No. 746,899. PATENTED DEC. 15, 1903.

J. TODD.

COLLAPSED FURNACE STRAIGHTENER.

APPLICATION FILED FEB. 27, 1903.

NO MODEL.

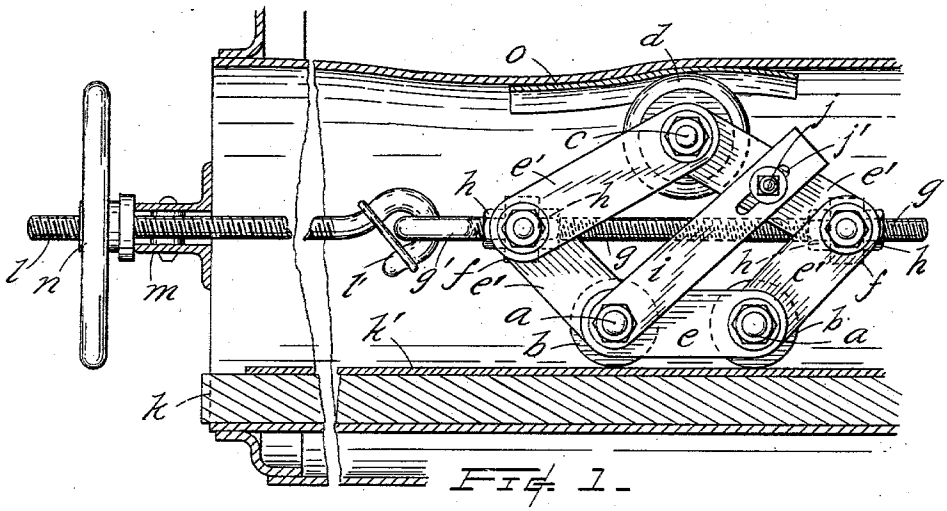


Fig. 1.

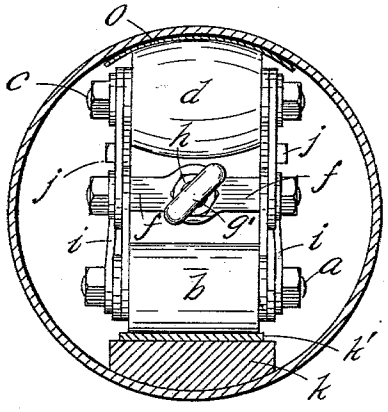


Fig. 2.

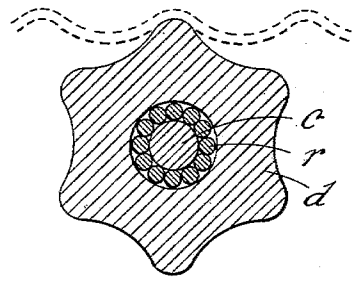


Fig. 3.

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No. 746,899. Patented December 15, 1903.

UNITED STATES PATENT OFFICE.

JOHN TODD, OF SEATTLE, WASHINGTON.

COLLAPSED-FURNACE STRAIGHTENER.

SPECIFICATION forming part of Letters Patent No. 746,899, dated December 15, 1903.

Application filed February 27, 1903. Serial No. 145,451. (No model.)

To all whom it may concern:

Be it known that I, JOHN TODD, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Collapsed-Furnace Straighteners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to boiler-shop tools, and has for its object the provision of an apparatus of simple, strong, and thoroughly practical construction capable of replacing to its former symmetrical shape a sagged crown-sheet of a boiler-furnace without the assistance of sledges, hydraulic jacks, or the like which have a tendency to mutilate or strain the furnace-plates and leave them with such uneven surfaces as to materially reduce the efficiency of the boiler. This object is attained in the construction and combination of parts hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal elevation, and Fig. 2 is an end view, of my invention inserted in a boiler-furnace shown in section. Fig. 3 is in enlarged cross-sectional view of a modified form of the shaping-roll and its roller-mounting.

In carrying out my invention I construct a vertically-adjustable frame mounted upon the axles *a* of carrying-rolls *b* and supporting thereabove the axle *c* of a bending or shaping roll *d*. An advantageous construction of the frame is to connect the extremities of the axles *a* by a longitudinal link *e* upon each side and reversely-disposed toggle-joints *e'*, pivoted at their lower ends to the axles *a* and at their upper ends to the axle *c*.

Transverse bars *f* connect and form upon their ends the intermediate pivots of the toggle-joints. A screw-threaded bar *g* extends longitudinally of the frame through apertures in the mid-lengths of the bars *f* and is provided with set-nuts *h*, whereby the longitudinal spread of the toggle-joints and elevation of the shaper-roll is regulated. To prevent any horizontal distortion of the frame, I provide upon both sides thereof a brace *i*, connecting the projecting ends, preferably, of one of the axles *a* with the diagonally opposite members of the toggle-joints by means of bolts *j*, passed through the last-named connections, and the bolt-apertures *j'* of the braces are made elongated in order to provide for varying changes in the shape of the frame. The several aforesaid rolls are preferably mounted on roller-bearings, as *r*, in Fig. 3. The carrying-rolls are made cylindrical, while the shaper-roll is made to taper in curved or conoidal form toward the ends and correspond with the arc or cylindrical shape of the furnace being operated upon, and where corrugated furnaces are being repaired a fluted roller, such as shown in Fig. 3, would be substituted for the one shown in the other views.

In operation I preferably place beneath the device and diametrically opposite the portion of the furnace being reshaped a heavy piece of timber *k*, protected on its top surface by a plate *k'*, which forms the track for the carrier-rollers aforesaid. The operation of bending the crown-sheet is accomplished by heating the crown-sheet in advance of the shaper-roll and forcing the device forwardly, which presses the bent plate into shape. Where there is but little bend or sag to be taken out, one travel of the device along the furnace will usually suffice, though it may be done more gradually by a number of repetitions. The device may be drawn through the furnace by any suitable means; but I prefer to use a screw-threaded draw-bar *l*, having upon one end a hook *l'*, which engages with an eye *g'* of the bar *g*. The draw-bar projects through a bridge-piece or "strong-back," such as *m*, placed across the mouth of the furnace, and is actuated by suitable nut or hand-wheel *n*, as shown. In practice better results are obtained by interposing a layer of asbestos *o* between the shaping-roller and the furnace-plate being bent in order that the former will not chill the other, which is heated externally of the furnace by a torch or other means capable of raising its temperature to a high degree.

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

1. In a device of the class described, comprising carrying-rolls mounted on axles, a shaper-roll mounted on an axle, toggle-joints connecting the extremities of the first-named axles with those of the shaper-roll, longitu-

dinal links connecting the axles of the carrying-rolls, transverse bars connecting the intermediate pivotal connections of the said toggle-joints and having a screw-threaded aperture midway of the said bar lengths, a bar passed through said apertures and having a corresponding thread, and nuts of the last-named bar.

2. The combination with the carrying-rolls and the axles thereof, of a shaper-roll, and means for adjusting the shaper-roll comprising means pivoted on the axles of the carrying and shaper rolls, and means for actuating the same.

3. The combination with the carrying and forming rolls, and the axles thereof, of toggle-joints operatively connected to the axles of said rolls, transverse bars connecting said toggle-joints, braces mounted on one of the roll-axles and being adjustably connected to said toggle-joints, and means for actuating said toggle-joints.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN TODD.

Witnesses:
PIERRE BARNES,
HENRY S. NOON.