

(No Model.)

3 Sheets—Sheet 2.

E. W. WOLFE & G. SCHUHMANN.

MECHANISM FOR EJECTING TUBES FROM FURNACES.

No. 267,635.

Patented Nov. 14, 1882.

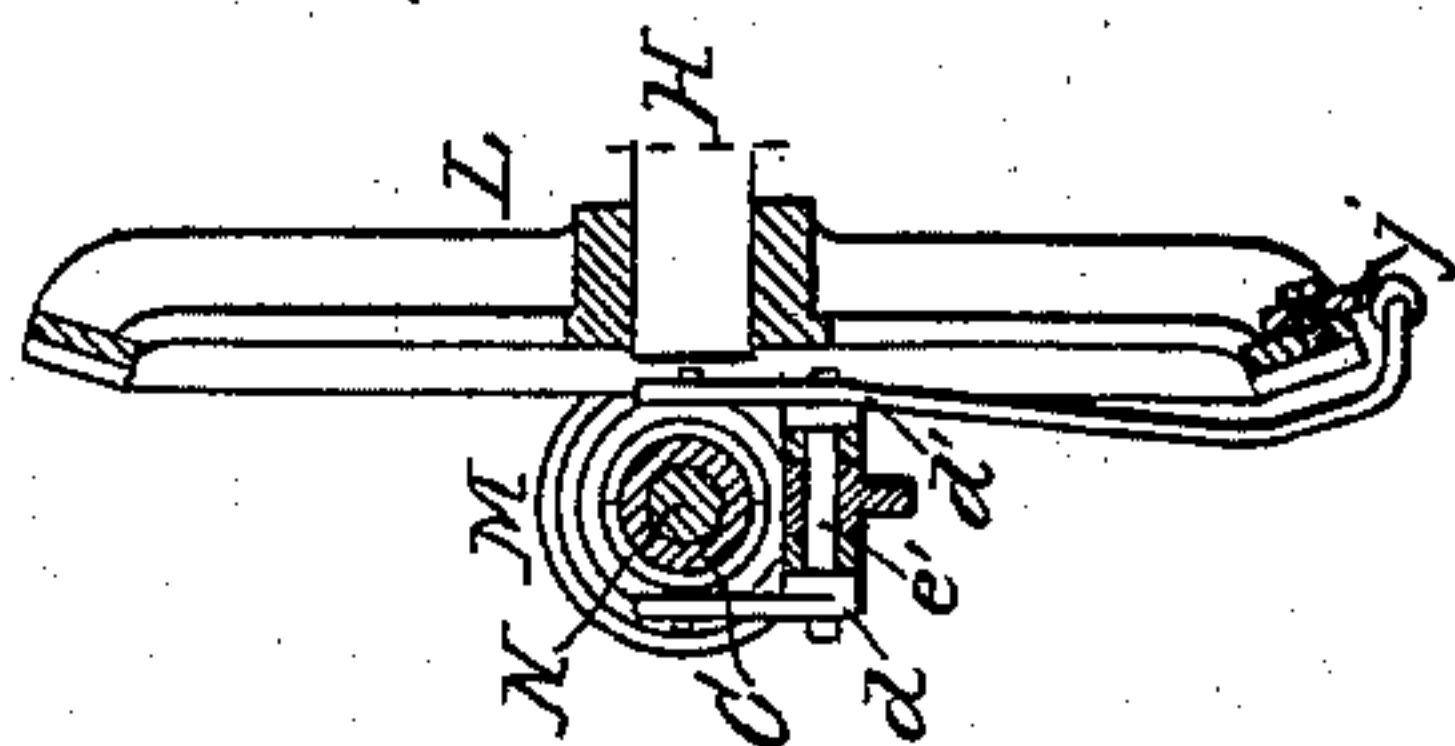


FIG. 4

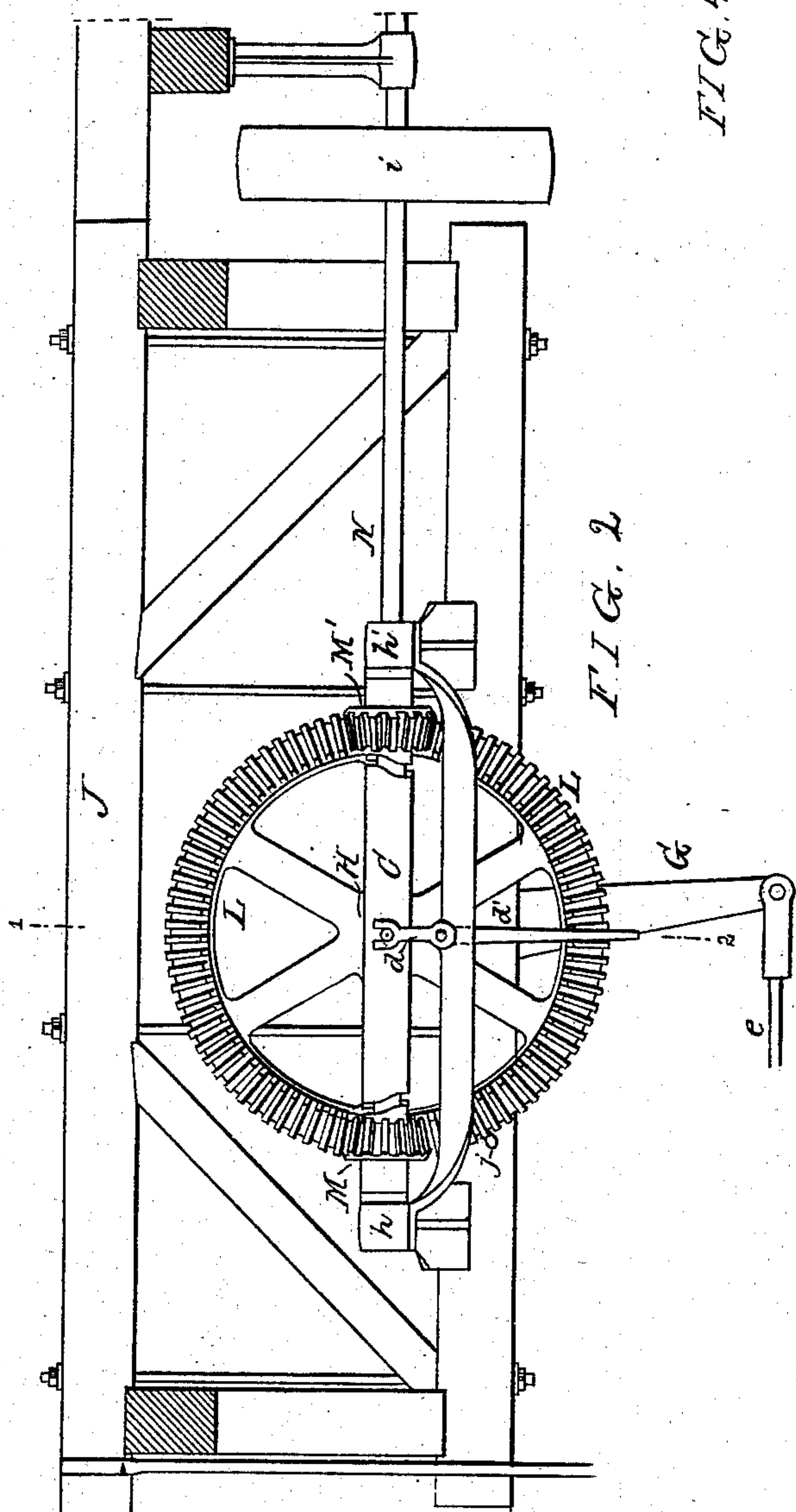


FIG. 2

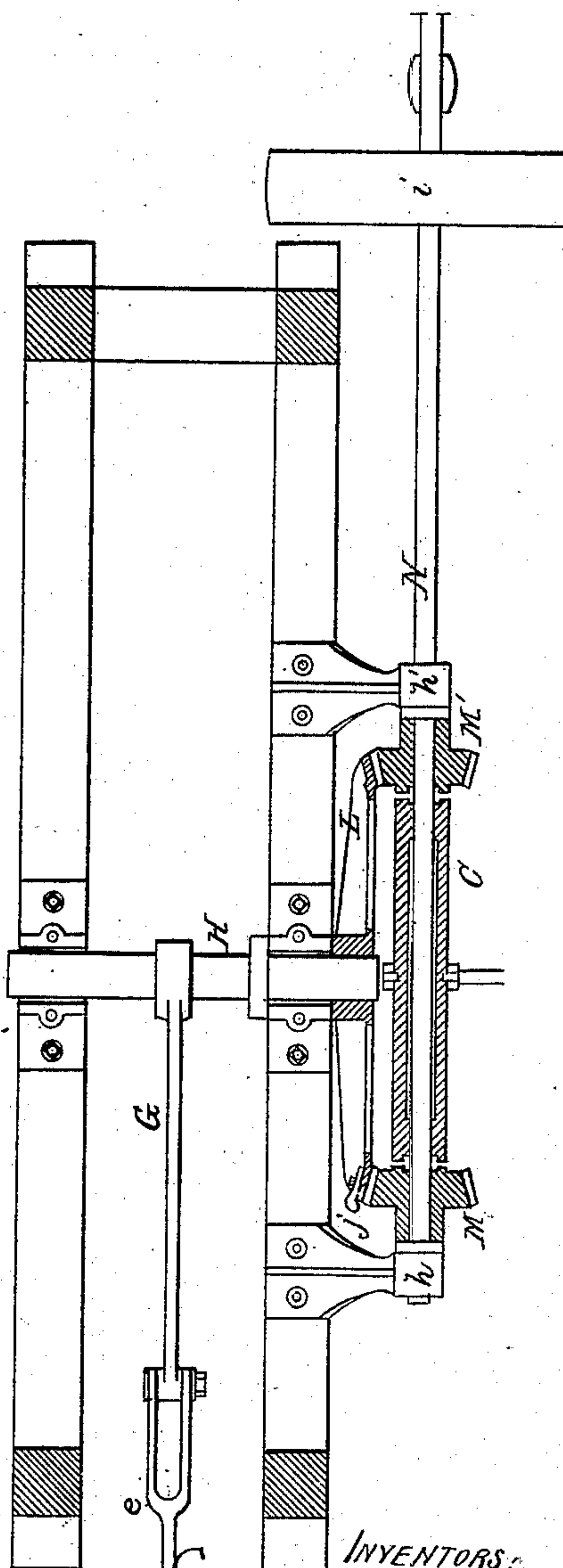


FIG. 3

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INVENTORS:
Edward W. Wolfe
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By their Attorneys
Howson and Sons

(No Model.)

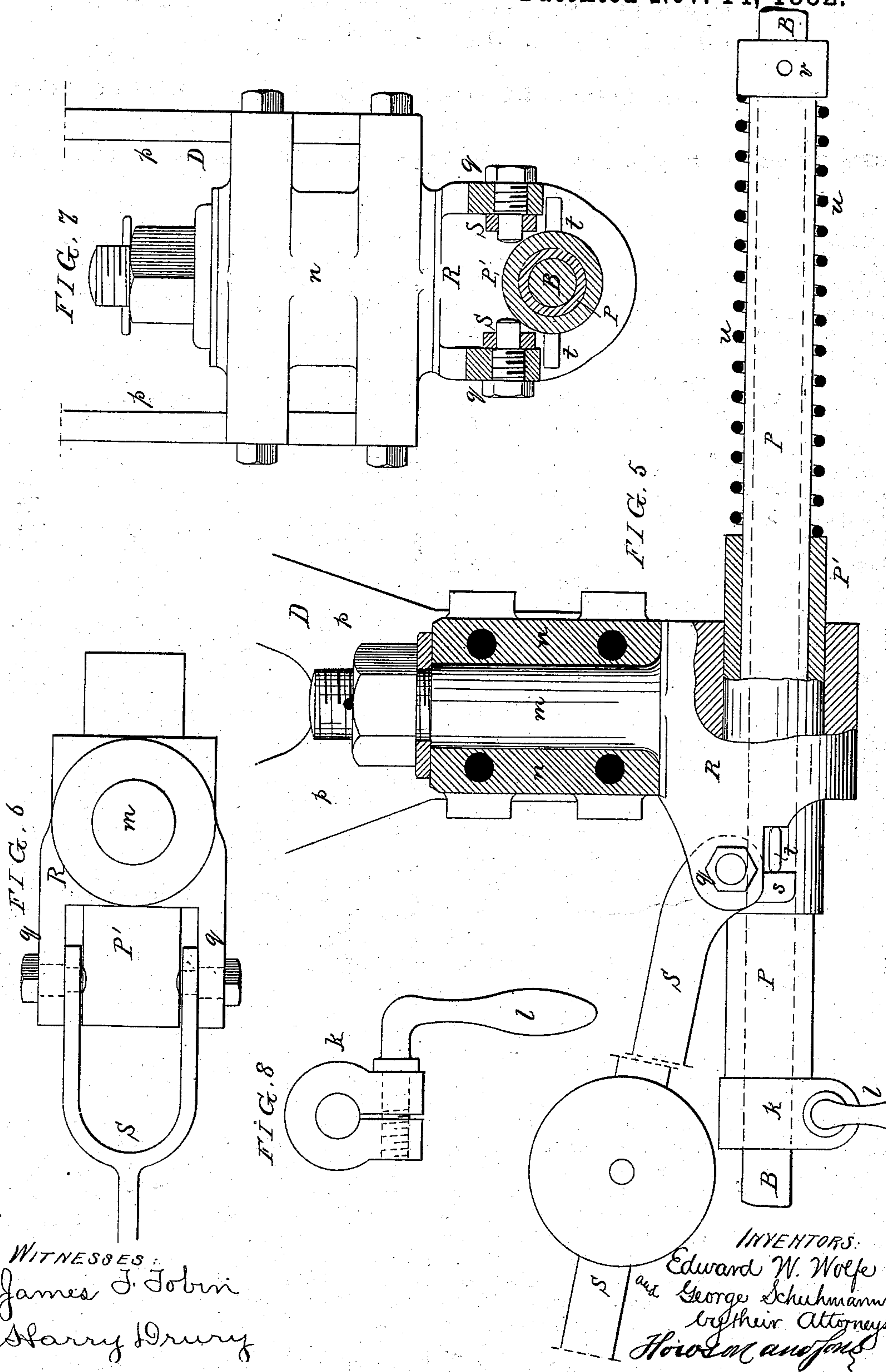
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UNITED STATES PATENT OFFICE.

EDWARD W. WOLFE AND GEORGE SCHUHMAN, OF READING, PA.,
ASSIGNORS TO THE READING IRON WORKS, OF SAME PLACE.

MECHANISM FOR EJECTING TUBES FROM FURNACES.

SPECIFICATION forming part of Letters Patent No. 267,635, dated November 14, 1882.

Application filed June 12, 1882. (No model.)

To all whom it may concern:

Be it known that we, EDWARD W. WOLFE, a citizen of the United States, and a resident of Reading, Pennsylvania, and GEORGE SCHUHMAN, a subject of the Emperor of Germany, and also a resident of Reading, Pennsylvania, have invented certain Improvements in Mechanism for Ejecting Heated Tube-Skelps from Furnaces, of which the following is a specification.

Our invention relates to mechanism for ejecting heated skelps from the furnace of a tube-rolling mill, the main object of our invention, which is fully described hereinafter, being to impart an accelerating movement to the push-rod, so that the heated skelp shall be moved gently in the first instance to prevent the wounding and distortion of the tube, and shall be moved at the desired velocity as it approaches the rolls, so that the latter will properly seize the tube.

Other features of our invention and their mode of operation are too fully explained hereinafter to need preliminary explanation.

In the accompanying drawings, Figure 1, Sheet 1, is a general outline view of the mechanism for ejecting bent and heated skelps from a furnace; Fig. 2, Sheet 2, a side view of gearing and other appliances for operating the push-rod; Fig. 3, a sectional plan of Fig. 2; Fig. 4, a transverse section on the line 1 2, Fig. 2; Fig. 5, Sheet 3, a side view, partly in section, of a device for connecting the push-rod to the carriage; and Figs. 6, 7, and 8, views illustrating the detailed construction of the device.

A general understanding of the main feature of our invention may be best communicated by a description of Fig. 1, Sheet 1, in which A represents in section an ordinary furnace—such as is used in tube-mills for heating bent skelps prior to their conversion by rolling into lap-welded tubes—*a a'* being the grooved rolls, and *b* the usual mandrel. B is the push-rod, attached to a carriage, D, having upper and lower flanged wheels adapted to suspended rails E, as described in another application for a patent made by E. W. Wolfe. Should a uniform motion in the direction of the arrow be imparted to this guided carriage and push-rod, there would be such a sudden and abrupt pushing action on the skelp that it would in many cases be bent and distorted.

On the other hand, the motion of the skelp should be rapid as it approaches the rolls; otherwise there might be a failure of the rolls to seize the skelp. In pushing a skelp by hand from the furnace it is the usual practice for a number of operatives, stationed at and near the outer end of the push-rod, to move the latter slowly in the first instance in order to prevent the wounding of the skelp, and after the latter is in motion to move the rod more rapidly.

The main feature of our invention consists in the combination of a driving-shaft, the guided carriage, and push-rod, with mechanism for imparting the desired accelerating movement to the said rod and tube from the driving-shaft.

To one end of the carriage D is hinged a lever, F, the fulcrum of which is on the end of a radius-rod, I, suitably hinged to a structure, J, which is properly secured and stayed to the roof or walls of the building containing the furnace and rolls. This lever F is connected by a rod, *e*, to an arm, G, on a shaft, H, which has suitable bearings on the structure J, and is connected with gearing, described hereinafter, through the medium of which the shaft may be moved to and fro to the extent indicated by the dotted lines 2 and 3. When the carriage D is at its farthest distance from the furnace the arm G will be in the position shown by the dotted line 2, the positions of the radius-rod I and lever F being also indicated by dotted lines. The shaft H being turned at a uniform speed in the direction of the arrow, the arm G, in moving in the same direction, will impart but a very slight movement to the carriage D and push-rod in the first instance; but the speed of the carriage will be accelerated as the arm G approaches the position shown by plain lines, and it is this accelerating movement which is desired in pushing the heated skelp from the furnace against the rolls.

Referring to Figs. 2, 3, and 4 on Sheet 2, which illustrate in outline mechanism for operating the device Fig. 1, it will be seen that a bevel-wheel, L, is secured to the shaft H, which carries the above-mentioned arm G, and that two bevel-pinions, M M', loose on the driving-shaft N, gear into the said bevel-wheel. A clutch, C, is arranged to slide on, but must turn with, the driving-shaft, the clutch being constructed to engage at one end in the hub

of the pinion M and at the opposite end in the hub of the pinion M'. The clutch is controlled by a clutch-lever composed of two arms, $d d'$, on a shaft, e' , which, in the present instance, 5 has its bearings in a cross-bar secured to the bearings $h h'$ of the shaft N, this shaft e' being continued to any desired convenient point, and furnished with a hand-lever. The shaft N is driven by a belt passing round a pulley, 10 i . The clutch may be adjusted to such a position as to be in gear with either of the bevel-pinions, according to the direction in which the shaft H has to be turned, or with neither of the pinions, in which case the shaft will be stationary. When the arm G, Fig. 1, Sheet 15 1, has moved from the position indicated by the dotted line 2, in the direction of the arrow, to the extent of nearly one-half of a revolution—that is, to the position indicated by the line 3—a toe, j , on the bevel-wheel L will come in contact with the arm d' of the clutch-lever, and through the medium of the latter will move the clutch to such an intermediate position that there will be no further movement of the 20 shaft H until the clutch is operated by the hand-lever on the shaft e' to insure a reverse movement of the arm, a rearward motion of the carriage, and the withdrawal of the push-rod from the furnace. When the lever reaches the position indicated by the line 2 another toe on the bevel-wheel will operate the clutch-lever and throw it out of gear, and the motion of the carriage will cease until the clutch is operated by the hand-lever, when another forward accelerating movement of the carriage will take place. It will thus be seen that the carriage D is automatically arrested when it reaches the desired limit both of its forward and backward movement. 40 All the manual aid required in attending to the mechanism described is that of a man stationed at the outer end of the push-rod to guide the same and that of a man who has to attend to the hand-lever for operating the clutch. 45 Occasionally a heated skelp on being pushed toward the rolls will fail to pass between them, owing to some obstruction. Hence it is important that the connection of the carriage with the push-bar should be of a yielding character, 50 so that the carriage D may continue its movement to a limited extent while the push-rod remains stationary, and thus afford time for the reversal of the carriage and push-rod before any serious damage has been done. We prefer to make this yielding attachment in the manner shown in Figs. 5, 6, 7, and 8, Sheet 3. The push-rod is fitted to a tube, P, on one end of which is formed the clamp k . (Shown in Fig. 8.) By means of a set-screw provided with a 60 handle, l , this clamp may be closed on the push-rod or may be released therefrom when the bar has to be adjusted in the tube. Surrounding the tube P, and fitting snugly but so as to slide freely thereon, is another tube, P', 65 which passes through and fits snugly in a block, R, the stem m of which fits and can turn in a casting, n , secured to hangers $p p$, extend-

ing downward from and forming part of the carriage D. By this swivel-block an opportunity is afforded for moving the push-rod laterally to any extent desired; but it should be here understood that we do not claim broadly a swivel connection of the push-rod with the carriage, as this is the invention of Mr. Wolfe. 70

To lugs $q q$ on the swivel-block is pivoted the forked end of the weighted lever S, which has short arms $s s$ bearing against projections $t t$ on the tube P', one arm s and one projection t on each side of the said tube. 75

A spiral spring, u , intervenes between a collar, v , on the end of the tube P and one end of the tube P', and serves to keep the tube P in place. 80

Under ordinary circumstances, where there is no obstruction to prevent the ejection of the heated skelp from the furnace, there will be no raising of the weighted lever S, the push-rod traversing with the carriage; but should the heated skelp refuse to enter the rolls, or should there be any other obstruction, the carriage will pursue its course and the push-rod will remain stationary, the weighted lever will be raised, and the swivel-block, as it moves with the carriage, will slide on the tube P', this raising of the weighted arm being the signal for the reversal of the carriage. 85 90 95

We claim as our invention—

1. In appliances for ejecting tube-skelps from furnaces, the combination of the following instrumentalities, namely: a push-rod, a traveling carriage connected to and supporting said rod, a vibrating lever for imparting a gradual and accelerating movement to the carriage, and a driving-shaft for communicating a vibrating motion to the lever, all substantially as set forth. 100 105

2. The combination of a carriage, D, constructed for attachment to the push-rod of a tube-furnace, and adapted to horizontal guide-rails, with the lever F, pivoted at its upper end to a radius-rod, I, and connected to the arm G, to which the within-described movement is imparted, substantially as specified. 110

3. The combination of the arm G, the lever F, connected thereto, and the guided carriage D, with the bevel-wheel L on the same shaft with the arm, bevel-pinions on a driving-shaft, N, a clutch, C, and mechanism for operating the same, substantially as set forth. 115

4. The combination of the push-rod B, the tube P, provided with a clamping device for gripping the said rod, the tube P', the block R, swiveled to the carriage D, and the weighted lever S, swiveled to the block and acting on the said tube P', all substantially as specified. 120 125

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ED. W. WOLFE.
GEORGE SCHUHMAN.

Witnesses:

HARRY DRURY,
HARRY SMITH.