

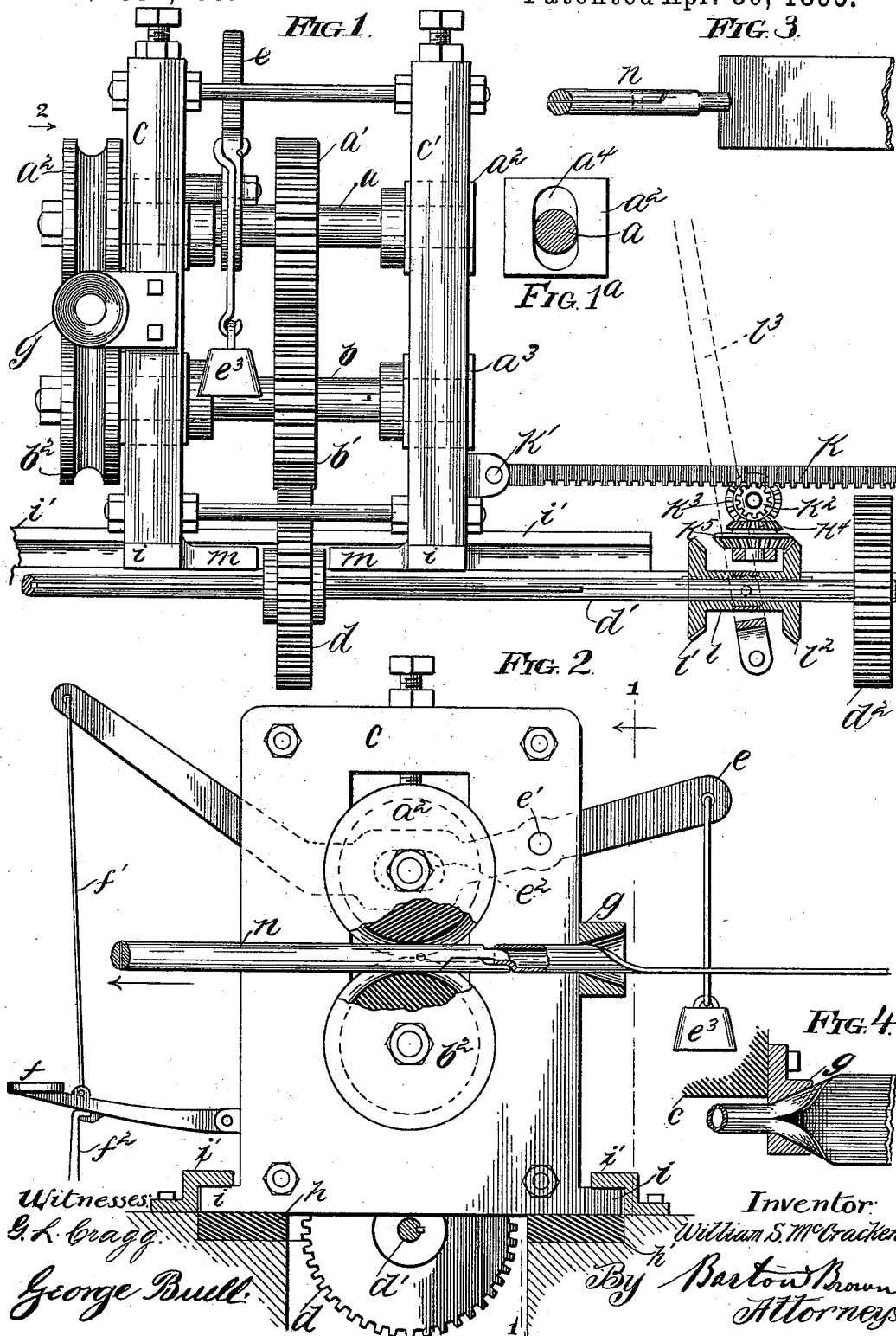
(No Model.)

2 Sheets—Sheet 1.

W. S. McCRACKEN.
PIPE ROLLING MACHINE.

No. 538,268.

Patented Apr. 30, 1895.



Witnesses
E. L. Cragg.

George Bull.

Inventor

William S. McCracken.

By Barton Brown
Attorneys

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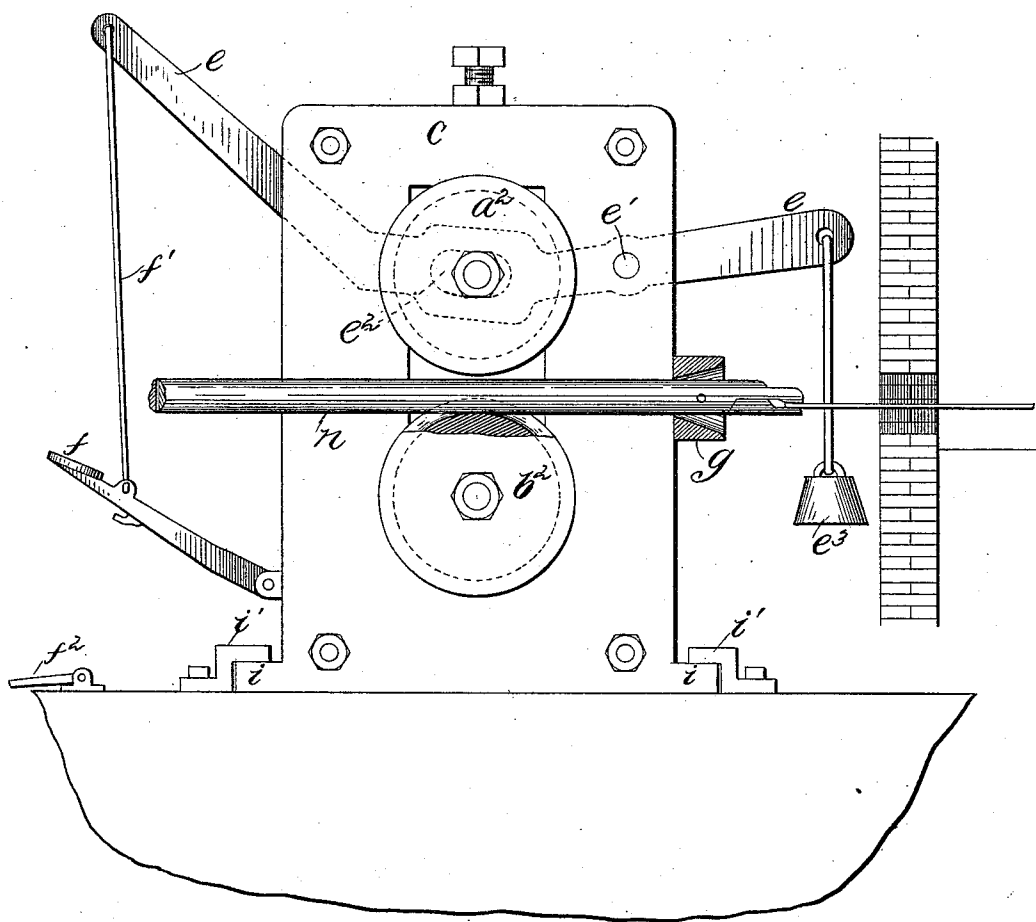
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FIG. 3.



Witnesses:

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George Buell.

Inventor:
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By Barton & Brown
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UNITED STATES PATENT OFFICE,

WILLIAM S. MCCrackEN, OF KEWANEE, ILLINOIS.

PIPE-ROLLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,268, dated April 30, 1895.

Application filed July 11, 1894. Serial No. 517,217. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. MCCrackEN, a citizen of the United States, residing at Kewanee, in the county of Henry and State of Illinois, have invented a certain new and useful Improvement in Pipe-Rolling Machines, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a tube rolling machine, and its object is the provision of means for cheaply and efficiently forming a tube from a skelp.

Heretofore it has been proposed to form the skelp into a tube by grasping the skelp between a pair of tongs and drawing the tongs and the skelp through a bell to thereby bend the skelp and bring the opposed edges into contact to form a butt weld. To impart to the tongs the necessary movement to draw the skelp through the bell, a device known as a swing bench, has been employed, which comprises a bench supporting a traveling endless chain, to which the tongs may be attached after the skelp has been grasped thereby, whereby the necessary movement is imparted to the tongs to draw the skelp through the bell. In the process of manufacturing the tubes, a number of skelps are placed side by side in the furnace, and in order that the bell which is carried upon the end of the bench may be brought opposite any point of the furnace, the bench is mounted to swing about the end farthest from the furnace.

My invention herein consists, first, in means for imparting to the tongs the required movement without the necessity of employing a traveling chain, this feature of my invention in its preferred form comprising a pair of rollers, between the peripheries of which the tongs are adapted to be engaged and to be fed forward to impart thereto the necessary movement.

My invention consists, second, in a tong-moving mechanism mounted to move back and forth parallel to the front of the furnace so that it may be brought opposite any part of the furnace.

My invention consists, third, in such other features as will be hereinafter more fully set forth.

I will describe my invention in connection with the accompanying drawings, in which—

Figure 1 is a side view of a machine embodying my invention. Fig. 1^a is an end view of one of the shaft bearings in Fig. 1. Fig. 2 is a side view of the machine. Fig. 3 is a view showing the skelp grasped by the tongs. Fig. 4 is a detail view showing the skelp in the act of passing through the bell. Fig. 5 is a side view of the machine showing the upper roller raised to permit the insertion of the tongs into the furnace.

Like letters refer to like parts in the several figures.

Shafts *a* and *b* are mounted in bearings supported in the housings *c c'*, intermeshing gear wheels *a'* and *b'* being provided upon the shafts *a* and *b* respectively, the gear-wheel *b'* being adapted to mesh with a gear wheel *d* splined upon a shaft *d'*, upon which it is longitudinally movable. A gear wheel *d'* is provided upon said shaft which may be continuously driven to rotate the shafts *a* and *b*. Upon the shafts *a* and *b* respectively are mounted the rollers *a*² and *b*², provided with grooved peripheries adapted to engage the tongs in a manner hereinafter described.

The upper shaft *a* is adapted to move vertically, the journal blocks *a*³ *a*³ being provided with an elongated slot *a*⁴, Fig. 1^a, to permit the movement of the shaft. A lever *e* journaled to rotate at *e'* is provided with a slot *e*² through which shaft *a* passes, a weight *e*³ being provided upon one end of the lever to maintain said end depressed and thereby lift the shaft *a* into its uppermost position. To the opposite end of lever *e* a foot lever *f* is connected by means of a link *f'*, a catch *f*² of any preferred form being provided for holding the foot lever in a depressed position to thus maintain shaft *a* in its lowermost position. Instead of positively driving both rollers *a*² and *b*², the gear wheel *a'* on shaft *a* may be omitted, and the lower roller alone be driven positively.

In line with the passage provided between the peripheries of the rollers *a*² *b*² is the bell *g* which comprises a metal block provided with a cone-shaped bore so that as the end of the skelp comes in contact with the tapering walls thereof the opposite edges of the skelp are bent around and brought into contact,

and, being heated to a welding heat, they are pressed together with sufficient force in passing through the bell to form a butt weld.

Beneath the lower ends of the housings are provided plates h h' which serve as a track upon which the machine may slide back and forth, projections i i' being provided at the lower ends of the housings adapted to move within the guide-ways formed by the angle plates i' i' to properly direct the movement of the machine. A rack bar k is secured to the machine at k' , said rack being adapted to mesh with a pinion k^2 , mounted to rotate with a bevel gear k^3 . The bevel gear k^3 meshes with a bevel gear k^4 which is mounted to rotate with a bevel gear k^5 . Upon the shaft d' is splined a sleeve l carrying bevel gears l' l^2 adapted to alternately engage the bevel gear k^5 , a lever l^3 being provided for shifting the position of the sleeve. When the sleeve is in the position illustrated in Fig. 1, the pinion k^2 is rotated to move the machine to the left, and when the gear l' is brought into engagement, the pinion k^2 is rotated in the opposite direction to move the machine to the right. When neither of the gears l' l^2 engage gear k^5 the machine remains at rest. Projections m m are provided upon the interior of the housings at the lower end adapted to engage the boss of gear wheel d and move the same along the shaft as the machine is moved.

The operation of the machine is as follows: A number of skelps being placed in the furnace side by side and heated, the machine is brought opposite one end of the furnace and a pair of tongs n inserted into the furnace through the bell g , the upper roller a^2 being in its elevated position, in which position it is maintained by the weight e^3 . The skelp having been grasped by the tongs, the upper roller a^2 is brought down upon the top of the tongs. The tongs being thus grasped between the peripheries of the rollers and the rollers being positively driven, the tongs are fed forward, thus bringing the end of the skelp into engagement with the walls of the bell to bend the edges and bring the same into contact to effect the weld. When the tongs have been advanced to such an extent that the tube thus formed is brought between the rolls, the rolls act upon the tube to feed the same forward and complete the same. The tongs are preferably made round in cross section, though if of proper shape to be engaged by the rollers they will perform their function. It has been customary heretofore in making tubes to pass the same successively through two bells before passing to the finishing rolls, and by employing my invention I am enabled to dispense with one of the bells as the feeding rolls may be used to accomplish the function of the second bell heretofore used. The passageway between the rolls I preferably make somewhat less in cross sectional area than the area of the bore of the bell in order that the tube in passing between the rollers may be decreased in

diameter, elongated and the surface thereof smoothed. The tube having been passed from the rolls, the lever l^3 is moved to rotate the pinion k^2 and move the carriage to a position in front of the second skelp in the furnace, the operation of forming the tube being repeated.

By my invention I am enabled to greatly cheapen the cost of rolling pipe, as the machine may be entirely handled by one man. I am enabled also to lessen considerably the space required for the tong-moving mechanism, the swinging bench with its traveling chain heretofore employed being supplanted by a carriage adapted to travel back and forth in front of the furnace, so that a greater furnace frontage may be worked by one machine.

It is evident that my invention is susceptible of modifications in matter of detail and I do not, therefore, desire to limit myself to the precise construction shown and described, but

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

1. The combination with a bell, of a pair of tongs adapted to be passed through the bell to grasp the skelp, and a pair of rollers adapted to engage said tongs to draw the skelp through the bell, substantially as described.
2. The combination with a bell, of a pair of tongs adapted to be passed through the bell to grasp the skelp, and a pair of rollers adapted to successively engage the tongs and the formed tube, the peripheries of said rollers being constructed to reduce and complete the tube as the tube passes between the rollers, substantially as described.
3. The combination with a carriage adapted to travel back and forth in front of the furnace, of a bell and a pair of feeding rollers mounted thereon, and a pair of tongs for grasping the skelp, adapted to be fed forward by said rollers, substantially as described.
4. The combination with the traveling carriage, of the bell mounted thereon, the tong-feeding rollers mounted thereon, means for separating the rollers, and means for imparting motion to the carriage, substantially as described.
5. The combination with the carriage supporting the bell g and the rollers a^2 b^2 , of the shaft d' , gear wheel d splined thereto, rack bar k , driving pinion k^2 , and the sliding sleeve l carrying bevel gear wheels l' l^2 adapted to be brought into engagement with bevel gear wheel k^5 to move the carriage, substantially as described.

In witness whereof I hereunto subscribe my name this 7th day of July, A. D. 1894.

WILLIAM S. MCCrackEN.

Witnesses:

WM. GLENN, Jr.,
ERNEST C. LADD.