T. Morris,

Derrick.

No. 70,455. Patented Nov. 5, 1867.

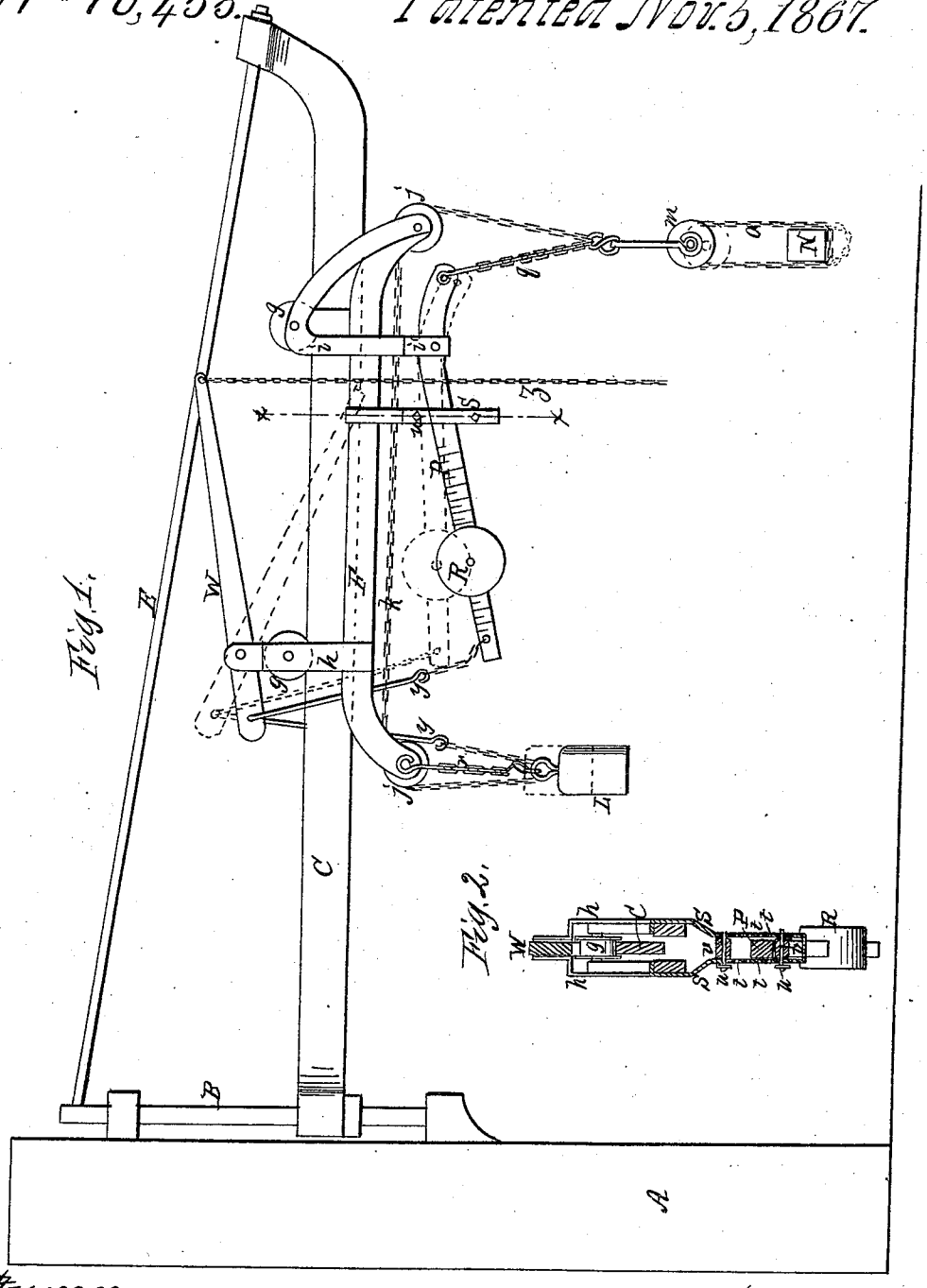


Fig. 1.

Fig. 2.

Witnesses
J. A. Davis
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Inventor
Thomas Morris
by J. Fraser & Co Attys

A.M. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

United States Patent Office.

THOMAS MORRIS, OF CLARBESTON, ENGLAND, ASSIGNOR TO HIMSELF, JOHN MORRIS, AND THOMAS C. KNOWLES.

Letters Patent No. 70,455, *dated November* 5, 1867.

IMPROVEMENT IN COMPENSATING FORGE-CRANE.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, THOMAS MORRIS, of Clarbeston, in the county of Pembroke, England, (temporarily residing at Toronto, Canada West,) have invented a certain new and improved Compensating Forge-Crane; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 represents a side elevation, and

Figure 2 a detached cross-section, in plane of line *x x*, fig. 1.

Like letters designate corresponding parts in both figures.

My invention relates to that class of cranes which are employed in furnaces and other iron-works for handling and sustaining the metal while it is being forged, in contradistinction to those employed in raising and lowering materials, and the invention consists in balancing the weight to be sustained by means of a weight and pulley, together with a lever or scale-beam, also provided with a ball or weight, which, by adjusting thereon, enables blooms of different weights to be readily balanced, the whole being attached to a frame or carriage, which traverses the beam or arm of the crane. It also consists in the employment therewith of a lever, by which the said weight and end of lever may be sustained while attaching to the bloom or other metal to be forged, and in adjusting and releasing the same.

In the drawings A represents an upright timber, to which the crane-post or vertical shaft B may be attached, (as shown,) or in any other suitable way. C is the horizontal jib or arm, which turns on or with the crane-post B, and is supported by the tension-bar E, that connects the top of the crane-post with the outer end of the beam. F is a frame or carriage, which lies alongside the beam, which it traverses by means of the rollers *g g*, mounted in any suitable bearings, *h i*, attached to the frame, that rest upon the upper edge of the beam, and sustain the carriage thereby as it traverses back and forth. I do not limit myself to the described arrangement and mode of connecting the carriage with the arm C, as it may be arranged above the latter, being supported by weights and pulleys, and in various other ways. In each end of this carriage is a sheave, *j*, over which passes the chain *k*, the inner end of which is attached to a weight, L, and the outer end connected with the sheave *m*, to which the metal N to be forged is attached by the chain *o* in the usual manner. P is a lever, having its fulcrum in a pendent bar or bars, *i'*, from the frame F, preferably of the construction shown, being an extension of the bearing *i* of the roller *g*. The short arm of the lever is connected to the sheave *m* by a chain, *q*, while the long arm is provided with a sliding ball or weight, R, which by adjusting thereon, enables blooms of different sizes to be readily balanced. When adjusted the ball may be retained in place by means of a pin, as shown, or by any suitable means. At a short distance from the fulcrum *i'* are the vertical bars S S, secured to the carriage F, and forming a way or guides for the long arm of the lever P. These bars are provided with a series of holes, *t t*, in any two of which are inserted bolts *u u*, above and below the lever, which serve as stops to limit the vertical play of the arm, and prevent an undue falling or "kicking up" of the same. These bolts *u u* pass through blocks of India rubber, *v v*, or other elastic material, inserted between the guides S, which serve as shields to deaden the noise and soften the concussion of the lever as it comes in contact therewith, (as shown in fig. 2.) A short chain, *r*, of suitable length, may connect the weight L with the end of the carriage, for the purpose of preventing said weight, when the crane is detached from the bloom, from falling an unnecessary distance, and thereby elevating the sheave *m* to an inconvenient height. W is a lever, having its fulcrum in any suitable standard from the carriage F, but which may be conveniently jointed in an extension of the bearing pieces *h*, as represented in both figures. The short arm of this lever is connected by suitable rods or chains, *y y*, to the weight L and the end of the long arm of lever P, while a rope or chain, *z*, is attached to the end of the long arm, by which the weight L and lever P may be raised and sustained while attaching the crane to the metal to be forged, and in adjusting or releasing the same, as shown in red lines.

The operation of my improvement is obvious. The crane is brought into the proper position for attaching to the metal by turning the jib C, and causing the carriage to traverse thereon, so as to bring the sheave *m* over the proper spot, which with cranes of ordinary size can be readily accomplished by pushing by hand. If required, however, a rack and pinion, or rope and pulleys, may be employed in propelling it when the crane is loaded. Having been brought to the proper position, one attendant raises the weight L and lever P by means

of lever W, as before described, while another attaches to the bloom N. The ball or weight R is then adjusted along the arm of lever P until the bloom is elevated and balanced, when it is readily swung round and conveyed to the furnace or hammer, as may be required. The chain around the bloom can be loosened with the greatest ease when its adjustment is required, by simply operating the lever W, as shown in red lines.

One of the greatest advantages of my improved crane is that it is self-compensating, the bloom or metal being perfectly balanced at all times, the weight L and arm of lever P rising and falling to compensate for the various requirements of the operator, without the time and labor which are involved in manipulating with cranes of the ordinary construction. The metal, while being subjected to the blows of the hammer, being sustained in the manner described, yields in a measure to its action, and thereby lessens in a great measure the unpleasant effects produced by the concussions on the operator who handles the metal. The stop-bolts *u* prevent any undue displacement of the parts of the machine, so that it is always ready for convenient operation. The elastic shields *v* prevent any unpleasant noise and jarring of the machine from the striking of the lever against the bolts *u*.

What I claim as my invention, and desire to secure by Letters Patent, is—

The lever P, adjusting-weight R, and chain *q*, in combination with the weight L, sheaves *j*, chain *k*, and carriage F, arranged and operating substantially as and for the purpose set forth.

I also claim in combination therewith the lever W, and its connecting-rods or chains *y y*, operating substantially in the manner and for the purpose specified.

I also claim the guides S S and stop-bolts *u u*, provided with elastic shields *v*, arranged and operating with the lever P, for the purpose and in the manner described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THOMAS MORRIS.

Witnesses:

THOS. G. LOCKIE,

JNO. STARK.