E. C. HODGES.

APPARATUS FOR MAKING ARTIFICIAL STONE AND THE LIKE.

APPLICATION FILED JULY 12, 1920.

1,433,204.

Patented Oct. 24, 1922.

2 SHEETS—SHEET 1.

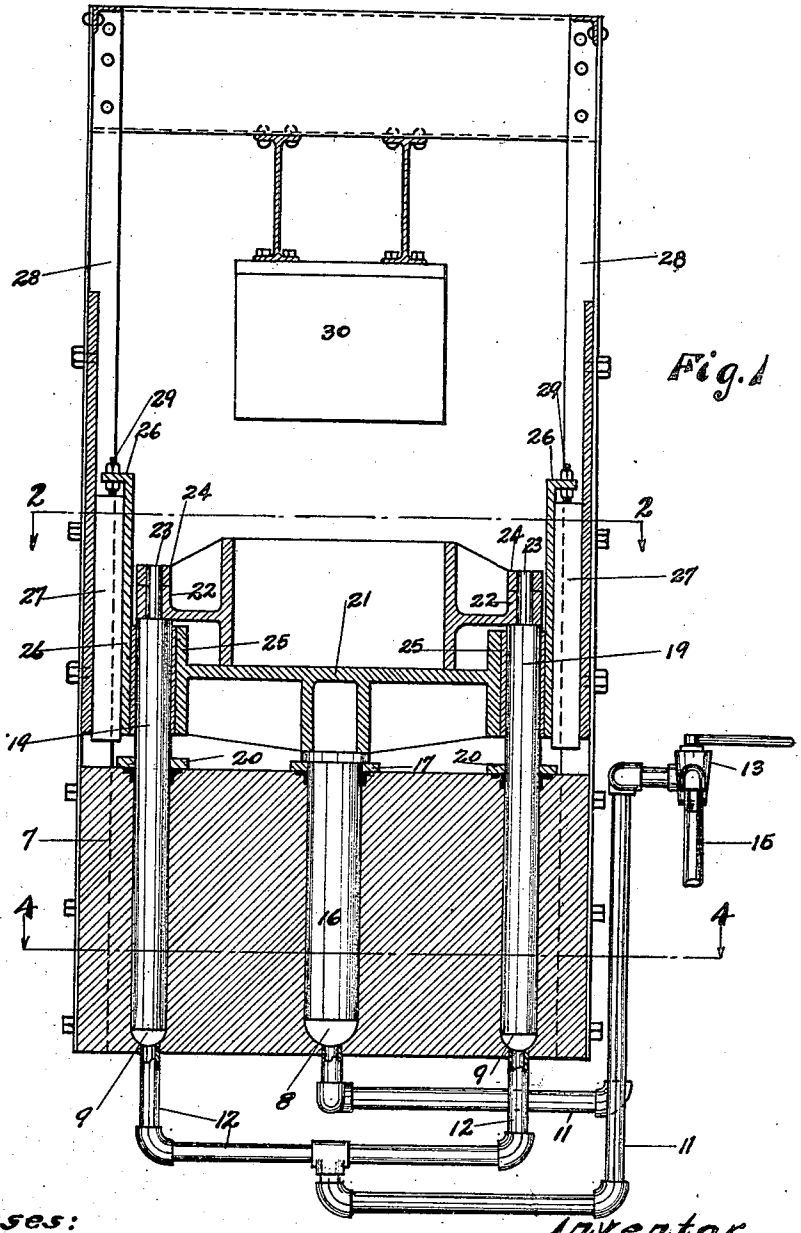


Fig. 1

Witnesses:
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B. G. Richards

Inventor
Emery C. Hodges.
By Joshua R. H. Scott
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2 SHEETS—SHEET 2.

Fig. 2

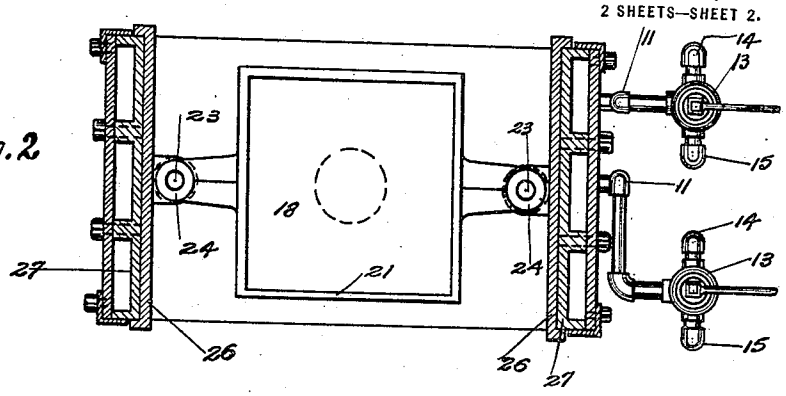
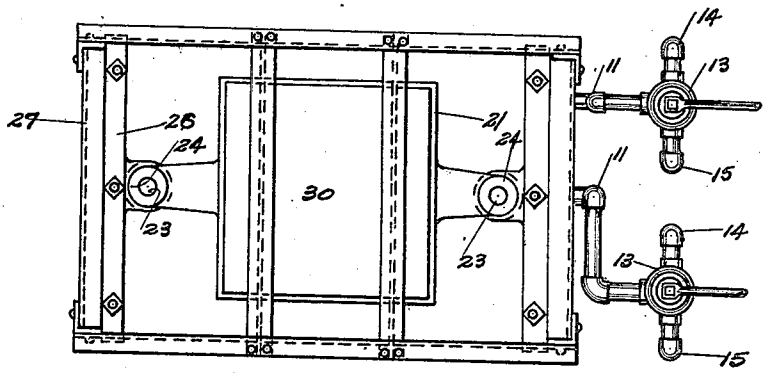


Fig. 3



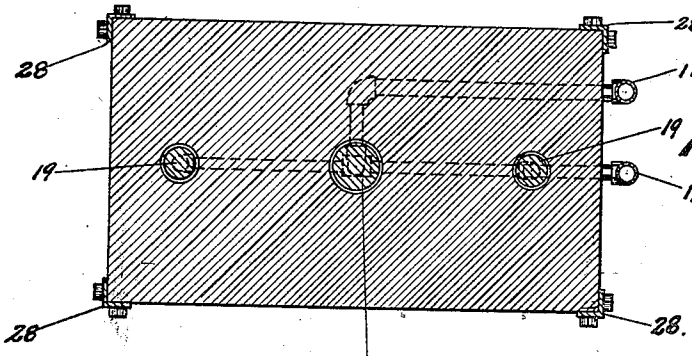
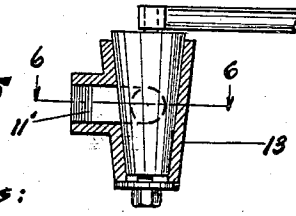


Fig. 4

Fig. 5



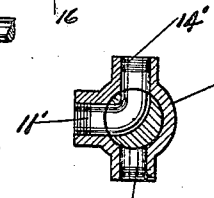


Fig. 6

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Patented Oct. 24, 1922. 1,433,204

UNITED STATES PATENT OFFICE.

EMERY C. HODGES, OF JOLIET, ILLINOIS.

APPARATUS FOR MAKING ARTIFICIAL STONE AND THE LIKE.

Application filed July 12, 1920. Serial No. 395,669.

To all whom it may concern:

Be it known that I, EMERY C. HODGES, a citizen of the United States, and a resident of the city of Joliet, county of Will and State of Illinois, have invented certain new and useful Improvements in Apparatus for Making Artificial Stone and the like, of which the following is a specification.

My invention relates to improvements in apparatus for making artificial stone and the like, and has for its object the provision of an improved method and apparatus of this character whereby artificial stone of high grade may be readily and economically manufactured.

Other objects will appear hereinafter.

The invention consists in the combination and arrangements of parts hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings forming a part of this specification, and in which,

Fig. 1, is a vertical section of an apparatus for carrying on the invention,

Fig. 2, a section taken on line 2—2 of Fig. 1,

Fig. 3, a top plan view corresponding with Fig. 1,

Fig. 4, a section taken on line 4—4 of Fig. 1,

Fig. 5, a detail view of one of two valves employed in the apparatus, and

Fig. 6, a section taken on line 6—6 of Fig. 5.

The preferred form of construction, as illustrated in the drawings, comprises a heavy rectangular base block 7 formed of solid steel and having bores 8 and 9 formed therein and projecting downwardly into the body thereof from the top thereof. These bores are arranged as indicated, the central bore 8 being comparatively large and the lateral bores 9 being considerably smaller and positioned on opposite sides of the central bore 8 as shown. A pipe 11 leads into the bottom of the central bore 8 through the bottom of the block 7 as shown and branch pipes 12, similarly lead into the bottoms of the lateral bores or cylinders 9, said branch pipes 12 being in turn connected with another pipe 11. Each of the pipes 11 is supplied with a three way valve 13, the corresponding pipe 11 leading into the valve casing through the corresponding opening 11′ in each instance. Each valve casing 13 is supplied with water under heavy pressure through a corresponding type 14 leading thereinto to a corresponding opening 14′. Likewise, each valve casing 13 is provided with an exhaust pipe 15 leading therefrom through an opening 15′, and the valve arrangement is such that in one position water under pressure is admitted to the corresponding cylinder or cylinders as the case may be, in another position, the valve is wholly closed to prevent either entry or escape of water, and in a third position the water is exhausted from the corresponding cylinder or cylinders through the corresponding exhaust or drain pipe 15.

The central bore or cylinder 8 has a piston 16 operating therein through a suitable packing gland 17 at the top of the base block 7 and the lateral cylinders 9 have pistons 19 also operating through suitable packing glands 20. Above the top of base block 7, a table 18 is mounted on the top of the piston 16 and on the top of the table 18 is arranged a rectangular form member 21 as shown. The form member 21 is provided with lateral eyes 22 secured to the stems 23 on the upper ends of the pistons 19 by means of nuts 24. Table 18 is also provided with lateral bearings 25 sliding freely on the pistons 19 as shown and whereby independent movements of the table 18 and the form member 21 are rendered possible. Table 18 also carries lateral guides 26 sliding on guide blocks 27 secured in the sides of frame 28 of the apparatus, said frame being secured to the four corners of the base block 7 as shown. The guides 26 are provided with stop bolts 29 contacting with the tops of the blocks 27 to limit downward movements of the table 18 and the form member 21. An abutment head 30 is rigidly mounted in the upper portion of the frame 28 above the form member 21 and is shaped to fit freely within said form member as shown.

In carrying on the process, a pulverized base material such as pulverized lime stone, marble, or the like is first prepared and preferably mixed with cement and a small amount of water, a suitable quantity of said material being placed in the mold form 21 resting upon the top of the table 18. Thereupon pressure is admitted to the central cylinder 8 forcing the table 18, the form mem-

ber 21 and the contents thereof upwardly into operative contact with the under side of the abutment head 30 thus compressing material in the form. The pressure employed is heavy, preferably about 200 tons to the square foot. This heavy pressure forms the material into a solid block, of high grade and having a very fine texture hardly distinguishable from marble. After the material has been subjected to the action of this pressure for a suitable length of time, usually a few minutes sufficing, the corresponding valve is turned to discontinue the supply of water under pressure, but to retain the supply in cylinder 8. Thereupon water under pressure is admitted to the cylinders 9 which operate to raise the form member 21, the same passing over the abutment 30 which is shaped to permit of this. This strips the form member 21 from the material which has been compressed, whereupon the table 18 is lowered or depressed by opening the corresponding valve to permit of the exhaust of the water from cylinder 8. The block thus formed is then removed from the table 18, the form member 21 lowered when the apparatus is ready to receive another charge of material for making another block. Various forms of mold members may be employed as desired, the one illustrated being designed and adapted to form a simple rectangular block. Also various kinds of adhesive may be employed in place of the cement and water and in fact I have found that mere water will suffice to form a fairly satisfactory block if the pressure applied is sufficiently heavy. In this way, artificial stone blocks of various forms and of high quality may be readily and economically manufactured.

While I have illustrated and described the preferred method and form of apparatus for carrying on my invention, these are capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the exact details set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. Apparatus of the class described comprising a stationary abutment, a table movable towards and from said abutment, a form member situated between the table and the abutment and movable with reference to the abutment, pistons, one of which acts on said table, the other of said pistons acting on said form member and forming guiding means for the table.

2. Apparatus of the class described comprising a heavy rectangular base block having a large central bore and smaller lateral bores arranged on opposite sides thereof, said bores projecting downwardly from the top of said block and constituting hydraulic cylinders; a pipe leading through the bottom of said block into said central bore; branch pipes leading through the bottom of said block into said lateral bores; valves controlling the entry and exhaust of water from said cylinders; a frame secured to said base block and extending upwardly therefrom; pistons operating in said bores and projecting upwardly from the top of said block; a table secured to the upper end of the piston in the central bore and guided to slide vertically in said frame; a form member, open at the top and bottom and co-operating with the top of said table to form the side walls of a mold, said form member being mounted on the upper ends of the pistons in said lateral bores; guides on said table slidably engaging the pistons in said lateral bores; and an abutment mounted in said frame above said form member and fitting within the same, substantially as described.

3. A hydraulic press comprising a solid base block of large size having a central larger bore and lateral smaller bores arranged on opposite sides of said central bore; pistons operating in said bores and projecting from the top of said block; pipes leading into said bores through the bottom of said block; valves controlling said pipes; a frame secured to said base block and projecting upwardly therefrom; a press member mounted on the upper end of the cylinder in the central bore and guided in said frame; a second press member arranged above said first mentioned press member and mounted on the upper ends of the pistons in said lateral bores, there being bearings in said first mentioned press member slidably engaging said last mentioned pistons; and a press member in the form of an abutment rigidly mounted in said frame above said second mentioned press member and adapted to fit therein, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EMERY C. HODGES.

Witnesses:
B. G. RICHARDS,
ROSE ROSEN.