2 Sheets—Sheet 1.

A. E. BROWN.

Truck Apparatus for Lifting and Conveying Ingots, Pots, &c.

No. 208,222. **Patented Sept. 24, 1878.**

Fig. 1.

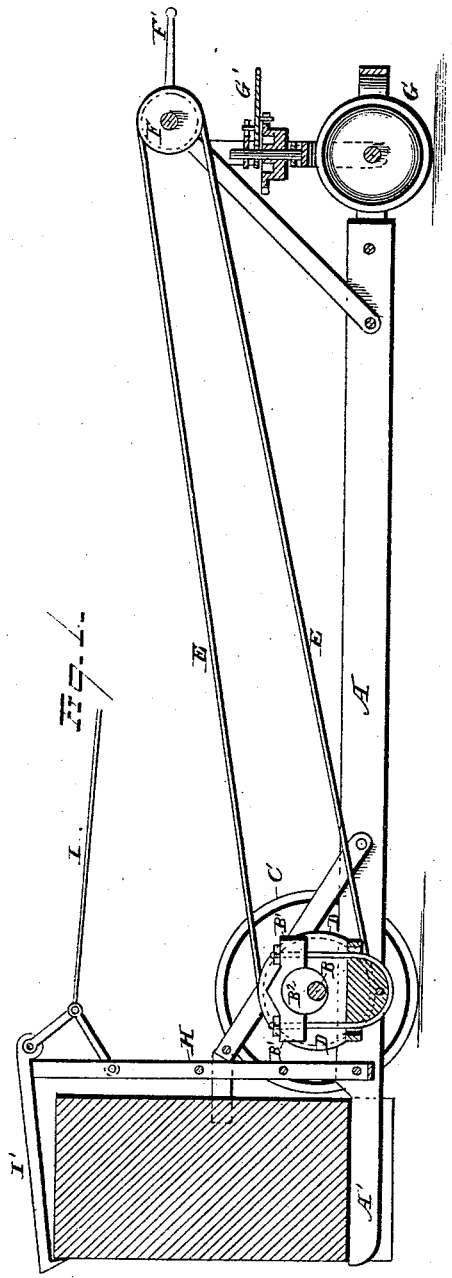
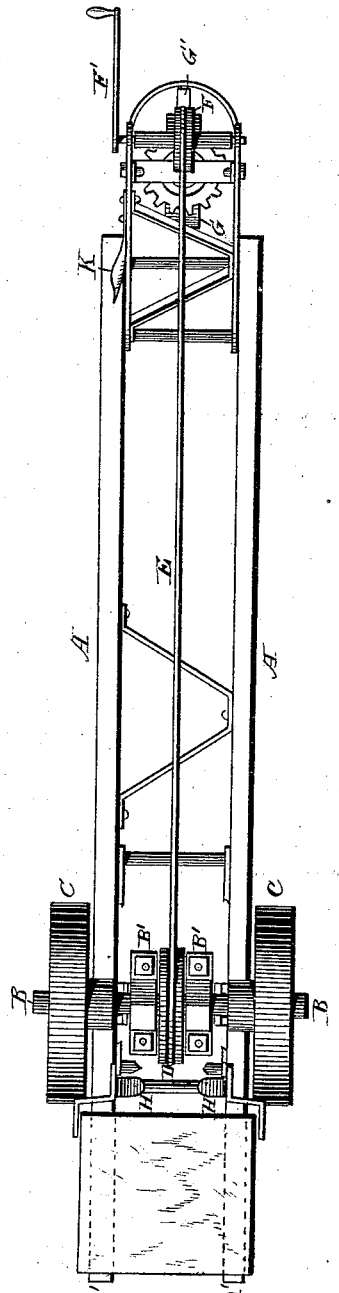


Fig. 2.



WITNESSES

E. G. Nottingham

A. M. Bright.

INVENTOR

A. E. Brown

By Leggett & Leggett

ATTORNEYS

2 Sheets—Sheet 2.

A. E. BROWN.

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Fig. 3.

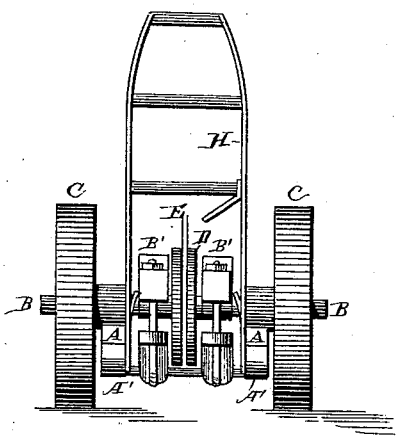
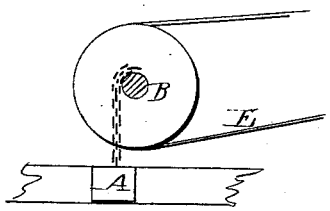


Fig. 4.



WITNESSES
E. S. Nottingham
A. M. Bright

A. E. Brown INVENTOR
By Baggett & Baggett
ATTORNEYS

UNITED STATES PATENT OFFICE.

ALEXANDER E. BROWN, OF CLEVELAND, OHIO.

IMPROVEMENT IN TRUCK APPARATUS FOR LIFTING AND CONVEYING INGOTS, POTS, &c.

Specification forming part of Letters Patent No. **208,222**, dated September 24, 1878; application filed July 22, 1878.

To all whom it may concern:

Be it known that I, ALEXANDER E. BROWN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Lifting-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improved device for lifting weights and conveying them from place to place; and consists in a wheel-truck, the forward axle of which is made to support the lifting arm or bracket, the said axle being turned eccentrically along those parts which receive the suspenders, and mechanism for turning said axle in its bearings, so that the eccentrics may operate to lift the weight.

In the drawing, Figure 1 is a longitudinal central section, exhibiting my improved lifting and conveying apparatus in detail. Fig. 2 is a plan view of the same; Fig. 3, an end view. Fig. 4 is a detail view of a modification of the invention.

This invention was designed more especially for the purpose of lifting pots or vessels from hot furnaces—as, for instance, such as are employed in the annealing-furnaces of malleable-iron works—or for handling ingots and ingot-molds in the manufacture of steel and for other like purposes, but it is equally well adapted for the purpose of lifting and conveying weights of any nature; and I do not limit myself to its employment in any particular locality.

The structure may be varied considerably without departing from my invention. The device which I have shown in the drawing is as follows:

A is a suitable frame-work of iron or other suitable material, which possesses sufficient strength at its ends A′ to bear up the weight to be lifted and transferred. This frame A is suspended beneath an axle, B, by stirrups B^1, which stirrups, at their top, have a bearing upon the axle B. The truck-wheels serve to make the device portable, and are journaled upon the axle B. At B^2, beneath the stirrups B^1, the axle is turned eccentrically midway of the axle, and fastened rigidly to the latter is a band-wheel, D, over which passes the band, or, preferably, the chain, E, which passes back to the pulley F. This pulley is located upon a shaft, and governed by a crank, F′. With this crank F′, through the medium of the belt E, the band-wheel D, and with it the axle B, may be turned, and, as the axle B is turned, the eccentric B^2 upon the axle will lift or lower the frame A. G is a pilot-wheel, and G′ any suitable lever and clamp mechanism for turning the wheel, and thereby govern the direction of travel of the vehicle. H is an upright bracket, located just in front of the axle B, and of any suitable construction, to assist in supporting the weight as it is being transferred; and for this purpose, if desired, there may be the additional security of a rope or chain, I, and hook I′, which may or may not be employed; nor is the upright H absolutely essential, though desirable in some cases.

I will now proceed to describe its operation.

Where it is desired to lift a given weight the vehicle is run forward until the prongs A′ are adjacent to the object to be lifted. The crank F is then turned until the eccentrics B^2 permit the prongs to drop beneath the weight or to the level of suitable recesses provided for the reception of the prongs. The vehicle is then pushed forward, the prongs A′ run beneath the weight, the crank F is then again turned, revolving the axle B until its eccentrics present upward, thus lifting the frame A′ and lifting up the weight. The vehicle is then run back upon the truck-wheels C to the place where it is desired to deliver the weight. The crank F is then again turned, and the action of the eccentrics B^2 will lower the frame until the weight rests upon the ground or floor. The carriage is then run back, and is ready for use again.

This device is especially applicable in locations where the weight to be handled is hot or not directly accessible by reason of the heat surrounding it—as, for instance, in malleable-iron works, where the castings are put into suitable pots or vessels—and in that condition are placed in an annealing-furnace, which is heated to a high heat.

Heretofore it has been customary, after the annealing process has progressed to a suffi-

cient extent, to break down the door of the annealing-chamber and then permit the furnace to cool. This cooling process consumes a great deal of time. It has then been customary for the workmen to go into the chamber, and, lifting the receptacle by means of pinch-bars, &c., upon iron rolls, roll it out from the chamber—another tedious operation, and frequently accompanied by damage to the castings. Then, after recharging the furnace, it takes considerable time to reheat. But with my device, if the receptacles are properly fashioned, or the chamber properly formed to admit of the introduction of the prongs A′ beneath the receptacle, all that is necessary to be done is simply to remove one of the doors and push the machine into the opening while the operator is back at the rear end of the machine a sufficient distance to be out of the influence of the great heat. He may, with this apparatus, remove the vessel without reducing the heat and without cooling the chamber. He can do it very rapidly, and recharge the furnace in the same way, keeping the furnace all the while hot. So in like manner he may very conveniently handle the hot ingots or the ingot-molds in the manufacture of steel; or the device may be employed in any locality where weighty articles are required to be lifted and transported to other localities. If the chain E is employed, then the wheel D and pulley F are preferably made in the nature of spur-wheels, so adapted that the spurs shall enter the links of the chain and prevent the chain from slipping.

K is a catch or fastening of any suitable nature for holding the crank F′, or for holding the eccentrics in position while the object lifted is being transferred from place to place.

The rear part of the frame A may be made sufficiently long or sufficiently heavy to counterbalance the weight that is to be lifted.

I would have it understood that I do not limit myself to the precise construction adjacent to the weight to be lifted, for it is apparent that the object may be accomplished in many ways substantially the equivalent—for instance, the axle B may be simply the axle for the truck-wheels, and not be provided with eccentrics; but, on the contrary, the said axle may support bearings, which, in turn, would receive the eccentric shaft, to which latter shaft the frame A might be attached and the same object be accomplished.

Fig. 4 represents, in detail form, a modification of the invention, wherein the lifting-frame is connected with a plane axle-shaft by a chain or other flexible fastening, said plane axle being provided with the band or chain wheel by which the same is actuated in rotary movement, tending to raise or lower the lifting-frame.

What I claim is—

1. In a lifting-machine, the combination, with a truck-axle provided with a band or chain wheel and mechanism for actuating the same in rotary movement, of a lifting-frame suitably connected with the axle and adapted to be vertically adjusted by said rotary movement of the same, substantially as set forth.

2. A lifting apparatus consisting in the combination, with a lifting-frame, of an axle upon which the same has eccentric bearing, together with mechanism adapted to rotate said axle, and thereby operate to raise said frame, substantially as set forth.

3. A lifting apparatus consisting of the frame A, with projecting prongs A′ for seizing the object to be lifted, truck-wheels and axle for supporting the said frame near the article to be lifted, eccentric bearings for the said frame, and mechanism for turning the said eccentric bearings and causing them to lift the weight, substantially as and for the purpose described.

4. The lifting apparatus consisting of the frame A with prongs A′, truck-wheels C, shaft B, with eccentric B^2 and supporting-stirrups B^1, in combination with band-wheel D and F, chain or belt E, and crank F′, substantially as and for the purposes described.

5. The combination, with the lifting apparatus, substantially as described, of pilot mechanism G G′, substantially as and for the purposes described.

6. The combination, with the frame A, prongs A′, and bracket H, of the rope or chain I and grapple I′, substantially as and for the purposes described.

7. A lifting-machine consisting in the combination, with a truck, of a lifting-frame supported by eccentric connection with the axle of the same, together with mechanism which extends rearward and is adapted to operate said axle in rotary movement at any suitable distance therefrom, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER E. BROWN.

Witnesses:
JNO. CROWELL, Jr.,
WILLIAM E. DONNELLY.