

(No Model.)

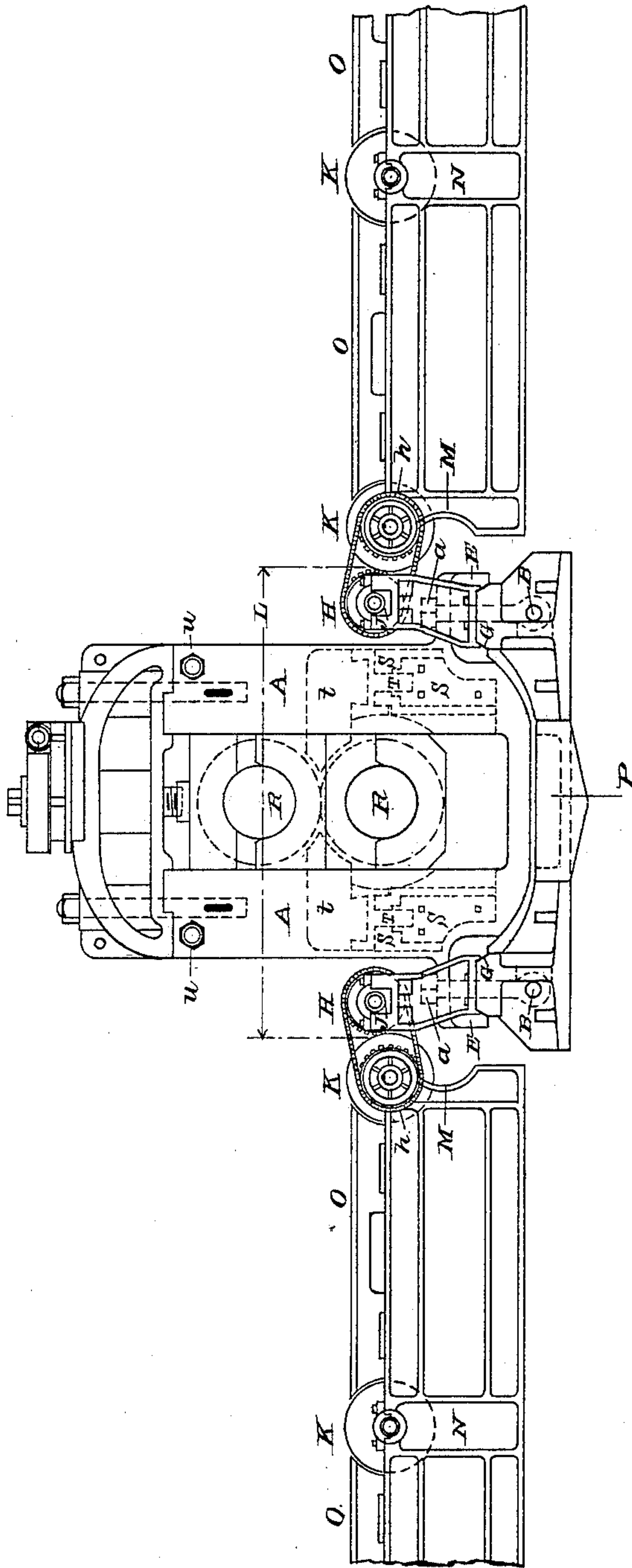
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C. F. LLOYD.
ROLLING MILL.

No. 394,122.

Patented Dec. 4, 1888.

Fig. 1



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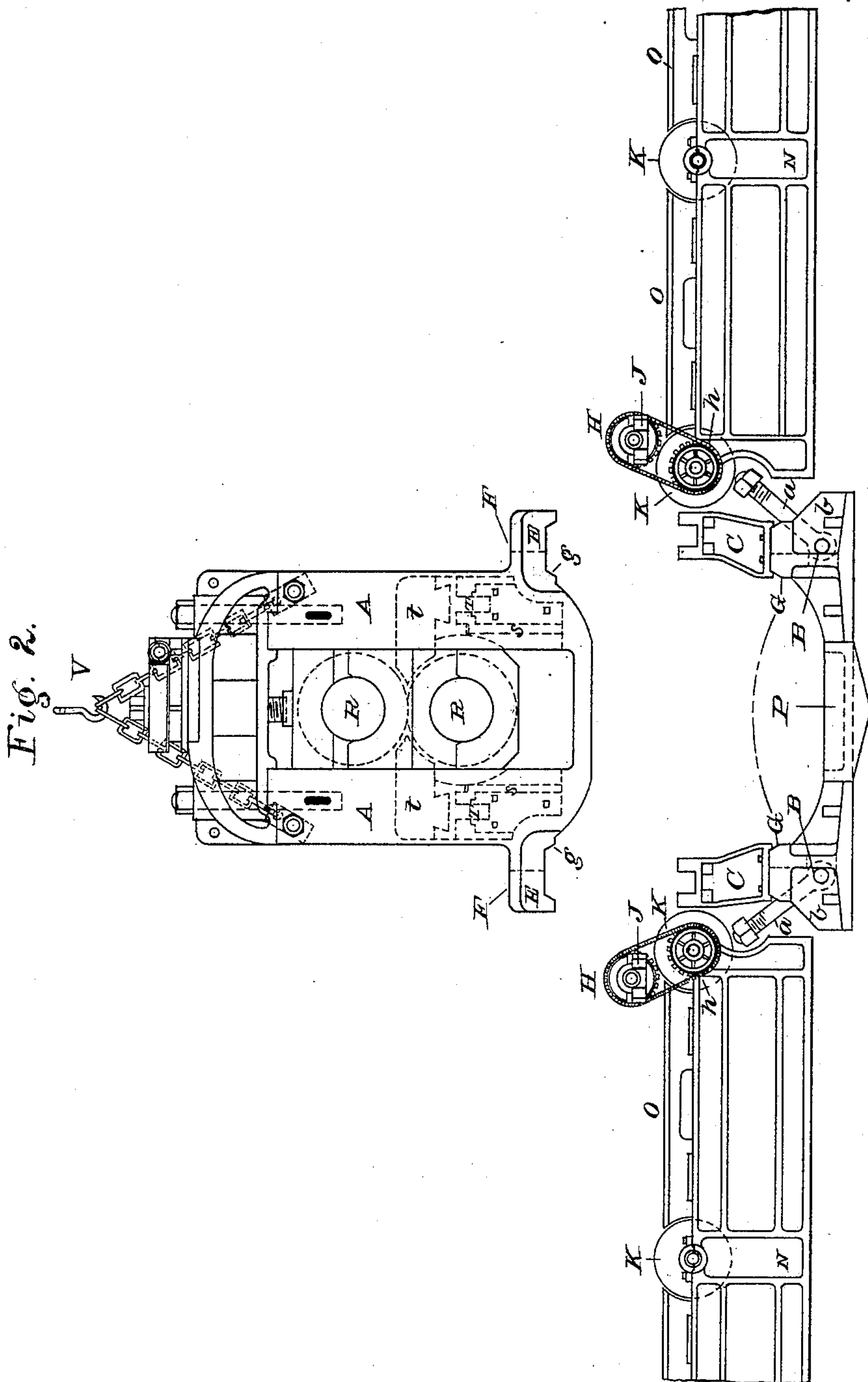
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(No Model.)

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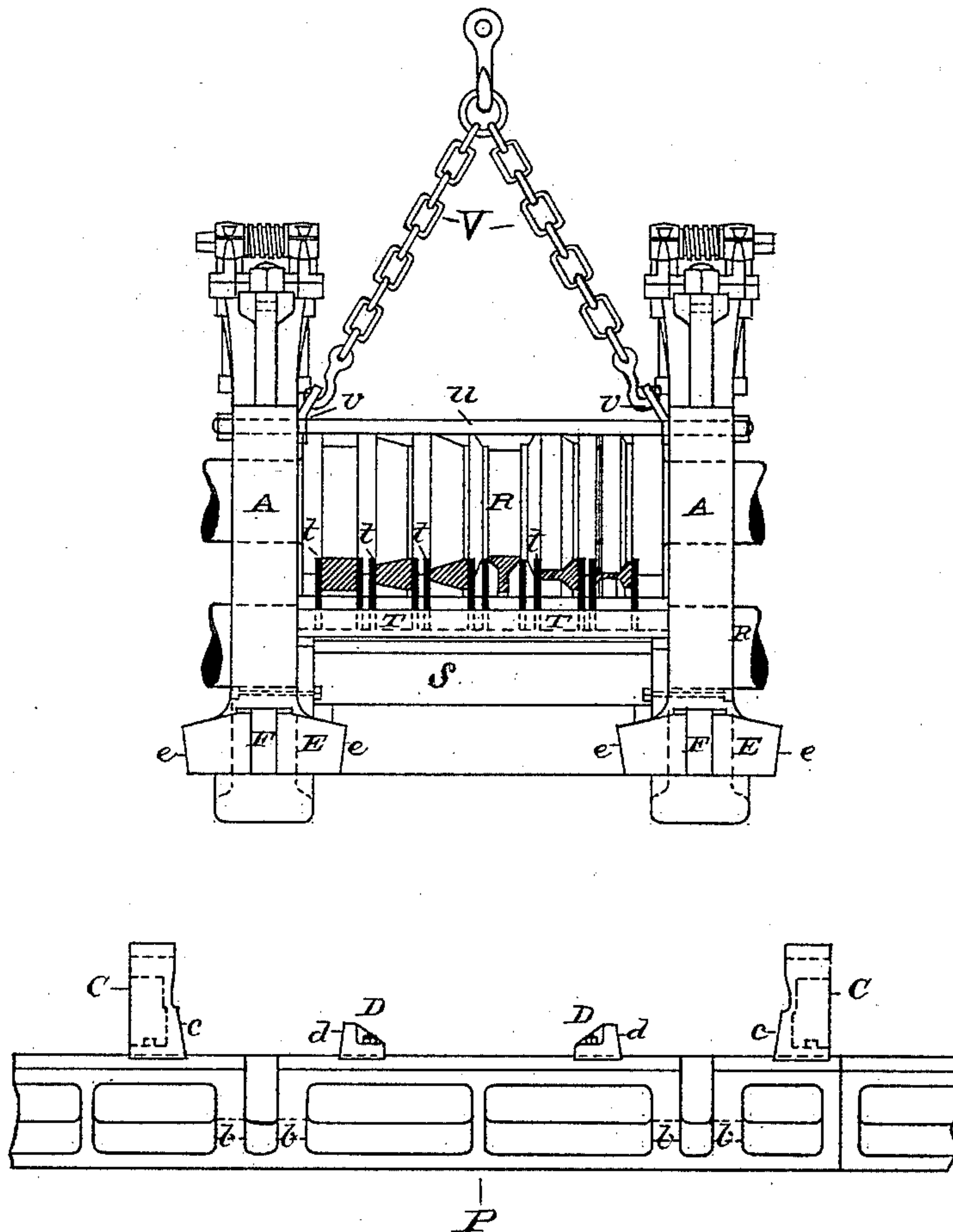
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Fig 3



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UNITED STATES PATENT OFFICE.

CHARLES F. LLOYD, OF JOHNSTOWN, PENNSYLVANIA, ASSIGNOR TO THE
JOHNSON STEEL STREET RAIL COMPANY, OF KENTUCKY.

ROLLING-MILL.

SPECIFICATION forming part of Letters Patent No. 394,122, dated December 4, 1888.

Application filed September 15, 1888. Serial No. 285,468. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. LLOYD, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented a new and useful Improvement in Rolling-Mills, which invention is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to facilitate the rapid changing of the rolls, and, that delay shall not occur by reason of such change, the rolls, with their entire housings, are lowered in and lifted out of place, and so transported, instead of separately with accompanying separate parts.

The invention will first be described in detail and then particularly set forth in the claims.

In the accompanying drawings, Figure 1 illustrates in side elevation the plant in place ready for work. Fig. 2 shows in side elevation a set of rolls and housings lifted out of place. Fig. 3 illustrates in end elevation the parts shown in Fig. 2.

In said figures the several parts are indicated by reference-letters as follows:

The letter A indicates the housings; R, the rolls fitted up in place; S, the guide-rests, and T the guide-plates located in the guide-rests. The guides *t* are shown in place.

The drawings clearly show the caps which secure the rolls in the housings, and their connections, of ordinary construction; hence such need not be described in detail. It will be observed that the guide-rests S S form connecting-pieces holding the two parallel housings together at the bottom, their upper portions being held rigid by means of the tie-bolts U.

V indicates a four-sling chain, by means of which the lifting of the housings and rolls all together is effected.

P indicates the bed-plate of the roll-train; N, the girders carrying the feed-rollers K; O, plates covering the open spaces on top of said girders, and H the removable feed-rolls immediately adjoining the housings. These feed-rolls are driven, preferably, by a chain belt, *h*, from a sprocket-wheel on the axle of the last fixed feed-roll K. Said removable feed-

rolls are provided with boxes J, which boxes fit into corresponding recesses in the standard C. The chain *h* is a comparatively loose chain; hence by putting liners under the box J the height of said feed-rolls can be varied to suit the section being rolled, and this construction also permits of the adjustable rollers H being swung quickly out of place, as shown in Fig. 2, when it is desired to change the main rolls. The bolts *a* are hinged at B by means of a pin passing through the lugs *b b* of the main bed-plate P. The bottoms or feet of the housings A are slotted at F, by means of which the holding-down bolts *a* can be swung into place and tightened down over the feet E of the housings. It will be observed that the under sides of the feet E are beveled, as shown at *g*, in one direction. They are also beveled, as shown at *e*, in the other direction.

Referring to Fig. 3, it will be observed that the standards C are beveled at *c*, and also that a small guide-piece, D, is provided and attached to the main bed-plate, which guide-piece is similarly beveled at *d*.

Referring now to Fig. 2, it will be observed that the bearing-surfaces of the main bed-plate P are beveled, as at G G, to suit the bevel on the under part of the feet E of the housing A. Guiding beveled surfaces are thus presented in every direction, which, on lowering the main housings into place, so guide them that a true seat is secured without the necessity of having an absolutely-true point of suspension from the crane which does the lifting. The method of attachment to the crane by means of the chain V is shown in Figs. 2 and 3.

The method of effecting a change of rolls is as follows: Fig. 1 shows the housings in place as they are used for rolling. In the meantime another complete set of housings may be fitted up at any suitable point, preferably on a false bed-plate or other support. These housings can be fitted up as completely as on the main bed-plate, the rolls screwed down and properly adjusted, the guides fitted and put into place, and every detail prepared for work. When it is desired to change the mill from the rolling of one section of metal to another, the nuts on the bolts *a* are slacked and

the bolts swung over on their centers B. The adjustable feed-rolls H are then lifted, boxes and all, and swung over out of their bearings, so as to rest upon the plates O. The housings and rolls complete are then vertically lifted out of place by the crane and removed, when another set, previously prepared, are lifted and lowered into place. The bolts *a* being then swung into a bearing and tightened down, the adjustable feed-rolls are put back into place. As the housings are lowered into place, they are guided from all points to a true seat. This is essential to success, for it has been found in practice almost an impossibility to secure such a true point of suspension from the crane in lowering the housings as to get their proper bearings without being guided, even with overhead cranes of the most modern construction. It has been found in practice that a roll-change by this means can be effected in from eighteen to twenty minutes, whereas if the housings were left in place and the rolls, carriages, guides, &c., lifted out and replaced separately, it would take from six to eight hours to do the changing.

It will be observed that double bevels are shown in each direction for guiding the housings into their seats; but, if desired, but one set of bevels would be sufficient for each part—as, for instance, the bevels *g* in the feet E could be retained on the inside edges and omitted from the outside edges of said feet.

I am aware that it has heretofore been suggested that a pair of housings, with the rolls in the same, should be lifted out for the purpose of changing the rolls, and this I do not claim; but

As of my invention I claim—

1. The combination of a bed-plate and removable roll-housings, said bed-plate and housings being provided with reverse beveled guiding-surfaces to interfit, substantially as and for the purposes set forth. 40

2. In combination with a bed-plate and removable roll-housings provided with slotted foot-flanges, as E, hinged bolts, as *a*, for securing the bed-plates and housings together, substantially as set forth. 45

3. A bed-plate for removable roll-housings, provided with side lugs, as *b b*, substantially as and for the purposes set forth. 50

4. A bed-plate for removable roll-housings, provided with standards, as C, having beveled guides, as *c*, substantially as and for the purposes set forth. 55

5. In a roll-plant, an adjustable roll, as H, provided with a lifting-box, as J, driven by a chain, as *h*, substantially as and for the purposes set forth.

6. A bed-plate for removable roll-housings, provided with beveled guide-pieces, as D, substantially as and for the purposes set forth. 60

7. A bed-plate for removable roll-housings, provided with beveled guides, as G, substantially as and for the purposes set forth. 65

8. In combination with removable roll-housings provided with eyes, as *v*, four-part sling-chains engaging said eyes for lifting and lowering said housings, substantially as set forth.

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Witnesses:

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