No. 796,124. PATENTED AUG. 1, 1905.

F. S. HUTCHINSON.

TILE MACHINE.

APPLICATION FILED APR. 14, 1905.

2 SHEETS—SHEET 1.

Fig. 1

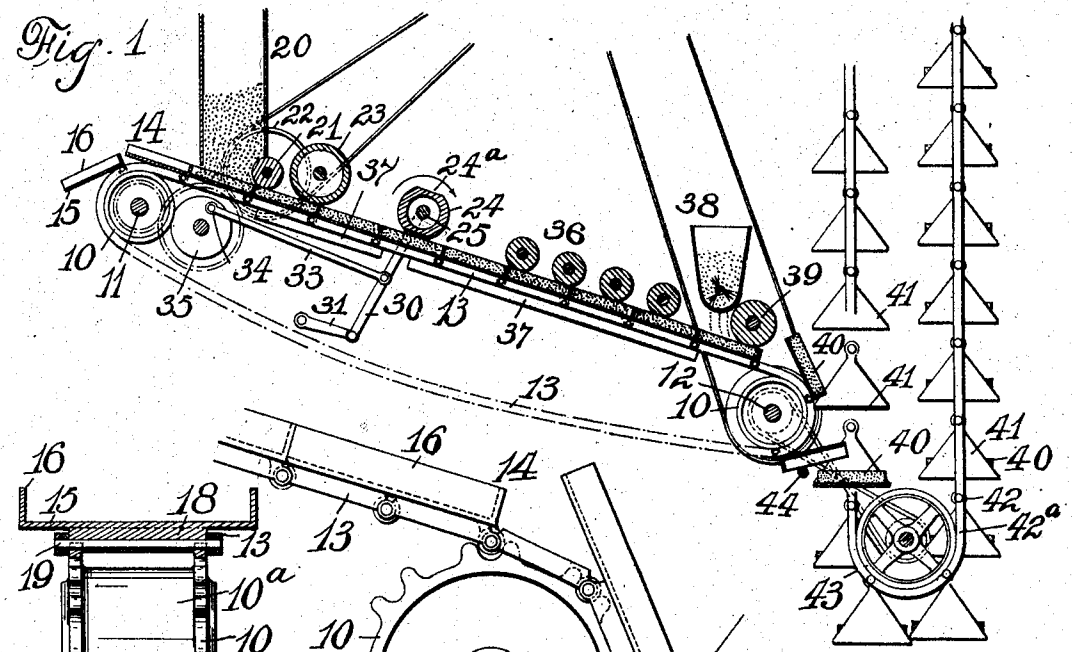


Fig. 2

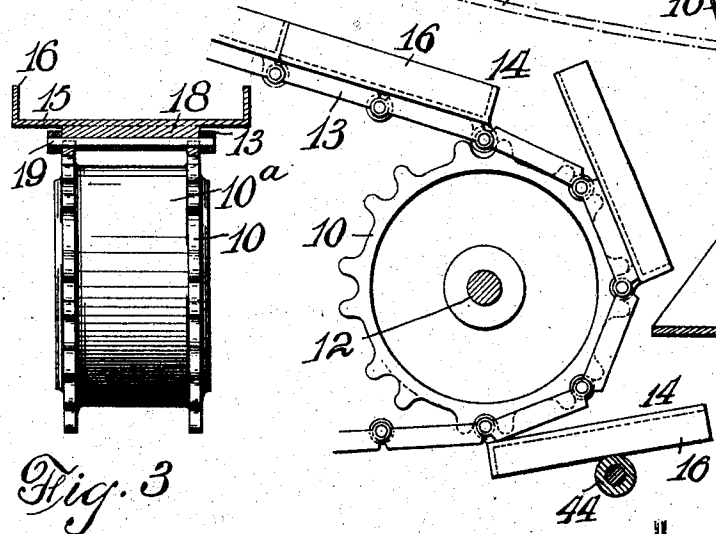


Fig. 3

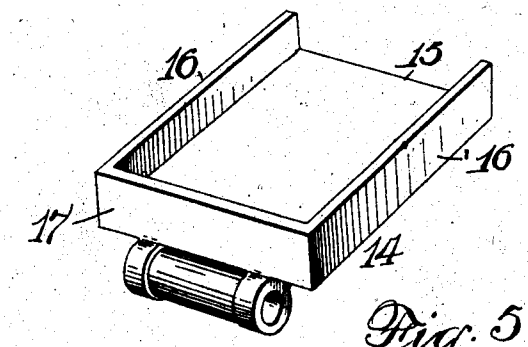


Fig. 5

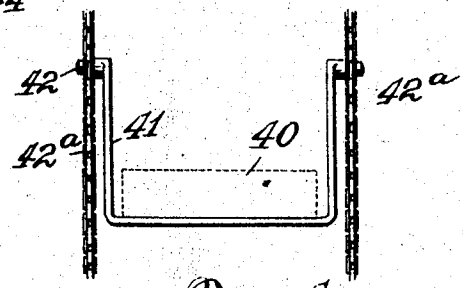


Fig. 4

WITNESSES:

Mrs. H. Campbell.

Frank L. Stubbs.

INVENTOR

Frank S. Hutchinson.

BY

W. B. Hutchinson.

ATTORNEY.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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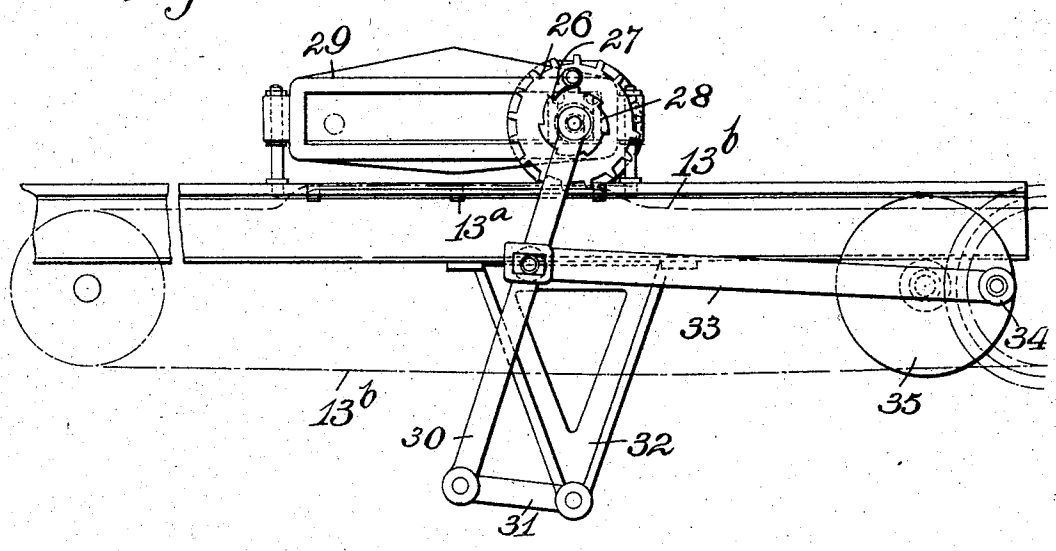
F. S. HUTCHINSON.

TILE MACHINE.

APPLICATION FILED APR. 14, 1905.

2 SHEETS—SHEET 2.

Fig. 6



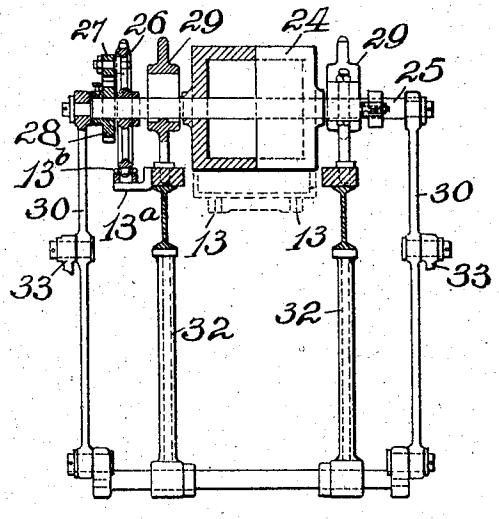


Fig. 7

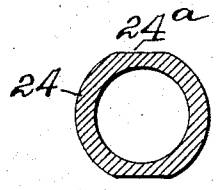


Fig. 8

WITNESSES:

Wm. H. Campbell

Frank L. Stubbs.

INVENTOR.

Frank S. Hutchinson.

BY

W. B. Hutchinson,

ATTORNEY.

ANDREW B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK S. HUTCHINSON, OF FLUSHING, NEW YORK, ASSIGNOR TO BARRETT MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA.

TILE-MACHINE.

No. 796,124. Specification of Letters Patent. Patented Aug. 1, 1905.

Application filed April 14, 1905. Serial No. 255,482.

To all whom it may concern:

Be it known that I, FRANK S. HUTCHINSON, of Flushing, in the county of Queens and State of New York, have invented a new and Improved Tile-Machine, of which the following is a full, clear, and exact description.

My invention relates to improvements in machines for making roofing-tiles, although the machine can also be used for making paving-blocks or other things which are made from plastic or semiplastic material.

The object of my invention is to produce a simple form of apparatus which will automatically receive its charge from a hopper containing the material to be formed into tiles or other things, which will compress the matter to the requisite extent, will smooth the surface, will sand it or give it a coating of other material, if desired, and will finally automatically discharge the formed block or tile into a receiving-carrier.

A further object of my invention is to construct the apparatus so that the tiles will be evenly rolled—that is, will be of an even thickness throughout—and also to produce an apparatus which is very simple and will run a long time without getting out of order. All this is to the end that the tiles may be nicely and cheaply made.

With these ends in view my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a sectional elevation of the apparatus embodying my invention. Fig. 2 is an enlarged detail view showing particularly the manner in which the tiles are discharged from the forming-machine. Fig. 3 is a sectional end elevation of the tile-forming apparatus, showing particularly the double sprocket-wheel and the relation of the mold thereto. Fig. 4 is a broken elevation showing a tray of the carrier which receives the tiles after they are formed. Fig. 5 is a detail perspective view of one of the tile-molds. Fig. 6 is a detail side elevation of the tile-smoothing apparatus which prevents the tile from being thick at one end, the view being taken on the side opposite to that shown in Fig. 1. Fig. 7 is a cross-section of the structure shown in Fig. 6, and Fig. 8 is a detail cross-section of the smoothing-roll.

In illustrating my improved apparatus I have not shown a supporting-frame, as any suitable framework can be provided to carry the several rollers and other parts.

The title-forming apparatus has at the ends double sprocket-wheels 10, which are preferably connected by a single drum 10^a and which are preferably arranged on elevations, the sprocket-wheel at the discharge end of the apparatus being preferably lower than the one at the receiving end. The sprocket-wheels are carried by shafts 11 and 12, and I have shown the latter as being driven by a pulley and belt. The sprocket-wheels connect by chains 13, which can be of any usual construction, and these carry the molds 14, which are each pivoted at one end only, and each mold has sides 16 and one end 17, the remaining end being left open to facilitate discharging the tiles formed therein, and it will be seen by reference to Fig. 1 that the closed end 17 of one of the molds serves also as a closure for the open end of the mold next in front of it. It will be noticed that the molds 16 are not connected together and are pivoted at one end only, so that when they pass one of the wheels 10 they can swing freely outward and turn bottom side up, so as to make certain that the tile carried by a mold shall be deposited flatly and surely upon the carrier to be hereinafter described.

To facilitate the pivoting of the molds, each is preferably thickened at one end, as shown at 18, to receive the pivot-pin 19, by which it connects to the sprocket-chains 13.

The mixture from which the tiles or other things are made is preferably ground up and fed from a hopper 20, which discharges directly upon the molds 14 as they come to the top surface of the apparatus, as shown in Fig. 1, and in the rear wall of the hopper is located the first compression-roller 21, the shaft of which is driven by a pulley 22 and a suitable belt, though obviously other means of driving can be employed. Just behind the compression-roller 21 is a second roller 23,

which also serves to compress the semiplastic material into the molds, and this can be driven in any suitable way. A little behind the roller 23 is the smoothing-roller 24, which has opposite flat sides 24[a], and this is carried by a shaft 25. Loose on the shaft 25 is a sprocket 26, which connects, by means of a pawl 27, with the ratchet-wheel 28, (see Fig. 6,) and this ratchet-wheel is fast to the shaft. The shaft can slide backward and forward in the guides 29, which are supported at opposite ends of the roller 24. The shaft is journaled in the upper ends of the levers 30, which are pivotally connected at the bottom by links 31 with the hangers 32, which can be secured to the supporting-frame of the apparatus. The levers 30 also connect by a pitman 33 with the pulleys 35, with which they have a crank connection, as shown at 34, and these pulleys can be driven in any suitable way—as, for instance, by gearing them to the shaft of the roller 21, as shown by broken lines in Fig. 1.

The object of the arrangement just described is this: Under ordinary circumstances compression-rollers acting on material in molds carried along as specified have a tendency to roil the material toward one end of the mold and make the tile or other thing a little thicker at this end; but by the arrangement just described the roller 24 will be moved backward and forward with relation to the hopper 20. Thus as it slides toward the hopper the flat side 24[a] will be next the material in the molds, and no action takes place; but on the reverse movement the pawl 21 acts on the ratchet-wheel 28, turns the roller 24, and so rolls the material in the right direction to prevent the aforesaid thickening. By reference to Fig. 6 it will be seen that guides 13[a] are used to carry a chain 13[b] up into contact with the sprocket-wheel 26. This chain is shown in outline merely in Fig. 6, and it can be any usual sprocket-chain.

Behind the roller 24 are a series of smoothing-rollers 36, any necessary number being used, and they can be turned in any usual way. To prevent sagging of the molds, supports 37 are arranged, as in Fig. 1, beneath them. Behind the rollers 36 is a hopper 38, which can be used to dust sand, marble dust, or other finishing material over the surface of the molds to give them the desired finish, and this material is rolled in by a roller 39.

As each mold 14 turns over the lower end of the tile-forming apparatus its free end swings upward and outward and then downward, as shown in Figs. 1 and 2, and the tile 40 therein drops upon a stirrup-like tray 41, a series of which are pivoted, as shown at 42, to the chains 42[a], which run over a guide-pulley 43, thus forming a carrier. The trays are prevented from dropping too far by the abutment 44. It will be seen, then, that once the machine is started the molds are automatically filled, the contents rolled, smoothed, compressed, dusted, and finished, and that the formed material is automatically discharged into a carrier in a way to receive no injury. In this connection attention is called to Fig. 1, and it will be seen that the trays 41 move down in the same direction with the tile as it is discharged, and so the latter is received in an easy manner and it is not likely to be injured.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine of the kind described, the combination with the traveling molds and the rollers for compressing and smoothing the material therein, of a second compressing device adapted to squeeze the material in the molds in a direction opposite to the movement of the said smoothing and compressing rollers.

2. In a machine of the kind described, the combination with the traveling molds and the compression-rollers for compressing the material therein, of a smoothing device moving backward and forward above the molds, the said device, during one part of its movement, acting to engage and press the material in the mold.

3. In a machine of the kind described, the combination with the traveling molds and the compression-rollers acting on the material in the molds, of a flattened roller movable in one direction with its flat side next the molds and in the other direction with its curved surface engaging the material in the molds.

4. A machine of the kind described, comprising sprocket-chains, a series of freely-swinging molds carried by the chains each mold being pivoted at one end only and each mold being also closed on three sides, a hopper to feed material to the molds, compression-rollers acting on the material in the molds, means for dusting material over the molds, and a carrier moving downwardly in the path of the swinging molds to receive the matter discharged from the molds as the latter swing outward.

5. In a machine of the kind described, the combination with the traveling molds adapted to swing outward and downward at one part of the apparatus, of a carrier comprising a series of freely-swinging trays there being a tray arranged to receive the discharge of each mold as it tips.

6. In a machine of the kind described, the combination with the carrying-chains, of the three-sided molds arranged to lie end to end on the chains each mold being unconnected

with the other molds and pivoted at one end only so as to swing freely outward as it turns over with the chains.

7. In a machine of the kind described, the combination with the carrying-chains and suitable wheels to guide them, of the molds carried by the chains and arranged to lie end to end, each mold being independently pivoted to the chains so as to swing freely outward independent of the other molds as it passes over the wheels of the chains.

FRANK S. HUTCHINSON.

Witnesses:
WARREN B. HUTCHINSON,
WILLIS A. BARNES.