

G. M. VON HASSEL.
 APPARATUS FOR TREATING BUILDING AND ROAD MATERIAL.
 APPLICATION FILED OCT. 12, 1912.

1,213,982.

Patented Jan. 30, 1917.
 2 SHEETS—SHEET 1.

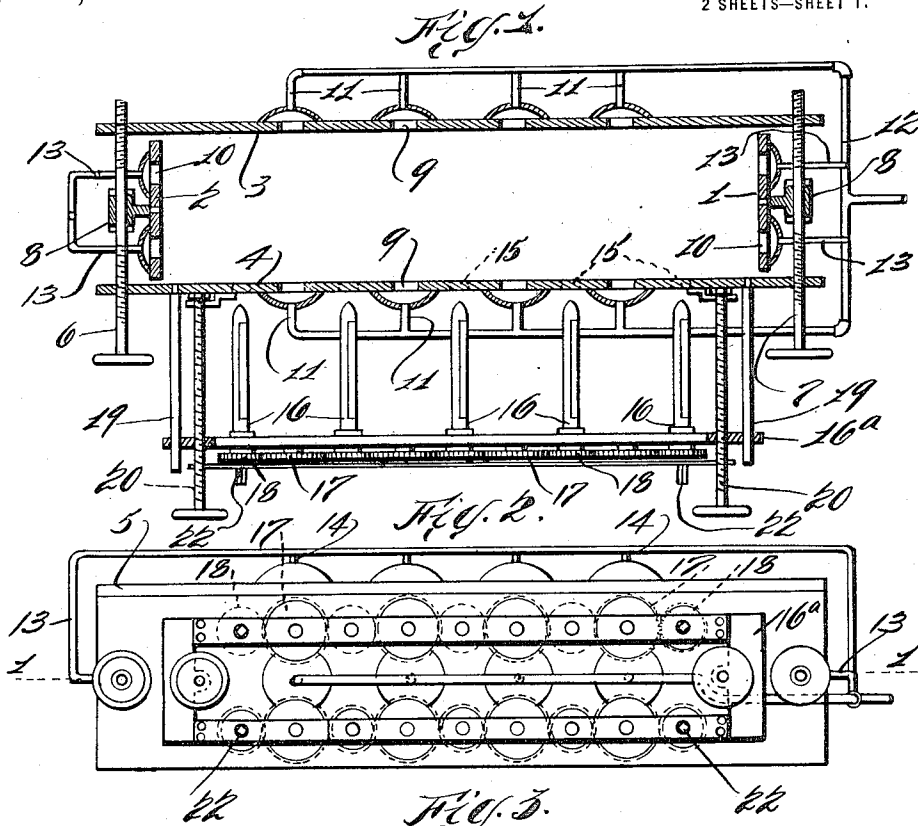


Fig. 5.

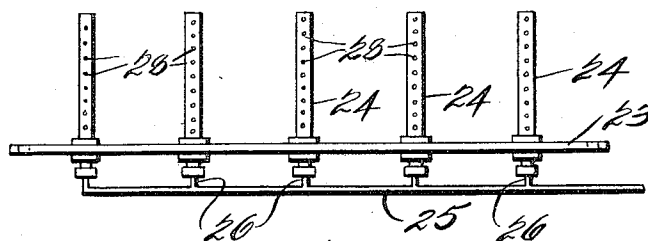
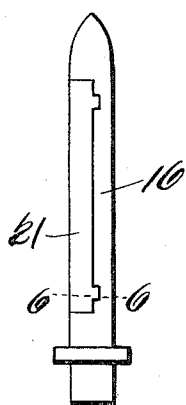


Fig. 4.

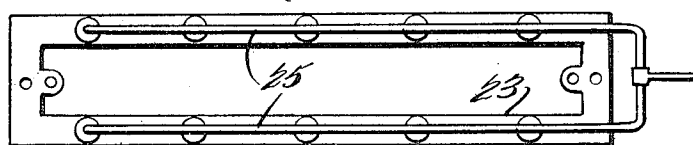
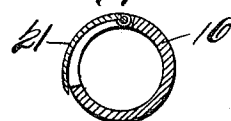


Fig. 6.



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Fig. 7.

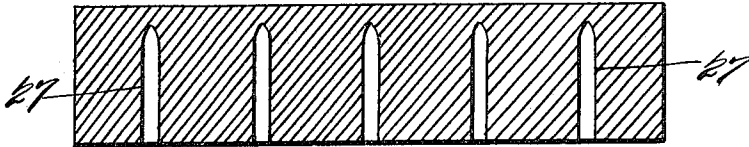


Fig. 8.

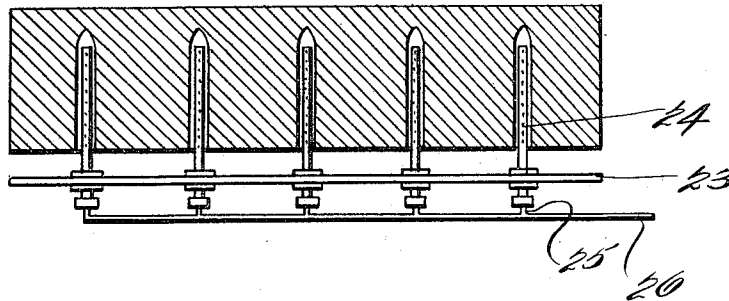
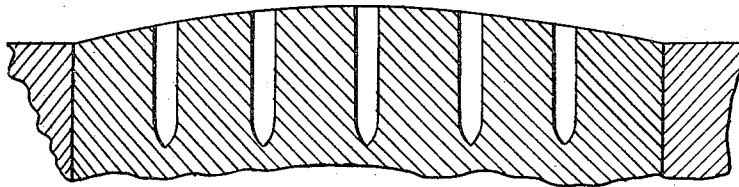


Fig. 9.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TREATING BUILDING AND ROAD MATERIAL.

1,213,982.

Specification of Letters Patent.

Patented Jan. 30, 1917.

Application filed October 12, 1912. Serial No. 725,544.

To all whom it may concern:

Be it known that I, GEORG M. VON HASSEL, civil engineer, a citizen of Germany, residing at New York city, county and State of New York, have invented an Apparatus for Treating Building and Road Material, of which the following is a specification.

This invention relates to an improvement in an apparatus or mold for compressing and treating clay for building, road or tunnel construction.

The object of the invention is to facilitate the construction of buildings, roads, tunnels or the like by providing a novel apparatus in the nature of a mold into which the clay is poured and afterward suitably treated, such as baking, coloring, etc., while the mold is in position. The material being molded, baked or treated (that is to say, a wall, for instance) is built up block by block by placing my improved mold in position, forming and treating the block, then removing the mold and placing it on top of the previously formed block or to one side thereof.

Other features of improvement will hereinafter appear.

I will now proceed to describe my invention in detail, the novel features of which I will point out in the appended claims, reference being had to the accompanying drawings forming part hereof, wherein:—

Figure 1 is a sectional plan view of a preferred embodiment of my invention, the section being taken on a line 1—1 in Fig. 2; Fig. 2 is a side elevation thereof; Fig. 3 is a detail view of the burning tubes; Fig. 4 is a side view thereof; Fig. 5 is an enlarged plan view of one of the core tubes; Fig. 6 is a cross-sectional view thereof, the section being taken on a line 6—6 in Fig. 5; Fig. 7 is a sectional view of a block showing the cored pockets; Fig. 8 is a similar view of a block, showing the burning tubes in position; Fig. 9 is a sectional view of a roadway showing the cored pockets.

My improved mold as herein illustrated consists of end walls 1 and 2, side walls 3 and 4 and a top 5. The walls 3 and 4 are movable and can be caused to approach or recede from each other by threaded spindles 6 and 7 rotatably supported in brackets 8 on the end walls 1 and 2. The top 5 is removable and can be secured in position upon the mold in any suitable manner. The side

walls 3 and 4 are provided with openings 9, and the end walls with openings 10, the openings 9 having in communication therewith tubes 11 leading from ducts 12 through which gas or other heating element can be introduced into the mold through the openings 9. The openings 10 have in communication therewith tubes 13 through which a heating element is introduced into the mold. The top 5 is also provided with openings, not shown, through which a combustible gas is introduced into the mold through tubes 14, the ducts leading to the various tubes being preferably resilient. The side walls 3 and 4 are further provided with openings 15 through which coring-tubes 16 can be passed into the material within the mold, as shown in Fig. 7.

The tubes 16 are rotatably supported by a frame 16^a and are rotatably connected, one to the other, by idle-gears 17 meshing with gears 18 on the tubes 16. The frame 16^a is slidably supported on rods 19 carried by the moldwall 4, the said frame being moved along said rods, to force the tubes 16 into the material within the mold, by rotatable threaded spindles 20.

By referring to Figs. 5 and 6, it will be seen that the coring tubes 16 are provided with hinged doors 21 which will open when the tubes are rotated toward the left, allowing the cored out material to collect within the tubes; a reversal of this movement will close the doors 21, thereby shutting in the cored-out material. The spindles of the end tubes 16 are squared, as at 22, providing a grip for a handle to rotate the tubes.

Figs. 3 and 4 illustrate a frame 23 carrying perforated tubes 24 constituting burners, into which a combustible gas is introduced through a duct 25 and tubes or nipples 26. The frame 23 is designed to be mounted on the supporting rods 19 after the frame 16^a for the coring tubes 16 has been removed. Fig. 8 illustrates the application of the burning tubes 24.

The material for a wall (for instance) is placed into the mold; the top 5 is then placed on and secured. After the above operation, the walls 3 and 4 are brought together by turning the spindles 6 and 7, whereby the material in the mold is formed into a block by the pressure of the inwardly moving walls. After the walls 3 and 4 have been forced home, the spindles 20 are rotated

to cause the coring tubes 16 to enter the material and produce pockets, such as 27, Fig. 7. The tubes may be forced in and withdrawn, without rotating the same, or they may be rotated by turning the end tubes by means of a lever or wrench applied to the squared ends 22. If the tubes are rotated toward the left, the doors 21 will open and the cored out material will pass into the tubes. When the tubes are rotated in the opposite direction, the doors 21 will close, shutting in the cored material, after which the tubes can be withdrawn, and the frame and tubes removed from the mold entirely. After the coring-tubes have been withdrawn, the heating tubes are placed in position on the mold, that is to say, the frame 23 is placed upon the rods 19 and the heating-tubes moved into the pockets 27, as shown in Fig. 8.

Before the heating tubes are moved into the pockets, a combustible gas will be caused to flow into the tubes 24, and ignited at the openings 28. The heat from the ignited gas will assist in baking or hardening the material in the mold. After the heating-tubes have been moved into the pockets, the walls 3 and 4 of the mold will be moved away from the molded material, leaving a space. After the walls 3 and 4 have been moved away from the molded material, gas will be caused to flow through the pipes 12, 11 and 13, the said gas being ignited at the openings 9 and 10. The flame from the burning gas will heat or bake the molded material by coming in contact therewith in the space between the walls of the mold. After the block has been sufficiently treated, the mold will be lifted therefrom and placed elsewhere. Substantially the same operation is carried out for building roads, tunnels, etc., with my improved apparatus, and my apparatus can also advantageously be utilized in the manufacture of hollow or porous tiles and for other analogous purposes not herein specifically mentioned.

The cavities made in the clay by the coring devices are of greater diameter than that of the burner tubes which subsequently enter said cavities; hence there is sufficient intervening space for the inflow of air and the outflow of steam and products of combustion. The clay is not supplied to the mold in a moist condition, but has undergone preliminary drying, though not to a degree which will prevent the coring tubes 16 from making pockets in the mass of material. Of course I am not confined to any particular degree of heat or amount of initial moisture or rapidity of the heating or baking operation. A gradual moderate heat applied to clay not moist will not lead to serious injury from cracking or shrinkage. The quantity of clay supplied to the mold is so calculated as to leave the plate or mass of clay of

sufficient size after baking or firing in the mold as described. The holes or cavities in the clay made by coring devices 16 are so close together that the flames from openings 28 of tubes 24 will heat all parts of the clay within the mold quite evenly and thoroughly, avoiding in most instances the crumbling or cracking of the clay. The latter may be supplied with binding material as an additional guard, such binder being injected into the clay through holes 28 aforesaid. The greatest part of the heat is applied through said holes, within the mass of clay, so that the walls of the mold are not subjected to injurious heat and materials may be mixed with the clay facilitating the action of the heat so as to shorten the period of subjection thereto.

In treating a road, the clay is spread in layers taking the form of the road. It is then perforated or penetrated to a certain depth by the coring devices. The perforated heating tubes 24 are then inserted into the cavities thus made, the binder or chemical compound is injected through them and the said tubes are supplied with inflammable fluid which is ignited at holes 28. Of course the length of coring devices 16 and heating tubes 24 and the corresponding depth of the cavities are matters of choice and degree; as are also the diameters of the coring devices, the cavities and the heating tubes. Instead of clay, a mixture of sand and clay may be used, or any other building or road material suitable to hardening by the action of heat.

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

1. A mold consisting of a plurality of movable walls, provided with openings, movable coring devices detachably secured to said mold, means to move said coring devices through said openings and into said mold, a frame adapted for attachment to said mold after said coring devices have been removed, and burners carried by said frame adapted to pass through the openings in the walls of said mold.

2. A mold for clay or the like, consisting of a plurality of walls provided with a plurality of openings, means to introduce heat into said mold through some of said openings, and coring devices adapted to be forced into said mold through the other of said openings.

3. A mold for clay or the like, consisting of a plurality of walls provided with a plurality of openings, means to introduce heat into said mold through some of said openings, coring devices adapted to be forced into said mold through the other of said openings, and burners adapted to be forced into said mold through the openings for the passage of said coring devices.

4. A mold for clay or the like, consisting

of a plurality of walls provided with a plurality of openings, means to introduce heat into said mold through some of said openings, and rotatable coring devices adapted to be forced into said mold through the other of said openings.

5 5. A molding apparatus, consisting of a plurality of walls adapted to retain clay or the like, means to produce pockets in the material in said mold, and means to introduce heat into said pockets.

10 6. A molding apparatus, consisting of a plurality of walls adapted to retain material to be treated, means to produce pockets in said material, and burners adapted for insertion into and withdrawal from said pockets.

15 7. A mold consisting of a plurality of movable walls provided with openings, rotary tubular coring devices carried by said mold, each coring device being provided with an opening in its side and a hinged door covering said opening, said door being arranged to open when said device is rotated in one direction and to close when said device is rotated in the other direction, and

means to move said coring devices through said wall-openings and into the mold.

8. In apparatus for treating building and road materials, a series of coring devices arranged at brief intervals and adapted to make cavities in such material, in combination with means for forcing said devices into such material and withdrawing said devices therefrom, perforated tubes adapted to enter said cavities and discharge flame therein and means for supplying said tubes with fluid fuel.

9. In apparatus for treating building material and road materials, a series of cavity-forming devices, in combination with means for applying them to such materials and withdrawing them therefrom, and heating devices adapted to be introduced as a series simultaneously into said cavities and to heat the mass of building material equally and simultaneously at a number of points.

GEORG M. VON HASSEL.

Witnesses:

OTTO G. LINDBERG,
I. HEIL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."