Oct. 14, 1924. 1,511,486

E. WESTBERG ET AL

MACHINE FOR RECESSING PLASTER LATH BOARD

Filed Jan. 2, 1923. 3 Sheets-Sheet 1

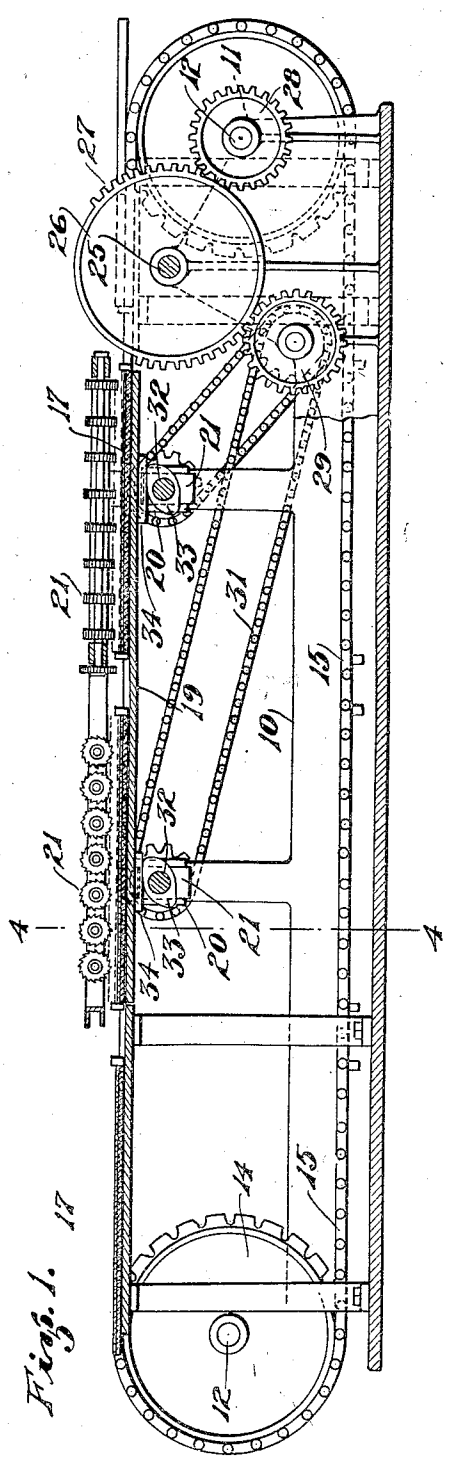


Fig. 1.

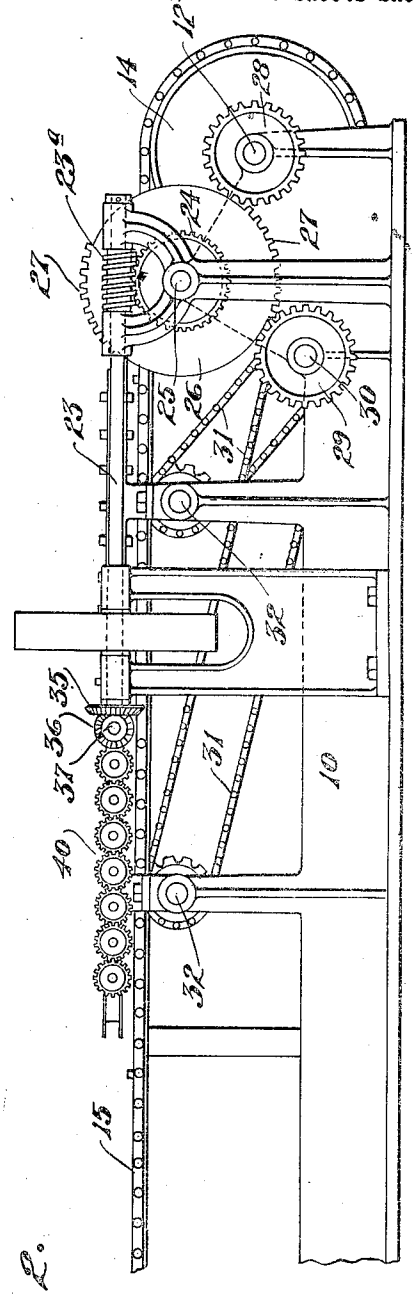


Fig. 2.

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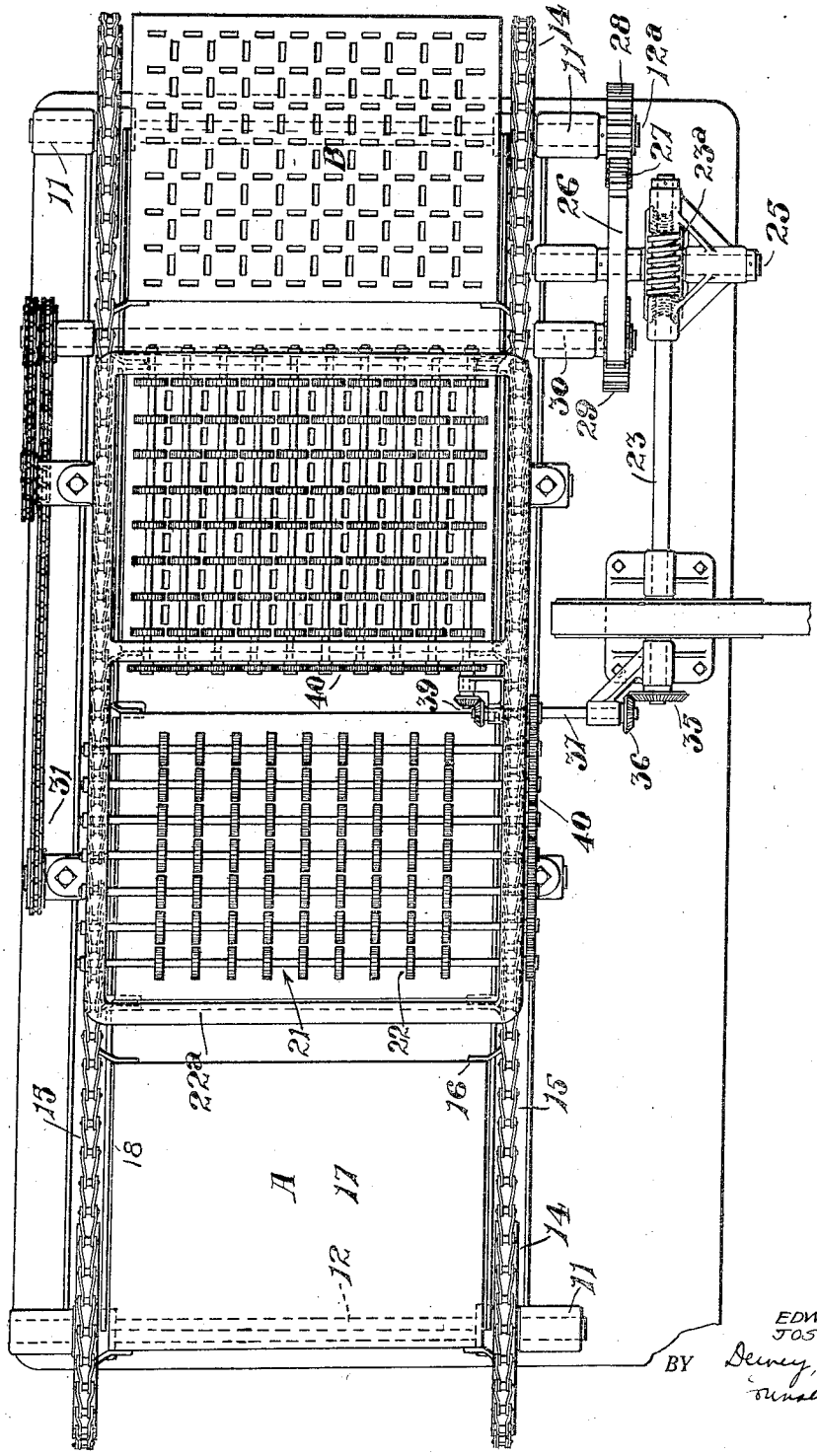


Fig. 3.

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Fig. 4.

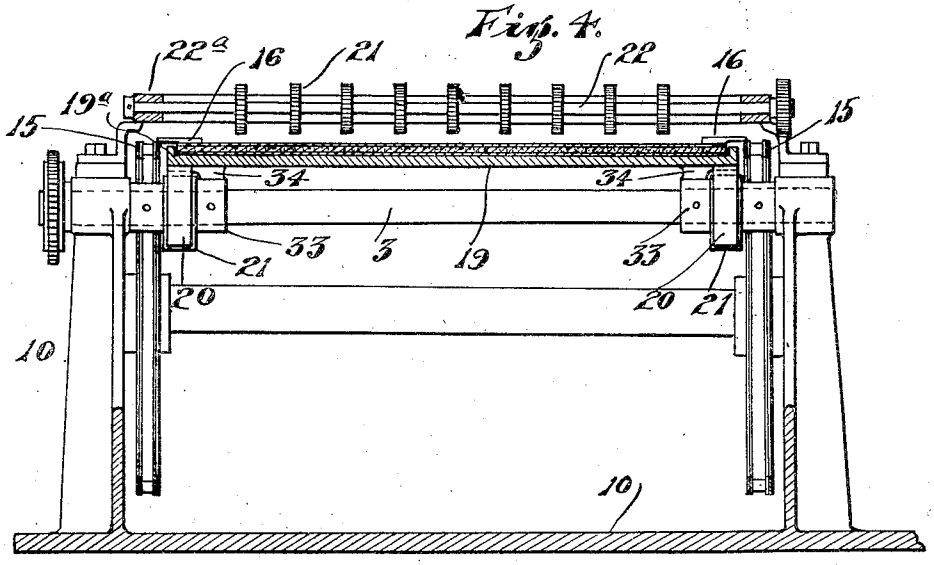


Fig. 5.

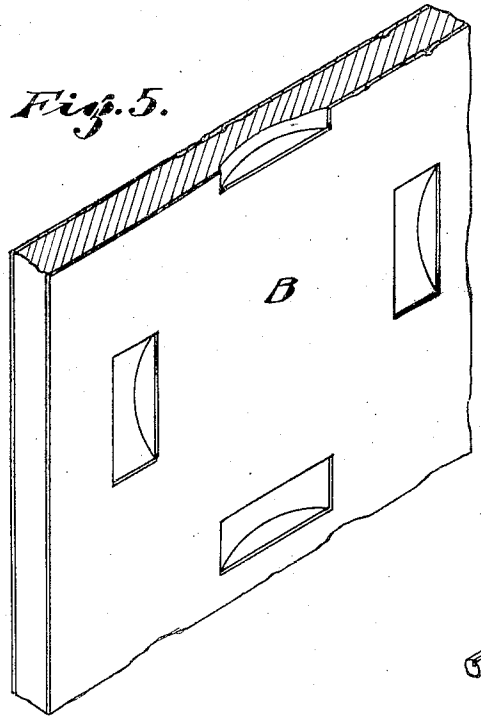
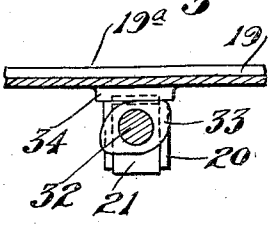


Fig. 6.



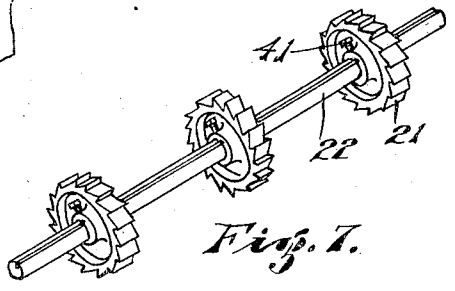


Fig. 7.

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UNITED STATES PATENT OFFICE.

EDWARD WESTBERG AND JOSEPH STRAND, OF LOS ANGELES, CALIFORNIA.

MACHINE FOR RECESSING PLASTER LATH BOARD.

Application filed January 2, 1923. Serial No. 610,130.

To all whom it may concern:

Be it known that we, EDWARD WESTBERG and JOSEPH STRAND, citizens of the United States, residing at Los Angeles, county of Los Angeles, and State of California, have invented new and useful Improvements in Machines for Recessing Plaster Lath Board, of which the following is a specification.

This invention relates to machines employed in the manufacture of plaster lath board, and particularly pertains to a machine for forming obtrusions in the surface of sheets of lath board of the character described in our co-pending application entitled "Plaster lath board and method of making the same," Serial No. 602,298, filed Nov. 20, 1922.

It is the principal object of the present invention to provide a simple, efficient and automatically operating machine which may be employed to inexpensively and expeditiously form depressions in and to be systematically arranged over the surface of sheets of plaster lath board.

The invention contemplates the use of gangs of rotary cutters arranged in desired spaced relation to each other, operating in conjunction with an automatically operating mechanism adapted to deliver sheets of plaster lath board thereto and to feed the boards against the cutters to form a plurality of depressions of desired size and depth in the surface of the board.

One form which the invention may assume is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

Fig. 1 is a view in longitudinal section through a machine embodying the invention.

Fig. 2 is a side elevation of the same.

Fig. 3 is a plan view of the machine.

Fig. 4 is a transverse section through the machine taken on line 4—4 of Fig. 1.

Fig. 5 is a perspective view of a portion of a sheet of plaster lath board with depressions in the surface thereof such as formed by the machine.

Fig. 6 is a fragmentary view disclosing the table guide member and the lifting cam.

Fig. 7 is a perspective view disclosing a portion of a mandrel with cutters mounted thereon.

Referring more particularly to the drawings, 10 indicates a main frame formed with bearings 11 which support a pair of horizontal end shafts 12 and 12ª. These shafts are fitted with sprockets 14, over which chains 15 are led. These chains constitute a conveyor and are fitted with lugs 16 arranged in pairs to accommodate sections of plaster lath board 17.

Mounted on the frame, intermediate the conveyor chains 15 are a pair of horizontal guide members 18. It is intended that the conveyor should carry sections of plaster board along these guides to predetermined positions over a centrally located vertically reciprocable table 19. This table is fitted with vertical guides 19ª aligned with the guides 18 when the table is disposed in its normal position.

The table is guided for vertical reciprocable movement by guide yokes 20 which are fixed to the under side of the table and slidably engage stationary guide blocks 20 secured at each side of the main frame.

Two sets of rotatable cutters 21 are feathered onto horizontal mandrels 22 and are disposed above the table. These mandrels are journalled at their ends in a subframe 22ª mounted above the main frame as shown in Fig. 4. The mandrels of one set are disposed at right angles with relation to the other set, as it is intended that the sets of cutters co-operate to form rows of relatively staggered depressions in the surface of the board arranged alternately at right angles to each other.

The conveyor is intermittently operated to feed plaster boards beneath the sets of cutters. When the boards are properly positioned beneath the cutters the operation of the conveyor is momentarily interrupted and the table 19 is vertically reciprocated to raise the boards into contact with the cutters. To accomplish this, a drive shaft 23 is journalled adjacent the frame and is fitted with a worm 23ª. This worm meshes with a worm gear 24 fixed on an operating shaft 25. The shaft is provided with a mutilated gear 26 having two sets of teeth 27 which are formed on diametrically opposed sides of the gear. These sets of teeth are adapted to alternately mesh with a pinion 28 secured on the shaft 12ª of the conveyor and with a pinion 29 fixed on a shaft 30. This shaft is connected by sprockets and chain connections 31 to a pair of horizontal cam shafts 32. These shafts are disposed below the table adjacent the ends thereof and are fitted with cams 33; that is, each

shaft is fitted with two cams which are disposed in engagement with cam plates 34 formed on the bottom thereof. The cams 33 are formed with two swells, so shaped that the table will be slowly raised and rapidly lowered during each half revolution of the cam shafts.

It should be stated that the number of teeth in each set 27 on the mutilated drive gear is sufficient to impart one-half revolution to each of the pinions 28 and 29. A half revolution of the pinion 28 is sufficient to impart one complete step of advance to the conveyor. This step is sufficient to transfer a board fed to the machine to a position below the first set of cutters, and to advance a board positioned below the first set of cutters to a position below the second set, etc.

Reference being had to Fig. 1, it is seen that the sets of teeth 27 on the mutilated drive gear are so positioned that the pinions 28 and 29 are alternately operated. Therefore, during the rest period of the conveyor the cams will be actuated to reciprocate the table, and during the idle period of the cams the conveyor will advance the sheets of board one step.

To drive the cutters a bevel gear 35 is fixed on the end of the drive shaft 23 and is in mesh with a gear 36 secured on a stub shaft 37. The stub shaft drives the first cutter set through a gear connection 38. It also drives the second set by a bevel gear connection 39. The mandrels of each set are connected together by spur gear trains 40 which operate to drive the mandrels in opposite directions. Each mandrel will then rotate the cutters thereon in a direction opposite that of the cutters on the adjacent mandrels. This is desirable as it eliminates the tendency of the cutters to shift the board out of position when they engage the surface thereof.

As shown in Fig. 7, the cutters are feathered on the mandrels and are secured in place by set screws 41. This mounting permits the cutters to be spaced to form slots in the sheets of board at any desired distance apart.

In operation, sheets of the plaster lath board are fed to the machine between the guides 18 at the point indicated at A. Assuming that the drive shaft 23 is being continuously driven and that the mechanism has assumed the position shown in Fig. 1, continued rotation of the mutilated gear 26 will impart turning movement to the pinion 29. This pinion, through the medium of the shaft and the sprocket and chain connections 31, will rotate the cam shafts 32. As these cam shafts rotate, the cams 33 thereon will slowly raise the table 16 and force the sheet of board thereon into contact with the cutting edge of the continuously rotating cutters. The boards will be raised by the table until depressions have been cut to a suitable depth therein. The table will then be quickly lowered. As described, this operation takes place during one-half of a revolution of the pinon 29 or the entire time the set of teeth 27 on the mutilated gear 26 is in mesh therewith.

When the above operation is completed the mechanism will be in the position shown in Fig. 2. In this position the set of teeth on the mutilated gear 26 is just commencing to mesh with the pinion 28 on the conveyor drive shaft 12^a. Continued rotation of the gear 26 will rotate the pinion 28 and shaft 12^a one-half of a revolution, which, as described, is sufficient to cause the conveyor to advance the sheets of board one step through the machine. When this operation is complete the second set of teeth 27 on the mutilated gear 26 is in position to again drive the pinion 29 for reciprocating table for a second operation.

When the sheet of plaster board has been operated on by both sets of cutters its face is formed with arcuate recesses of rectangular section arranged in rows, the recesses in each row being disposed at right angles to and staggered with relation to the adjacent rows. This is clearly shown at B in Fig. 3 and Fig. 5.

While we have shown the cutters in the arrangement described, it is obvious that it is within the scope of the present invention to arrange the cutters in any desired formation and also the shape and depth of the recesses may be such as deemed desirable.

Although we have shown the invention in the form now preferred by us, it is to be understood that various changes in the combination, construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as claimed.

Having thus described our invention, what we claim and desire to secure by Letters Patent is:

1. A machine of the character described comprising a frame, a plurality of circular cutters carried by the frame, means for conveying the boards along the frame beneath the cutters, and means adapted to interrupt the travel of boards being conveyed when positioned directly below the cutters and to cause the boards to momentarily contact with said cutters by direct vertical movement during said interruption.

2. A machine of the character described comprising a frame, a plurality of cutters carried by the frame, means for conveying boards along the frame beneath the cutters, means adapted to interrupt the travel of boards being conveyed when positioned directly below said cutters, and other means adapted to slowly raise the boards into con-

tact with the cutters, and then rapidly lower them during said interruption.

3. A machine of the character described comprising a frame, a plurality of rotatable cutters mounted on the frame, a conveyor mounted on the frame beneath the cutters, a vertically reciprocable table supported by the frame directly below the cutters, and means for interrupting the movement of the conveyor at predetermined periods and vertically reciprocating said table during said interruptions.

4. A machine of the character described comprising a frame, a plurality of rotatable cutters carried by the frame, guideways formed on the frame beneath the cutters, a vertically reciprocable table mounted between the guideways directly below the cutters, an intermittently operating conveyor adapted to convey boards along the guideways to said table, and means for reciprocating said table during the inoperative periods of the conveyor.

5. A machine of the character described comprising a frame, a plurality of horizontally disposed mandrels journalled in the frame, circular cutters on said mandrels, a vertically reciprocable table mounted below said cutters, an intermittently operating feed means adapted to deliver boards singly to said table, and means for vertically reciprocating said table a distance less than the thickness of the board during the inoperative periods of said feed means.

6. A machine of the character described comprising a frame, two sets of cutters mounted on the frame and disposed at right angles to each other, an intermittently operating feed means adapted to convey boards to said sets of cutters successively, and means operative during the inoperative period of said feed means to vertically reciprocate boards positioned adjacent the cutters to force the surface of the boards into contact with the cutters.

7. A machine of the character described comprising a horizontal frame, two sets of rotary cutters disposed in the same plane above the frame and parallel thereto, each set comprising gangs of circular cutters arranged in spaced relation to each other upon parallel mandrels, the mandrels of the two sets of cutters being disposed at right angles to each other, a table disposed beneath said cutters and over the face of which boards may be moved, means for intermittently raising and lowering said table to place the uppermost faces of the boards raised thereon in cutting contact with the sets of cutters, and feed means intermittently operating while the table is in its lowermost position to move the board along the table to the cutting stations and whereby a board will first be moved in position to be acted upon by the first set of cutters in forming a plurality of parallel depressions in equal spaced relation to each other over the face of the board and will thereafter move to the second cutting station where the second set of cutters will act to form a plurality of equal spaced depressions in the face of the board and at right angles to the first formed depressions.

8. A machine of the character described comprising a frame, a horizontal table reciprocably mounted thereupon for vertical movement, said table being of a length and width capable of accommodating two lengths of board to be acted upon by the machine, a set of circular cutters disposed above the table and adapted to act upon the boards supported by the double section therebeneath, one set of cutters comprising a plurality of mandrils disposed in equal spaced relation to each other, and each carrying a plurality of circular cutters equal in number on the various mandrils, and the successive cutters on the various mandrils being in alignment whereby rows of spaced parallel depressions will be cut in the face of a board moved thereagainst, the second set of cutters being substantially the same as the first with the exception that their mandrils are disposed at right angles to the first set of cutters, means for intermittently advancing boards along the table to assume positions beneath the two sets of cutters whereby action by the first set of cutters will form depressions extending in one direction over the face of the board and action by the second set of cutters will form depressions at right angles to said first formed depressions and between the rows thereof, and means for raising and lowering the table at intervals between the operation of the board feeding mechanism.

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