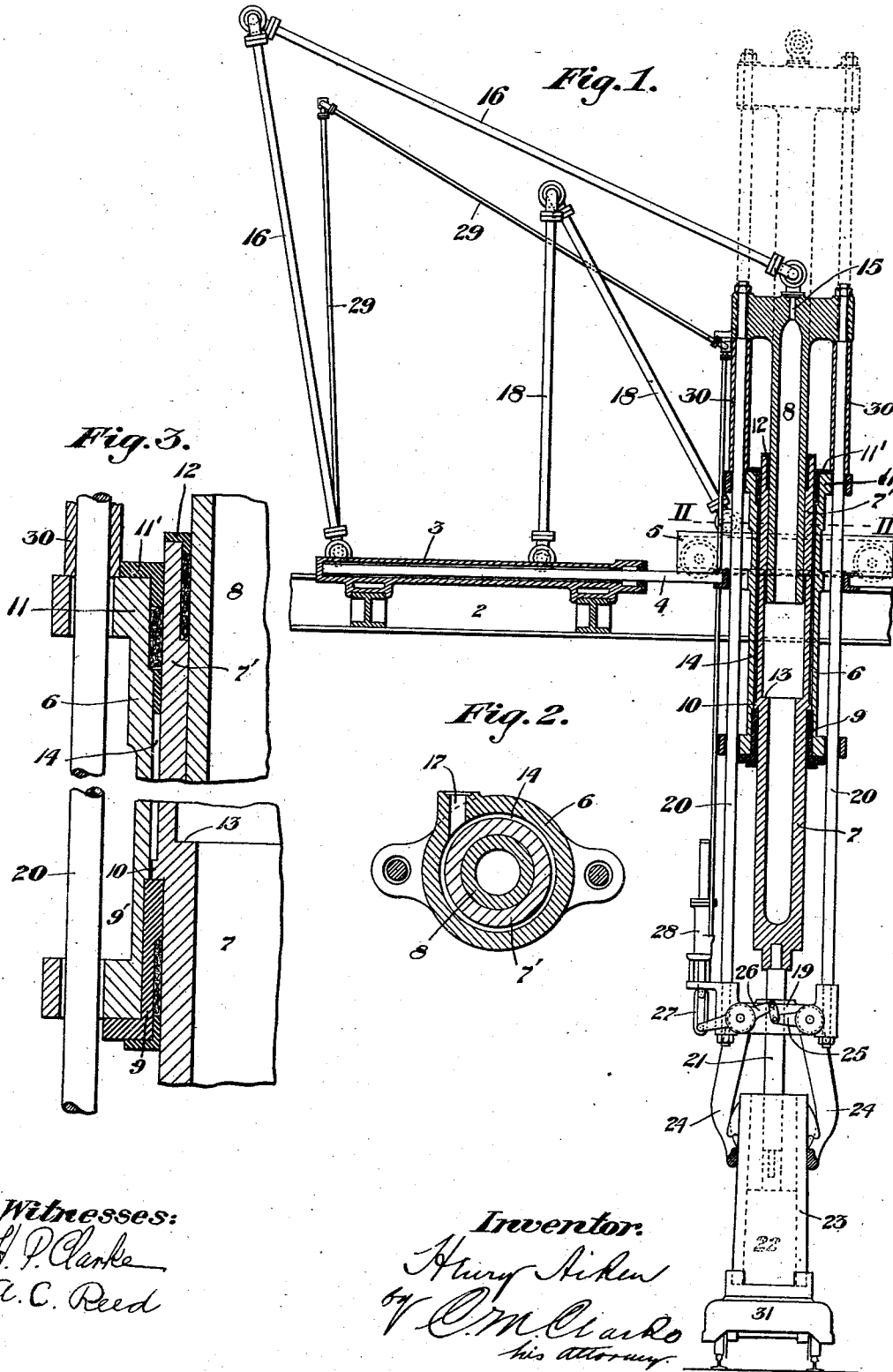


906,359.

Patented Dec. 8, 1908.



Witnesses:
 H. P. Clarke
 A. C. Reed

Inventor:
 Henry Aiken
 by C. M. Clarke
 his Attorney

UNITED STATES PATENT OFFICE.

HENRY AIKEN, OF PITTSBURG, PENNSYLVANIA.

INGOT-EXTRACTOR.

No. 906,359.

Specification of Letters Patent.

Patented Dec. 8, 1908.

Application filed August 12, 1908. Serial No. 448,200.

To all whom it may concern:

Be it known that I, HENRY AIKEN, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Ingot-Extractors, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to improvements in apparatus for extracting ingots of that type shown in my former Letters Patent No. 526093 dated September 18th, 1894.

The object of the invention is to provide a construction whereby the lifting plunger and pushing plunger are telescopically combined to provide alining bearings at all positions and whereby the lifting operation is performed by the pushing plunger, the construction also rendering possible the lifting of the pushing plunger independent of the cross head of my former invention.

In the drawings:—Figure 1 is a sectional elevation of my improved apparatus, showing the parts lowered to operative position with relation to an ingot mold. Fig. 2 is an enlarged cross section on the line II. II. of Fig. 1. Fig. 3 is a vertical sectional detail view enlarged and partly broken away, of portions of the pushing plunger and lifting plunger and the packing therefor.

2 represents any suitable supporting framework, as an elevated jib or platform.

3 is a horizontal racking cylinder mounted thereon and having a plunger 4 connected with a trolley 5, which can be moved back and forth on the jib or elevated support 2 by means of fluid pressure within the cylinder. Said trolley carries the upright extracting cylinder 6, depending vertically as shown, from a suitable mounting within the trolley, and is provided with a pushing plunger 7 and a telescoping lifting plunger 8.

The lower end of cylinder 6 is provided with an inserted shouldered bushing 9 having a bearing extension 9' for supporting the plunger 7 in its lowered position, and for providing a bearing therefor at all positions, by engagement with an annular pressure flange or head 10 and having a suitable stuffing box and gland. The upper end of cylinder 6 is also provided with a stuffing box terminal 11, suitable packing, and an inserted bearing bushing 11', through which projects the hollow extension 7' of plunger 7 whereby an alining bearing is provided for the pushing

plunger at all positions. The upper end of extension 7' is likewise provided with a stuffing box terminal 12 surrounding lifting plunger 8, and between plunger 7 and extension 60 7' is an internal annular shoulder 13 adapted to provide a lifting bearing abutment for the lower end of plunger 8, for raising both plungers, by engagement with lower end of plunger 7 by cross-head 19, as in my prior construction. Both plungers may also be 65 raised independent of the cross-head by independent fluid pressure within annular cavity 14 between the cylinder 6 and the exterior of plunger 7 and its extension 7'. 70

As shown in Fig. 3, the diameter of annular head 10 is slightly less than the internal diameter of cylinder 6, providing for free circulation of the actuating fluid.

Fluid pressure is supplied to the interior of pushing plunger 7 and lifting plunger 8 75 through passage 15 in plunger 8 and jointed pipes 16 from any source of pressure, or the fluid inlet may be connected with plunger 7 with equally good results. Fluid pressure is 80 supplied to the interior cavity 14 of cylinder 6 through passage 17 as shown and jointed pipes 18, similarly connected.

19 is a cross-head below the plunger 7 connected with the head of plunger 8 by vertical 85 hangers 20.

21 is a projection or post which extends down from the end of the plunger 7 through head 19 and is adapted to engage the top of an ingot 22 within a mold 23, as shown, sufficient movement being provided for ingots of 90 maximum and minimum length.

24, 24, are tongs-levers or jaws which are pivoted to the head 19 and are adapted to engage lugs on the mold for the purpose of 95 lifting the same. These jaws may be operated by levers 25, 26, connected by link 27 or other device with the plunger of an operating cylinder 28 actuated by fluid pressure through jointed pipes 29 connected with a 100 source of supply.

30, 30, are supporting sleeves surrounding hangers 20 and bearing upon flanges of cylinder 6 to limit the downward travel of plunger 8 and its connected parts. 105

The operation is as follows:—The molds containing the ingots to be extracted are carried upon the car 31 on which they are cast, and without removing the mold from the car, the car is drawn to the ingot 110 extracting apparatus, so that the mold shall be directly beneath the post 21; previously

to such time the post having been elevated by admitting fluid into cavity 14, the effect of which is to raise plunger 7 thus lifting plunger 8 and cross-head 19, the tongs 24 being also opened. The mold being in position beneath, plunger 7 is then lowered by exhausting pressure from cavity 14 until the end of the post 21 engages the ingot, the plunger 8 also descending and lowering the cross-head 19 until jaws 24 come opposite and below the lugs on the mold. Then by operation of cylinder 28 the jaws are brought together so as to engage the lugs, as shown in Fig. 1. Fluid pressure now being admitted into the interior of hollow plungers 7 and 8, causing them to act in opposite directions, lifting plunger 8 will be forced upwardly within extension 7' lifting the mold 23, the ingot being held from rising by reason of the bearing of post 21. Upon thus stripping the mold from the ingot it may be further raised until entirely clear and the ingot is left standing on the car, when the mold may be moved laterally and lowered upon another car or elsewhere as desired.

By the telescoping construction as thus described, I am enabled to maintain the working plungers in alinement with each other and with the cylinder 6; to supply working pressure to their interiors for performing their individual functions, while providing independent means for lifting one or both plungers (7 or 7 and 8) bodily by the pressure under exterior of plunger 7 within cylinder 6 without depending on the engagement of the cross-head with the lower end of plunger 7.

The construction, and operation, is comparatively simple, efficient and durable; it is economical to build and operate; and provides means for raising the plungers when inoperative at a minimum of power.

The invention may be changed or varied by the skilled mechanic in various features of design, construction, or details; but all such changes are to be considered as within the scope of the following claims.

What I claim is:—

1. In ingot extracting apparatus, a cylinder having two oppositely projecting telescoping plungers, one for lifting the mold and the other for holding down the ingot, and a common fluid supply to the interior of said plungers, substantially as set forth.

2. In an ingot extracting apparatus, a cylinder having two oppositely projecting and oppositely working telescoping plungers, a common fluid supply to the interior of said

plungers, and an independent fluid supply to the cylinder for lifting both plungers, substantially as set forth.

3. In ingot extracting apparatus, the combination of a cylinder having a fluid supply, a pushing plunger in said cylinder and extending through both ends thereof, an oppositely working lifting plunger telescopically mounted within the pushing plunger, and a common fluid supply opening to the interior of both plungers, substantially as set forth.

4. In ingot extracting apparatus, the combination of a cylinder having a fluid supply and a lower annular shoulder, a hollow plunger extending through each end of said cylinder and provided with a lower terminal post, and a plunger mounted within the other end of said hollow plunger and having means connected therewith for lifting the mold, substantially as set forth.

5. In ingot extracting apparatus, the combination of a cylinder having a fluid supply and a lower annular shoulder, a hollow plunger extending through each end of said cylinder and provided with an annular pressure head and a lower terminal post, and a plunger mounted within the other end of said hollow plunger and having means connected therewith for lifting the mold, substantially as set forth.

6. In ingot extracting apparatus, the combination of a cylinder having a fluid supply, a hollow down-holding plunger within the cylinder extending through both ends thereof, and an oppositely operative mold-lifting plunger telescopically mounted within the upper end of the down-holding plunger and provided with externally connected means for engaging and lifting the mold, substantially as set forth.

7. In ingot extracting apparatus, the combination of a cylinder having a fluid supply, a hollow down-holding plunger within the cylinder extending through both ends thereof and provided with an interior annular shoulder, and an oppositely operative mold-lifting plunger telescopically mounted within the upper end of the down-holding plunger and provided with externally connected means for engaging and lifting the mold, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY AIKEN.

Witnesses:

NELLIE C. AIKEN,
NELLIE AIKEN.