T. CRITCHLOW.
Elevating Apparatus.

No. 214,109. **Patented April 8, 1879.**

Fig. 1.

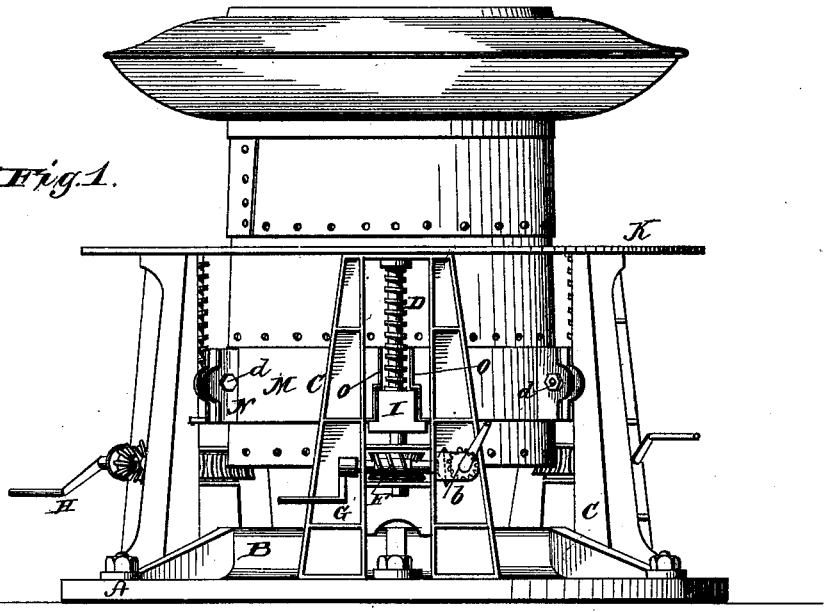
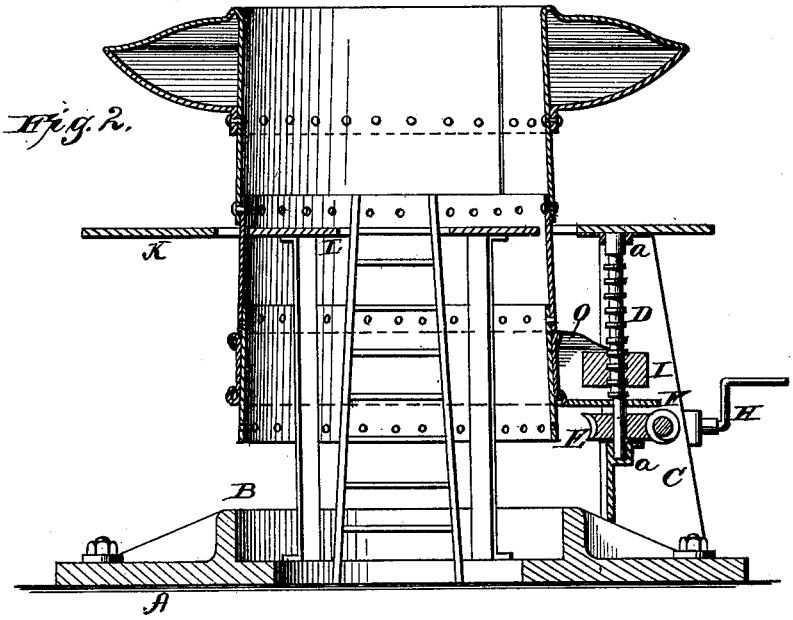


Fig. 2.



WITNESSES

Jack L. Ouraud

Aubrey Poulmin

By

INVENTOR

Thomas Critchlow

Alexander Mason

ATTORNEYS

UNITED STATES PATENT OFFICE

THOMAS CRITCHLOW, OF STEEL WORKS, PENNSYLVANIA.

IMPROVEMENT IN ELEVATING APPARATUS.

Specification forming part of Letters Patent No. **214,109**, dated April 8, 1879; application filed March 6, 1879.

To all whom it may concern:

Be it known that I, THOMAS CRITCHLOW, of Steel Works, in the county of Dauphin, and in the State of Pennsylvania, have invented certain new and useful Improvements in Elevating Apparatus; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to the erection of stacks or other tubular or hollow columns made of sheet-iron; and it consists in an apparatus for elevating and holding the same as the work progresses, the sections being added or put on at the bottom, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is a central vertical section of the same.

A represents the bed or bed-plate upon which the stack or column is to be erected. This bed-plate is, as usual, provided with a central opening, communicating with the underground passage, and on top of the bed-plate is the circular flange or box B, in which the stack is to rest.

On the bed-plate A are suitably fastened three frames, C, equidistant from each other, each frame containing a vertical screw, D, placed in bearings at *a a*, and provided with a worm-wheel, E. F is a worm-shaft engaging with the wheel E, and provided with a crank, G, at one end for rapid operation, while at the other end said shaft F is, by gears *b b*, connected with another crank, H, to be used for slower operation. Each screw D has a nut, I, thereon, as shown.

On top of the frame C is laid a platform, K, upon which the workmen are to stand to rivet the sections together on the outside of the stack. A similar platform or staging, L, is erected within the stack.

I further use a clamp or band for encircling the stack, which clamp is made in three sections, M, each section having at its ends projecting ears or flanges N, for the passage of bolts *d*, to unite the sections and clamp the same tightly around the stack. Each section of the clamp is, at or near the center, provided with projecting-horns O O, to fit over the nuts I upon the screws D.

The usual method of erecting vertical tubular structures is by building course upon course, and by means of scaffolding and rope tackling and climbing, all of which my invention dispenses with.

I commence with the capping-piece, bolting two or more courses together, and resting the lower end in the foundation-plate and in its true position centrally. The three-part clamp is then secured around the upper end of the lower course, letting it bear up under the edge of the course above it. By now turning the cranks G (while the load is yet light) the structure is raised about half an inch higher than will admit of introducing another course of plates. After the same are secured by temporary bolts, the structure is lowered the half-inch until the structure rests on the foundation-plate. The bolts binding the clamp are then unscrewed, releasing the clamp, and by turning the cranks G the nuts are lowered, allowing the clamp to descend until it can be again adjusted for another lift, always taking hold under the edge on the lower end of the course above, giving a good support for the structure on the clamp while the work of raising the structure is proceeding.

The clamp being lowered and readjusted, and the additional plates secured, the workmen on the inside stage and outside platform are busy driving the rivets, so that the whole of the operation is going on at the same time.

If necessary, guy-lines may be attached to the capping and used in case a storm of wind arises. They are, however, hardly required until the structure attains a height of one hundred feet. There is usually a step-ladder riveted on the outside, and the entire height of the structure, so that access can be had to release the guy-lines secured on top of the structure. When the structure gets heavy the cranks H are used for raising, and the cranks G simply for lowering, the nuts.

Hydraulic pressure may be used, if desired; but I prefer to employ jack-screws, as there is no liability of one shooting far ahead of an-

other, which sometimes happens in using hydraulic pressure.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a series of jack-screws and a sectional clamp, for the purposes herein set forth.

2. The combination of the sectional clamp M, provided with horns O, the jack-screws D, and nuts I, substantially as and for the purposes herein set forth.

3. The combination of the bed A, frames C, with jack-screws D, the platforms K L, sectional clamp M, and nuts I, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of March, 1879.

THOS. CRITCHLOW.

Witnesses:
C. L. EVERT,
W. T. JOHNSON.