(No Model.)

W. R. HINSDALE.

DEVICE FOR BREAKING BARS.

No. 362,381. Patented May 3, 1887.

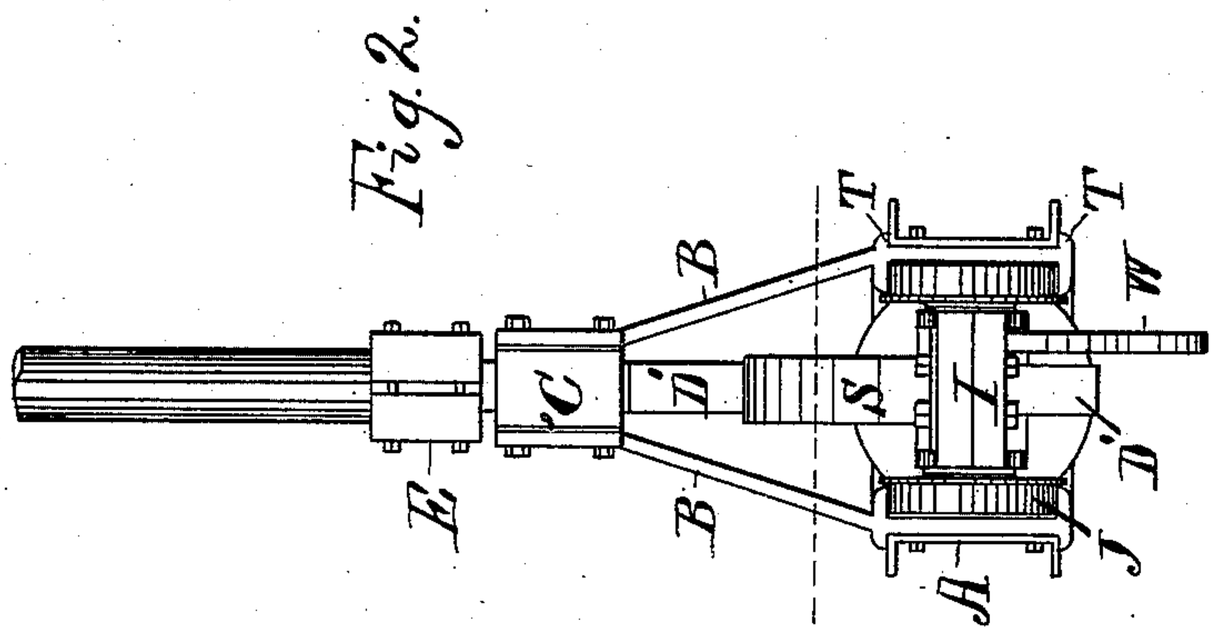

Fig. 2.

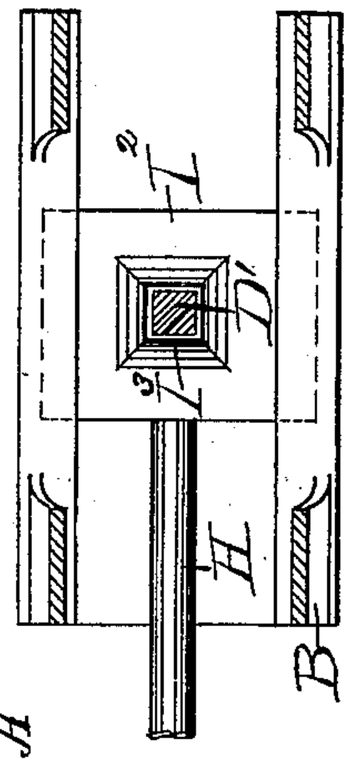

Fig. 5.

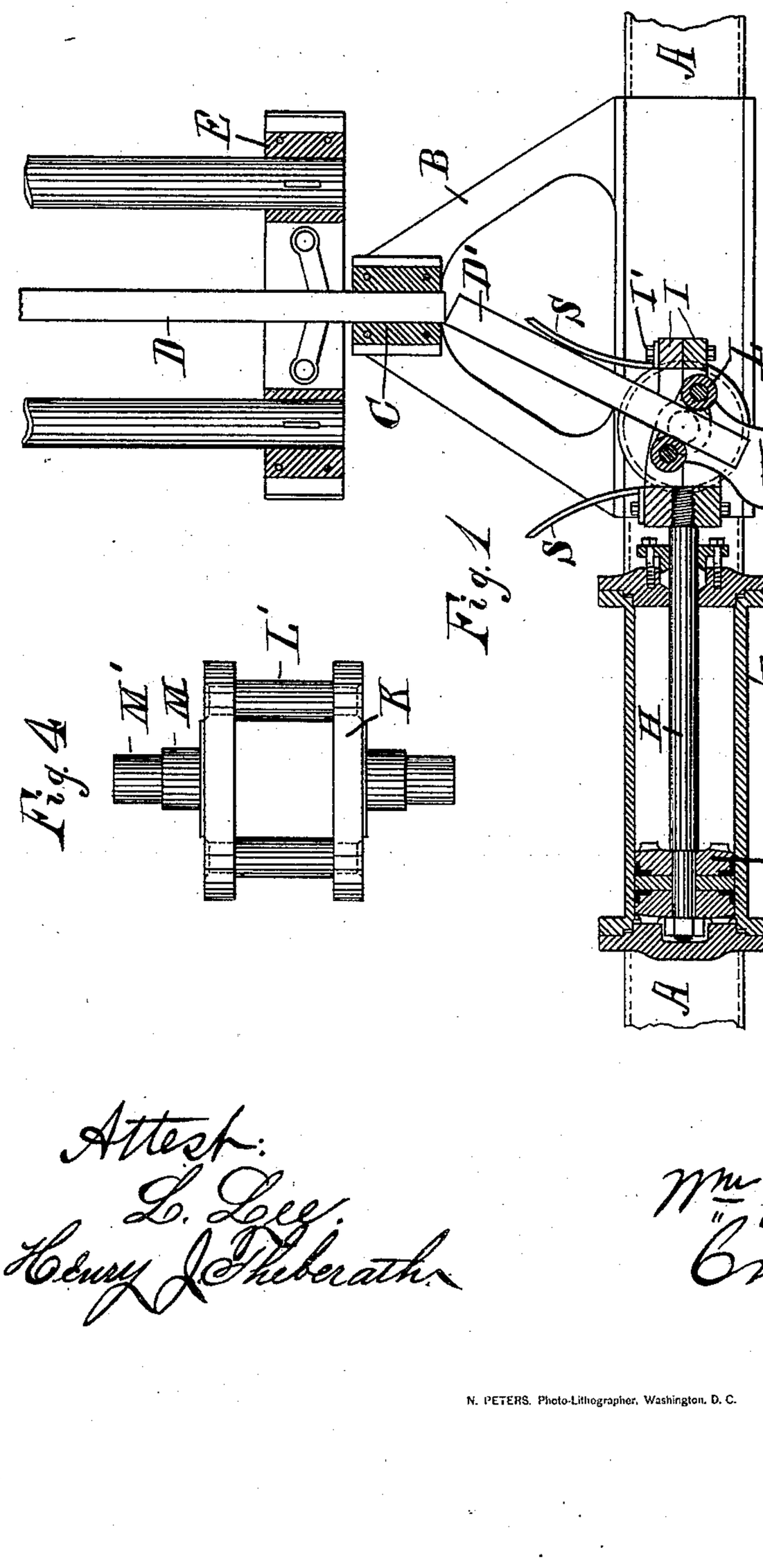

Fig. 1.

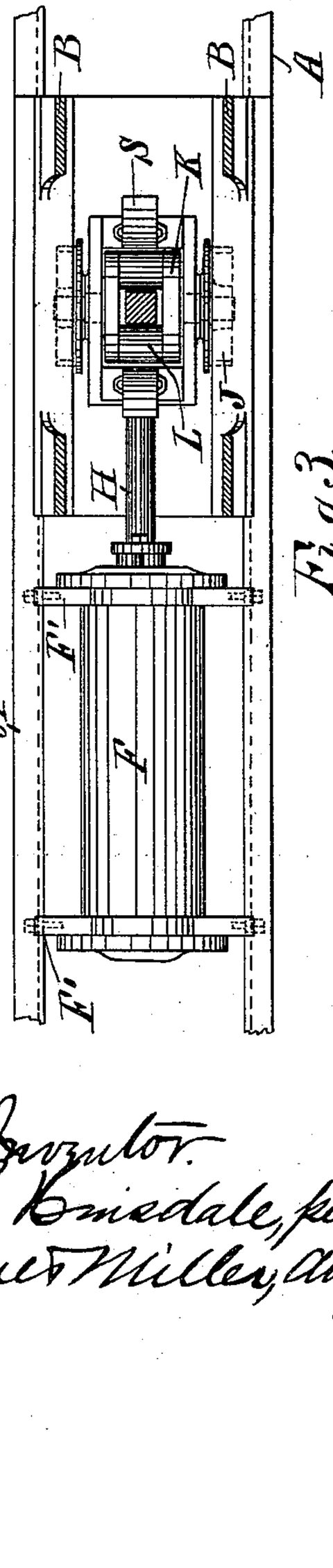

Fig. 3.

Fig. 4.

Attest:
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UNITED STATES PATENT OFFICE.

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DEVICE FOR BREAKING BARS.

SPECIFICATION forming part of Letters Patent No. 362,381, dated May 3, 1887.

Application filed January 27, 1887. Serial No. 225,678. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. HINSDALE, a citizen of the United States, residing at Brooklyn, Kings county, New York, have invented certain new and useful Improvements in Apparatus for Dividing a Continuous Ingot-Bar, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to break up an ingot-bar into separate ingots; and it consists in the combination, with a holder to sustain the lateral stress upon the ingot-bar at the point of fracture, of means for laterally moving the end of the bar.

It also consists in special constructions thereof.

In the annexed drawings, Figure 1 is a central longitudinal section of the entire apparatus in connection with the cross-head of a device shown and described in my patent application No. 222,371, and illustrating in the present case the drawing of the ingot-bar from the mold to the breaking apparatus. Fig. 2 is an end view of the same. Fig. 3 is a sectional plan on line *x x* in Fig. 2. Fig. 4 is a plan of the grip for the end of the bar, detached from the other parts of the apparatus; and Fig. 5 is a plan similar to Fig. 3, with the grip in the form of a plain perforated cross-head.

A A are two channel-beams, which, with the upright braces B B, having their bases bolted to such channel-beams to sustain the holder C, constitute the frame of the apparatus. The holder is provided with an aperture, through which the ingot-bar D passes as it is drawn from the mold by the cross-head E.

F is a hydraulic cylinder attached to the channel-beams A A by means of the flanges F′, extended outward, and shown herein notched at their ends to hook over the said beams. The cylinder is provided with a piston, G, and piston-rod H, attached to a carriage-frame, and having a grip into which the end of the section D′ to be broken off projects.

The carriage, as a whole, consists in a carriage-frame, I, supporting-wheels J, and a grip having sides K, and provided with rollers L, and pivoted within the carriage-frame.

The grip is preferably constructed as shown in Fig. 4, with the sides K rigidly connected together by means of the shouldered axles L′ of the rollers L, riveted thereto, and with integral trunnions M M′, to serve as pivots for such grip upon the carriage, and also as axles for the wheels J, which support the carriage-frame.

One of the sides K is shown in Figs. 1 and 2 provided with a depending weight, W, to return it to its normal position when tipped by the inclination of the ingot.

In order to permit the insertion of such grip and its integral trunnions, the carriage-frame is divided on a line through the center of its bearings, and the two parts thus formed are secured together by means of the bolts I′.

S are outwardly-curved springs attached to the ends of the carriage-frame and projecting upward therefrom, the object of which is to support the upper end of the section immediately after the same is broken from the body of the bar, to allow the section to slip through the rollers in a nearly upright position.

T T are tracks upon the frame, (shown integral with the same herein,) upon which the supporting-wheels of the carriage run.

The operation of the apparatus is as follows: The carriage being adjusted directly in line with the ingot-bar, such bar is passed through the holder and its end projected between the rollers of the grip within the carriage-frame, and the bar is held in place longitudinally at such a point in its length that the section to be broken off may project entirely through the holder. The piston and its rod are then operated to move the carriage, thus bending the ingot-bar between the same and the lower edge of the holder and breaking the bar, as desired. In practice I find that the fracture of the bar may generally be effected by the movement of the piston from the center to the end of its stroke, and then returning the same to its former position; but, if necessary at any time, the bar may be bent by repeated movements of the piston throughout its entire stroke.

From the above description it will be seen that the essential part of my invention is the combining of the holder with means for mov-

ing the end of the bar laterally beyond the same, and that none of the particular constructions shown herein are positively necessary to the practice of my invention, although preferable.

It is evident that the supporting-wheels for the carriage-frame may be dispensed with, and that the tracks shown herein could be replaced by simple guides for such frame upon the main frame of the apparatus. Such carriage-frame provided with a pivoted grip may be replaced by a simple cross-head provided with an aperture for the end of the ingot-bar, as in Fig. 5, where the end of the piston-rod H is shown provided with a cross-head, I^2, having a plain square opening, I^3, large enough to admit the ingot-bar and to permit its inclination at the required angle during the bending operation.

It is also obvious that in place of the hydraulic piston-rod, preferably used as a means of bending the free end of the ingot-bar, any other suitable means—such as the piston-rod of a steam-cylinder or a rack-bar operated by a pinion—may be substituted.

Having thus set forth my invention, what I claim herein is—

1. The combination, with the frame of an apparatus for breaking ingot-bars into sections and a holder for the ingot-bar attached thereto, of a grip constructed to permit the longitudinal passage of the bar from the holder and means for guiding the grip transversely to the ingot-bar and moving it transversely to break the same, substantially as herein set forth.

2. The combination, with a holder for the ingot-bar at the point of fracture, of a hydraulic piston-rod provided with a grip and operated to move transversely to the line of the ingot-bar, substantially as and for the purpose set forth.

3. The combination, with the frame of an apparatus for breaking ingot-bars into sections and a holder for the ingot-bar at the point of fracture attached thereto, of a hydraulic cylinder provided with a piston and piston-rod and secured to the said frame transverse to the line of the ingot-bar, and a carriage adapted to receive the end of the ingot-bar and mounted in guides upon the said frame and reciprocated by means of the said piston-rod, substantially as shown and described.

4. The combination, with the frame of an apparatus for breaking ingot-bars into sections and a holder for the ingot-bar at the point of fracture attached thereto, of a hydraulic piston-rod operated to move transversely to the line of the ingot-bar, carriage-tracks upon the said frame, a carriage-frame mounted upon wheels to fit said tracks and reciprocated by means of the said piston-rod, and a grip pivoted upon the carriage-frame to receive the end of the ingot-bar, substantially as shown and described.

5. The combination, with the frame of an apparatus for breaking ingot-bars into sections and a holder for the ingot-bar at the point of fracture attached thereto, of a hydraulic piston-rod operated to move transversely to the line of the ingot-bar, carriage-tracks upon the said frame, a carriage-frame mounted upon wheels to fit the said tracks and reciprocated by means of the said piston-rod, and a grip provided with rollers to bear against the ingot-bar and pivoted upon the carriage-frame, as and for the purpose set forth.

6. The combination, with the frame of an apparatus for breaking ingot-bars into sections and a holder for the ingot-bar, of a hydraulic piston-rod, tracks upon the said frame, a carriage-frame mounted upon wheels and reciprocated by means of the said piston-rod, and a grip provided with rollers and trunnions integral with the sides of the said grip and projecting therefrom through the sides of the carriage-frame and the hubs of its supporting wheels, substantially as and for the purpose set forth.

7. The combination, with the frame of an apparatus for breaking ingot-bars into sections and a holder for the ingot bar, of a hydraulic piston-rod, carriage-tracks upon the said frame, a carriage to move on the said tracks and reciprocated by means of the said piston-rod, and outwardly-curved flat springs secured to the ends of the carriage and projecting upward, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM R. HINSDALE.

Witnesses:

HENRY J. MILLER,

HENRY J. THEBERATH.