liquid wet mixture composed of stony material, cement and liquid commingled until the mass attains a creamy consistency, pouring such mixture into a mold, permitting the mixture to attain its initial set in the mold without the application of pressure, causing the engagement of an ejecting means with one
80 face of the molded article after it has attained its initial set, to cause its ejection from the mold, and receiving the contents on a suitable support during its ejection from the mold.

85 23. The process of casting cementitious materials comprising the preparation of a liquid wet mixture composed of stony material, cement and liquid commingled until the mass attains a creamy consistency, pouring such mixture into a mold, permitting the mixture to attain its initial set in the mold without the application of pressure, and finally receiving the molded article on a suitable support
90 during its removal from the mold.

95 24. The process of casting cementitious materials comprising the preparation of a liquid wet mixture composed of stony material, cement and liquid commingled until the mass attains a creamy consistency, pouring such mixture into a mold, permitting the mixture to attain its initial set in the mold without the application of pressure, removing the molded article from the mold, and supporting it during such removal on its original bed.

In testimony whereof, we affix our signatures in presence of two witnesses. 100

ROBERT E. LAUGHRAY.

GEORGE FREDRICK LAUGHRAY.

Witnesses:

GEO. B. WILLCOX,

RALPH S. WATFIELD.