No. 628,473. Patented July 11, 1899.

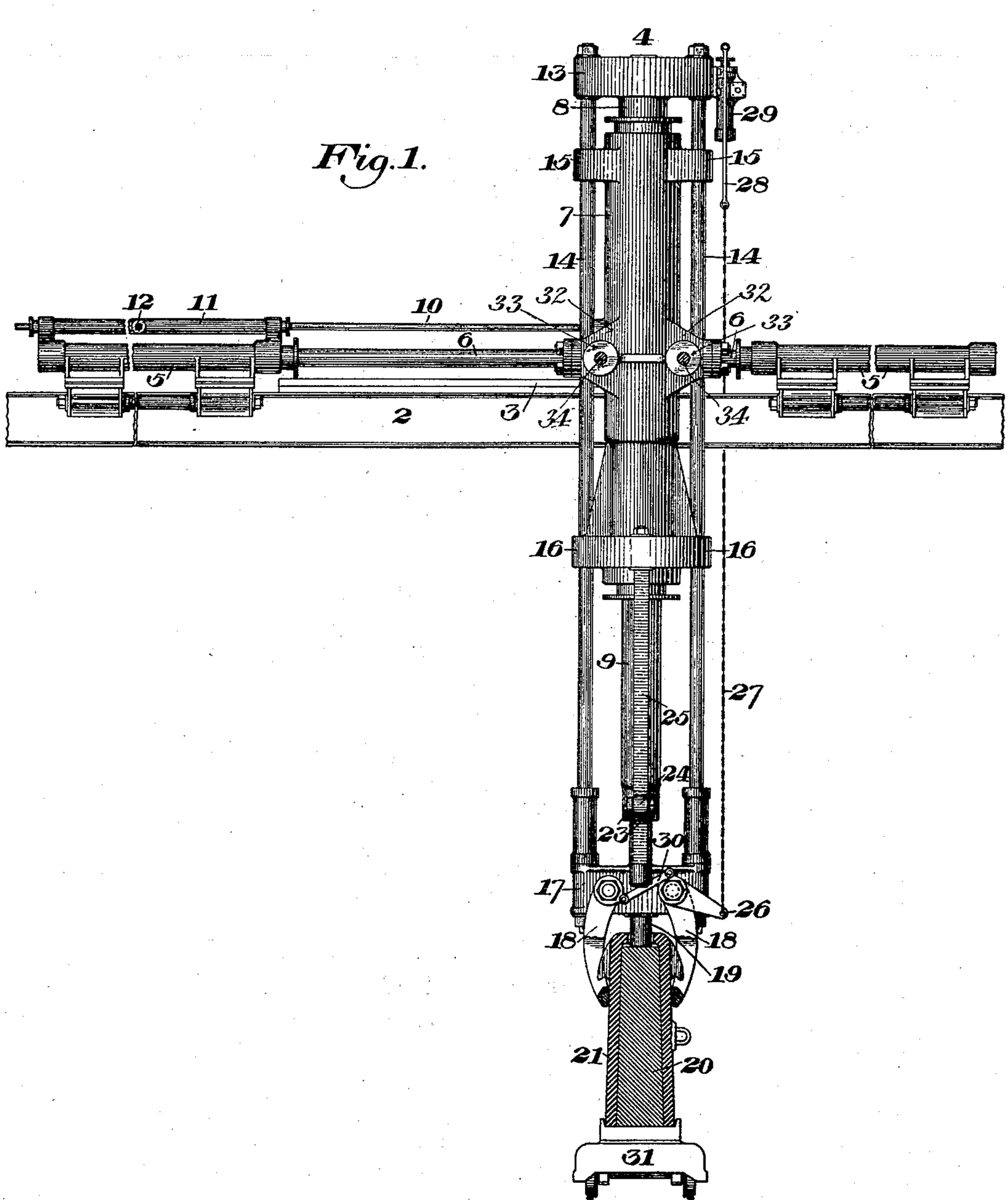
J. KENNEDY.

INGOT EXTRACTOR.

(Application filed June 10, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.



WITNESSES

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George B. Blemming

INVENTOR

Julian Kennedy

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Fig. 2.

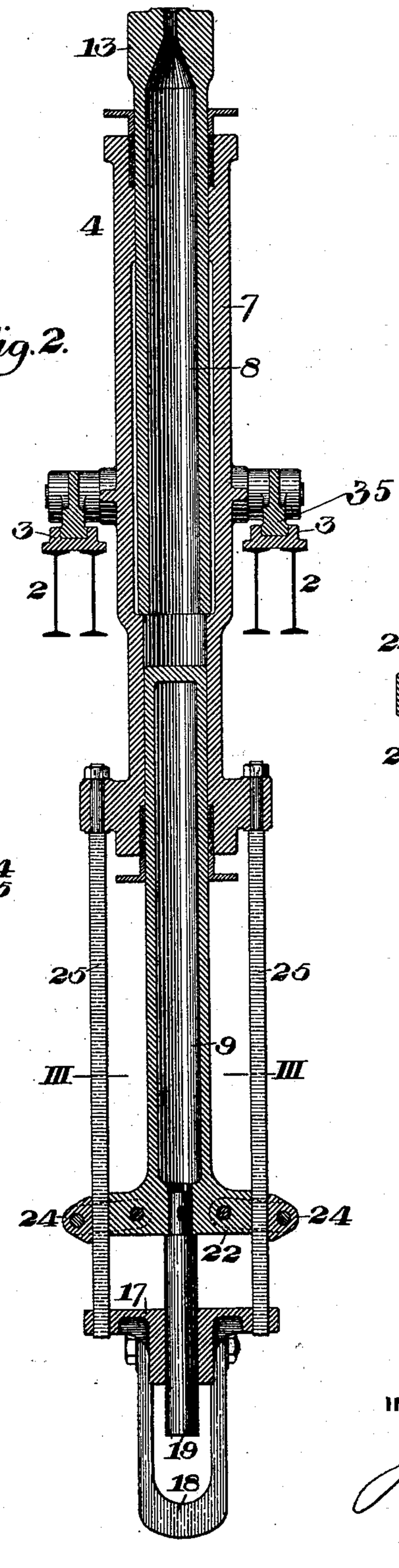


Fig. 3.

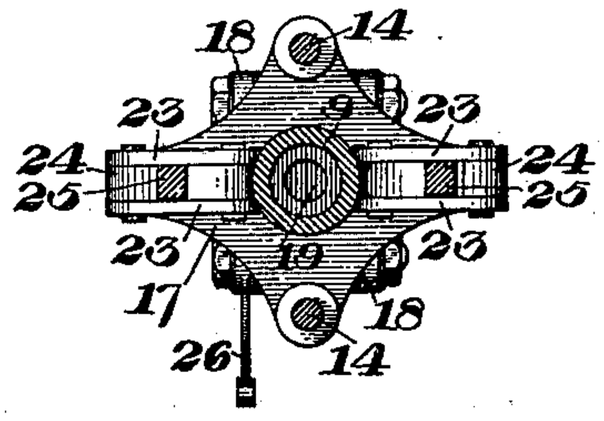
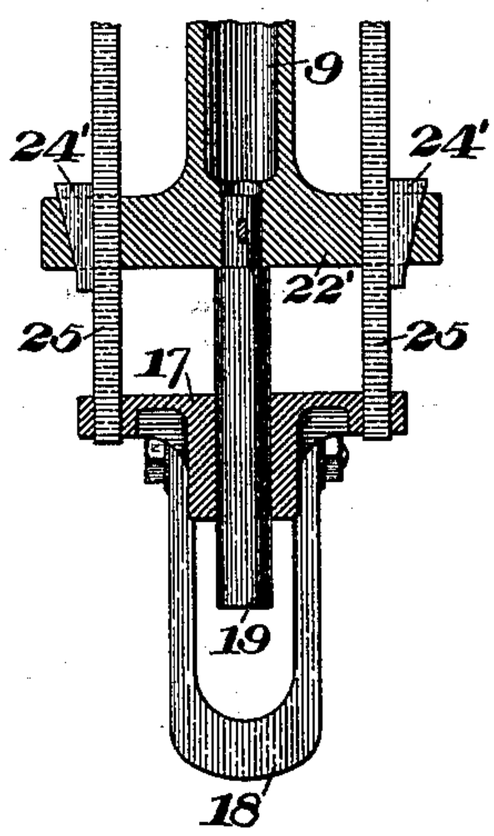


Fig. 4.



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INVENTOR

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UNITED STATES PATENT OFFICE.

JULIAN KENNEDY, OF PITTSBURG, PENNSYLVANIA.

INGOT-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 628,473, dated July 11, 1899.

Application filed June 10, 1898. Serial No. 683,087. (No model.)

To all whom it may concern:

Be it known that I, JULIAN KENNEDY, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Ingot-Extractors, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, of my improved apparatus. Fig. 2 is a vertical section of the same, taken at right angles to the view of Fig. 1. Fig. 3 is a cross-section on the line III III of Fig. 2, looking downwardly; and Fig. 4 is a detail view of a modified form of lock.

My invention relates to that class of ingot-extractors wherein two plungers are used, one for lifting the mold and the other for holding down the ingot where the mold is stripped upwardly from it; and it is designed to prevent the lifting of the mold and ingot together from the car or stool for a short distance, which commonly occurs in extractors of this character, the ingot rising a short distance and then dropping back upon the car.

To that end it consists in a lock which holds the stop for the ingot firmly in depressed position until the mold has been partially stripped from such ingot.

It also consists in the above combination together with a latch or other mechanism which automatically trips the lock after the mold has been partially stripped from the ingot, so that all the parts then move upwardly to clear the ingot.

In the drawings, 2 represents an elevated jib or platform, having a track 3 upon which is carried the movable trolley 4, which is reciprocated by suitable motors or racking-cylinders 5 5 moving their plungers 6, connected thereto. Upon the trolley is mounted the upright motive cylinder 7, containing the two plungers 8 and 9, the plunger 8 projecting upwardly from the cylinder, while the plunger 9 projects downwardly and is set in a contracted portion of the cylinder, so that the effective area of the upper plunger is greater than that of the lower. The difference in area between the plungers is sufficient to enable the upper plunger to lift the mold and the moving parts of the apparatus.

32 are web portions projecting laterally from the sides of the cylinder 7 and having bosses 33, provided with stubs or stems 34, by which the cylinder is suspended upon the slides 35 of the trolley, moving on the tracks 3, as shown in Figs. 1 and 2.

Water is admitted into the narrow annular space surrounding the upper plunger through a telescopic pipe 10, secured in the side of the cylinder, which pipe slides within the jacket 11, secured above the racking-cylinder and having a suitable fluid-inlet 12. To the upper end of the plunger 8 is secured a cross-head 13, provided with depending hangers 14, which pass through suitable guides 15 and 16 and are provided at their lower ends with a cross-head 17, to which the tong-levers or jaws 18 are pivoted.

19 is a projecting stop or post which extends downwardly from the end of the lower plunger through the cross-head 17 and is arranged to engage the ingot 20 within a mold 21. The lower end of the lower plunger is provided with a cross-head 22, to which are pivoted two pairs of links 23, between the ends of which are pivotally carried the clutch-blocks 24. These clutch-blocks are arranged to engage vertical bars 25, which are secured to the head of the vertical cylinder and extend downwardly between the links 23 and through suitable guide-holes therefor in the cross-head 17.

The jaws or tong-levers are connected by a link 30 and are operated by a lever 26, connected by a chain 27 and hangers 28 to a cross-head secured to the upper end of a small motive cylinder 29, which is secured to the cross-head 13.

The operation is as follows: The car 31, carrying the mold containing the ingot, being brought to the apparatus and placed directly beneath the post or stop, the water is exhausted from the stripper-cylinder, thus allowing the lower plunger to descend until the post contacts with the ingot and the upper plunger to descend until the jaws or tong-levers are below the lugs or ears of the mold. Water then being admitted to the extractor-cylinder, so as to act upon the plungers therein, the larger area of the upper plunger will cause it to move upwardly and lift with it the mold. The post or stop upon the lower plunger prevents upward movement of the ingot,

and as the mold begins to move upwardly any tendency to lift the post will be prevented by the clutch-jaws engaging the stationary vertical bars, and thus locking the stop in its lowered position. When, however, the lower cross-head, carrying the tong-levers, has moved upwardly a short distance, it will strike these clutch-jaws and unlock them, whereupon the lower plunger, with its attached parts, will move upwardly with the cross-head 17, thus lifting all the parts free from the ingot. The lifting is continued until the mold has been entirely stripped from the ingot, which is left standing upon the car. The trolley may then be moved along the jib and the mold released by admitting fluid to the small cylinder 29, and thereby opening the tongs.

In the form of Fig. 4 I employ a cross-head 22′ upon the lower end of the lower plunger, which cross-head is provided with holes having outer inclined faces and containing wedged dogs 24′, which rest loosely therein and contact with the vertical bars 25. The action of these wedges is the same as that of the clutch-blocks. They lock the lower plunger in lowered position until moved upwardly by the lower cross-head carrying the tong-levers.

The advantages of my invention result from the positive locking of the stop or post in its lowered position, so as to prevent any lifting of the ingot from the stool.

The moving parts (plungers) of the motors may fit around the stationary parts (cylinders) and many other changes may be made in the form and arrangement of the parts without departing from my invention as defined in the claims, since

I claim—

1. In ingot-extracting apparatus, a mold-lifting motor, a movable stop for the ingot, a lock arranged to hold the stop during part of the upward movement of the lifting-motor, and mechanism arranged to disengage the lock, said mechanism being actuated by the upward movement of the mold, at a determined point in said movement; substantially as described.

2. In ingot-extracting apparatus, a cylinder having plungers therein, tongs connected to one of the plungers and arranged to lift the mold, a stop upon the other plunger arranged to hold down the ingot, a lock arranged to clamp the stop in its lower position and mechanism actuated by the upward movement of the mold and arranged to automatically disengage the lock at a determined point in said movement; substantially as described.

3. In ingot-extracting apparatus, a cylinder having two oppositely-projecting plungers, tongs connected to one of the plungers for lifting the mold, a stop upon the other plunger to hold down the ingot, a lock for holding the stop in adjusted position, and mechanism arranged to automatically release the lock after the mold has been lifted a determined distance said mechanism being actuated by the tongs; substantially as described.

4. In ingot-extracting apparatus, the combination of a cylinder-lifting plunger and a downholding-plunger acting in opposite directions, said plungers having a common fluid-supply, the downholding-plunger being of less area than the other, a lock arranged to clamp the downholding-plunger in adjusted position and mechanism set into action by the upward movement of the mold and arranged to release the lock at a certain point in this movement; substantially as described.

5. In ingot-extracting apparatus, an extractor-cylinder containing two oppositely-projecting plungers, the upper plunger having depending hangers provided at their lower end with a cross-head carrying tongs to engage and lift the mold, the lower plunger having a post to hold down the ingot, and automatic clamps acting upon the lower plunger to hold it in depressed position, the tongs-carrying cross-head being arranged to contact with and release the clamps when the mold has been lifted a certain distance; substantially as described.

In testimony whereof I have hereunto set my hand.

JULIAN KENNEDY.

Witnesses:

GEO. B. BLEMMING,

L. A. CONNER, Jr.