

M. P. COLEMAN.
CORE PRESS.

No. 573,643

Patented Dec. 22, 1896.

Fig. 2.

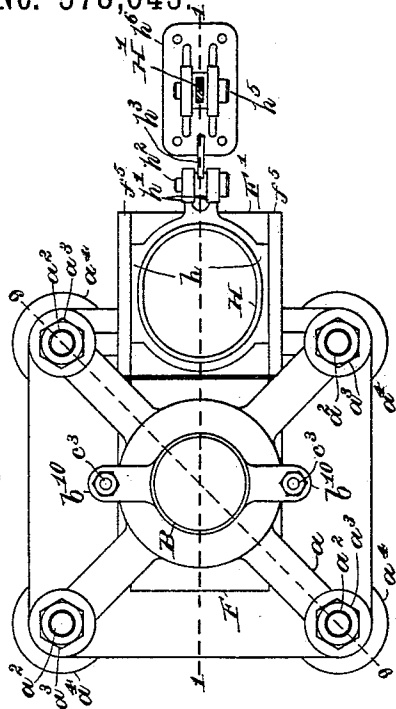
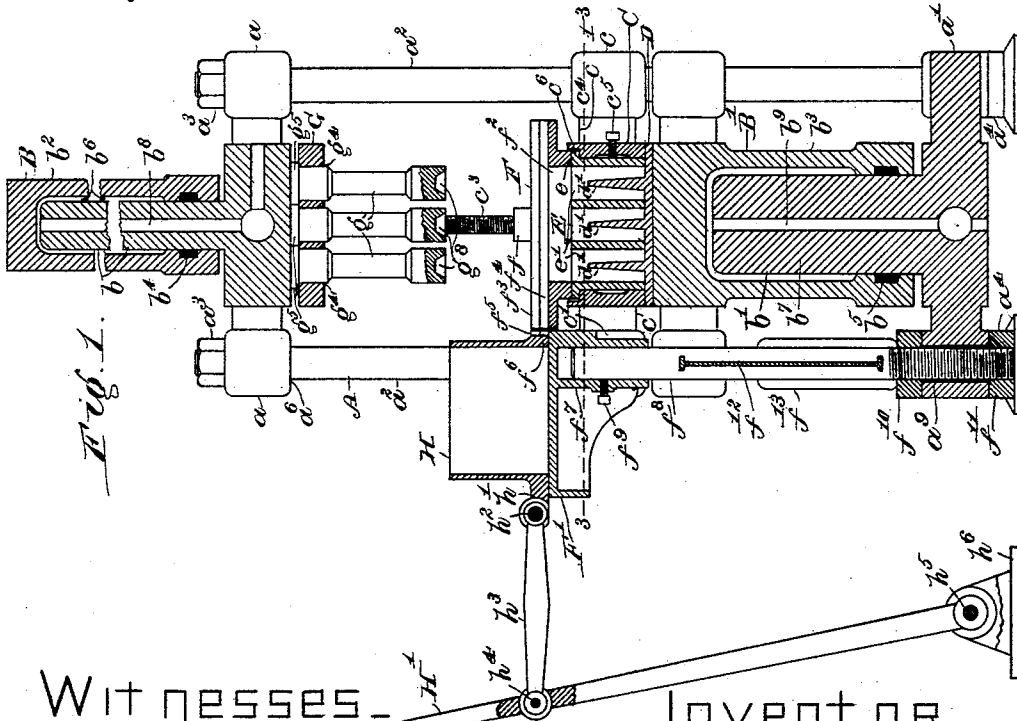
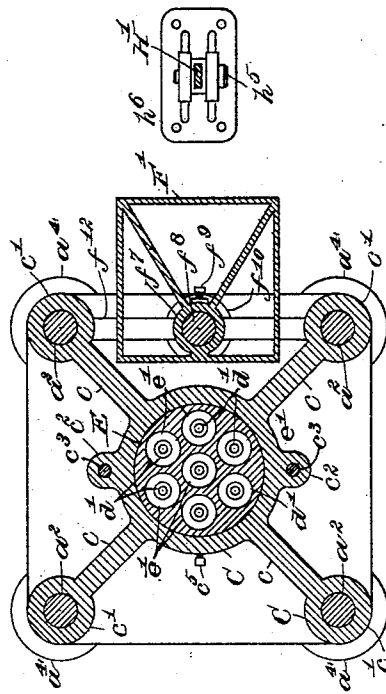


Fig. 3.



Witnesses—

William P. Hannaford
William B. Goring

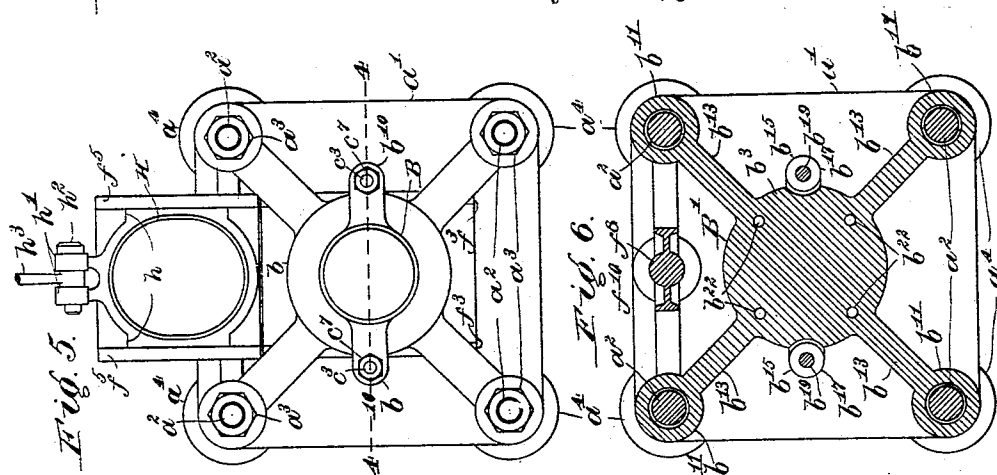
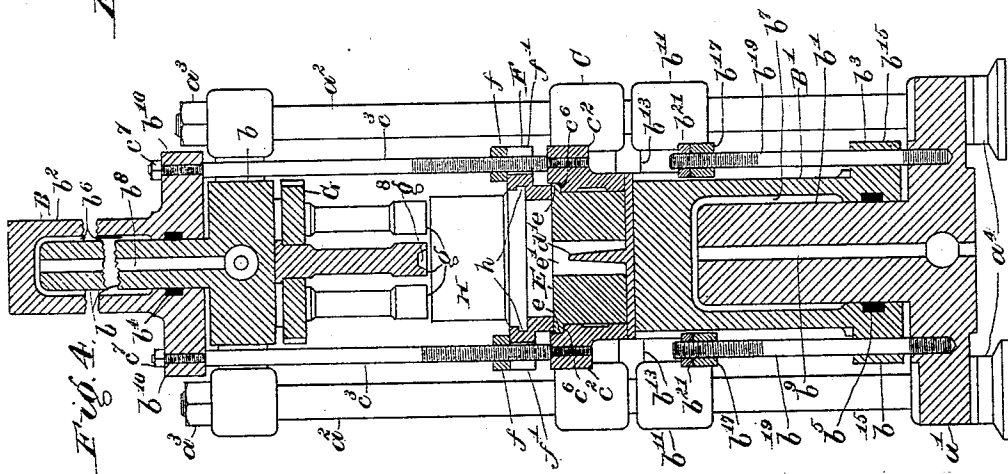
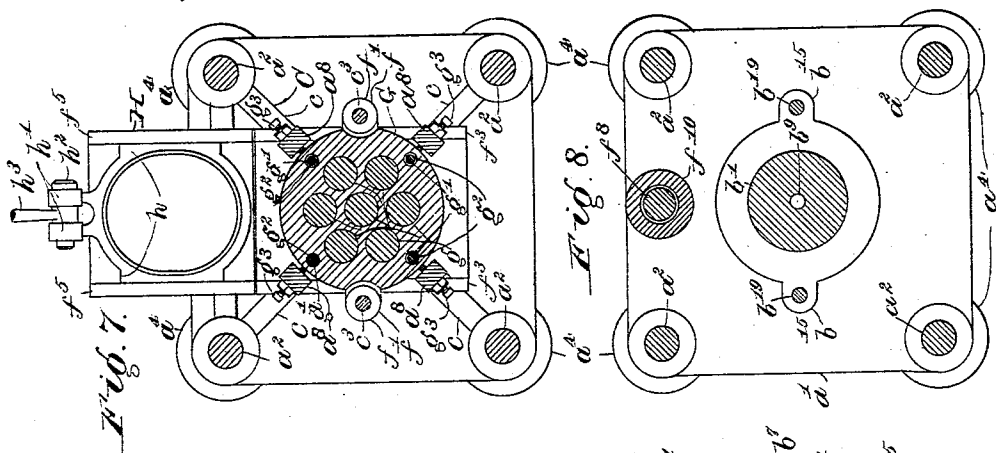
Inventor—

Michael P. Coleman,
By Albert M. Moore,
His Attorney

3 Sheets—Sheet 2.

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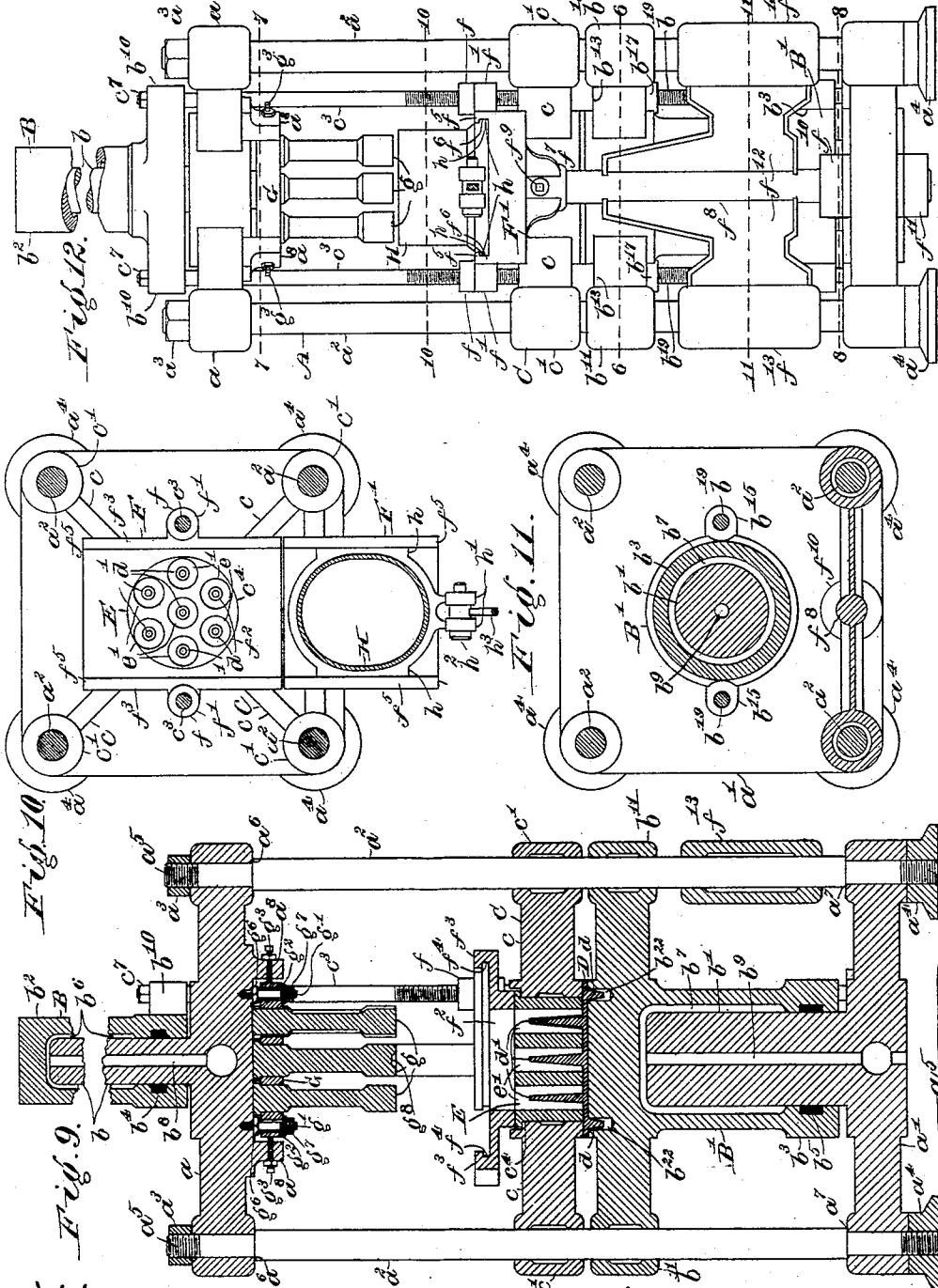
Witnesses—
William N. Hannaford
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UNITED STATES PATENT OFFICE.

MICHAEL P. COLEMAN, OF BOSTON, MASSACHUSETTS.

CORE-PRESS.

SPECIFICATION forming part of Letters Patent No. 573,643, dated December 22, 1896.

Application filed December 14, 1893. Serial No. 493,672. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL P. COLEMAN, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Core-Presses, of which the following is a specification.

My invention relates to core-presses or presses for forming the cores or internal molds used in metal founding; and it consists in the devices and combinations hereinafter described and claimed.

Commonly cores for large pipes, hollow columns, and many other articles are made in longitudinal halves and stuck together, and if the joining of the halves of the core is carelessly performed the overlapping edges of the halves of the core make thin places in the pipes or columns and render them unfit to sustain great weights or pressures.

The object of this invention is to make such cores without longitudinal division, to make them with great accuracy and rapidity, and, where large numbers of similar cores are required, to make such cores cheaper than they can be made by the usual method, which consists in ramming the sand or other core material in boxes by hand.

By the use of the core-press hereinafter described perfectly homogeneous and perfectly-shaped cores may be made, effecting a saving of metal, and where the cored surface requires to be finished subsequently, as in the case of eyes to receive axles or shafting, a saving of labor in turning or otherwise smoothing such surfaces.

In the accompanying drawings on three sheets, Figure 1 is a vertical section on the line 1 1 in Fig. 2 of a core-press containing my improvement; Fig. 2, a plan of the same, a part of the connecting-rod being broken away and the lever being shown in horizontal section; Fig. 3, a horizontal section on the line 3 3 in Fig. 1; Fig. 4, a vertical section on the line 4 4 in Fig. 5; Fig. 5, a plan of said core-press; Fig. 6, a horizontal section on the line 6 6 in Fig. 12; Fig. 7, a horizontal section on the line 7 7 in Fig. 12; Fig. 8, a horizontal section on the line 8 8 in Fig. 12; Fig. 9, a vertical cross-section on the line 9 9 in

Fig. 2; Fig. 10, a horizontal section on the line 10 10 in Fig. 12; Fig. 11, a horizontal section on the line 11 11 in Fig. 12; Fig. 12, a rear elevation of the core-press, omitting the lever.

The frame A of the core-press consists of a cap *a* and a base *a'*, connected by a suitable number of uprights *a²*, each passing through said cap and base, which are held parallel with each other by nuts *a³ a⁴*, which turn on the threaded end portions *a⁵* of said uprights and press and hold said cap and base against shoulders *a⁶ a⁷* on said uprights, the lower nuts *a⁴* serving also as feet on which the press stands in a well-known manner. To the upper surfaces of the cap *a* and base *a'* are secured the stationary plungers *b b'* of the hydraulic presses B B', said plungers *b b'* being preferably cast in one piece with said cap and base, respectively.

The movable cylinders *b² b³* of the hydraulic presses B B' are provided with suitable packing-rings *b⁴ b⁵* to prevent leakage between the plungers *b b'* and said cylinders, and water or other fluid is introduced to the chambers *b⁶ b⁷* of said cylinders through suitable inlets *b⁸ b⁹*, arranged in the stationary parts of said presses, respectively, in an obvious manner and substantially as usual, except that the cylinders are commonly the stationary parts of such presses. Facing the open ends of the cylinders at the bottom of said cylinders prevents, to a great extent, the entrance of dust. The upper cylinder *b²* is guided by its plunger and by a die-holder C, provided with arms *c*, having at their extremities sleeves *c'*, which embrace and slide freely on the uprights *a²*, said die-holder having ears *c²*, connected by rods *c³* with similar ears *b¹⁰* on said upper cylinder, said rods passing through nuts *c⁷*, placed above said ears *b¹⁰*, Figs. 1, 4, 9, and 12.

The cylinder *b³* is guided by its plunger *b'* and by sleeves *b¹¹*, which are carried by arms *b¹³*, projecting from said cylinder *b³*, said last-named sleeves surrounding and sliding on the uprights *a²*. The upward movement of said cylinder *b³* is limited by ears *b¹⁵* on said cylinder striking against nuts *b¹⁷*, which turn on the threaded upper ends of stop-rods *b¹⁹*, which pass vertically down through said ears

and are secured in the base a' , said nuts b^{17} being adjustable on said rods and being held in place by check-nuts b^{21} .

The hydraulic presses B B' are operated independently of each other.

The core-plate D, Figs. 1, 4, and 9, rests upon the top of the lower cylinder b^3 and has legs d , which enter depressions b^{22} in said cylinder and prevent any lateral or rotary motion of said core-plate. Said core-plate has as many core-pins d' as there are cores to be made at one operation of the machine, the core-pins being frustums of cones and forming the vents of the cores and, owing to their shape, being readily withdrawn from the cores after the same are baked. The legs d support the core-plate in the baking-oven and allow the heated air to pass under the core-plate, baking the cores more uniformly and in a shorter time.

The core-cylinder or die E is held in a central aperture c^4 in the die-holder C by means of one or more set-screws c^5 , Figs. 1 and 3, which turn in said die-holder and thrust radially against said core-cylinder and by the pressure thereon of the slide-plate F, said die E having at its upper end an external annular flange e , which rests upon the top of said die-holder within a vertical annular flange c^6 on the top of said die-holder, and the slide-plate F rests upon the top of the core-cylinder and is held down upon the same by nuts f^f , which turn on the above-mentioned connecting-rods c^3 against the top of said slide-plate, said rods c^3 passing through arms $f' f'$, with which said slide-plate is provided, as shown in Figs. 1, 4, 9, 10, and 12.

The core-cylinder E has as many die-openings e' as there are core-pins d' , said die-openings being represented as hollow cylinders, but being in practice of any other desirable horizontal cross-section, and the slide-plate F is provided with a central aperture f^2 , large enough to allow all the punches g hereinafter named to pass through said slide-plate into said die-openings when said slide-plate and the core-cylinder are raised, as hereinafter described.

The punches g are equal in number to the die-openings e' and are of a size and shape to enter and fit said openings and are fast in the punch-plate G, secured by bolts g' to the under side of the stationary cap a , Figs. 1, 4, 9, and 12, the slots g^2 in said punch-plate through which said bolts pass being large enough to allow of a slight lateral and rotary adjustment to bring the axes of said punches in line with the axes of the die-openings e' , such lateral adjustment being assisted by means of radial screws g^3 , which turn in ears a^8 , cast or otherwise secured on the bottom of the cap a and thrust against the sides of said punch-plate. The punches g are represented as fitted in holes g^4 in the punch-plates and as having flanges g^5 , which rest upon the top of said punch-plate and are clamped between said punch-plate and the cap a by the bolts g'

above mentioned, said bolts g' being supplied with check-nuts g^6 , which turn against the bottom of said cap, and with other nuts g^7 , which turn against the bottom of said punch-plate and hold the same when properly adjusted.

The slide-plate F is provided on top with ledges f^3 , grooved at f^4 on their inner faces and arranged on two opposite sides of the aperture f^2 , and a bracket or table F' is provided with ledges f^5 and grooves f^6 , which form a continuation of the grooves and ledges of said slide-plate when the tops of said slide-plate and bracket are in the same horizontal plane. A sand-box H (really a box without top or bottom) is provided with external flanges h , which slide in the grooves $f^4 f^6$ when the box is moved over said bracket and slide-plate, the sides of said box reaching down to said bracket and slide-plate and said box H being provided at its outer end with ears h' , between which is pivoted at h^2 one end of a link h^3 , the other end of said link being pivoted at h^4 to a hand-lever H', the lower end of which lever is pivoted at h^5 to a stand h^6 , bolted to the floor. By moving the lever H' in one direction the sand-box, previously filled with sand or other core material, may be moved over the central opening f^2 of the slide-plate, where the contents of the box will fall into said central opening and into the die-openings beneath, filling said central opening, when by moving said lever and sand-box in the other direction the core material will be struck off level with the top of said slide-plate. The bracket F' is provided with a sleeve f^7 , which receives the top of the vertical post f^8 and to which it is secured by a set-screw f^9 in said sleeve, said post being vertically adjustable in a hole a^9 in the base a' by means of nuts $f^{10} f^{11}$, which turn on the threaded lower end of said post above and below said base a' to bring the top of said bracket on a level with the top of said slide plate, said post being steadied by wings f^{12} and guide-sleeves f^{13} , sliding on uprights a^2 .

Evidently the length of the cores will be limited by the thickness of the core-cylinder, their diameter by the size of the die-openings, and their density, other things being equal, by the thickness of the slide-plate or the amount of core material that can be placed in the central openings f^2 . Hence the punches, dies, and slide-plate are all made removable that others may be substituted for them when it is desired to vary the characteristics of the cores.

When the central opening f^2 is filled and the sand-box is drawn out from under the punches, the lower cylinder b^3 is forced upward a distance limited by the nuts b^{17} on the stop-rods b^{19} , raising the slide-plate, core-cylinder, and the core-plate and forcing the core material into the die-openings e' , and at the same time raising the upper cylinder b^2 . When the lower cylinder is stopped by striking the nuts b^{17} , the pressure is shut off from

said lower cylinder by any well-known automatic means or by hand, and pressure is admitted to the upper cylinder b^2 , raising the latter until the bottom of the die-openings e' are at a level or above the lower ends of the punches g , drawing the core-cylinder off the cores and leaving said cores on the core-plate D, which stops when the lower cylinder b^3 stops. When the core-cylinder is raised to the required height, the pressure is shut off from the upper cylinder, and the lower cylinder is lowered to its normal position, and the core-plate with the cores supported is placed on a truck and run into the baking-oven, another core-plate is placed on the lower cylinder b^3 , and the upper cylinder b^2 is lowered, and the operation is repeated.

Cores made as above described may be used for forming the eyes of pulleys, car-wheels, and similar articles, and by making the core-pins long enough to form vents entirely through the cores a number of such cores may be placed end to end and held together by a long bolt running through them all and provided at its ends with nuts and washers, as shown in another application, Serial No.

493,673, filed herewith, the hollows g^8 in the lower ends of the punches forming core-prints on the cores to enter the large ends of the vents in adjacent cores.

With the core-press above described two men, one to operate the press and one to remove the cores, may make a much larger number of cores in a given time than could be made by the labor of many men following the usual methods.

I claim as my invention—

The combination of the independently-operating upper and lower presses, the core-plate carried by said lower press, the die-cylinder, resting on said core-plate and connected with the cylinder of said upper press, and the stationary punches, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 28th day of November, A. D. 1893.

MICHAEL P. COLEMAN.

Witnesses:

ALBERT M. MOORE,
JOSEPH NORRIS.