Dec. 19, 1933. J. J. SYLVA 1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

Filed May 2, 1932 6 Sheets-Sheet 1

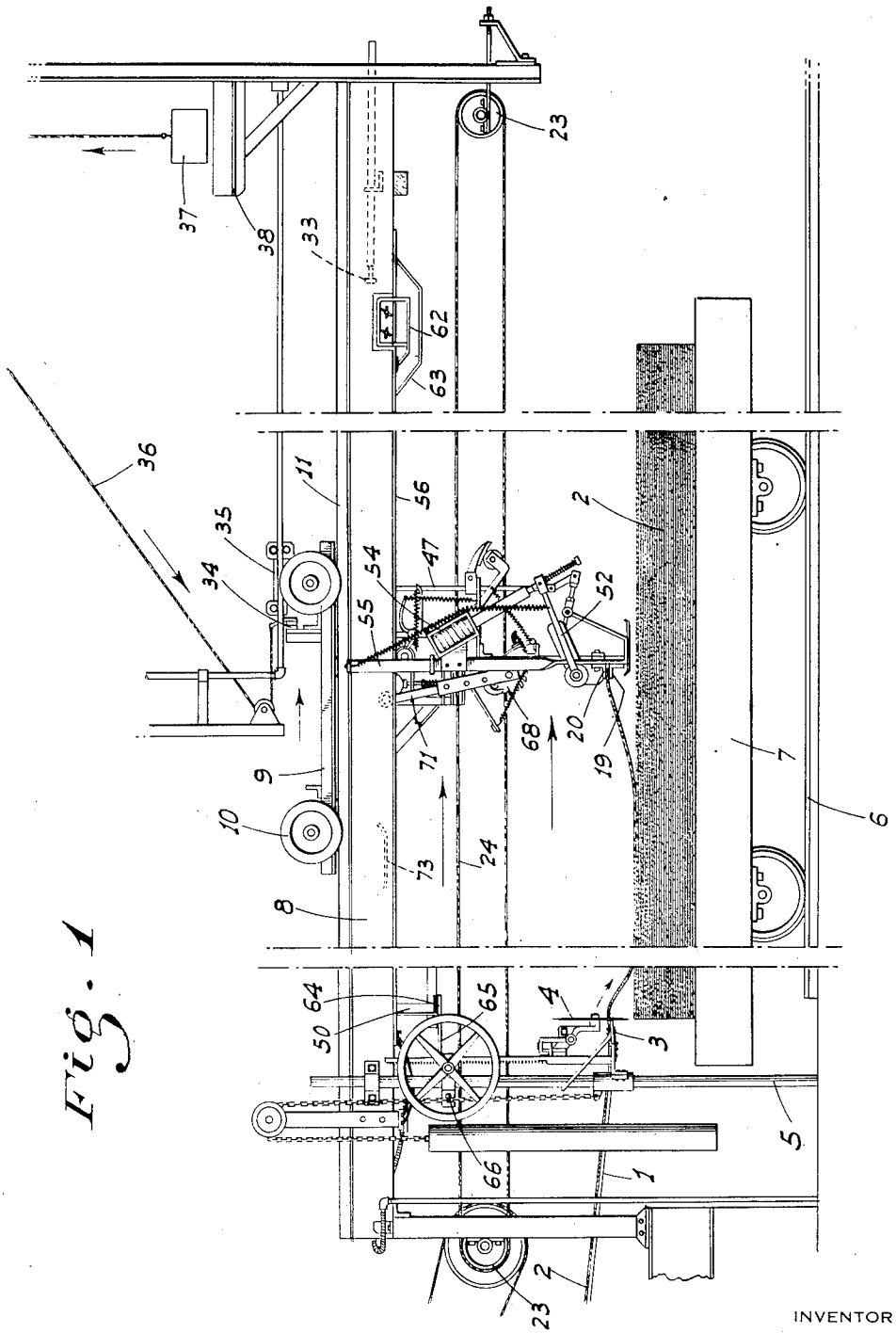


Fig. 1

INVENTOR

J. J. Sylva

BY

ATTORNEY

Dec. 19, 1933. J. J. SYLVA 1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

Filed May 2, 1932 6 Sheets-Sheet 2

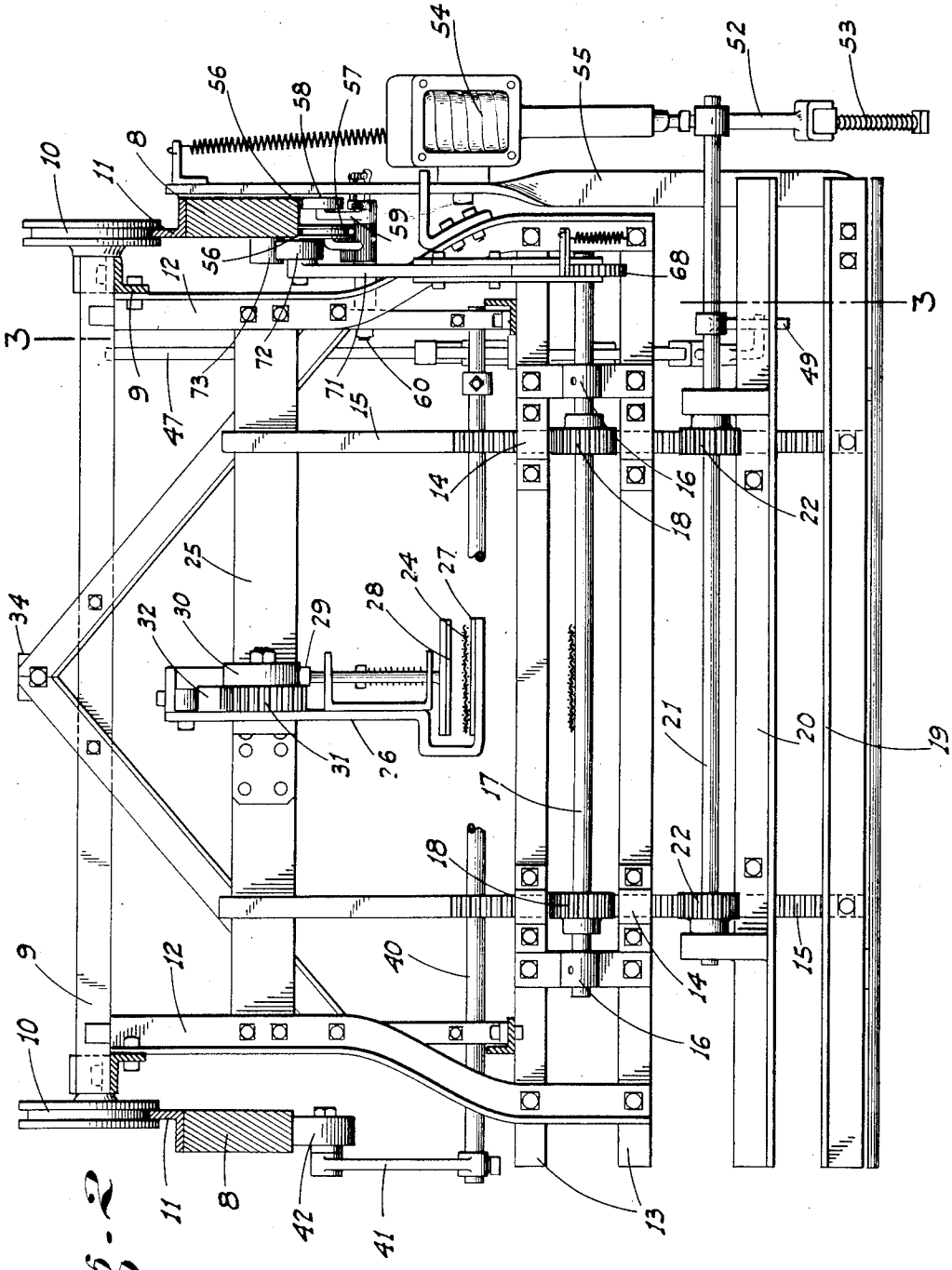


Fig. 2

INVENTOR

J. J. Sylva

BY

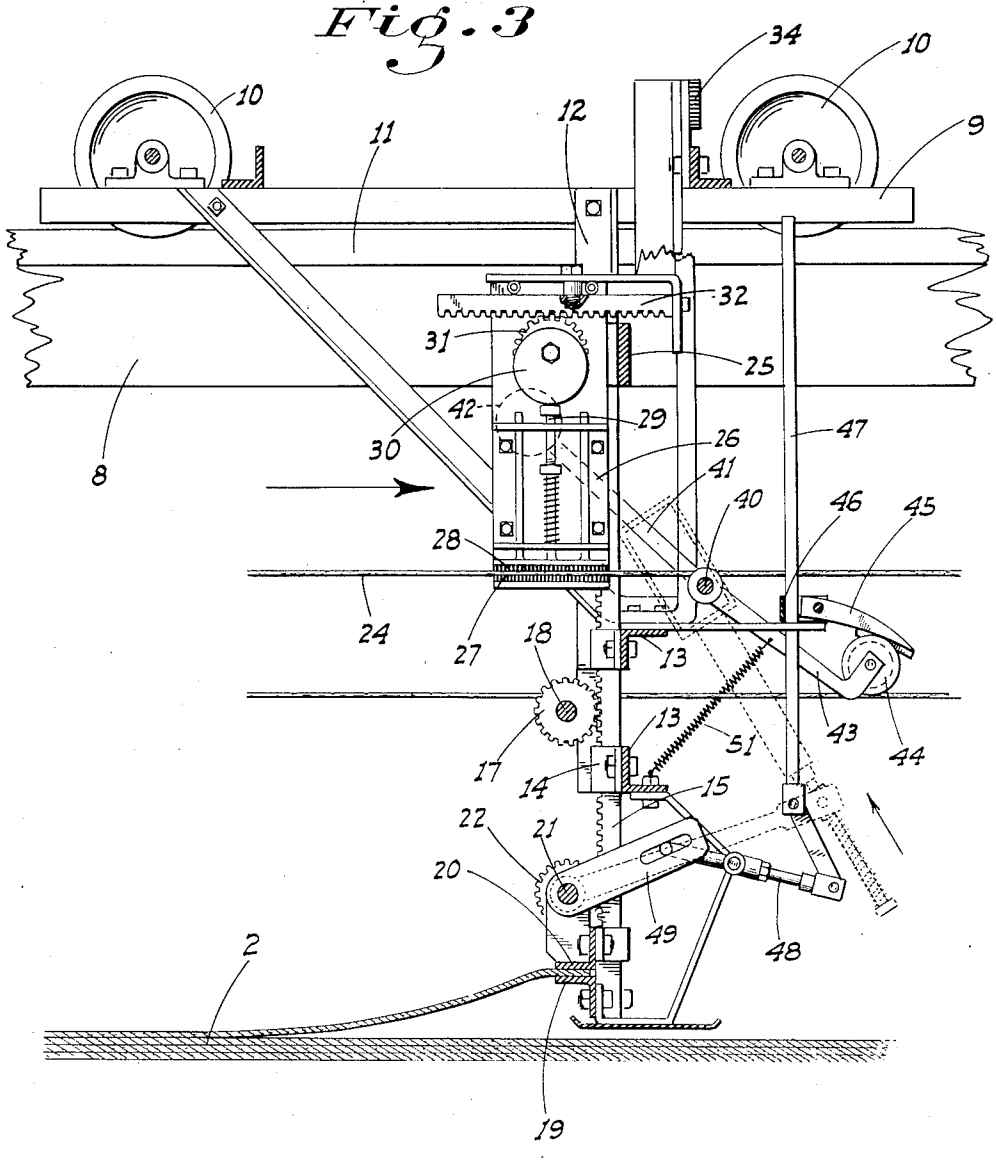
ATTORNEY

Dec. 19, 1933. J. J. SYLVA 1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

Filed May 2, 1932 6 Sheets-Sheet 3

Fig. 3



INVENTOR

J. J. Sylva

BY

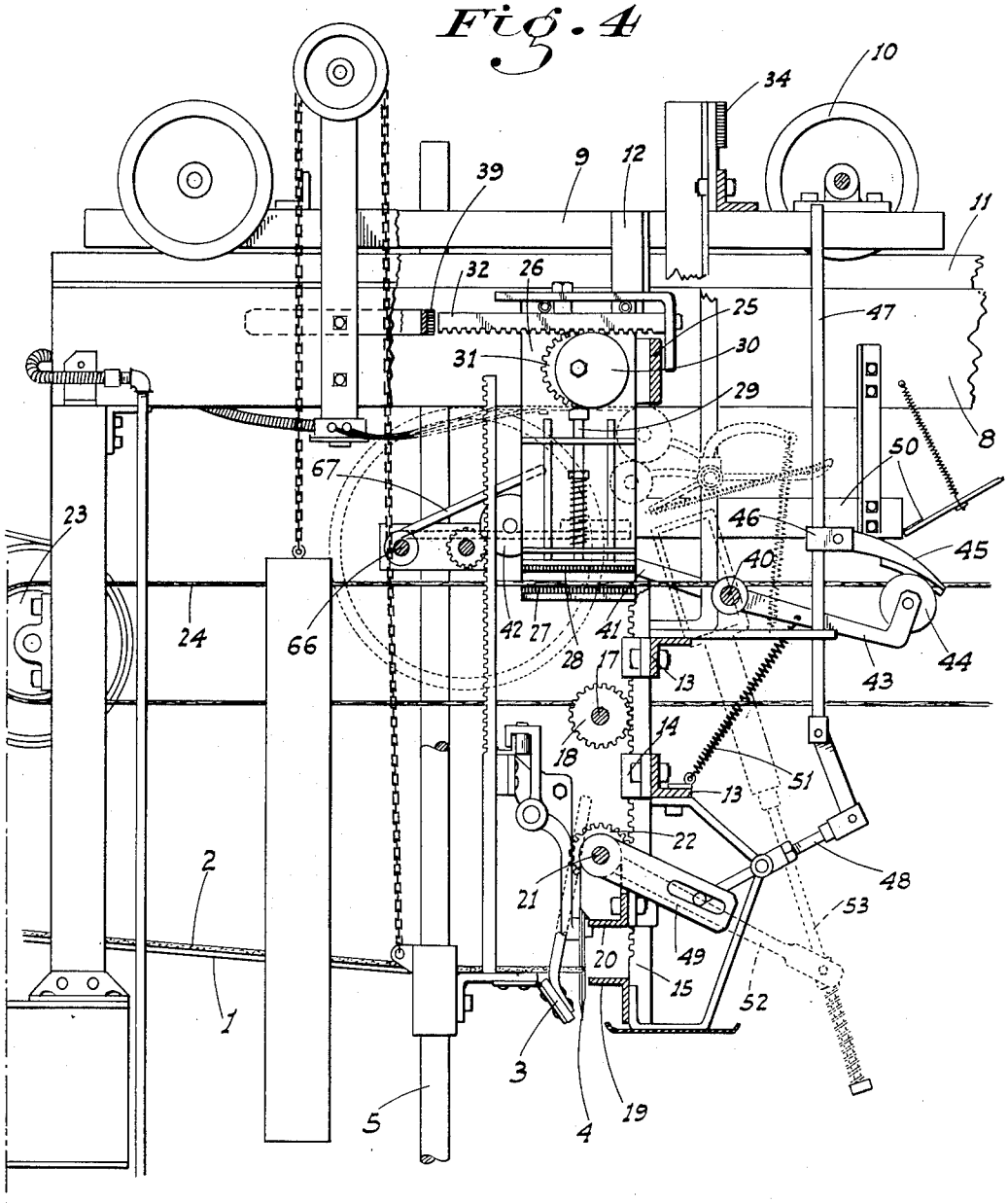
ATTORNEY

Dec. 19, 1933. J. J. SYLVA 1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

Filed May 2, 1932 6 Sheets-Sheet 4

Fig. 4



INVENTOR

J. J. Sylva

BY

ATTORNEY

Dec. 19, 1933. J. J. SYLVA 1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

Filed May 2, 1932 6 Sheets-Sheet 5

Fig. 5

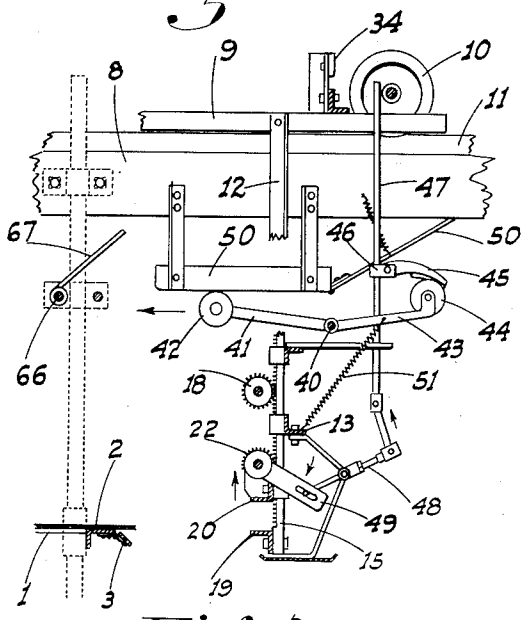


Fig. 6

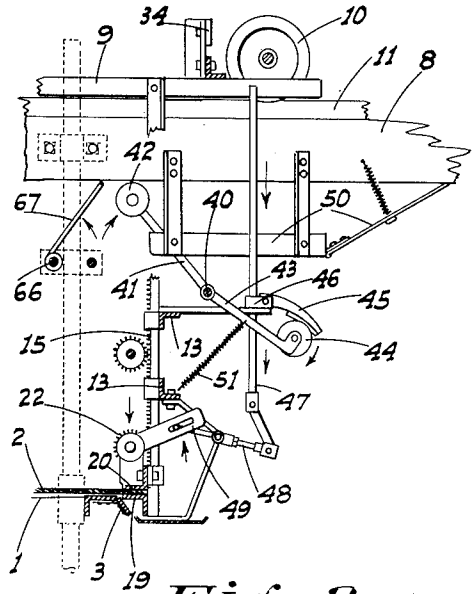


Fig. 7

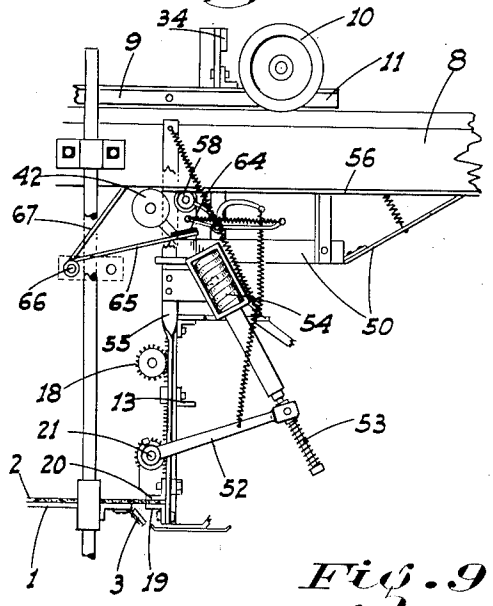


Fig. 8

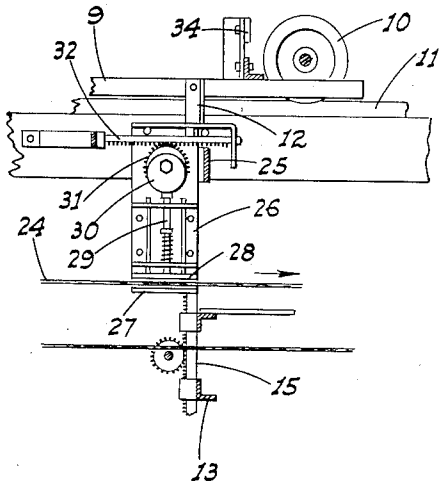
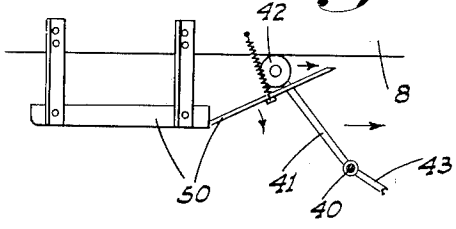


Fig. 9



INVENTOR

J. J. Sylva

BY

ATTORNEY

Dec. 19, 1933. J. J. SYLVA 1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

Filed May 2, 1932 6 Sheets-Sheet 6

Fig. 10

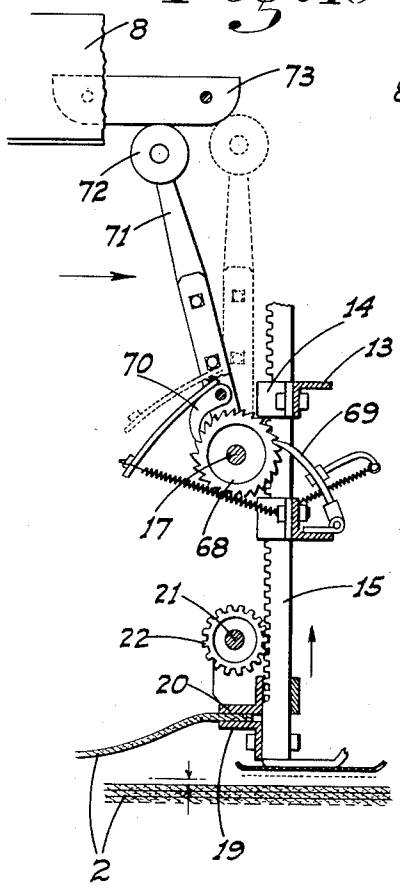


Fig. 11

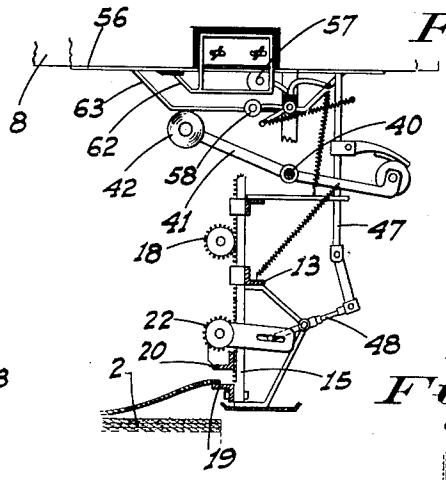


Fig. 12

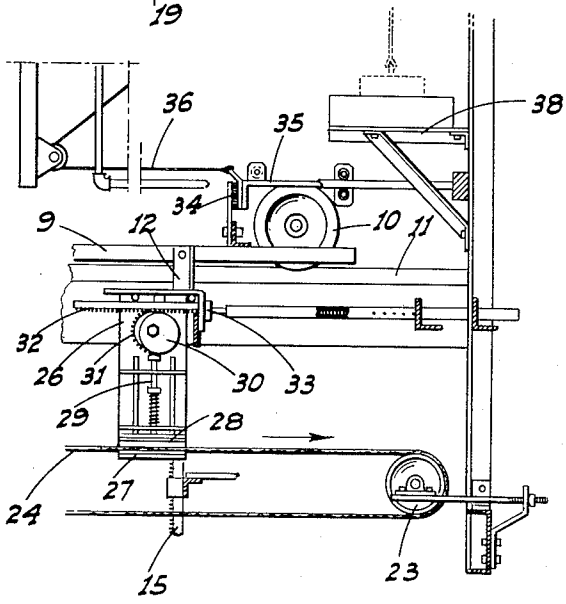


Fig. 13

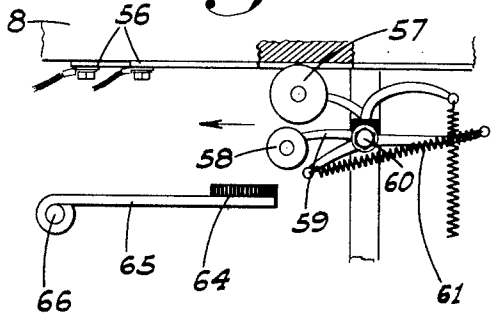
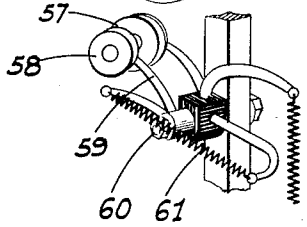


Fig. 14



INVENTOR

J. J. Sylva

BY

ATTORNEY

Patented Dec. 19, 1933

1,940,154

UNITED STATES PATENT OFFICE

1,940,154

APPARATUS FOR HANDLING GREEN PLASTER BOARD

John J. Sylva, Stockton, Calif., assignor to California Cedar Products Company, Stockton, Calif., a corporation

Application May 2, 1932. Serial No. 608,739

20 Claims. (Cl. 271—63)

This invention relates to machines for drawing plaster board as continuously formed from a point beyond the forming rolls and depositing the board on a truck or the like in the form of stacked sheets; this invention particularly representing improvements over the structure of J. F. Makowski, Patent No. 1,598,381, dated August 31, 1926.

In this previous device the engagement and disengagement of the jaws with the board, the movement of the jaw supporting carriage and the vertical adjustment of the jaws to compensate for the differences in level of the boards piled on the truck as the height of the stack increases, was manually controlled and left to the judgment of the operator. This proved unsatisfactory in that it necessarily relied on the human element, and the resultant occasional errors in judgment sometimes caused the tearing of the board, the failure to stack the boards in regular alinement, and other occurrences which tended to slow up and destroy the efficiency of operations as a whole.

The principal object of the present invention is to eliminate the objectionable features of the previous apparatus by providing one so constructed that engagement and disengagement of the jaws with the board is effected automatically at the proper instant; the carriage is power driven with its drive automatically engaged and disengaged with the carriage at periods synchronized with the jaw engaging and disengaging action; and the jaws are automatically raised vertically a distance equal to the thickness of a board with each reciprocation of the carriage.

Other objects will be apparent upon a perusal of the accompanying drawings and the following specification.

These objects I accomplish by means of such structure and relative arrangements of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of the complete apparatus foreshortened showing the carriage drawing a board as formed onto a stack on the truck.

Fig. 2 is a transverse view of the carriage looking toward the back of the same.

Fig. 3 is an enlarged longitudinal section of the carriage as moving along with a board and taken substantially on the line 3—3 of Fig. 2.

Fig. 4 is a similar view of the carriage and the adjacent parts at the head end of the apparatus showing the carriage nearing the position at which the jaws engage the end of the board.

Figs. 5 and 6 are diagrammatic longitudinal sections of the carriage showing the operating parts controlling the engagement of the jaws as the carriage returns to and reaches the board supporting apron.

Fig. 7 is a diagrammatic side elevation of the carriage in a position corresponding to Fig. 6 and showing closing action of the switch in the circuit of the jaw holding magnet.

Fig. 8 is a fragmentary diagrammatic section of the carriage in positions corresponding to Figs. 6 and 7 and showing the engagement of the belt clamp with the driving belt.

Fig. 9 is a fragmentary diagram showing the return movement of the jaw actuating control arm past the sloping track member which effects the closing of the jaws on the back stroke of the carriage.

Fig. 10 is a fragmentary longitudinal section of the carriage showing the vertical adjustment mechanism in operation.

Fig. 11 is a diagrammatic longitudinal section of the carriage showing the magnet circuit breaking device and the jaw releasing mechanism in operation.

Fig. 12 is a diagrammatic fragmentary view of the carriage and sundry other parts, the carriage being in the same position as in Fig. 10 and showing the disengaging action of the belt clamp.

Fig. 13 is a fragmentary longitudinal view showing the magnet switch as open and as approaching the switch closing device.

Fig. 14 is a perspective view of the switch itself.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes a supporting surface on which the board 2 as formed is fed from the rolls as fully set forth in the Makowski patent aforementioned. This surface terminates in a short apron 3 hinged for downward movement from a horizontal position and manually controlled by the operator. A cutter 4 of suitable character is mounted above the apron in connection with a supporting frame 5 for movement transversely of the apron and disposed in a vertical plane in alinement with the outer end of said apron when it is horizontally disposed. This cutting structure is preferably the same as shown in the Makowski Patent No. 1,609,654, dated December 7, 1926. Rails 6 to support and guide a board carrying truck 7 extend away from the apron at the floor level, and substantially horizontal supporting beams 8 for the board pulling carriage which forms the subject matter of this invention are mounted above the rails in parallel relation thereto.

The carriage comprises a frame 9 mounted on wheels 10 engaging rails 11 mounted on the beams 8. Frame members 12 depend from the frame 9 and at their lower ends support vertically spaced cross bars 13. These bars support guides 14 in which transversely spaced vertical rack bars 15 are slidable, and also support journals 16 for a transverse shaft 17 having pinions 18 engaging

the racks. The lower ends of the racks are secured to the lower transverse jaw 19, while the upper jaw 20 is not directly attached to the racks but supports a transverse shaft 21 on which pinions 22 are mounted which engage the racks. The jaws are arranged to automatically close and grip the cut end of the board 2 at the apron 3 when the latter is depressed and to automatically open and release the board when the latter is pulled along a predetermined distance and deposit such board on the truck 7.

The travel of the carriage through a stroke of such predetermined length is controlled as follows:

Mounted on fixed end pulleys 23 some distance below the beams 8 is a horizontally disposed endless belt 24 whose upper run is driven away from the apron 3. Secured to and depending from a cross bar 25 connected to the frames 12 is a bracket 26 on which is mounted a clamp jaw 27 which engages the under face of the upper run of the belt. A cooperating clamp jaw 28 engages the upper face of said run of the belt and is mounted on an upstanding stem 29 slidably mounted in the bracket. The upper end of this stem is engaged by an eccentric 30 fixed in connection with a pinion 31 journaled in the bracket. A horizontal rack 32 slidably mounted in the bracket and extending lengthwise of the beams 8, engages said pinion. When the carriage travels away from the apron the belt is engaged by the jaws and the rack 32 then projects rearwardly beyond the carriage some distance.

As the carriage approaches its limit of movement in this direction the rack engages a fixed cushioned bumper 33 (see Fig. 12) which causes the rack to be shifted in the opposite direction. This turns the pinion 31 in a corresponding direction and releases the eccentric from clamping engagement with the stem 29. The carriage is then released from driving engagement with the belt and is free to return to the starting point. Before the carriage is thus released however a bumper 34 on the carriage frame 9 engages a truck 35 mounted in connection with the beams 8 for movement lengthwise thereof. This truck is attached to a cable 36 which extends thence to a counterweight 37, the cable being arranged so that when the truck is thus moved the counterweight will be raised from its normal resting place on a fixed support 38. When the carriage frame 9 is released from driving engagement with the belt therefore the weight will exert its influence to move the truck in the opposite direction and it will travel unrestrained in such direction until adjacent the apron 3; this movement being aided if desired by disposing the beams 8 on the slight downward slant toward such end.

As the carriage reaches such end of its travel the rack 32, which was pushed forward when engaged by the bumper 33, now engages a bumper 39 mounted in fixed connection with the beams 8. Such engagement moves the rack rearwardly causing the eccentric 30 to be rotated and again clamp the upper jaw member 28 against the belt 24. Since the belt is constantly driven such engagement causes the carriage to immediately start on another stroke. These parts are arranged so that just as the belt is again clamped the jaws 19 and 20 assume positions in overlapping relation to the adjacent end of the board 2, which has been cut through by the manipulation of the cutter 4 during the return movement of the carriage.

Simultaneously with the engagement of the belt the jaws are automatically clamped against the board in the following manner:

Pivoted in connection with the upper cross bar 13 is a shaft 40 having on one end a radial arm 41 carrying a roller 42 which engages the under side of one of the beams 8, this arm projecting forwardly relative to the retractive movement of the carriage. The other end of this shaft carries a similar but oppositely projecting arm 43 on which is mounted a roller 44 which engages and supports a grip member 45 projecting from one side of a slide collar 46. This collar is disposed about a vertical rod 47 which at its lower end is linked to one end of a lever 48. This lever is pivoted intermediate its ends in connection with the lower cross bar 13, and at its opposite end is flexibly connected to an arm 49 projecting radially from and secured to the shaft 21.

The arrangement of these parts is such that when the member 45 is lifted it grips and lifts the rod 47. This through the described connections rotates the pinions 22 in a direction such as to raise the upper jaw 20 so as to temporarily hold the same clear of the lower jaw. This enables the end of the board 2 to project therebetween so that the jaws when brought together will be clamped against the board. This lifting action on the rod 47 is effected a short distance before the belt is gripped by its clamp by the engagement of the roller 42 with a sloping track 50 mounted on one of the beams 8, as shown in Fig. 5. This engagement of the roller 42 with the downwardly sloping end of this track causes the opposite arm 43 to be raised, imparting the upward action to the rod 47, as above described. The track 50 terminates abruptly allowing the roller 42 to suddenly raise to the level of the beam 8, as in Fig. 6, the movement being aided by a spring 51 applied to the arm 43. This frees the rod 47 from the member 45, allowing the upper jaw 20 to drop down of its own weight onto the board 2 thereunder, this movement being accompanied by a reversal in position of the arm 49 and lever 48, and a corresponding downward movement of the rod 47. As the carriage then starts to move in a driven direction, the roller 42 maintains contact with the beam 8, the sloping portion of the track 50 being hinged at the bottom and being unattached to the beam to allow the roller to deflect and pass by said portion of the track, as shown in Fig. 9.

At the same instant the jaws are thus held clamped by an electrical device in the following manner:

Projecting from the shaft 21 is an arm 52 to the outer end of which an upwardly projecting rod 53 is swivelly connected. The upper end of this rod is secured to or forms the core of a solenoid 54 which is swivelly mounted on a post 55 upstanding from and secured to the lower jaw 19. The current carrying leads for the solenoid are in the form of a pair of rails 56 mounted in insulated relation on the under side of one of the beams 8. One of said rails is constantly engaged by a spring pressed roller 57 mounted in connection with the rigid carriage structure below the beams and having suitable electric connection with one terminal of the solenoid in any desired manner. The other rail is engaged by a roller 58 mounted on an arm 59 which is turnable on a spindle 60 secured to the carriage frame. A snap action spring 61 acts to hold the roller either in its

raised or lowered position. This roller is also suitably connected to the other terminal of the solenoid and is of course insulated from the roller 57. Both rollers are in contact with the circuit rails as the carriage moves away from the apron, so that the solenoid is energized and holds the jaws in firm clamped engagement with the board. Just before the carriage reaches the point in its travel where the belt becomes disengaged the roller 58 is engaged by and rides on a downwardly sloping track 62 insulated from the circuit rail, so that the solenoid circuit is broken and the clamping grip on the jaws 19 and 20 is broken.

The length and slope of this track 62 is sufficient to move the arm 59 past a dead center position relative to the spring 61 so that the latter then holds the roller 58 from again engaging the track.

At the same time the roller 42 engages a sloping track 63, causing the rod 47 and the upper jaw 20 to be raised thus definitely releasing the board and allowing the adjacent end of the latter to fall onto the truck 7. Since the various releasing actions all take place at the same point in the travel of the carriage with recurring reciprocations of the same, the boards will all be stacked in even alinement as will be evident.

As soon as the roller 42, with the return movement of the carriage, as imparted thereto by the counterweight, leaves the track 62, the jaw 20 drops of its own weight to its lowered position and remains there until the jaws are again spread at the opposite limit of the level of the carriage as already described. The solenoid circuit also remains broken until the carriage assumes a position adjacent the apron 3 at which time the roller 58 overhangs a pad 64, as shown in Fig. 13. This pad is mounted on the outer end of an arm 65 which is fixed on a transverse shaft 66 mounted in fixed connection with the frame 5 or other suitable stationary parts. Fixed on said shaft and extending in the path of movement of the roller 42 in front of the same in the direction of its retractive movement is a finger 67. This finger is positioned to be engaged and raised by said roller as the latter leaves the forward abrupt end of the track 50. The sudden upward movement of said roller as released from the track causes the roller to impart a corresponding sharp movement to the finger. The arm 65 will likewise be suddenly raised, causing the pad 54 to hit the roller 58 upwardly. This moves the roller arm 59 past a dead center position relative to the spring 61 which then acts to hold said roller in contacting relation with its rail 56, so that the circuit to the solenoid is again closed and the latter energized. At the same instant as previously described the belt is clamped between the jaws and the carriage immediately starts a board advancing stroke.

In connection with the above automatic clamping and movement controlling mechanism I have provided means to automatically raise the carriage jaws on each stroke a distance equal to the thickness of a board. This is done by means of a ratchet wheel 68 fixed on the shaft 17 and engaged by a fixed holding pawl 69 and a movable advancing pawl 70. The pawl 70 is mounted on an upstanding arm 71 pivoted on the shaft 17 and carrying a roller 72 on its upper end. As the carriage approaches the apron 3 on its return movement the roller 72 engages and passes by a cam track 73 fixed on one of the beams 8. This causes the arm to be turned upwardly and about the ratchet wheel without rotating the same. As the carriage after engaging a fresh length of board again moves away from the apron 3, the roller 72 again engages the cam 73 turning the arm 71 in the opposite direction and imparting rotation to the ratchet wheel and the shaft 17. This rotation of the shaft 17 by reason of the pinions 18 thereon causes the rack bars 15 to be raised.

Since the solenoid and parts connected thereto are mounted in connection with the lower jaw they are raised also and their relationship to the jaws is not disturbed. The control mechanism for the movement of the rod 47 is mounted on the fixed-level parts of the carriage, but since said rod is relatively long and is slidable in the collar 46 which is a part of such mechanism, the action of the mechanism on the rod is the same regardless of the shifting in vertical position of the latter due to the raising of the jaws and associated parts.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention what I claim as new and useful and desire to secure by Letters Patent is:

1. A plas'er board handling apparatus including with a supporting surface for the board as formed, a carriage movable horizontally toward and from the outer end of said surface, jaws mounted on the carriage for engagement with the forward edge of the formed board on said surface, means functioning with the movement of the carriage toward the surface and upon the positioning of the jaws in overlapping relation to said edge of the board for moving the jaws into clamping relationship with the board drive means to move the carriage away from the surface and means functioning with the movement of the carriage toward said surface and operatively connecting said drive means with the carriage at the same instant that the jaws become clamped to the board.

2. A structure as in claim 1, with means functioning with the driven movement of the carriage to a position a predetermined distance from the surface for breaking the driving engagement of said drive means with the carriage, and means operating on the jaws at approximately the same time for releasing the jaws from the board.

3. In a plaster board handling apparatus, vertically adjustable jaws for engaging one end of the board, a horizontally movable member mounted in a fixed plane and supporting said jaws, means functioning with the movement of the member toward the board and to a position such that the jaws overhang said end of the board for causing the jaws to then clamp the board, and drive means for the member functioning with the engagement of the jaws to move said member in the opposite direction.

4. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, board engaging jaws mounted on the carriage, a driven belt extending parallel to said supports, means on the carriage for clamp-

ing engagement with the belt, means functioning with the movement of the carriage in one direction to a predetermined position for moving the belt engaging means into clamping relationship therewith, whereby the carriage will then move with the belt, and means functioning with the driven movement of the carriage to a predetermined position for releasing the belt engaging means from the belt.

5. A structure as in claim 4, with means to impart a movement to the carriage in the opposite direction when the carriage is released from the belt.

6. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, board engaging jaws mounted on the carriage, means to drive the carriage in one direction, means on the carriage for releasable engagement with said drive means, means for releasing such engagement after the carriage has been moved by the drive means to a predetermined position, a normally idle counterweight supported in a fixed horizontal position relative to the supports, and means between the carriage and weight for raising the latter from a point in the driven travel of the carriage a predetermined distance before the drive means is released whereby when the drive means is released the action of the raised counterweight will move the carriage in the opposite direction.

7. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, board engaging jaws mounted on the carriage, means to drive the carriage in one direction, means on the carriage for releasable engagement with said drive means, means for releasing such engagement after the carriage has been moved by the drive means to a predetermined position, a normally idle counterweight supported in a fixed horizontal position relative to the supports, a supporting cable for the weight, a movable member connected to one end of the cable and positioned in the path of driven movement of the carriage ahead of the releasing position thereof, means mounting said member for movement parallel to the carriage, a fixed direction changing element for the cable ahead of said member, and a stop on the carriage for engagement with said member whereby as the carriage advances the member will be advanced and the weight lifted so that when the carriage drive is released, the weight will be effective to move the carriage in the opposite direction.

8. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, board engaging jaws mounted on the carriage, a driven belt extending parallel to said supports, a pad fixed on the carriage for engagement with one face of one run of the belt, a relatively movable cooperating pad for engagement with the opposite face of said run, a stem projecting from said movable pad at right angles to the belt, an eccentric mounted on the carriage and engaging the outer end of said stem, a pinion fixed with the eccentric, a rack extending parallel to the direction of travel of the carriage engaging said pinion, and fixed bumpers positioned at the opposite limits of travel of the carriage for alternate engagement with the opposite ends of the rack to cause the latter to be moved lengthwise in opposite directions and thus rotate the eccentric in a pad releasing or clamping direction.

9. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, board engaging jaws mounted on the carriage, a driven belt extending parallel to said supports, a pad fixed on the carriage for engagement with one face of one run of the belt, a relatively movable cooperating pad for engagement with the opposite face of said run, a stem projecting from said movable pad at right angles to the belt, an eccentric mounted on the carriage and engaging the outer end of said stem, means to rotate the eccentric in a pad clamping direction upon the arrival of the carriage to its limit of movement in one direction, and means to rotate the eccentric in a pad releasing direction upon the arrival of the carriage at its opposite limit of movement.

10. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, racks depending from the carriage, a lower board engaging jaw fixed on and extending between the racks, an upper cooperating jaw slidably mounted on the racks, pinions engaging the racks, a shaft on which said pinions are fixed journaled on said upper jaw, a radial arm projecting from the shaft, an electrical device applied to said arm to turn the same in a direction to cause the upper jaw to be moved into clamping relationship with the lower jaw, a circuit for said device, and means closing and opening the circuit as the carriage reaches its limits of movement in opposite directions respectively.

11. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, relatively movable board engaging jaws on the carriage, an electric device for closing the jaws, a circuit for said device including rails extending along one of the carriage supports, a switch including a contact element constantly engaging one of the rails, and a roller for engagement with the other rail, a swinging arm on which said roller is mounted, a snap-action spring applied to said arm and acting to hold the roller in contact with the rail or away from the same, a cam track insulated from said rail and on which said roller rides after being engaged with said rail and upon the arrival of the carriage at its limit of movement in one direction, said track being arranged to throw the arm past a dead center position whereby the spring will then prevent reengagement of said roller with its rail, and means for engagement with said roller at the opposite limit of travel of the carriage for moving the arm past dead center position in the opposite direction to again cause the roller to contact with the rail.

12. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, relatively movable board engaging jaws on the carriage, an electric device for closing the jaws, a circuit for said device including rails extending along one of the carriage supports, a switch including a contact element constantly engaging one of the rails, and a roller for engaging with the other rail, a swinging arm on which said roller is mounted, a snap-action spring applied to said arm and acting to hold the roller in contact with the rail or away from the same, means functioning with the arrival of the carriage at one end of its travel for withdrawing the roller from the rail and causing the spring to hold it from reengagement with said rail, and means functioning with the arrival of the carriage at the other end of its travel for turning the arm in a direction and to an extent such that the spring functions to

suddenly move the roller into contact with its rail.

13. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, racks depending from the carriage, a lower board engaging jaw fixed on and extending between the racks, an upper cooperating jaw slidably mounted on the racks, mechanical means controlling the raising of the upper jaw, said jaw tending to drop of its own weight, means acting to place said raising means in temporary operation as the carriage moves toward the end of the board to be engaged by said jaws whereby to separate the jaws, said last named means being arranged to release the raising means and allow the upper jaw to drop as the end of the board is received between the jaws, and electrical means then functioning to hold the jaws clamped to the board.

14. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, racks depending from the carriage, a lower board engaging jaw fixed on and extending between the racks, an upper cooperating jaw slidably mounted on the racks, mechanical means controlling the raising of the upper jaw, said jaw tending to drop of its own weight, means acting to place said raising means in temporary operation as the carriage moves toward the end of the board to be engaged by said jaws whereby to separate the jaws, said last named means being arranged to release the raising means and allow the upper jaw to drop as the end of the board is received between the jaws, an electrical device to hold the jaws clamped to the board, and means functioning with and by reason of the release of the mechanical jaw raising means for placing said device in operation.

15. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, racks depending from the carriage, a lower board engaging jaw fixed on and extending between the racks, an upper cooperating jaw slidably mounted on the racks, mechanical means controlling the raising of the upper jaw, said jaw tending to drop of its own weight, means acting to place said raising means in temporary operation as the carriage moves toward the end of the board to be engaged by said jaws whereby to separate the jaws, said last named means being arranged to release the raising means and allow the upper jaw to drop as the end of the board is received between the jaws, and electrical means then functioning to hold the jaws clamped to the board, means to place the electrical means out of operation when the carriage reaches the end of its travel in the opposite direction, and means then acting on the jaw raising means to cause the jaw to be raised.

16. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, racks depending from the carriage, a lower board engaging jaw fixed on and extending between the racks, an upper cooperating jaw slidably mounted on the racks, pinions engaging the racks, a shaft on which said pinions are fixed journaled on said upper jaw, a radial arm projecting from the shaft, a lever pivoted intermediate its ends on the carriage and connected at one end to said arm, a vertical rod above and connected to the opposite end of the lever, a collar slidable on the rod, a grip arm connected to the collar to grip the rod only when upward pressure is imparted to said arm, and means functioning upon the movement of the carriage to adjacent the end of its travel to impart such pressure to the grip arm and to also raise the same; the shaft-arm being arranged relative to the pinions so that with the upward movement of the arm, the upper jaw will be raised.

17. A structure as in claim 10, in which said last named means comprises a shaft mounted on the carriage transversely thereof, an arm projecting from the shaft, and engaging the grip-arm, another arm projecting from the shaft in the opopposite direction to the first named arm thereof, a roller on the outer end of said other arm normally bearing on one of the carriage supports, and a cam track on said support engaged by said roller as the carriage approaches the end of its travel in one direction, and arranged to turn said roller arm in a direction to raise the grip arm; said cam track being arranged at its far end to cause the roller to suddenly leave the track and return to its former level whereby the grip arm is suddenly released and the jaw allowed to drop.

18. A structure as in claim 10, in which said last named means comprises a shaft mounted on the carriage transversely thereof, an arm projecting from the shaft, and engaging the grip-arm, another arm projecting from the shaft in the opposite direction to the first named arm thereof, a roller on the outer end of said other arm normally bearing on one of the carriage supports, and a cam track on said support engaged by said roller as the carriage approaches the end of its travel in one direction, and arranged to turn said roller arm in a direction to raise the grip arm; said cam track being arranged at its far end to cause the roller to suddenly leave the track and return to its former level whereby the grip arm is suddenly released and the jaw allowed to drop, and means formed with said track to allow the roller to remain at such level without reengaging the track with the movement of the carriage in the opposite direction whereby the jaw will remain lowered.

19. In a plaster board handling apparatus a carriage, supports for the carriage along which the same is movable between predetermined limits, relatively movable board engaging jaws on the carriage, an electric device for closing the jaws, a circuit for said device, and means closing and opening the circuit as the carriage reaches its limits of movement in opposite directions respectively.

20. In a plaster board handling apparatus a carriage, supports for said carriage along which the same is movable, board engaging jaws mounted on the carriage, a driven belt extending parallel to said supports, a pad fixed on the carriage for engagement with one face of one run of the belt, a relatively movable cooperating pad for engagement with the opposite face of said run, and instrumentalities to cause the movable pad to be clamped against the belt upon the arrival of the carriage at its limit of movement in one direction and to be released from said clamping engagement upon the arrival of the carriage at its limit of movement in the opposite direction.

JOHN J. SYLVA.