Jan. 2, 1923.

J. L. CÔTÉ.

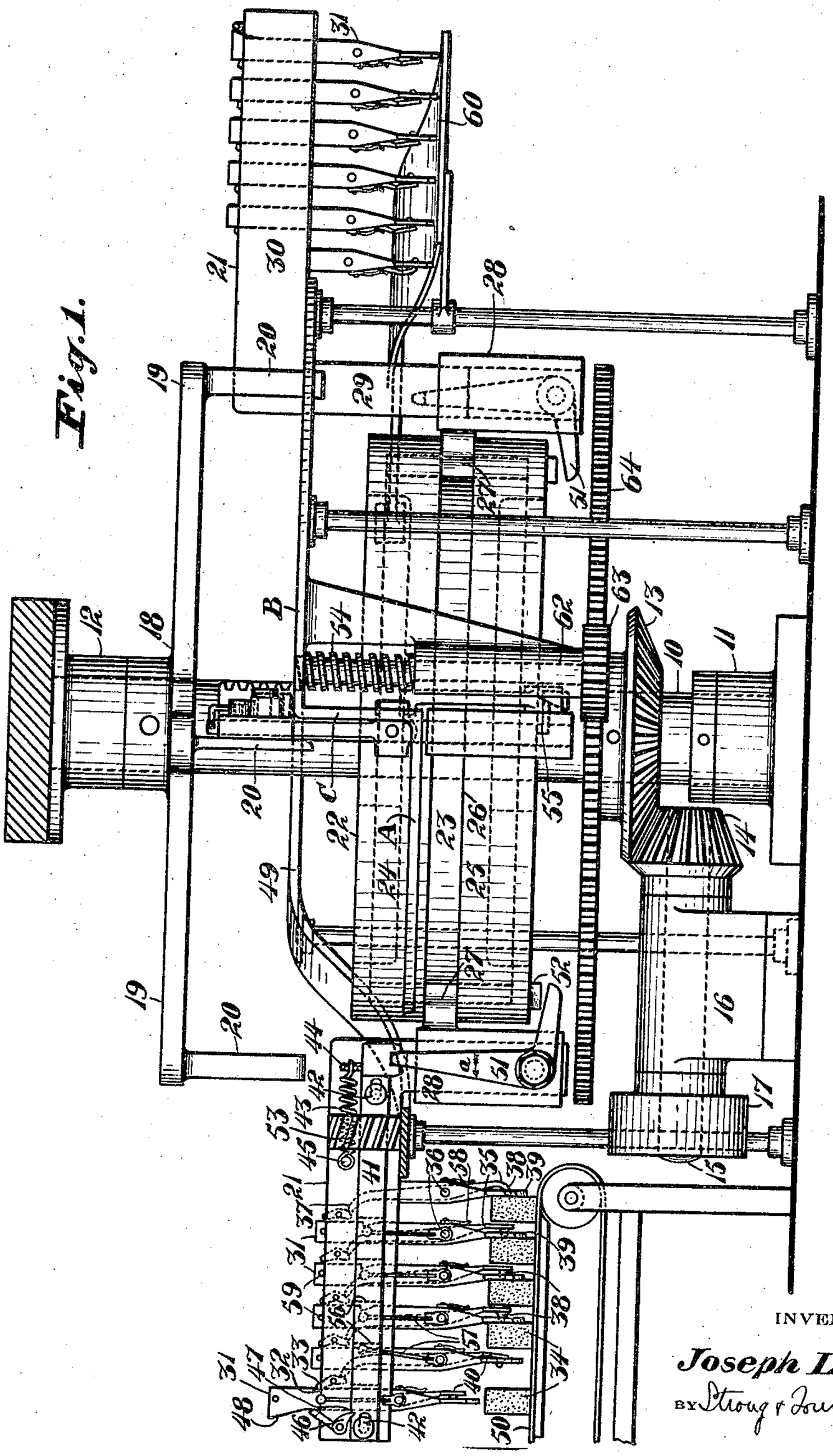
BRICK HANDLING MACHINE.

FILED DEC. 4, 1919.

1,440,769.

2 SHEETS—SHEET 1.

Fig. 1.



INVENTOR

Joseph L. Côté

BY Strong & Townsend

ATTORNEYS

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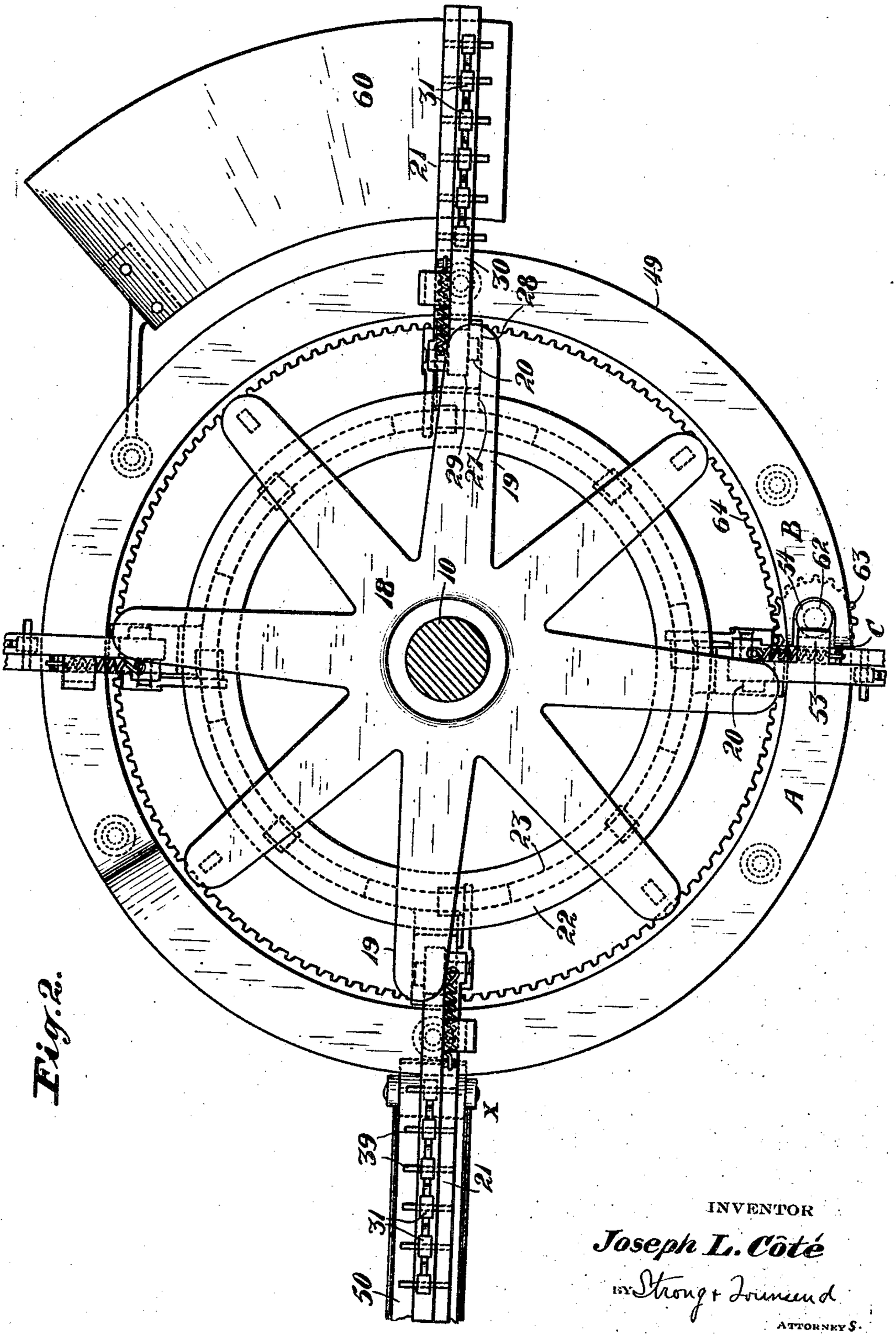

Fig. 2.

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Patented Jan. 2, 1923. 1,440,769

UNITED STATES PATENT OFFICE.

JOSEPH L. CÔTÉ, OF OAKLAND, CALIFORNIA.

BRICK-HANDLING MACHINE.

Application filed December 4, 1919. Serial No. 342,367.

To all whom it may concern:

Be it known that I, JOSEPH L. CÔTÉ, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Brick-Handling Machines, of which the following is a specification.

This invention relates to a brick handling machine.

It is the principal object of the present invention to provide a machine to which bricks may be continuously delivered, and by which they may be automatically transferred from the delivery means to be arranged in courses upon a flat car or a storage platform.

The present invention contemplates the use of a continuously operating conveyer, upon which bricks are carried and from which they may be withdrawn in quantities to thereafter be carried to a loading platform and then arranged in courses thereupon to form stacks, or to load a flat car when transportation is contemplated. Furthermore, the present invention contemplates a mechanism by which the bricks may be automaticaliy grasped and will, by their own movement, be locked in position prior to the transfer to the platform.

The invention is illustrated by way of example in the accompanying drawings, in which—

Fig. 1 is a view in side elevation, illustrating the completely assembled machine.

Fig. 2 is a view in plan, illustrating the machine with parts broken away for the sake of convenience.

In the drawings, 10 indicates a vertical shaft, mounted with its lower end resting in a combined radial and thrust bearing 11, and its upper end is housed within a radial bearing 12. This shaft is provided with a bevel gear 13, by which it is rotated. This gear is pinned upon the shaft and is in mesh with a bevel pinion 14, carried by a horizontally extending countershaft 15. The countershaft is rotatably supported within a journal block 16 and may be driven by a pulley 17 from any suitable source of supply.

The shaft 10 is provided at its upper end with a spider 18 which is more clearly shown in Fig. 2 as having a plurality of radial arms 19 for a purpose which will be hereinafter set forth. All of the arms of the spider are formed with downwardly extending hangers 20 which are adapted to engage movable carrying units 21 at certain intervals in the rotation of the spider and its shaft.

As shown in Fig. 2 of the drawings, four of the carrier units are provided, although it will be understood that various other arrangements might be made to permit the use of more of these arms in the event it is found advisable. The carrier units 21 are adapted to rotate concentrically with the vertical shaft 10 and in relation to a drum 22 which is secured around the vertical shaft and acts as a fixed circular guide for the units. This drum is formed with a cylindrical base portion 23, circumscribed by two bands 24 and 25. These bands are of larger diameter than the outside diameter of the base portion and their marginal edges are spaced from each other to form an annular and horizontally extending slot 26.

It will thus be seen that in connection with the annular slot 26 upper and lower annular recesses will also be provided and these are fitted to receive T-shaped guide brackets 27. The guide brackets 27 are formed integral with vertical bearing members 28. These bearing members are preferably rectangular in section and have a rectangular interior opening, into which the slide shank 29 of traveling frames 30 may reciprocate. The frames 30, as before stated, extend radially in relation to the shaft 10 and may be intermittently engaged by the downwardly extending hangers 20 of the spider 18. These frames are fitted with a plurality of brick-clamping arms 31 which are vertically reciprocable in the frame and are arranged in parallel relation to each other, as clearly shown in Fig. 1 of the drawings.

The arms are each fitted with a square shouldered notch 32 into which a supporting pawl 33 normally projects. This pawl suspends the arm above the line of the top of the bricks, as indicated in Fig. 1. That is to say, pawls 33 are provided for each of the arms, save the innermost arm which is constantly supported in its lowermost position in register with the bricks 34, and which arm is not vertically reciprocal. Each of the arms is fitted with a combined trip and clamping lever 35. This lever in each instance is pivoted, midway the length of the arm, upon a pin 36 and has its upper end

fitted with a finger 37 adapted to strike the lower portion of a pawl 33 and to move it upwardly to release the arm with which it is engaged and to permit that arm to fall. Each of the levers 35 is formed with a lug 38 which extends through a projection in a clamping pad 39, at the lower end of the arm. It will also be noted that all of the levers 35, save the innermost one in each set, are provided with clamping pads 40 which will engage the forward side of a brick and cooperate with the pad 39 in holding the brick in a manner which will be hereinafter set forth.

Upon each of the frames 30 a horizontally sliding bar 41 is provided. This bar is fitted with longitudinally extending slotted openings through which supporting pins 42 are positioned. A tension spring 43 is secured to a pin 44, on the rear end of each of the bars 41 and by its forward end to a pin 45 on the frame 30. This tends to force the bar 41 outwardly. However, this movement is prevented by a locking pawl 46 which engages a recess 47, at the outer end of each of the bars, and which pawl is adapted to be elevated by a cam face 48 carried upon the forward side of the outermost arm 31.

The frames 30, as before stated, extend horizontally and at right angles to the vertical shank portions 29 which are formed integrally therewith and which may reciprocate through the bearing brackets 28. The frames 30 are further supported by a track 49 which circumscribes the central structure of the brick loading machine and which has a lower runway A and an upper runway B, both of which runways are continuous and form an annular track for supporting the frames 30 in their lowermost positions, as represented when a loading operation is being made, and in their uppermost positions while traveling to and from the point of unloading.

In order to cause the loading units 21 to move, it is necessary for each of the arms 31 of one unit to have been encountered by a brick carried along the conveyer 50. When this is done, as before stated, the bar 41 will be released under the tension of spring 43 and will swing a bell-crank 51 in the direction of the arrow *a*. The upper end of this bell-crank projects into a seat on the end of the bar 41 and thus receives motion therefrom. The lower arm of the bell-crank will thus swing upwardly and beneath the supporting drum 23 to encounter one of a series of lugs 52. These lugs are formed integral with the drum and thus will permit the unit 21, which has been loaded, to be locked in relation to the drum 23 and to be carried around to a point of unloading, which we may assume in the present instance is at right angles to the point of loading. As the unit is carried in this direction it will pass along the lower horizontal portion A of the runway until it reaches the point of unloading. At this point a worm gear 53, rotatably supported upon the unit, will engage a vertically extending worm 54, carried upon the frame structure of the track 49, and will thus be elevated along the vertical portion C of the track until the bottom of the frame 30 will register with the bearing surface of the track at B. At the instant the unit is elevated, its frame will be encountered by one of the downwardly extending hangers 20 and may be carried along the track for subsequent operations.

It will be understood that at the instant prior to the registry of gears 53 and 54 the bricks will be released and will be deposited in a course upon the loading platform. It is further to be understood that this loading platform is provided with a suitable mechanism which may be lowered one course of bricks at a time and shifted so that the bricks may be piled, if desired. The release of the bricks is effected by the frame 30 striking the vertical portion C of the track 49, while the drum 23 continues to rotate. The lugs 53 of the drum are provided with tapered faces 55 so that as the lug continues to move the horizontal leg of the bell-crank 51 will be forced downwardly to positively draw the bar 41 inwardly. The cams 56 which are secured to or formed integral with the bar 41 will then be released from pressure against the upper ends of resilient operating levers 57 by which the pads 40 had been forced rearwardly to cooperate with the pads 39 in clamping the brick and will permit springs 58 to force the pads forwardly to their normal position for receiving other bricks.

After the bricks have thus been released all of the arms 31 will be free to reciprocate and will be dependent from pins 59, by which they are being supported from the tops of the frames 30. An inclined runway 60 is provided, along which the bottoms of the arms 30 may pass and which will act to elevate them until the pawls 31 fall into the recesses 32 and support them, as indicated at the outer end of the arm 30 in Fig. 1.

It will be understood that the worm gear 54 is mounted upon a rotating shaft 62, fitted with a pinion 63 at its lower end and that this pinion is in mesh with a large driving gear 64 rotating with the drum 22.

In the operation of the present invention it will be assumed that the arms 31 upon a frame positioned at X, as indicated in Fig. 2, will all be supported in their uppermost position save the innermost arm which is always down, and that these arms will be held by means of the pawls 33. It will be evident that the pad 39 of the innermost arm will be in the path of travel of the bricks 34 and that as a brick is carried by the con-

veyer belt it will strike this pad and move the extension 38 of lever 35 rearwardly. This movement will cause the upper end of the lever arm to strike the lower swinging end of pawl 33 upon the next arm and swing it out so that this arm may fall in front of the first brick and in position to be struck by the second brick. This will result in causing the second arm to swing rearwardly to release the pawl of the third arm and so on to the outermost arm.

When the outermost arm is released, the cam face 48 will strike the lever of the pawl 46 and will release the bar 41 to cause it to be projected horizontally and outwardly. This release will move the cams 56 against the outer ends of the resilient arms 57 and will force the pads 40 rearwardly and against the front faces of the bricks. Due to the fact that the arms 57 are resilient, it will be evident that variations in the thickness of the bricks will be accommodated and that all of the bricks will be positively clamped. At the same time the bar 41 moves outwardly it will swing the bell-crank lever 51 so that its horizontal leg is in engagement with the tapered front face of the lug 52 upon the drum 22. The drum and arm will then move along the horizontal portion A of the track until it encounters the track part C, when it will act, as before stated, to positively force the bar 41 rearwardly, release the bricks and elevate the frame to the level of the track portion B. This frame will then be driven by the spider 18 and will be carried around so that the arms will be elevated on the runway 60 and thereafter conveyed to the lower portion A of the track where the frame will move beneath the reach of the hanger 20 to remain stationary until the carrying unit has been filled with bricks.

It will thus be seen that the mechanism here disclosed embodies the use of a positively and intermittently driven carrier to which bricks may be successively delivered and automatically picked up and thereafter placed in a systematic row and along a course of bricks in a pile to again return for receiving more bricks.

While I have shown the preferred form of my invention as now known to me, I wish it understood that various changes in the construction, arrangement and combination of parts may be made by those skilled in the art without departing from the spirit of my invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A brick handling machine comprising a constantly rotating driving element, a plurality of multiple brick carrying units, to which bricks may be successively delivered, adapted to be intermittently driven by said driving element, automatic means for clamping said bricks in said unit and placing the unit in driving engagement with the driving element when the unit has been filled to its capacity, and means for automatically releasing all the bricks within said unit and simultaneously disengaging it from the driving element when the point of unloading has been reached.

2. A brick handling machine comprising a plurality of multiple brick conveying units adapted to move in a circular course of travel, means for loading each unit successively, automatic means for clamping the bricks in the unit being loaded when its capacity has been reached, means for advancing the units from loading to unloading position, means for automatically and simultaneously releasing all the bricks conveyed by the conveying units when they reach the point of unloading, and means for vertically moving the unit at the unloading point when the bricks have been released to effect an unloading operation.

3. A brick handling machine comprising a constantly rotating driving element, a plurality of brick-carrying units adapted to be intermittently driven thereby, means whereby a unit will be placed in driving engagement with the driving element, when it has been filled to its capacity, and means for releasing the bricks within said unit and simultaneously disengaging it from the driving element.

4. A brick handling machine comprising a central, vertical shaft, a rotary drum carried thereby, a plurality of radially disposed brick-carrying units movable in relation to the drum, means for locking said units to move with said drum, a driving spider, a track around which said units travel and which track has two horizontal planes, and means whereby the brick-handling units may be successively locked to rotate with the drum when they have been filled to their capacity and carried along the lowermost run of the track, and automatic means for disengaging the carrying unit from the drum while elevating it to the upper run of the track to there be engaged by the driving spider and carried therealong.

5. In a brick handling machine, a carrying unit comprising a plurality of downwardly extending arms, the innermost of which is normally supported in a plane below the remaining arms and against which a brick may be delivered, trip means carried by the innermost of said arms and adapted to effect the release and lowering of the next succeeding arm, and means whereby the delivery of a brick against the next to the outermost arm will cause all of the bricks to be locked in relation to the various arms.

6. In a brick handling machine, a carrying unit comprising a horizontally extend-

ing frame member, a plurality of vertically extending arms, the innermost of which is stationary and the remaining arms of which are vertically slidable and normally held at a level above the bottom portion of the stationary arm, a trip member upon each of said arms adapted to be operated by the presence of a brick thereagainst for releasing the next succeeding arm, clamping pads carried by said trip members, and means whereby the presence of a brick against the next to the outermost arm will cause all of said clamping pads to cooperate with the pad of the adjacent arm to clamp a brick in position.

7. In a brick handling machine, a carrying unit comprising a horizontally extending frame member, a plurality of vertically extending arms, the innermost of which is stationary and the remaining arms of which are vertically slidable and normally held at a level above the bottom portion of the stationary arm, a trip member upon each of said arms adapted to be operated by the presence of a brick thereagainst for releasing the next succeeding arm, clamping pads carried by said trip members, means whereby the presence of a brick against the next to the outermost arm will cause all of said clamping pads to cooperate with the pad of the adjacent arm to clamp a brick in position, and yieldable means for accommodating various sized bricks between the clamping pads and the arms.

8. In a brick handling machine, a carrying unit comprising a horizontally extending frame member, a plurality of vertically extending arms, the innermost of which is stationary and the remaining arms of which are vertically slidable and normally held at a level above the bottom portion of the stationary arm, a trip member upon each of said arms adapted to be operated by the presence of a brick thereagainst for releasing the next succeeding arm, clamping pads carried by said trip members, means whereby the presence of a brick against the next to the outermost arm will cause all of said clamping pads to cooperate with the pad of the adjacent arm to clamp a brick in position, yieldable means for accommodating various sized bricks between the clamping pads and the arms, conveying means, and means whereby the release of the outermost arm will cause the carrying unit to become movably connected with said conveying means.

9. In a brick handling machine, a carrying unit comprising a horizontally extending frame member, a plurality of vertically extending arms, the innermost of which is stationary and the remaining arms of which are vertically slidable and normally held at a level above the bottom portion of the stationary arm, a trip member upon each of said arms adapted to be operated by the presence of a brick thereagainst for releasing the next succeeding arm, clamping pads carried by said trip members, means whereby the presence of a brick against the next to the outermost arm will cause all of said clamping pads to cooperate with the pad of the adjacent arm to clamp a brick in position, yieldable means for accommodating various sized bricks between the clamping pads and the arms, conveying means, means whereby the release of the outermost arm will cause the carrying unit to become movably connected with said conveying means, and means whereby the carrying unit may be caused to release the bricks and to be elevated to withdraw the arms from therebetween at a predetermined point in the path of the conveying means.

10. In a brick handling machine, a carrying unit comprising a horizontally extending frame member, a plurality of vertically extending arms, the innermost of which is stationary and the remaining arms of which are vertically slidable and normally held at a level above the bottom portion of the stationary arm, a trip member upon each of said arms adapted to be operated by the presence of a brick thereagainst for releasing the next succeeding arm, clamping pads carried by said trip members, means whereby the presence of a brick against the next to the outermost arm will cause all of said clamping pads to cooperate with the pad of the adjacent arm to clamp a brick in position, yieldable means for accommodating various sized bricks between the clamping pads and the arms, conveying means, means whereby the release of the outermost arm will cause the carrying unit to become movably connected with said conveying means, means whereby the carrying unit may be caused to release the bricks and to be elevated to withdraw the arms from therebetween at a predetermined point in the path of the conveying means, and means for restoring the arms of the carrying unit to their original positions as they are redelivered to the loading station.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH L. CÔTÉ.

Witnesses:
FRED KING,
GEORGE L. SMITH.