(No Model.)

A. L. HOLLEY.

BESSEMER CONVERTER PLANT.

No. 253,049. Patented Jan. 31, 1882.

Fig 1.

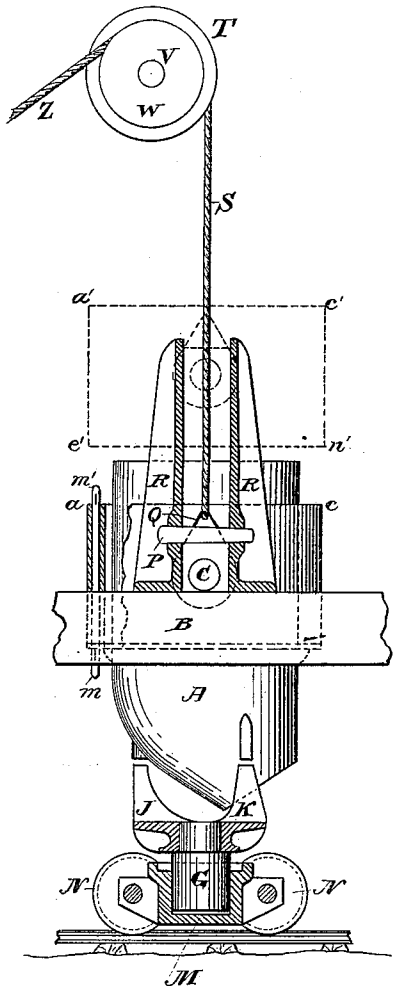
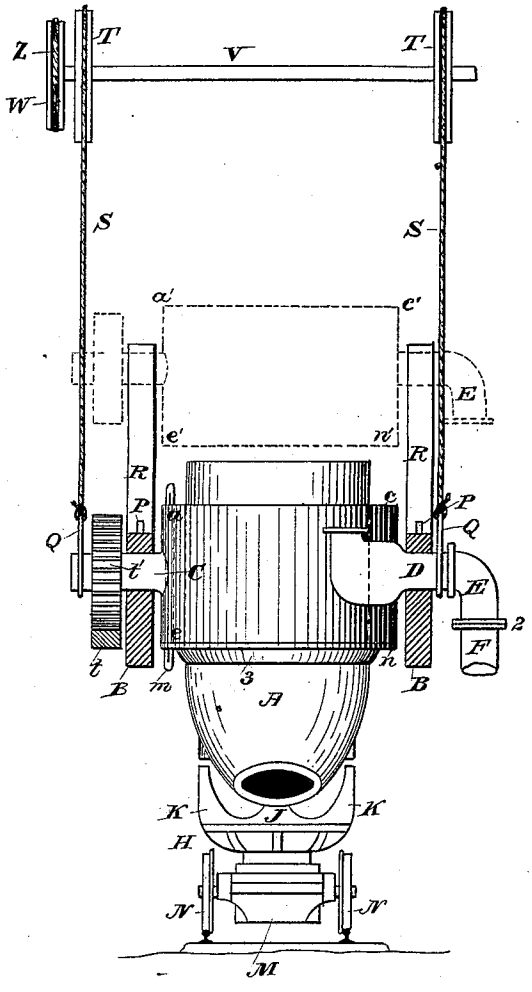


Fig 2.



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UNITED STATES PATENT OFFICE.

ALEXANDER L. HOLLEY, OF BROOKLYN, NEW YORK.

BESSEMER-CONVERTER PLANT.

SPECIFICATION forming part of Letters Patent No. 253,049, dated January 31, 1882.

Application filed September 24, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER LYMAN HOLLEY, a citizen of the United States, residing at Brooklyn, Kings county, in the State of New York, have invented new and useful Improvements in Bessemer-Converter Plant, of which the following is a specification.

Bessemer converters have hitherto been generally constructed so as to be fixed in their position permanently, having only a movement of rotation on their trunnions. It has, however, been proposed to remove them for repairs by lifting or otherwise displacing the converter and trunnion-ring together. Letters Patent of the United States, No. 240,714, issued to me the 26th day of April, 1881, described a Bessemer converter of which the shell (containing the refractory lining) is readily removable from the trunnion-ring, so that a newly lined or repaired shell can be quickly placed in the trunnion-ring, the object being to facilitate the repairs of the destructible refractory linings, and thus to increase and cheapen the output of the plant. As described in the said Letters Patent, the trunnion-ring remains in its supports, and the shell is lowered out of it upon a car and removed for repairs. This arrangement requires that the converter shall be hung high above the general ground-level of the plant, or else that there shall be a deep pit under the converter, in order to give room to lower the shell out of the trunnion-ring and to remove it laterally.

The object of my present invention is to secure the advantage of the removable shell in plants where the converter is hung near the ground-level (as in many existing Bessemer plants) without the use of a pit, as above described. For this purpose I construct the trunnion-ring and the removable shell in the manner described in the aforesaid Letters Patent; but instead of dropping the shell out of the trunnion-ring, I raise the trunnion-ring, so that the shell can be removed laterally without being lowered.

The accompanying drawings illustrate the manner in which I prefer to construct my apparatus.

Figure 1 is a side elevation, and Fig. 2 is a front view, both being partly in section.

B are the beams for supporting the trunnion-ring. C D are the trunnions. *a c n e* is the trunnion-ring, in which the shell A is detachably held by means of the cotter-bolts *m m'* and the ring 3, this ring being fast to the shell. Below the converter there is a car, M, for receiving and removing the shell A. This car may be raised enough to take the weight of the shell by a hydraulic lift underneath it, or by screws or other means; but I prefer to make the short hydraulic lift G a part of the car, water under pressure being brought to it by a hose. The table H of the lift is provided with brackets J K to receive the shell A.

Over the converter I hang the shaft V with the sheaves T and the wire ropes S and hangers Q, (which embrace the trunnions,) and I apply power to the shaft V, so as to lift the trunnion-ring in any suitable manner, preferably by a wire rope from the sheave W to a hydraulic cylinder conveniently situated; or the ring and trunnions may be lifted by two hydraulic jacks placed under the trunnions. The trunnion-caps are held down by the wedges P when the converter is in use. The brackets R guide the trunnion-ring when it is raised and lowered. When the trunnion C is raised the pinion *t'* lifts out of the horizontal rack *t*. By disconnecting the joint 2 in the air-pipe F the elbow E and its stuffing-box rise with the trunnion D.

The operation is as follows: When it is desired to replace a shell the converter-bottom containing the tuyeres is removed in the ordinary manner (or it may be removed with the shell and afterward disconnected from the shell) by means of a lift and car or a traveler. The shell A is then turned down, as shown, so as to be in a convenient position for repairs, (or it may be removed nose up, if preferred,) if the fixed collar or ring 3 be applied to the shell below the trunnion-band instead of above, as in the present illustration. The car M is run under, and by means of the lift takes the weight of the shell. The cotters *m* and the wedges P are then removed, leaving the trunnion-ring detached from the shell and free to rise. Power then being applied to the wire ropes S, the trunnion-ring is lifted to the position *a' c' n' e'*. The car M and the shell are then removed laterally to the repair-shed. Here the shell may remain on the car while being repaired; but by

means of the lift on the car I prefer to raise the shell enough to run the angle-ring 3 over a suitable frame to hold the shell up while it is undergoing repairs. The car then takes a repaired shell from the frame and carries it under the trunnion-ring, the trunnion-ring is let down and fastened to the shell by the cotters *m*, the wedges P are restored, and the joint 2 is screwed up.

The repaired shell may be heated, and may also receive the converter-bottom before being attached to the trunnion-ring, if preferred.

The converter may, as before stated, be made so as to admit of lifting the trunnion-band off the vessel while the latter is in erect position or nose up by having the fixed collar 3 located under said trunnion-band and supported therefrom by the cotter bolts and keys or other equivalent means.

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

The combination of the trunnion-ring of a Bessemer converter with suitable hoisting mechanism for lifting the trunnion-ring, and with a converter-shell detachable from the trunnion-ring, and with a car and lift under the converter, the combination being for the purpose of lifting the trunnion-ring off the shell, so that the shell may be removed laterally, and a repaired shell may be placed in the trunnion-ring in the manner described.

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