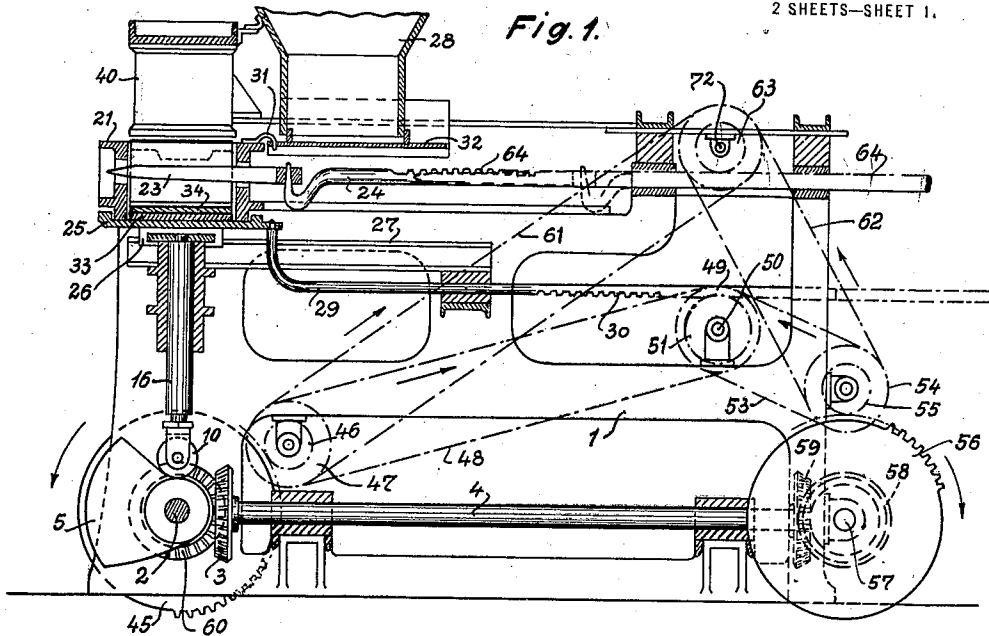
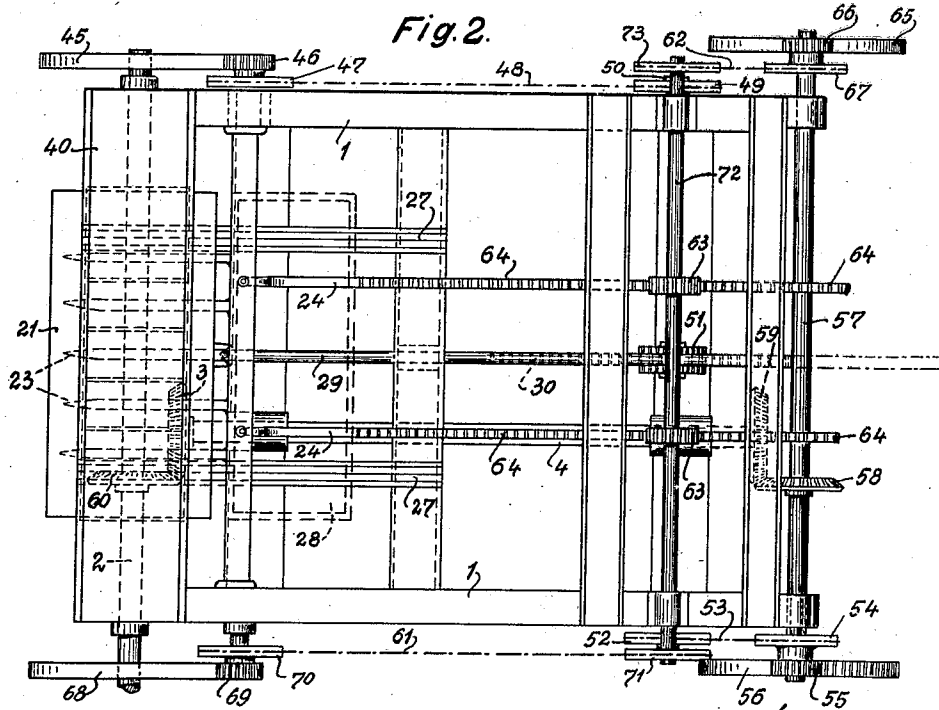


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PRESS FOR THE MANUFACTURE OF STONES.
APPLICATION FILED JUNE 29, 1920.

1,429,459.

Patented Sept. 19, 1922.

2 SHEETS—SHEET 1.



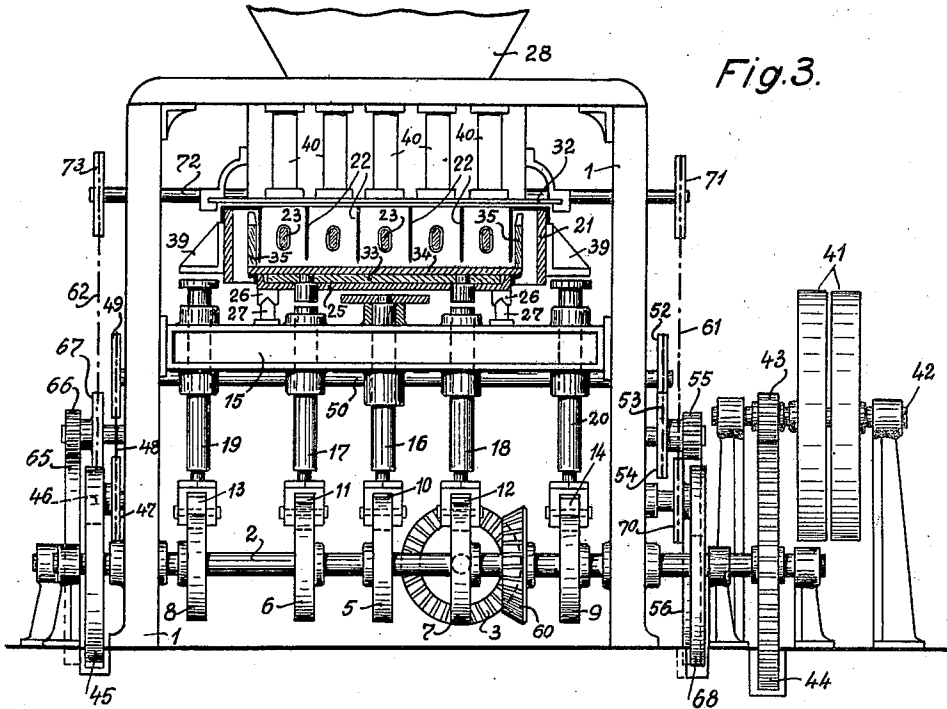
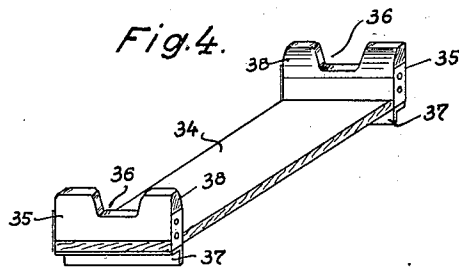
Inventor.
Carl H. Schol,
By Watson, Cox, Morse & Grindle,
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UNITED STATES PATENT OFFICE.

CARL HEINRICH SCHOL, OF ALLENDORF, DILLKREIS, GERMANY.

PRESS FOR THE MANUFACTURE OF STONES.

Application filed June 29, 1920. Serial No. 392,886.

To all whom it may concern:

Beit known that I, CARL HEINRICH SCHOL, manufacturer, a citizen of Germany, and resident of Allendorf, Dillkreis, Germany, with the post-office address Hauptstrasse 131, have invented new and useful Improvements in Presses for the Manufacture of Stones (for which applications for Letters Patent have been filed in foreign countries as follows: in Germany, Feb. 25, 1918; Sweden, Dec. 22, 1919; France, Jan. 26, 1920; Norway, Dec. 30, 1919; Luxembourg, Dec. 16, 1919; Denmark, Jan. 10, 1920; Spain, Dec. 26, 1919; Austria, Dec. 20, 1919; Hungary, Jan. 30, 1920; Belgium, Jan. 27, 1920; Netherlands, April 11, 1919; Czechö-Slovakia, July 22, 1919; Switzerland, Dec. 4, 1919), of which the following is a specification.

In the manufacture of sand stones and particularly of stones from blast furnace slag, great care must be exercised in the pressing of the stones. The stones must not be subjected to too high a pressure, as otherwise their highly porous structure would be lost.

Now in order to attain a correct shaping of the edges and corners of the stones, the press operates in the following manner according to this invention. The stone within its mould box is first of all pressed against an abutment, and this solely at a pressure sufficient to shape the upper edges and corners of the stone in a correct manner. Only after this operation the lower portion of the stone is shaped and this is effected by raising the bottom of the mould box by itself. By thus splitting the pressing operation into two parts, it is possible to obtain a concise configuration of the whole stone, without subjecting it to too high a pressure and thereby impairing its structure by the crushing of the components.

In this operation, in order to enable the freshly moulded stones to be withdrawn from the press employed, in a convenient way, and to enable them to be piled up without manual handling, special supporting trays are employed to carry the stones during their formation.

The press for carrying this method into effect operates so that first of all the whole stone together with its mould box is pressed against an upper abutment. Two plungers are then set in operation by which the bottom of the mould box is raised separately thereby applying pressure to the lower por-

tion of the stone. Finally two further plungers are used to lift the whole mould box from the finished stone resting on its supporting tray, so that the stone may be removed from the press together with its supporting tray. The mould box is then fitted with another tray and automatically brought beneath a supply hopper in the machine and after being charged with the material is brought back again into the working position.

The accompanying drawings illustrate by way of example a constructional form of such a press.

Fig. 1 is a longitudinal section.

Fig. 2^a is a plan view of Figure 1.

Fig. 3 a face view partly in section, and

Fig. 4 is a perspective view of the stone supporting tray.

Laterally journaled in the frame 1 of the machine is a main driving shaft 2 continually driven from a convenient pinion 43 mounted on shaft 42, which carries the loose and keyed pulleys 41, the pinion 43 meshing with large gear wheel 44 on shaft 2. Mounted on the shaft 2 are five cams 5, 6, 7, 8 and 9, in contact with rollers 10, 11, 12, 13 and 14, which are connected with plungers 16, 17, 18, 19 and 20 respectively, guided in a cross beam 15. These plungers are raised and lowered in a definite sequence by the action of the cams 5 to 9. Located above these plungers is a mould box 21, adapted, in the example shown, to enable five stones to be pressed to a finish simultaneously side by side, between partitions 22 placed between each stone and between the outermost ones and the upright borders 35 of the trays described further on. The stones are produced in the form of hollow bodies for which purpose a five-core grid 23 is introduced into the stones during the charging and pressing operations. This core grid is connected by a bar 24 to a drive by which it is advanced and retracted in an appropriate manner. The bottom of the mould box 21 is formed by a plate 25 resting on the central plunger 16. This bottom is provided with two lateral ledges 26 adapted to slide on appropriate guides 27. In this way it is possible to move the whole bottom 25 together with the mould box 21 supported thereupon laterally beneath the charging hopper 28 for filling. This movement is effected by a rod provided with a rack 30 operated from a suitable drive 30^a. The frame of the mould

box is moreover, provided with a hook 31 engaging with the sliding bottom 32 of the charging hopper, so that in the lateral movement of the mould box the sliding bottom is carried along and is opened when the mould box is situated beneath the hopper 28 and closed in the pressing position thereof, shown in Fig. 1.

Resting on the plate 25 is a movable bottom 33 connected to the dies 17 and 18, and adapted to be raised by the latter. On this bottom 33 are placed the supporting trays 34 on which the stones are pressed. Each supporting tray as shown in Figure 4 is provided with two upright borders 35 recessed at 36 so that when the trays are piled one on top of the other each individual tray may be readily taken hold of. Arranged beneath the bottom of the tray at each end thereof is an angle iron 37 adapted to engage the ends of the plate 25 and also adapted to bear on the lateral border 35 of the next lower tray to which end these lateral borders are inwardly beveled as shown at 38. The upper shank of the angle iron has each end bent up and secured on to the lateral border. The superimposed trays serve at the same time as piling box work in which the angle irons secured below the bottoms counteract lateral displacement.

The mould box 21 carries moreover, two cheeks 39 adapted to be engaged by the plungers 19 and 20 when the mould box is to be raised from the finished stones. Located above the plungers and the mould box is an abutment 40 which in accordance with the number of stones to be simultaneously produced, in the example shown is made in five sections.

The driving of the machine is done from the pulley 41 having an idler and being secured on the shaft 42, which also carries the pinion 43 meshing with the gear wheel 44. The latter is mounted upon the main driving shaft 2 which carries, at its other end, a gear wheel 45, being only partially provided with teeth, see Figure 1, and meshing by means of these teeth with the small gear wheel 46, upon the shaft of which a sprocket wheel 47 is mounted. A chain 48 connects this sprocket wheel with another one 49 mounted on the shaft 50. The latter carries a gear wheel 51 which meshes with the rack 30 of the bar 29 serving to draw the whole bottom 25 together with the mould box standing upon it, across under the hopper 28 for the purpose of filling the latter. When now the teeth of the gear wheel 45 engage with the gear wheel 46, the mould box will be drawn to the right, see Figures 1 and 2, when the shaft 2 rotates continually.

In order to return the mould box under the abutments 40 for the purpose of pressing the contents, a second sprocket wheel 52 is

mounted upon shaft 50, said wheel being connected by means of a chain 53 with the sprocket 45 mounted on the same shaft as the gear wheel 55. A larger gear wheel 56 meshes with the latter, and this wheel 56 is also only partially provided with teeth and mounted on shaft 57 rotated through the bevel gears 58, by the shaft 4, which in turn is rotated by shaft 2 through the bevel gears 60 and 3.

When the teeth of the gear wheel 56 come into engagement with the gear wheel 55, then the gear wheel 51 is moved through the transmission over chain 53, in the other direction so that the mould box 25 is returned to the other side, that is to say, to the left in Figures 1 and 2.

In similar manner follows, by means of the chains 61 and 62, the back and forth movement of two gear wheels 63, mounted on the shaft 72, which wheels mesh with the racks 64 mounted upon the bar 24 on the grid 23, whereby the grid will be moved back and forth in the same manner as the bar 29. For this purpose a partially toothed gear wheel 65 is mounted upon the shaft 57 and meshing with a pinion 66 on the same shaft with the sprocket wheel 67 for the chain 62, which transmits its movement to the sprocket wheel 73 mounted upon shaft 72.

On shaft 2 is moreover mounted another partially toothed gear wheel 68 meshing with gear wheel 69 mounted on the shaft of the sprocket wheel 70. The chain 61 runs over the latter and over the sprocket wheel 71 mounted upon the same shaft 72 as the gear-wheel 63.

The operation of the machine is as follows: To begin with the rod 29 seizes the bottom 25 and pulls it over the guides 27 beneath the charging hopper 28 in which action due to the hook 31 the bottom 32 of the hopper is opened to enable the mould box 21 fitted with the supporting trays 34 to be automatically charged. The core grid 23 then enters the mass and together with the mould box moves into the pressing position as the latter is moved by the rod 29 to lie over the plungers 16 to 20, when the slide 32 is simultaneously closed. The pressing operation now commences and this in such a way that first, due to the action of the cam 5 the plunger 16 is operated to raise the plate 25 and thereby the whole stone into contact with the abutment 40 thereby shaping the upper portion of the stone. Then the lower portion of the stone is pressed by the action of the cam discs 11 and 12 which actuate the plungers 17 and 18 thus force the plate 33 against the stone. After this operation the cams 8 and 9 become operative forcing the plungers 19 and 20 against the cheeks 39 of the mould box 21 and thereby raise the whole mould box

away from the finished stones. The five stones supported on their trays 34 can now be removed from the press and piled up while another supporting tray may be inserted and the operation repeated. The operating mechanisms are connected with the main drive so that the operation may proceed uninterruptedly it being only necessary to remove the pressed stones and insert fresh trays.

By the arrangements of requisite intervals between the action of the plungers 16, 17 and 18 and that of the plate 25 and bottom 33, the pressure operations may be effected in a more or less intermittent or hammer-like manner.

The press may also be used for the manufacture of solid stones in which case it is necessary to dispense with the use of the core grid and to employ a mould box in which the longitudinal walls are solid.

The press may further be used for the production of large tiles for which purpose an appropriate mould box is chosen, provided with only a single chamber and dispensing with the partitions 22. In this case the abutment 40 would of course consist of a single member shaped precisely to fill the interior of the mould box. The subdivision into five individual parts would be done away with. The press may of course be structurally modified so as to enable more than five, say six or more, stones to be produced simultaneously. Instead of arranging the bottom 32 of the charging hopper for operation by a hook as shown it may be opened and closed manually if desired such as by an operating lever or the like.

Now what I claim and desire to secure by Letters Patent is the following:

1. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments with moulds movable against the abutments, and means for raising the bottom in the mold substantially as and for the purpose described.

2. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments with moulds movable against the abutments and provided with a movable bottom, and means for moving the bottom relatively to the mould substantially as and for the purpose described.

3. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments with moulds movable against the abutments and means for raising the moulds and the bottoms of the moulds independently of each other, substantially as and for the purpose described.

4. In presses for the manufacture of stones, particularly from blast furnace slag,

the combination of fixed abutments with moulds movable against the abutments and plungers for raising the moulds and its bottoms independently, substantially as and for the purpose described.

5. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments with moulds movable against the abutments and plungers of which one is employed to force the moulds together with its charge against the abutments, others for the purpose of raising the bottoms of the moulds and others for raising the mould-frames away from the pressed stones, substantially as and for the purpose described.

6. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments with moulds movable against the abutments and plunger of which one is employed to force the moulds together with its charge against the abutments, others for the purpose of raising the bottoms of the moulds and others for raising the mould-frames away from the pressed stones, all plungers being moved by a common cam-shaft, substantially as and for the purpose described.

7. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments, movable moulds provided with movable bottoms and a plate supporting the moulds adapted to be moved away from the charging hopper under the fixed abutments, substantially as and for the purpose described.

8. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments, movable moulds provided with movable bottoms and trays on the bottom of the moulds for supporting the stones during the pressing and drying operations, said trays being provided with recessed lateral members, substantially as and for the purpose described.

9. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments, movable moulds provided with movable bottoms and trays on the bottom of the moulds, said trays being provided with recessed lateral members and downwardly projecting rails, said rails adapted to grip over the ends of said bottoms, substantially as and for the purpose described.

10. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments, a charging hopper adjacent said abutments, movable moulds provided with movable bottoms and trays on the bottom of the moulds, said trays being provided with recessed lateral members and downwardly projecting rails, said members and said rails interengaging between trays in different layers

when piled above each other, and a plate supporting the moulds adapted to be moved away from the charging hopper under the fixed abutments, substantially as and for
5 the purpose described.

11. In presses for the manufacture of stones, particularly from blast furnace slag, the combination of fixed abutments, movable moulds bottoms, movable in the
10 moulds, a plunger for raising the moulds,

and other plungers for raising the bottoms and the mould frame, trays for supporting the stones and a plate for supporting the moulds above their plunger, substantially as
and for the purpose described. 15

I claim the foregoing as my invention, I have signed my name this thirty-first day of May 1920.

CARL HEINRICH SCHOL