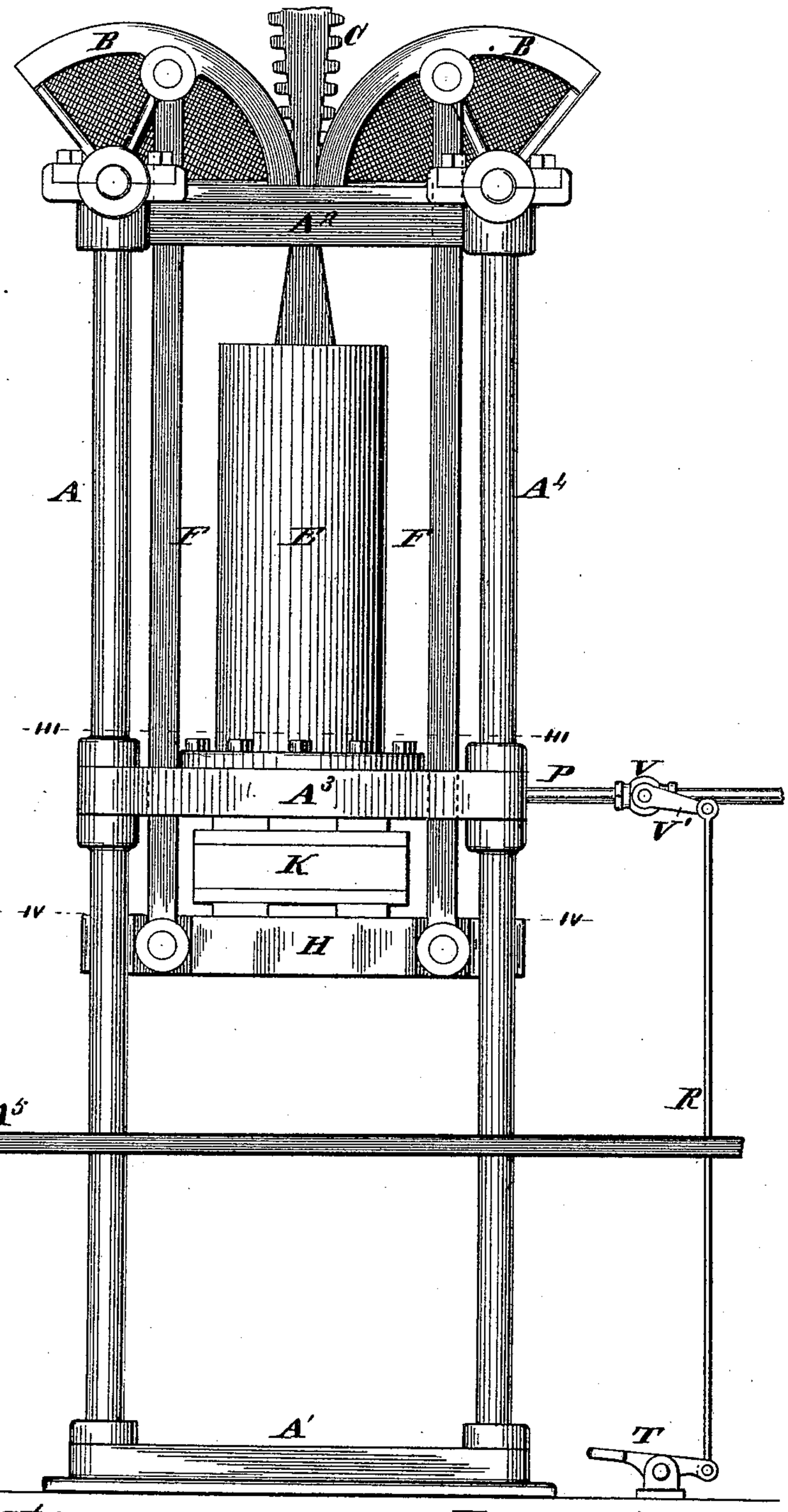
(No Model.) 3 Sheets—Sheet 1.

C. J. LE ROY.

MOLDING PRESS.

No. 439,075. Patented Oct. 21, 1890.

Fig. I.



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Charles Pickles.
R R Sweet.

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Charles J. LeRoy
By Wm M Eccles
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(No Model.) 3 Sheets—Sheet 2.

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Fig. II.

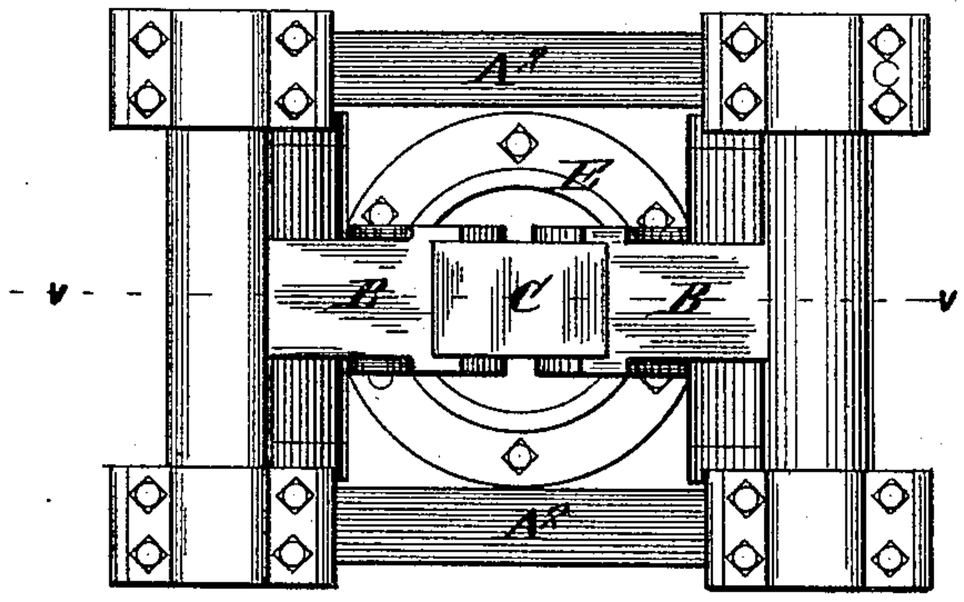


Fig. III.

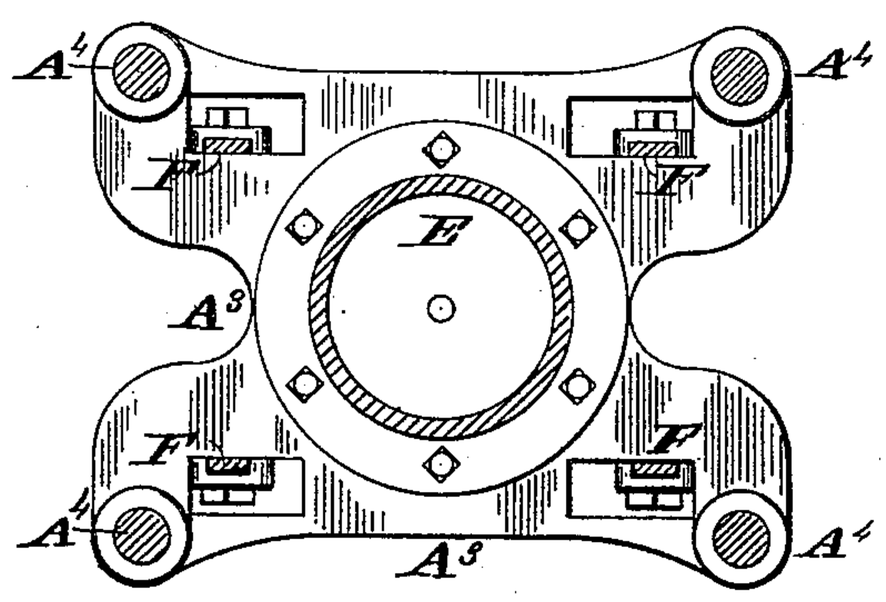
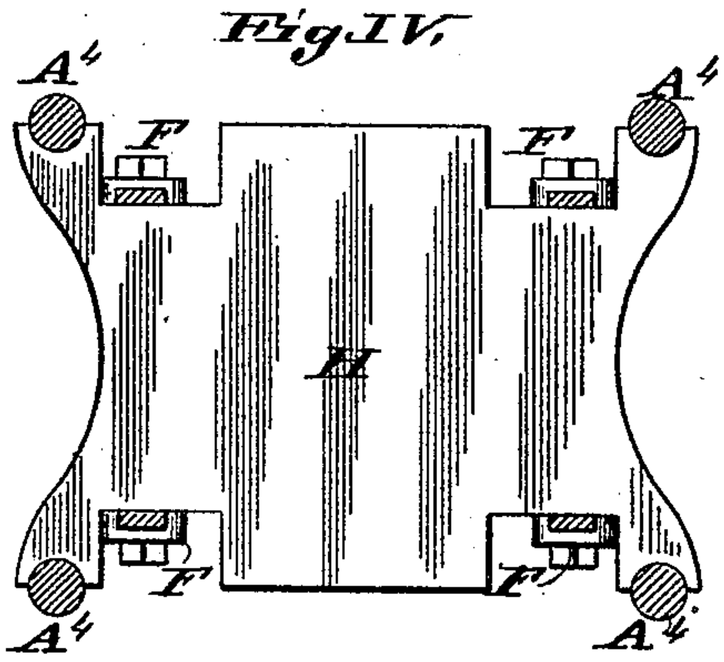


Fig. IV.



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(No Model.) 3 Sheets—Sheet 3.

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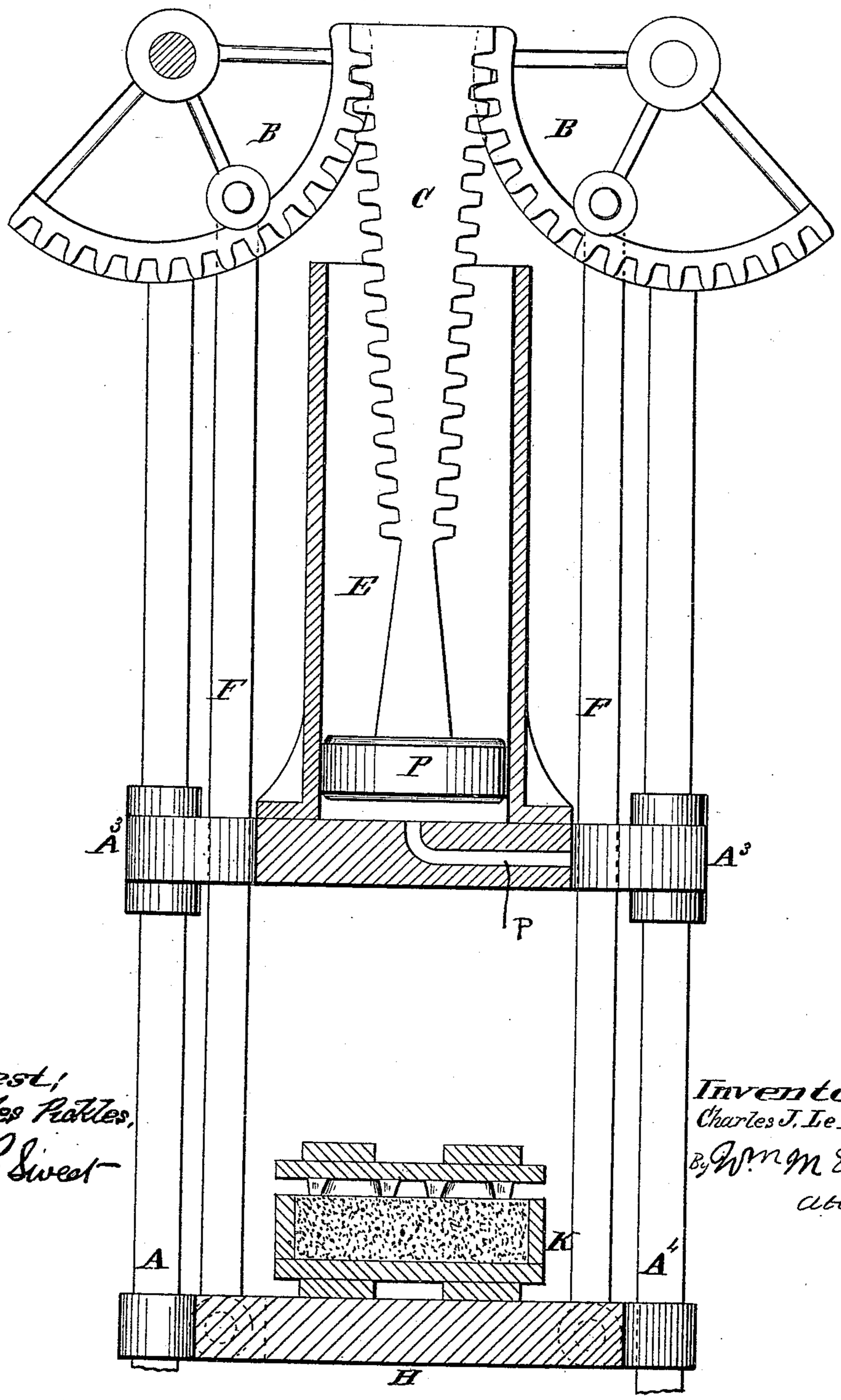
Fig. V.



Attest,
Charles Rattles,
R R Sweet—

Inventor,
Charles J. Le Roy
By Wm M Eccles
Atty's

UNITED STATES PATENT OFFICE.

CHARLES J. LE ROY, OF ST. LOUIS, MISSOURI.

MOLDING-PRESS.

SPECIFICATION forming part of Letters Patent No. 439,075, dated October 21, 1890.

Application filed June 9, 1890. Serial No. 354,801. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. LE ROY, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Presses for Packing Molding-Sand, of which the following is a specification.

My invention consists in the arrangement and combination of parts hereinafter described and claimed.

My objects are, first, to produce a cheap, durable, and effective press for packing molding-sand in molding-flasks containing the molding-sand and patterns in and around the same, so that steel castings can be made therein; second, to secure more compactness of the sand than can be secured by hand, so as to insure a perfect mold from steel castings. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure I is a side elevation of my machine with the molding-flask filled with sand and containing patterns and the machine in the position of its uppermost thrust. Fig. II is a plan view of the same. Fig. III is a section drawn on dotted line III III in Fig. I, looking from the top. Fig. IV is a section drawn on dotted line IV IV, Fig. I, looking from the top. Fig. V is a vertical section of the machine, drawn on dotted line V V in Fig. II.

A is a frame-work supporting the various mechanism of the machine; and it consists of a base A', a top A^2, an intermediate support A^3, and uprights A^4, which unite the base, top, and intermediate portions and bind them together. To this frame-work is attached a table A^5 for holding sand-flasks which are to be put in the machine.

B B are two segmental spur-wheels journaled on the top of the frame-work, and are adapted to mesh in cogs or spurs of an upright rack C. These segmental spur-wheels are made cam-shaped in the line of their cogs or spurs, so that the length of the lever or the radius of the wheel increases as the upright rack C ascends and shortens as the rack C descends. This upright rack C gradually becomes larger between the line of its spurs or cogs as you go from the bottom to the top, so as to accommodate itself to the varying lengths of the radii of the segmental spur-wheels. The lower end of this upright rack C is secured to a piston-head P, which piston-head is adapted to move tightly within the open cylinder E. This cylinder E is open at the top, and is securely fastened to the intermediate support A^3, which consists of a bed-plate made thick enough to become the lower head of the cylinder and to serve as a head of the cylinder. Through this intermediate support or base-plate A^3 passes an inlet-pipe *p*, which has its other end communicating with a steam chest or boiler, and forms an open communication between the boiler or steam-chest and the interior of the cylinder E for the admission of steam and discharge of the same from said cylinder. In this pipe P′ is placed a common three-way valve V, which is connected to a foot-treadle T by a connecting-rod R and crank-lever V′, whereby it can be operated at will by the foot of the operator and the steam let into the cylinder E and the passage-way from the boiler to the interior of the cylinder closed, and an open passage made between the interior of the cylinder E and the outer atmosphere at pleasure, so that by a part movement of the valve V the steam can be let in from the boiler until the piston-head P has ascended as far as desired, when it may be turned farther and the passage from the boiler closed, and an opening made from the interior of the cylinder E to the outside atmosphere through the valve V and the cylinder emptied of its steam.

F F are lifting-rods connected to the segmental spur-wheels B, of which rods there are four in number, two on each shaft, at their upper ends, and to a lifting-platform H at the lower ends, and serve to lift the platform H up against the bottom of the intermediate portion A^3 as the wheels B B are caused to revolve by the ascent of the upright rack C.

It will be observed that the lifting-rods F are four in number, as seen in Figs. III and IV, and that they are pivotally connected to the segmental spur-wheels B B about midway between the extreme ends of the segments of the segment-wheels, so that when the machine is at its extreme upper throw of the rack C the upper end of the rods are in the extreme upper arc of the segmental wheels B B, which,

in unison with the pressure of the rack C on the long arms or radii of the segmental wheels, exerts great pressure on the platform H as compared with the force exerted on it in the first part of the throw of the rack C. It will be observed that the force exerted on this platform H has a graduated increase from the first part of the throw to the last part, which is very essential in machines for compressing sand around patterns in a molding-flask.

K is a molding-flask containing molding-sand and patterns, and is placed on the lifting-platform between it and the intermediate part A^3, against which the top and bottom are pressed, respectively, when the parts A^3 and H are caused to come together by the action of the rack C on the segmental spur-wheels B B.

From the above description the further operation of the machine is fully apparent.

A rack having the lines of its cogs on each side parallel, or nearly so, with each other would necessitate making the segmental spur-wheels with their peripheries everywhere an equal distance from their journaled center, and the advantage of having the long arm of the lever at the last end of the throw, or at the time when the most pressure is required, would be lost. My invention differs from such construction in a very material and essential particular, in that I do not use a rack with the spurs or cogs situated thereon being placed so that the lines of their direction are parallel with each other, but one in which the cogs or spurs run in lines diverging from each other, so that the greatest pressure will be exerted on the segments at the time when the lifting-rods are passing the last part of their upward thrust. In this way I secure a double lever-pressure on the lifting-rods at the last part of the thrust, and secure double the amount of pressure at the last part of the thrust of the piston on the lifting-rods which any other similar device does. This is of great advantage where anything like molding-sand is to be pressed.

The gradual increasing pressure which my invention secures by means of the gradual receding of the lines of the spurs or cogs on the rack and the corresponding receding of the spurs or cogs on the segmental wheels from their journaled centers is of the greatest importance in such structures, as it will give the sand a very strong and quick pressure at the last, which will make it remain intact and stick together.

Now, what I claim as new, and ask Letters Patent to be granted to me, is—

1. In a press for packing molding-sand, segmental spur-wheels mounted on shafts, which shafts are journaled in appropriate frame-work and provided with cogs or spurs placed upon the periphery of the said wheels at an unequal graduated distance from the centers of said wheels, and adapted to intermesh with spurs or cogs on a graduated rack having one end attached to a piston-head and having its cogs or spurs engaging the spurs on the said wheels, a cylinder having its lower end secured to a stationary platform which serves as a head for the same, and its upper end open and adapted to inclose a moving piston-head and having its interior between said piston-head and its lower end openly connected with a boiler by a pipe, whereby steam can be admitted into said cylinder, and said pipe being provided with a common three-way valve, whereby the steam can be let escape from said cylinder through the same pipe through which it entered, a lifting-platform adapted to hold molding-flasks and provided with lifting-shafts pivotally connected to said segmental spur-wheels at their upper ends and connected to the lifting-platform at their lower ends, and suitable frame-work supporting the whole, substantially as described, and for the purposes set forth.

2. In a press for packing molding-sand, an open cylinder supported in suitable frame-work and inclosing a movable piston-head, an inlet-pipe connecting the interior of said cylinder between the lower end and the piston-head with the boiler and provided with a three-way valve, a graduated rack attached to a piston-head at its lower end, moving within said cylinder, and having its upper end provided with cogs or spurs gradually receding from the center line of said rack as you near the top, and adapted to engage the cogs or spurs of two segmental wheels having their respective peripheries upon which the spurs or cogs are placed gradually receding from the center throughout the whole arc of the segment, and a lifting-platform placed within said frame-work and connected to the segmental wheels by lifting-shafts, all combined and operating to exert greater pressure on an object placed between the lifting-platform and the intermediate part of the frame-work at the last part of the throw of the piston-head than at the first part, for the purposes set forth.

3. In a press for packing molding-sand, the combination of two segmental spur-wheels journaled in a frame-work, and having their peripheries gradually receding from their journaled centers throughout the arc of the segments, a movable rack having its sides diverging from each other, and having said sides provided with spurs or cogs adapted to engage the cogs or spurs on the said segmental wheels, a piston-head attached to said rack and adapted to move in a steam-cylinder arranged stationary on the frame-work of the press, and lifting-rods pinioned at one end to the said segmental wheels and at the other end attached to a lifting-platform adapted to move within said frame-work, for the purposes set forth.

CHARLES J. LE ROY.

Witnesses:
FRANCIS VALLÉ,
R. R. SWEET.