

(No Model.)

2 Sheets—Sheet 1.

L. FISCHER.
Teazer for Glass House Furnaces.

No. 240,902.

Patented May 3, 1881.

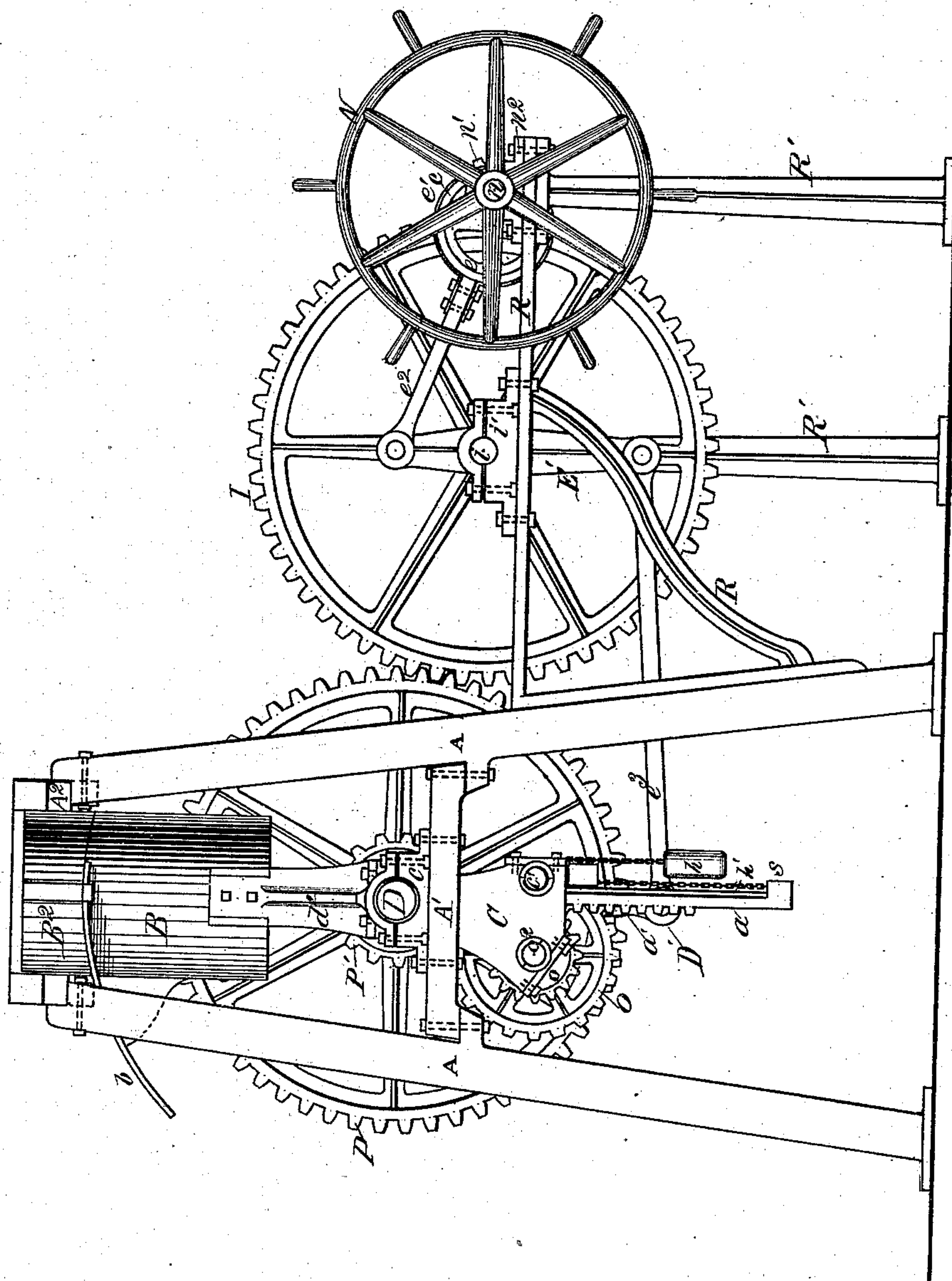


Fig. 1.

Witnesses
C. L. Parker
R. A. Whittlesey

Inventor Louis Fischer,
By Attorney George H. Christy

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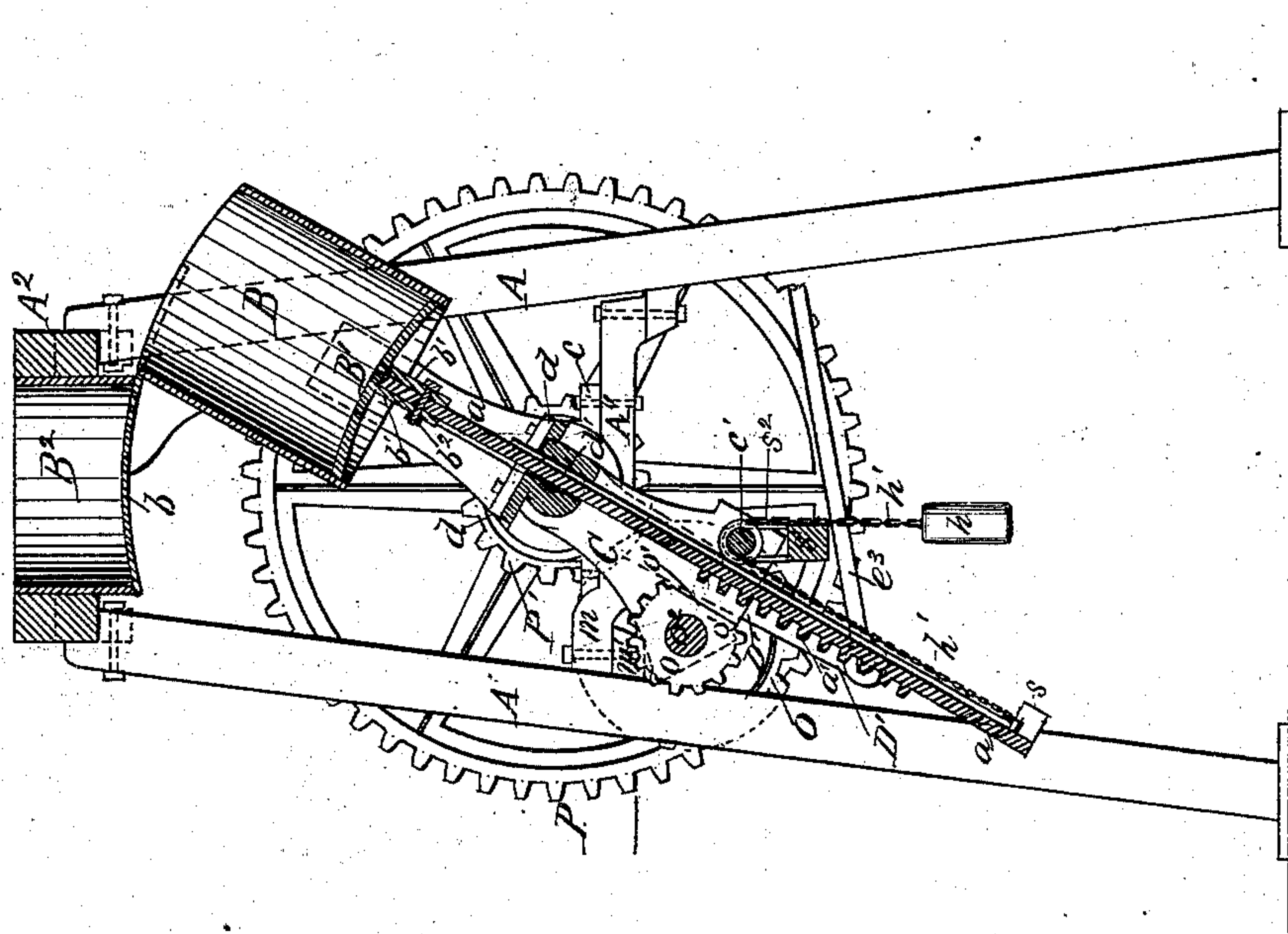


Fig. 3.

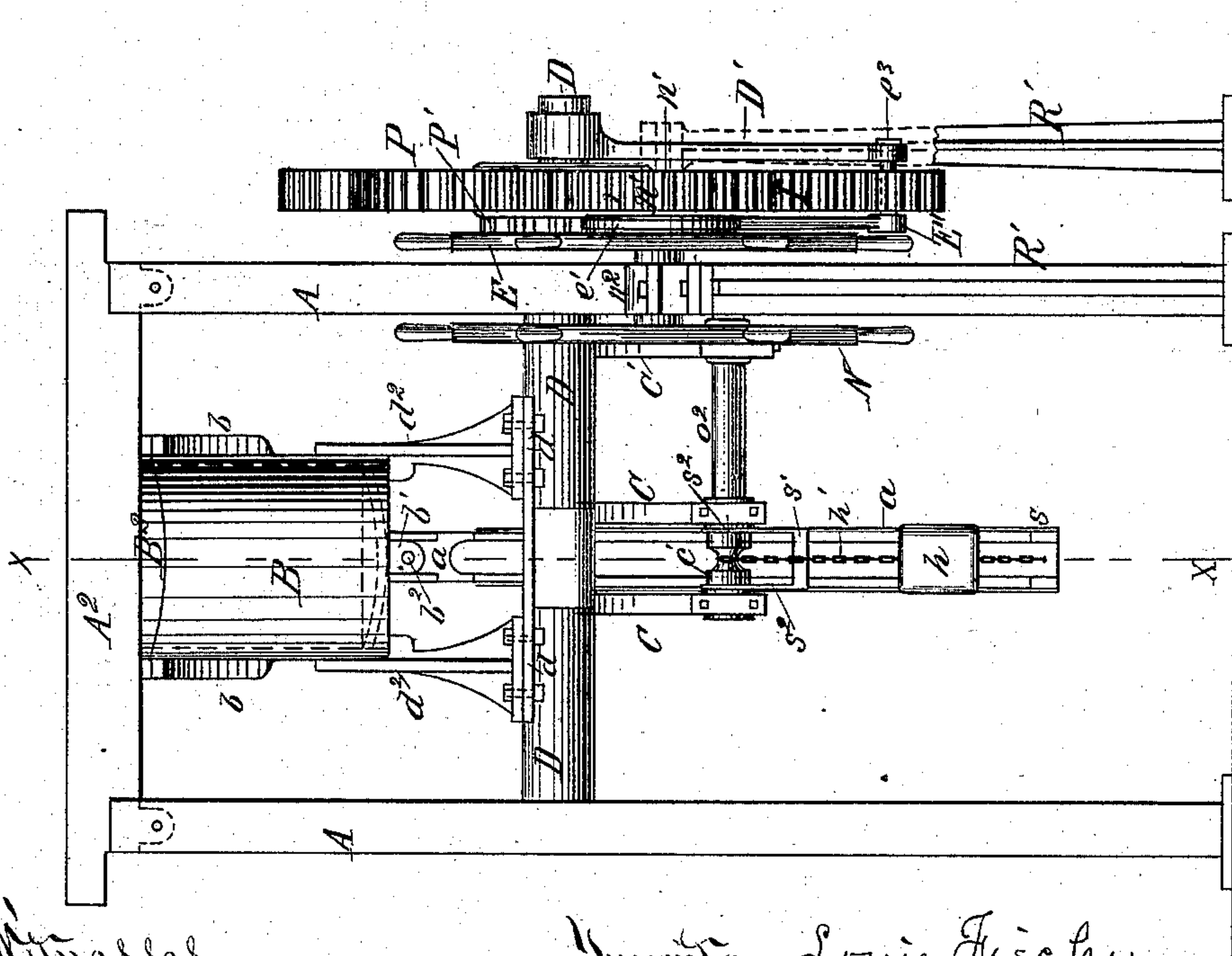


Fig. 2.

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UNITED STATES PATENT OFFICE.

LOUIS FISCHER, OF PITTSBURG, PENNSYLVANIA.

TEAZER FOR GLASS-HOUSE FURNACES.

SPECIFICATION forming part of Letters Patent No. 240,902, dated May 3, 1881.

Application filed January 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, LOUIS FISCHER, of Pittsburg, county of Allegheny, State of Pennsylvania, have invented or discovered a new and useful Improvement in Teazers for Glass-House Furnaces; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a view, in side elevation, of my improved teaser. Fig. 2 shows a front or end elevation; and Fig. 3 is a vertical sectional view of a part of the apparatus, the section being taken in the plane of the line *xx*, Fig. 2.

My invention relates to certain improvements in glass-furnace teasers; and it consists in new and improved means for operating the plunger and bucket of such apparatus.

In the drawings, A represents an upright frame formed of four pillars or posts, which are bound together by bed-pieces A' and cross-beams or caps A². In the top of such frame is secured a tubular rim or pipe, B², which, when the apparatus is in working position, opens into the bottom of the furnace and serves as an eye to direct the coal from the bucket into the furnace.

The pivoted bucket B is of the usual cylindrical form, with its bottom B' made as a plunger or piston, to be moved upward within the shell, and thereby discharge the contents of the bucket. In order to fill the bucket it is tipped or rocked to one side, as in Fig. 3, the plunger B' being down; and in order to charge its contents into the furnace the bucket is moved to an upright position, as in Figs. 1 and 2, and the plunger is forced up. The adjacent ends of bucket B and tube B² are curved, as in Figs. 1 and 3, to the arc described by the bucket when moved on its pivot, and a correspondingly-curved tail-plate, b, which is secured to the rim of the bucket on one side, closes the tube when the bucket is turned for filling.

The parts of the apparatus thus far mentioned may, except as hereinafter specified, have the usual form, construction, and operation.

In my improved apparatus the bucket and

plunger are mounted and operated as follows: The bucket is rigidly secured to and above a main rock-shaft, D, by means of two standards, d² d², which at their upper ends are bolted or riveted to the sides of the bucket, and at their lower ends are bolted to flat-faced seats d, formed on the upper side of the shaft. The shaft is journaled in pillow-blocks c, which are bolted to the bed-pieces A' on two opposite sides of the frame. By rocking shaft D the bucket may be moved back and forth from the upright position shown in Figs. 1 and 2 to the inclined position shown in Fig. 3. Such rocking motion is given to the shaft by the following means: A crank-arm, D', extends down from the extended end of the shaft, Figs. 1 and 2, which is coupled by bar or arm e² to the lower end of rocking beam or lever E', which latter is mounted or journaled loose on shaft i. The upper end of beam E' is connected by arm e² and collar or yoke e' with a cam, e, which is secured to and operated by a hand-wheel, E, Fig. 2, mounted loose on shaft n. By rotating this wheel E the cam e will impart, through the described connections, a vibratory motion to the arm D' and a corresponding rocking motion to the shaft.

The arrangement and purpose of shafts i and n, and the manner of supporting the same, will presently be described more fully.

The plunger B' is moved up and down within the bucket as follows: A bar, a, is secured to the under side of the plunger by passing its end between two lugs or ears, b', and binding it therein by bolts b². This bar extends downward through an opening or mortise, d', in shaft D, and between brackets or plates C, which latter are rigidly secured to and extend below shaft D. The bar is guided and held by the opening d' and by a roller, e', journaled in plates C on the back of the bar. Upon the opposite face of the bar is formed a rack, a', having a length equal to the desired range of motion of the plunger. A pinion, o, gearing with this rack serves to raise it, and thereby force the plunger B' upward. A part of this pinion is cut away, as at o', and when, in its rotation, this cut-away part comes toward the rack, as in Fig. 3, the two will be out of engagement, and the rack and plunger will fall by their own weight. To ease such fall a coun-

ter-weight, h , is suspended over the roller c' by chain h' , one end of such chain being secured to the lower extremity of the rack. The pinion o is carried on a short shaft, o^2 , which is journaled in the plates C and also in a similar arm or plate, C' , which is secured to the shaft D , near its end, and extends downward in the plane of the shaft o^2 . These parts, including the rack-bar, pinion, roller, shaft o^2 , and plates or brackets CC' , all move with shaft D when the bucket is tipped for filling, as before described; and in order to provide room for shaft o^2 when thus tipped, I bend the end m of bed-piece A' (see Fig. 3) upward, and raise correspondingly the lug m' above the plane of the lugs on the other posts. As shaft o^2 extends but part way across the frame (see Fig. 2) it is sufficient to raise this one corner only.

On the outer end of shaft o^2 is a spur-wheel, O , Fig. 1, which gears with a similar wheel, P' , mounted loose on the extended end of shaft D . The wheel P' is secured to a similar but larger wheel, P , which also runs idle on shaft D , and gears with a similar wheel, I , mounted on shaft i . The latter wheel, I , gears with a pinion, n' , secured on shaft n , and rotary motion is imparted to this shaft and pinion by hand-wheel N , which is keyed on the shaft n . By rotating this hand-wheel rotary motion will be transmitted through the train of gearing described to the pinion o , and by this the rack-bar and plunger will be raised intermittently, as before described. The shafts i and n are mounted by pillow-blocks i' and n^2 on an extended table or bracket, R , which receives support both from connection with the main frame and from posts R' , Fig. 1. By introducing the wheel I the hand-wheels E and N are removed farther from the heat of the furnace, over the bucket B .

It will be observed that two hand-wheels are provided, (see Fig. 2,) one for operating the train of gearing which raises the plunger, and the other for tipping the bucket, and that such hand-wheels, with their respective connections, are operated independently in doing such work. As a result of such construction it is necessary to operate the slowly-moving train of gear only for the purpose of raising the plunger where considerable power is required, and the comparatively easy work of tipping the bucket is done with a quicker movement and by a mechanism entirely independent of the train of gearing. This affords a great saving of time and a corresponding increase in the working capacity of the machine over that heretofore used, where both plunger and bucket were operated by one hand-wheel and a single train of gearing; also, in such old machines the plunger was raised by a crank-and-lever arrangement, in which the plunger could fall after it had been raised, and its work was done only so fast as the crank was moved around by the slow-moving train of gearing.

In my improvement as soon as the pinion passes engagement with the rack the plunger may fall promptly and entirely independent of the gearing; also, by means of the rack and pinion I obtain a much longer stroke of the plunger and move it with greater power than in the old construction. These features of improvement also add very much to the working capacity of the machine.

In operation the bucket is filled with coal while in the position shown in Fig. 3. The bucket is then turned to a vertical position, as in Figs. 1 and 2, by turning hand-wheel E . This being done, the plunger is forced upward by turning hand-wheel N , thereby discharging the contents of the bucket through B^2 into the furnace. The pinion o is, by preference, adjusted in such relation to the rack that when the plunger reaches the top of the bucket or has discharged its contents the last cog on the pinion shall be in engagement with the rack. To insure stoppage at such point a lug, s , is extended out from the lower end of the rack, and a block or stop, s' , is suspended, by loops or stirrups s^2 from the roller c' , in position for lug s to strike against such stop at the proper time to arrest the upward movement of the rack, as stated. The resistance offered by the train of gearing will nearly or quite suffice to hold the plunger up when raised, though the attendant may still retain his hold on wheel N . While the plunger is thus held up the bucket is again tipped to the position, Fig. 3, by turning wheel E , the lower end of tube B^2 being kept closed by the plunger and by the tail-piece b . In this position the lug s swings clear of stop s' , and the pinion o may be rotated out of engagement with the rack, allowing the plunger to fall within the bucket.

In machines heretofore used the pivot-bearings of the bucket, together with the cranks and levers which were employed in tipping the bucket and raising the plunger, were placed above the main shaft, near to the bottom of the furnace. In such position these parts, with their journal-bearings, are exposed to excessive heat and falling cinders to such extent as to be seriously injured thereby.

In my improved machine the mechanism for operating the plunger is placed below the shaft, and the journal-bearings of the shaft are the pivots of the bucket. By such arrangement these parts are much better protected from the fire above than in the old machines. These several features of improvement are in practice of great importance, and add not only to the durability of the machine, but also to the ease with which it can be operated.

With my improved machine a much larger quantity of coal can be charged into a furnace in a given time and with much less labor than with teasers heretofore used.

I claim herein as my invention—

1. The combination of main shaft D , bucket B , rigidly supported on the shaft, arm D' , cam e , with suitable connections, as described, for

imparting motion from the cam to the arm, and means for giving rotary motion to the cam, substantially as described, whereby the bucket may be moved into and out of vertical position.

5 2. The combination of bucket B, plunger or movable bottom B', rack-bar *a a'*, pinion *o*, having a cut-away side, *o'*, the toothed part of the pinion being adapted, with the rack, to raise the plunger a full stroke with one revolution
10 of the pinion, and suitable means for giving to the pinion rotary motion, substantially as and for the purposes described.

3. The combination of main shaft D, bucket B, rigidly supported on and above the shaft,
15 plunger B', bar *a*, extending from the plunger downward below the shaft, with rack *a'* on its lower end, cut-away pinion *o*, with means for giving the same rotary motion, roller *c'*, weight

h, chain *h'*, lug *s*, and stop *s'*, substantially as set forth.

4. A pivoted bucket, B, with suitable mechanism, as described, for turning such bucket
20 on its pivots from a vertical to an inclined position and reverse, in combination with movable bottom or plunger B', and suitable mechanism,
25 as described, for raising and lowering such plunger within the bucket, such mechanism for moving the plunger being independent in its operation of that by which the bucket is moved,
30 substantially as set forth.

In testimony whereof I have hereunto set my hand.

LOUIS FISCHER.

Witnesses:

R. H. WHITTLESEY,
C. L. PARKER.