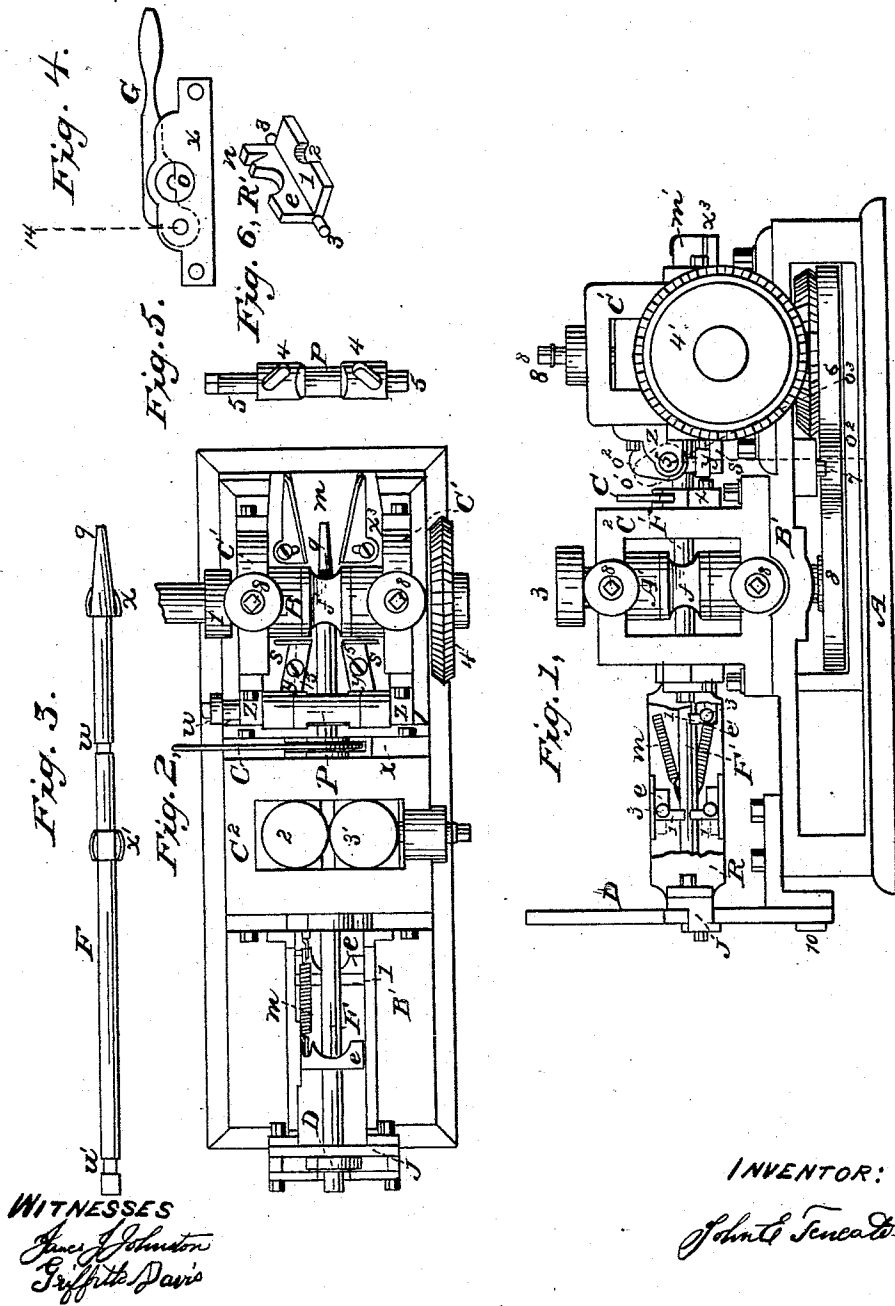


J. E. TENCATE.
Welding Metal Tubing.

No. 84,019.

Patented Nov. 10, 1868.



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JOHN E. TENCATE, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 84,019, dated November 10, 1868.

IMPROVEMENT IN MACHINES FOR WELDING TUBING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern :

Be it known that I, JOHN E. TENCATE, of Pittsburg, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Pipe-Welding Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon.

The nature of my invention consists in the combination and arrangement of a series of grooved rolls, levers, mandrel-guides, and scrapers, the whole being constructed, arranged, and operating in the manner hereinafter described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

In the accompanying drawings, which form part of my specification—

Figure 1 is a side elevation of my improvement in pipe-welding machine.

Figure 2 is a top view or plan of the same.

Figure 3 is a top view of the mandrel for forming the bore of the pipe.

Figure 4 is a side view of a cross-piece, in which is pivoted one of the levers for holding the mandrel in position.

Figure 5 is a top view of the rock-shaft for operating the scrapers.

Figure 6 is a perspective view of one of the automatic guides.

In the drawings, A represents the base of the machine.

B' represents the foundation upon which are secured the frames C' and C'', for the rolls A' and B.

To the frame C' is attached a frame, R, for the guides e, and their springs, m.

On the outer end of the frame R, in a guide, J, is placed the lever D, which is pivoted at 10.

To the frame C'' is attached a cross-piece, marked x, in which is pivoted the lever C, as shown in fig. 4.

The levers C and D are provided each with a notch, which is fitted to the grooves u and u', in the mandrel F'. The form of the notches in the levers is shown at o, in fig. 4. The levers C and D are used for holding the mandrel F' in a fixed position during the welding-process.

To the frame C' are attached the bearings Z, for the eccentric rock-shaft P, which is provided with journals 5, and oblique slots 4, in which are fitted the pins V of the scrapers y, the ends of which are provided with cutting-edges, which in form and size correspond to the exterior of the welded pipe.

The rock-shaft P is provided with a lever, w, (see fig. 2,) which lever hangs in the position represented by the dotted line o', (see fig. 1,) when the scrapers are inoperative.

The scrapers y are pivoted at 15 to the plate or cross-piece marked S. On the front end of the machine, to

the cross-piece marked x', is secured a guide, m', the form and position of which are indicated in figs. 1 and 2. The machine is provided with two sets or pairs of rolls, the front pair of which is placed in a horizontal position, and the back pair in a perpendicular position. Each pair of rolls is provided with grooves. The grooves f', in the front rolls B, are larger than the grooves f in the back or perpendicular rolls A', the grooves of rolls A' being made smaller for the purpose of giving a finish to the welded pipe, after passing from the action of the scrapers y, and also for the purpose of "drawing the pipe," which term is well understood by manufacturers of pipe.

The gear-wheels for operating the rolls are arranged as follows:

On the end of the roll B, of the front pair, is placed a wheel, 1, which gears into a wheel placed on the end of the lower roll, on the opposite end of which is placed a bevel-wheel, 4', which gears into a bevel-wheel, 5', under which, and on the same shaft, is placed a wheel, 6, which gears into a wheel, 7, which gears into the wheel 8, placed on the lower end of the perpendicular roll A', on the upper end of which is placed a wheel, 3, which gears into a wheel, 2, on the upper end of the "match-roll" of the roll A'. The rolls are regulated, with regard to their pressure upon the pipe, by means of the set-screws, marked 8.

The automatic guides e are provided with notches, R', Q, and n, and trunnions 3, which are fitted to openings made in the sides of the frame R, for the purpose of pivoting the guides in the desired position. The notches R' in the guides correspond to the form and size of the diameter of the exterior of the welded pipe, and the notches Q correspond to the form and size of the diameter of the mandrel F'. The notches n are made for the purpose of passing over the springs m which hold the guides in the desired position.

The mandrel F' is provided with swells or projections, x and x', and a cone-formed point, 9. The swells or projections x and x' are used for obtaining and retaining the desired bore of the pipe in the welding, and finishing of it, and the coniformed point 9 is used for the purpose of facilitating the entering and guiding of the iron upon the swell or projection x, and into the groove f' of the rolls B.

As the construction and arrangement of my improvement in machine for welding pipe, and the relation that the several parts bear to each other, will readily be seen by reference to the accompanying drawings, and understood from the foregoing description in connection therewith, I will, therefore, proceed to describe its operation, which is as follows:

Having the mandrel F' placed in the machine as represented in figs. 1 and 2, I impart motion to the rolls B, which will, through the medium of the wheels 1, 4', 5', 6, 7, 8, 3, and 2, impart motion to the rolls A'. The iron for forming the pipe is heated to a "welding-heat." Two or three inches of one end of the iron are then bent

to the form of the pipe. This formed end, resting on the guide *g'*, is then forced on the coniformed end 9 of the mandrel *F'*, and into the grooves *f'* of the rolls *B*, which will draw in the iron and weld it, and as it passes from these rolls, the operator places his foot against the lever *w*, (the end of which is shown in fig. 2, and represented by dotted lines *o'*, in fig. 1,) and forces it back into the position represented by the dotted lines *o''*, which will bring the scrapers *y* in operation against the welded pipe, as it passes along the mandrel *F'* to lever *C*, which is then raised up to the position indicated by the dotted lines, marked 14, in fig. 4. The pipe passes then into the groove *f* of the rolls *A'*, which will "draw-finish" the pipe. As the pipe passes from rolls *A'*, the end of it comes in contact with the parts marked 1 of the guides *e*, and, pressing against these parts, will turn the guides so that the notches, marked *R'*, will be turned down over the pipe, and thereby guide it on the mandrel. After the notches *R'* have been brought over the pipe, the lever *D* is moved sideways, to allow the pipe to pass out at the end of the frame *R*. When the entire pipe has passed the lever *C*, the latter is brought back to the position represented in fig. 4, so that the notch *o* in the lever will enter the groove *u* in the mandrel *F'*, and thereby hold that part of it in the desired position for receiving the iron for forming the next piece of pipe.

As the pipe passes out of the guides *e*, the springs *m*

will turn them back, so that the notches *Q* will be brought over the mandrel, and thereby hold that part of it in the desired position, and after the operator, with a pair of suitable tongs, has drawn the pipe off the mandrel *F'*, the lever *D* is brought back, so that its notch will enter the groove *u'*, in the mandrel *F'*, and thereby hold it in the machine. It will be observed that, in welding, the mandrel *F'* is never taken out of the machine.

I wish it clearly understood that I do not claim, broadly, welding pipe by means of rolls, nor do I claim, broadly, the use of guides and a mandrel, in connection with a series of rolls, for welding pipe; but

What I do claim as of my invention, is—

1. The arrangement of the rolls *A* and *B*, guides *e*, levers *C* and *D*, and mandrel *F*, provided with enlargements *x* and *x'*, the whole being constructed, arranged, and operating as herein described, and for the purpose set forth.

2. The scrapers *y*, in combination with the rock-shaft *P*, provided with oblique slots 4, constructed, arranged, and operating substantially as herein described, and for the purpose set forth.

JOHN E. TENCATE.

Witnesses:

A. C. JOHNSTON,
JAMES J. JOHNSTON.