March 27, 1928. 1,663,805

G. C. MARTIN

DEVICE FOR FORMING SLABS

Filed Oct. 11, 1926

Fig. 1

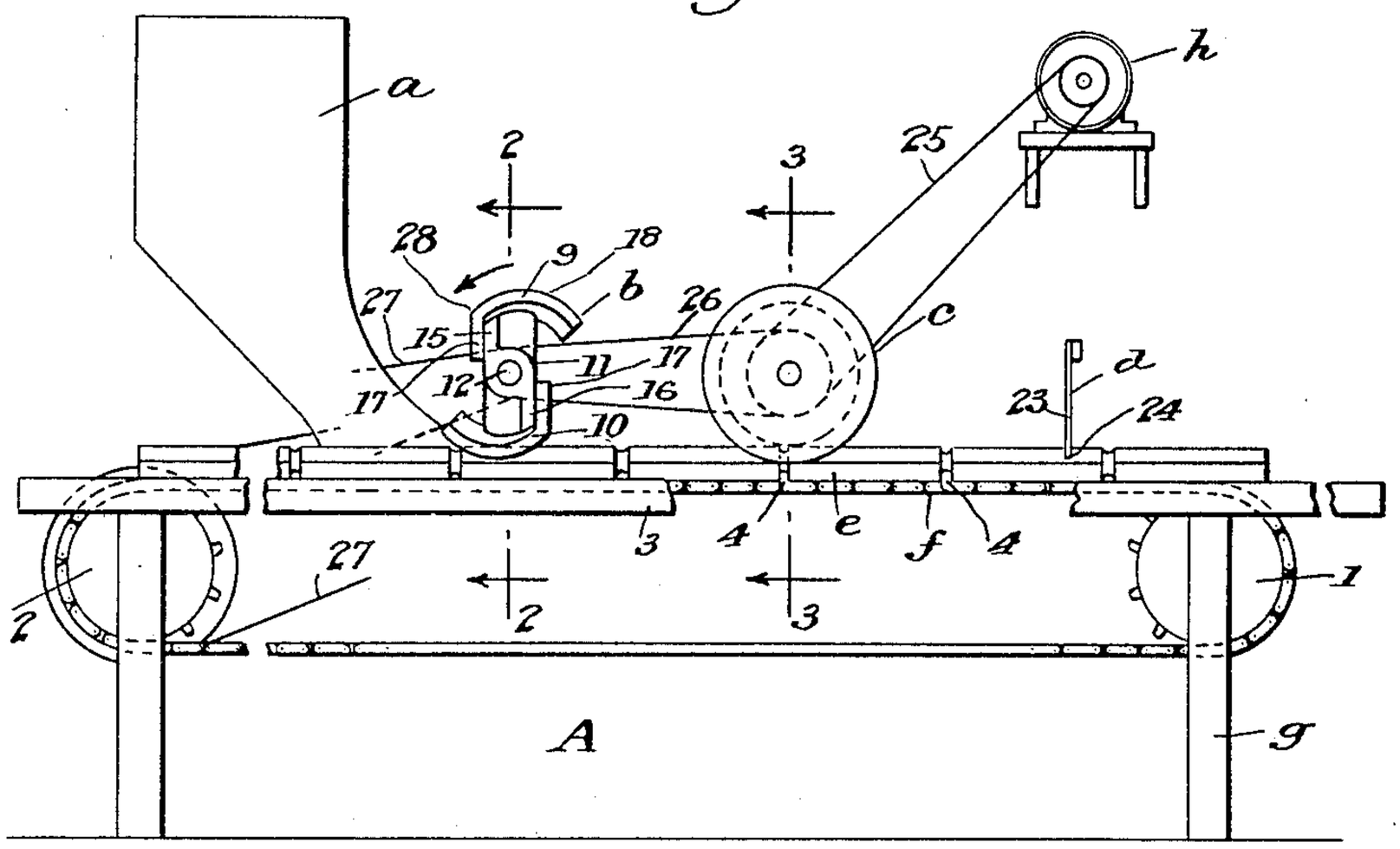


Fig. 2

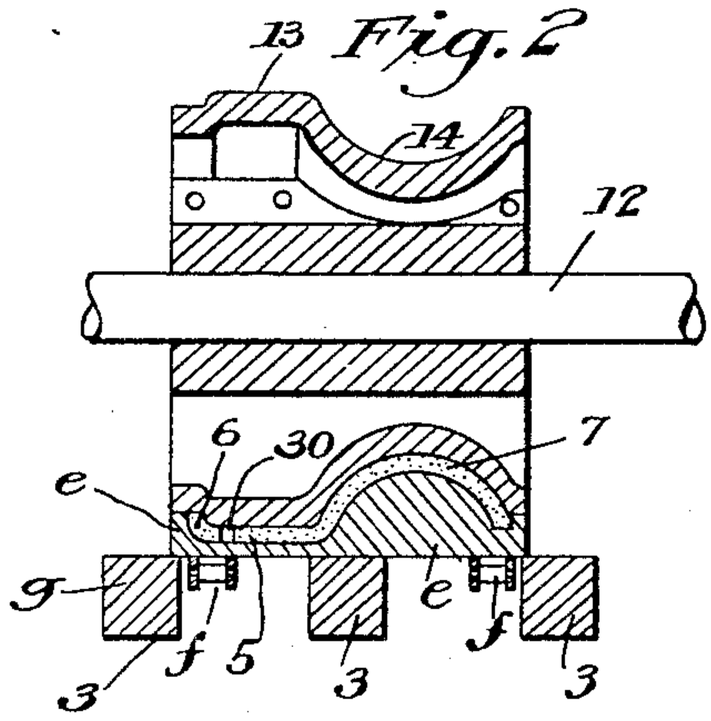


Fig. 3

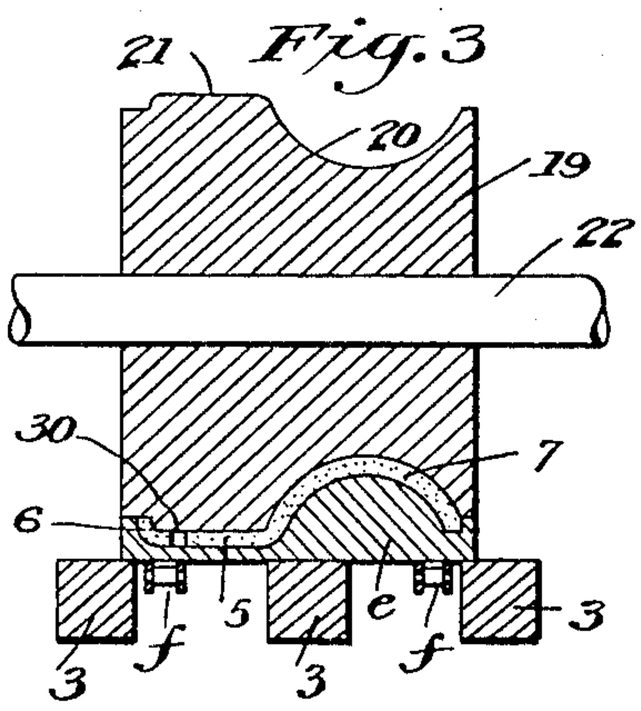
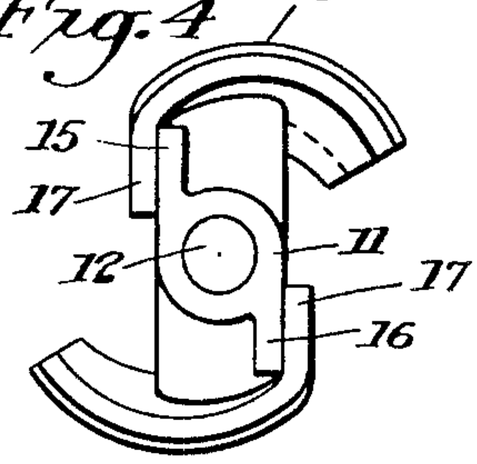


Fig. 4



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UNITED STATES PATENT OFFICE.

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DEVICE FOR FORMING SLABS.

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This invention relates to devices for forming slabs, such as tile and the like. The invention has for an object the provision of a device of this character which is rapid in performance, economical in operation and generally superior in results obtained.

The present device considered as an entirety is adapted to form slabs from any selected material, although primarily the invention is arranged for forming concrete slabs or tile. The device to be described will form a finished tile of greater strength than the usual form of tile which is molded, and which tile is practically impervious to water. It is of course evident that a resultant product of this character by being less bulky and likewise rapidly formed, will materially reduce the cost to the consumer of said product.

With the above and other objects in view, which objects will appear as the specification proceeds, the invention consists in the novel and useful provision, formation, construction, association and relative arrangement of parts, members and features, all as shown in certain embodiments in the accompanying drawing, described generally, and more particularly pointed out in claims.

In the drawing:

Figure 1 is a fragmentary side elevation of the device;

Figure 2 is a cross sectional view on the line 2—2 of Fig. 1, and on an enlarged scale;

Figure 3 is a cross sectional view on the line 3—3 of Figure 1, and on an enlarged scale from the showing of such figure; and,

Figure 4 is a side elevation of the packer.

Corresponding parts in all the figures are designated by the same reference characters.

In its broadest aspect the invention includes a device such as a hopper adapted to feed and direct the tile material to suitable dies and which tile material is then acted upon by a packer which closely compresses the tile or slab material, immediately followed by a smoother and a scraper for removing any excess of such tile material. The steps that follow would be the generally well-understood steps now in use, such as allowing the tile to cure the required length of time.

In particular the invention as an entirety is designated by A, of which *a* is the hopper, *b* the packer, *c* the smoother, *d* the scraper and *e* die members adapted to receive the concrete or other material fed thereto by the hopper, and which die members are carried upon a continuous chain *f*,—all of which elements may be utilized in practicing one embodiment of the invention. Considering first the dies and conveyer therefor, it will be noted that in the present arrangement I have provided a suitable stand or table *g* which has journaled thereto end sprocket wheels 1 and 2 over which is passed the continuous chain *f*. In particular it will be noted upon reference to Figs. 2 and 3 that two of such continuous chains *f* are provided and that said chains are received between spaced top pieces 3 of the table *g*. Furthermore, said chains carry on the periphery thereof spaced lugs 4 and the pans or dies or molds *e* are placed in each instance between two of said lugs, as indicated and shown best in Figure 1. These dies or molds or pans, as they may be termed may assume any desired configuration, and in the present instance it will be noted upon reference to Figs. 2 and 3 that the periphery of the mold is shaped to form tile having a flat portion 5 with an up-turned part 6 and with a second portion 7 curved. This form of tile is used extensively in roof construction and the extremity of the curved portion is adapted to overlap the flat portion 5 and the up-turned portion 6. This form of tile is ordinarily known to the trade as pan tile. The hopper has its discharge mouth directly above the periphery of the dies *e* and said hopper is adapted to have placed therein any material desired for the formation of said tile or slabs. If concrete is used then the concrete is placed within the hopper, it being of course realized that the constituent elements of the concrete such as rock or stone, are in a finely divided state. The packer *b* is detailed in Figs. 2 and 4. Particularizing, the said packer includes in the present instance two packer heads or dies shown at 9 and 10, and of identical construction, and which packer heads are adapted to be secured to a hub member 11, which hub member is mounted upon a shaft 12, the hub being keyed to the shaft so that rotation of the shaft produces rotation of the packer. The periphery of each packer head in transverse section will conform to the periphery of the dies *e*. In other words, the periphery of each packer head will have a substantially flat portion 13 followed by a concave portion 14. However, all points on the periphery of said packer heads are not equi-distantly spaced

from the center of rotation of the packer. In other words, each packer head is substantially segmental with the periphery spirally formed. The hub 11 is formed with two arms 15 and 16 which are substantially parallel with one surface of each arm substantially tangential to the periphery of the hub. The said packer heads are adapted to be secured to said arms in any approved manner such as by bolting, each packer head to this end being provided with a lug or arm 17 to permit such attachment. The periphery of each packer head curves upwardly and outwardly from said arm or lug, the portion of less radius relative to the axis of rotation being at the zone where the curve merges with the arm or lug 17, and the portion of greatest radius at the opposite end portion of the packer head. This construction is not a mere happenstance, but performs a very useful function in the packing of the concrete or other material, as will be more fully pointed out in the statement of the operation.

To render description easier, the portion 18 of each of the packer heads just described, will be termed the spiral packer blade. The next device of importance is the smoother *c* which is shown in cross section in Fig. 3, and the said smoother comprises a solid drum 19, the periphery of which is formed to correspond to the periphery of the tile, and to this end the periphery will take the general form taken by the dies *e* as well as the packer heads, viz: an annular concave portion 20 and a substantially flat portion 21. This drum is keyed to a shaft 22. The scraper *d* may comprise a thin strip of material 23, likewise formed at its tile-engaging part 24 in accordance with the peripheral form of the tile. The scraper is adapted to remove excess material from the dies *e*. A suitable means such as a motor *h* is used for driving the different rotatable elements, and in this particular a chain or belt 25 rotates the smoother *c*, a second chain or belt 26 drives between the smoother and the packer *b*, and a third chain or belt 27 drives between the packer and the sprocket 2. The relation between the drives is not important, save and except that the packer rotates at a greater speed than the smoother. Furthermore, the sprocket 2 rotates at considerable less speed than the packer or the smoother. This is in order that the packer will act upon all portions of the concrete during the formation of the tile.

The operation, uses and advantages are as follows: If we assume that concrete is used, said concrete is placed in the hopper *a*. A workman would stand at one end of the table *g* and said workman would place the dies on the chains and between the lugs 4 thereof, and as the chain moved the dies would be drawn under the mouth of the said hopper and a certain amount of concrete would be deposited therein or thereon. The packer would be rotating in the direction of the arrow of Fig. 1, and the concrete would be acted upon by the curved leading edge 28 of the spiral packer blades immediately followed by a greater compression of the material between the said packer blades and the die. In other words, this spiral construction permits the material to be progressively acted upon in such a manner as to densely pack the material to a determined thickness. If the blade were not formed in the way mentioned, and all parts thereof were equidistantly spaced relative to the center of rotation, part of the material would be struck by the advancing or leading edge portion and an uneven tile, from a thickness standpoint, would result and furthermore, the tile material would not be properly compressed.

Reference to Fig. 1 will likewise indicate that tile material standing up within the die *e* would be forced downwardly by the curved leading edge with gradually increasing pressure. After the tile has had both surfaces formed as just outlined, the said material is acted upon by the smoother *c* which rolls the surface, as it were. Any material then remaining along the sides or edges of the formed tile would then be removed by the scraper and allowed to drop into any receiving hopper. As the dies with the formed tile reach the limit of excursion they are automatically released from the chain as would be evident upon inspection of Fig. 1, as the table top continues out for a certain length and the dies would be shoved along said top by following dies. Of course the tile is left within said dies *e* so that it may properly cure.

The device is extremely simple in nature and yet performs the tile-making operation with great speed, and only requires the services of two workmen, namely, one workman to place new dies upon the conveyor *f* at the feeding end, and a second workman to see that the hopper *a* is properly filled and that the discharged dies containing formed tile are properly taken care of.

It is perhaps unnecessary to state that each of the dies *e* would be provided with a small peg whereby an opening in the formed tile would result, such opening being shown at 30. This opening is necessary so that the tile may be secured to a roof.

It is obvious that various changes and modifications may be made in practicing the invention, in departure from the particular showing of the drawing, without departing from the true spirit of the invention.

Having thus disclosed my invention, I claim and desire to secure by Letters Patent:

1. In a device of the character disclosed, a conveyer, a packer head comprising two oppositely disposed spiral packer blades, and

means for moving said conveyer and rotating said packer head whereby any material upon said conveyer will be acted upon by said packer head to compress said material and shape the same.

2. In a device of the character disclosed, a conveyer, a die member thereon, means for feeding material on said die, a packer head comprising oppositely disposed spiral packer blades formed with a die portion, and means for rotating said packer head and moving said conveyer whereby the packer head acts upon the die material on said die to compress the same.

3. In a device of the character disclosed, a rotary packer head, comprising two oppositely disposed spiral packer blades formed with die portions, and whereby when the packer head is rotated it will act on the substance to be formed to compress the same.

4. In a device of the character disclosed, a hopper, a conveyer in part beneath said hopper, dies carried by said conveyer, said hopper being adapted to hold material to be formed by said dies, a spiral bladed packer head adapted to act upon material carried by the dies to pack and form a surface of said material, a smoother for finishing the surface acted upon by said packer, and means for moving said conveyer and rotating said packer and smoother.

In testimony whereof, I have signed my name to this specification.

GEORGE C. MARTIN.