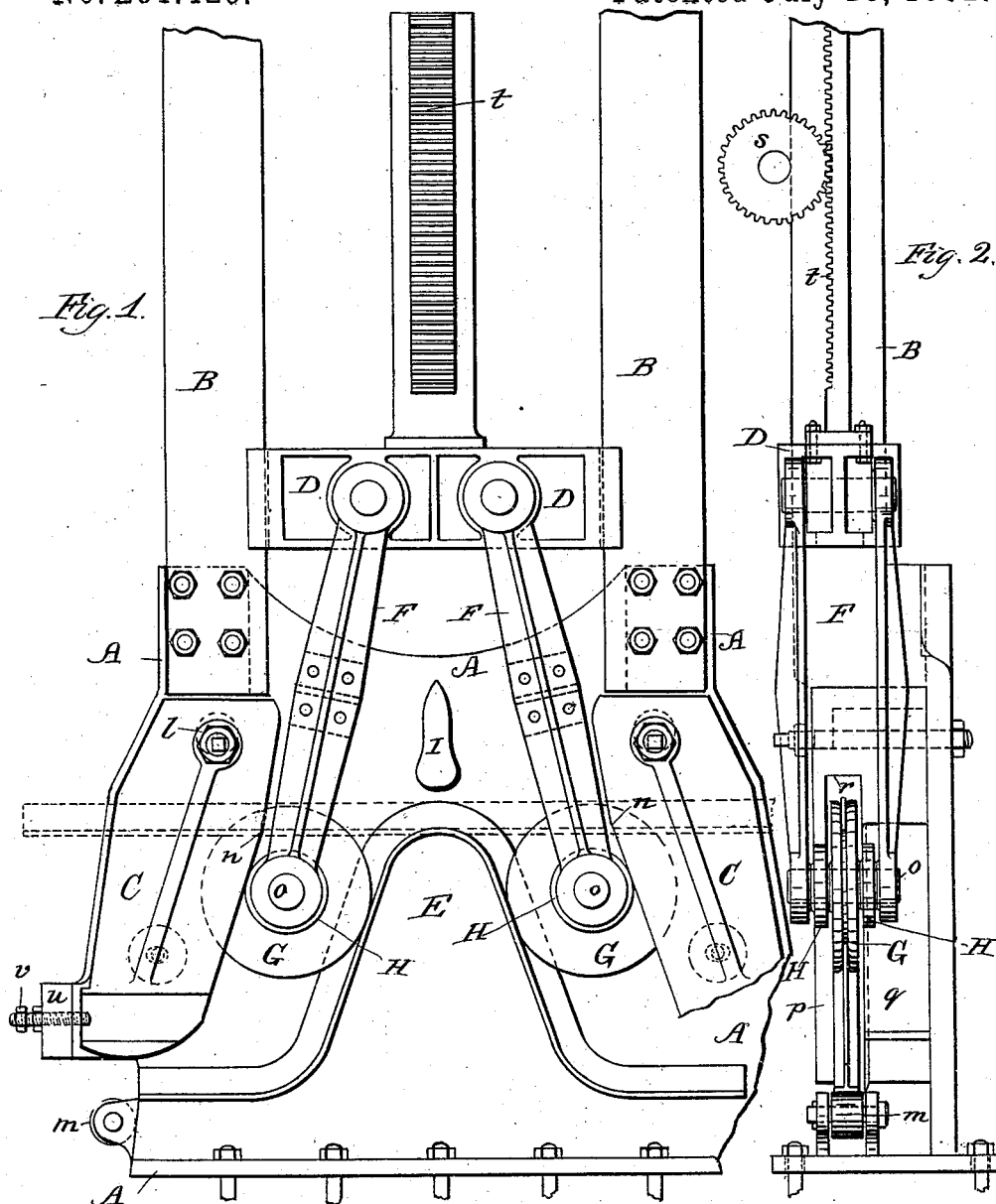


(No Model.)

J. CHRISTIANSEN
BENDING MACHINE.

No. 261.429.

Patented July 18, 1882.



WITNESSES—
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UNITED STATES PATENT OFFICE.

JOHN CHRISTIANSEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE UNION
FOUNDRY AND PULLMAN CAR WHEEL WORKS, OF SAME PLACE.

BENDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 261,429, dated July 18, 1882.

Application filed October 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOHN CHRISTIANSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bending-Machines; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, of which—

Figure 1 is a front elevation of my machine; Fig. 2, an end elevation of the same, and Fig. 3 a side view of the device formed by the machine.

In the construction of cable street-railways (by which term is meant those street-railways in which the cars are propelled by means of an endless cable below the track-level, moved by stationary engines at different points of the route) a device is used for supporting the track and all attendant parts, which device is technically called a "yoke." The main part of this yoke is formed of a T-bar bent to the shape shown in Fig. 3.

My invention relates to a machine for forming this part of the yoke from a common T-bar, the object being to save time and expense in the manufacture, and also to secure greater uniformity in the results than can be obtained by hand; and it consists in the general combination of parts by which the bending is effected, all as hereinafter more fully set forth.

In the drawings, A is the frame of the machine, consisting of a heavy iron plate at the rear of the operating parts, and also below them.

B B are uprights secured to the frame A, and C C guides, also secured to the frame. These guides project downward from the lower ends of the uprights in a direction inclining outward, and are secured at their lower ends by means of set-screws *v*, connecting them to arms *u*, projecting forward from the frame A. If necessary, they may be strengthened by means of buck-stays.

D is a cross-head sliding up and down in guides in the uprights B, being moved by any suitable mechanism—as, for example, the rack and pinion *t s*, together with the necessary gearing, and a clutch or other suitable device for reversing the direction of motion, all constructed in any well-known manner, whereby

the cross-head D, with its attendant parts, may be raised or lowered at will. If preferred, a steam cylinder, directly on top of the machine, with the necessary reversing mechanism, may be employed for moving the cross-head.

E is the yoke-former, consisting of a heavy iron form securely bolted to the groundwork of the frame A. The upper surface of this former has the precise shape of the yoke to be formed, and the sole object of all the other mechanism is to bend the red-hot T-bar down over it.

F F are two pitmen pivoted to the cross-head D and depending therefrom, and each terminating in three rollers, one large one, G, having a grooved periphery to fit over the flange of the T-bar, and adapted to roll downward over the said bar and thus bend it over the form, and two smaller ones, H, traveling on the inner faces of the guides C, whereby the roller G, in its descent, is borne hard upon the bar.

The guides C, from the point *r* to their lower ends, are each divided into two parts, *q* and *p*, between which the roller G travels.

The rollers G and H are set upon a common axle, *o*, in the lower end of the pitman, but revolve independently of each other, whereby they are enabled to turn in contrary directions in traveling upon the opposite planes formed by the T-bar and the guide C.

To operate the machine, the cross-head, with the pitmen and rollers, is raised and the red-hot T-bar inserted under the rollers, between the parts *q* and *p* of the guides C over the top of the former E, in the position indicated by the dotted lines in Fig. 1. The clutch is then reversed, causing the rollers G to bear down upon the bar.

It will be noted that the guides C and former E are nearly parallel, but that from a point, *n*, even with the top of the former the sides of the guides become more nearly perpendicular. This construction is not absolutely necessary, but it is preferable, for, as the roller G here bears almost vertically upon the bar, the latter will not only shape itself to the top of the former without the aid of guides, but better results are obtained by giving the rollers a little lateral play at this point. Hence the friction attendant upon guides may here be avoided.

The rollers *m* at the base of the machine serve

to lessen the friction at the finish, when the bar, under a heavy downward pressure, is drawn inward into the bend at the base of the former.

I is a horizontal projection upon the frame
5 A, extending over the top of the former. A wedge inserted under it holds the bar to the top of the former as the rollers descend.

The guides C should be provided with means of adjustment, in order to bring them closer to
10 or farther from the former E, according to the thickness of the metal of the T-bars. This adjustment may be effected by means of the set-screws *v*, before referred to, in connection with the device shown at *l* for connecting the guides
15 to the frame A. This device consists simply of an eccentric bolt, by turning which the position of the guide is shifted.

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

1. The combination, with the depending pitmen and bending-rolls, of the hinged guides and set-screws *v* for adjusting the inclination of the same, the former E, and the anti-friction rolls *m*, as and for the purpose set forth.

2. Jointly with the rolls G and H, having
25 common axes, the hinged and adjustable guides C and former E, as and for the purpose set forth.

JOHN CHRISTIANSEN.

In presence of—

P. C. DYRENFORTH

WM. H. DYRENFORTH.