(No Model.)

T. F. ROWLAND.

WELDING MACHINE.

No. 412,122. Patented Oct. 1, 1889.

Fig. 1

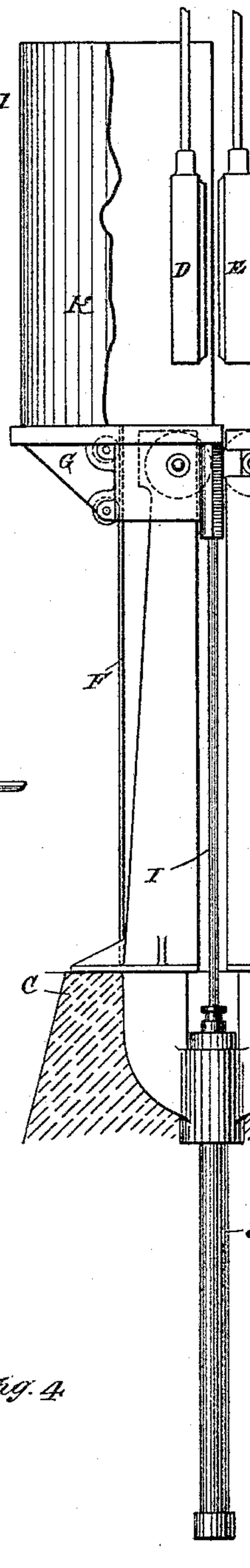

Fig. 2

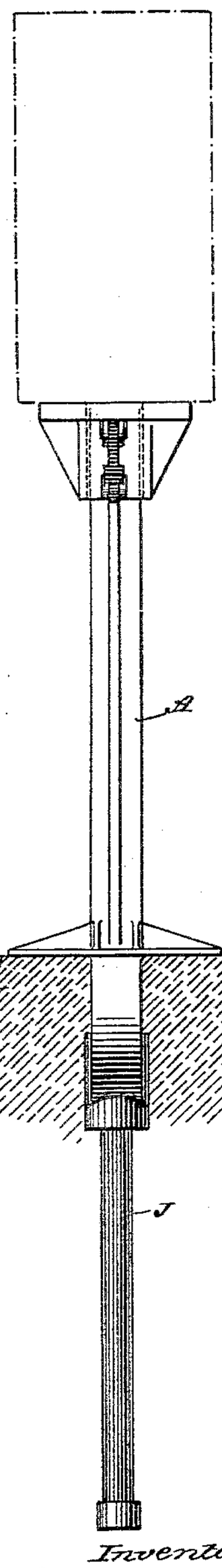

Fig. 3

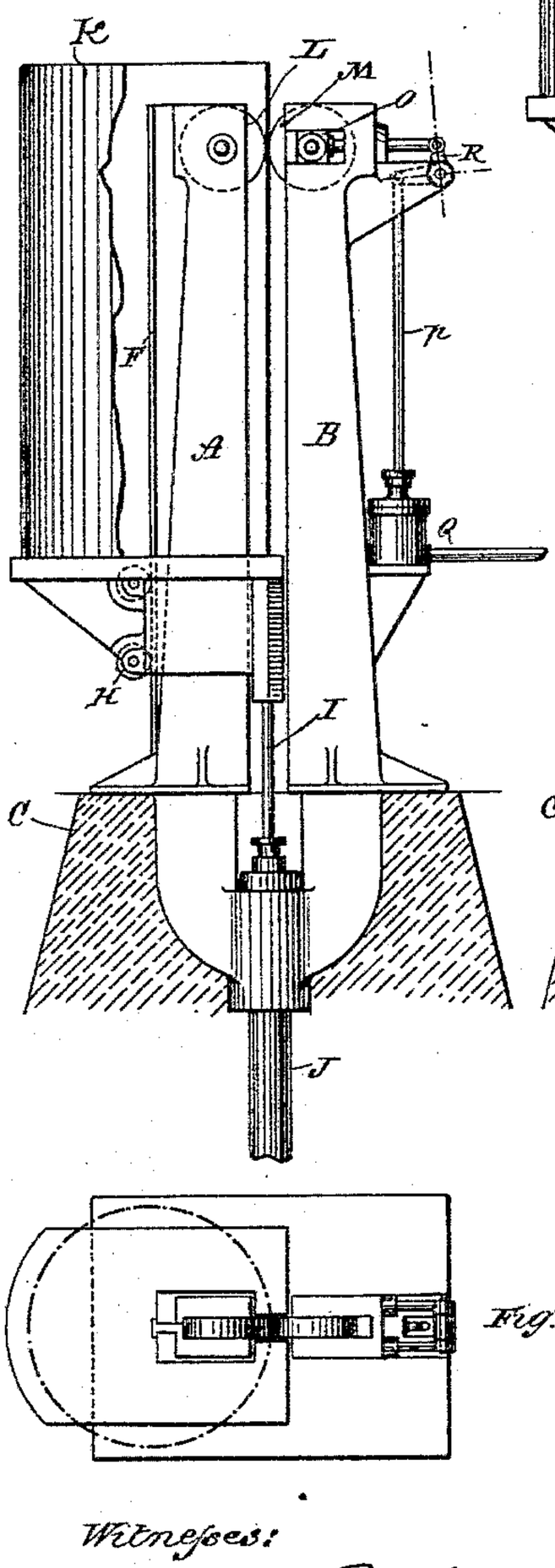

Fig. 4

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UNITED STATES PATENT OFFICE.

THOMAS F. ROWLAND, OF NEW YORK, N. Y.

WELDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,122, dated October 1, 1889.

Application filed June 24, 1889. Serial No. 315,442. (No model.)

To all whom it may concern:

Be it known that I, THOMAS F. ROWLAND, of the city, county, and State of New York, have invented certain new and useful Improvements in Welding-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The present invention relates, generally, to machines for welding together the edges of plates, especially in the form of tubes or similar structures. It relates particularly to a form of welding-machine composed of two vertically-arranged parallel arms or horns, which are supported at their lower ends and carry at their upper or free ends welding-rolls adapted to receive the overlapping edges of the blank being formed and weld them together, such edges being previously properly heated and the structure operated on being properly supported and its seam portion passed vertically between said horns as the formation of the seam progresses.

The object of the invention is to provide such a welding-machine with improved mechanism, first, for supporting and operating the blank, and, second, for adjusting and applying to the welding-rolls the pressure requisite to accomplish a proper weld.

The various features of construction will be described in detail, and those regarded as new will be recited in the claims to follow the description.

Referring to the drawings, Figure 1 is an elevation view of a machine embodying my improvements, the blank being shown in position ready to be passed between the welding-rolls. Fig. 2 is a like view, but from the left-hand side of Fig. 1. Fig. 3 is a like view to Fig. 1, except that the blank is shown as drawn in between the welding-rolls. Fig. 4 is a plan view of the machine.

In the views, A and B represent the two roll-supporting arms. These are arranged vertically and are firmly fixed in a suitable base C. These arms are substantially parallel and of the general form and construction well known in such machinery.

D and E represent the oppositely-arranged parts of the heating-furnace. They may be of any suitable form, but will ordinarily consist of some kind of removable gas-furnaces, and will be supported above the machine, as shown.

F is a guide-rail or guide-frame attached to the arm A and extending from the upper end thereof to the base of the machine. On this guide travels the carriage G, which has bearing or friction rolls H. This carriage is recessed for the passage of arm A, and at its inner side, between the arms A and B, it is attached to the piston-rod I of the cylinder J, which extends below the bed C and is firmly attached to the arms A B. This cylinder and its piston constitute a hydraulic apparatus by which the carriage G may be raised and lowered, though steam or compressed air may be similarly employed.

K is a cylindrical blank attached to the carriage by any suitable clamps and arranged in position for its opposite overlapping edges to be drawn in between the welding-rolls.

L and M represent the welding-rolls. These rolls are properly mounted in journals in the ends of the arms, the bearings of the roll L being stationary, while those of the roll M are carried in a block O, having motion to and from the roll L. This block is moved by the piston P of the power-cylinder Q, mounted on the arm B, the piston-rod being adjustably connected with such block by the bell-crank lever R. This power-cylinder may be one operated by hydraulic, steam, or air pressure.

The operation of the machine is as follows: The blank, with its seam parts brought properly together, will be firmly clamped to the carriage. The furnaces will then be lowered so as, when started, to apply heat to the lower end of the seam. The welding-rolls will be adjusted so as to be brought to the proper proximity when the piston P is at the lower end of the cylinder Q. The furnaces may now be started and when a portion of the seam is brought to welding heat the hydraulic apparatus J will be started and the seam will be drawn between the welding-rolls and its parts welded together.

In lieu of reciprocating the blank during the process of heating and welding, the furnaces may be so arranged with such proximity to the welding-rolls that it will be practi-

cal to move the blank between the furnaces and welding-rolls with a continuous motion.

An important feature of the machine is mounting or supporting the parallel arms vertically, thereby saving much space in shop room over that that would be required for a machine of like capacity arranged horizontally. The blank can also be more economically handled when in a vertical position—that is, in regard to the space necessary for the same. So, too, the vertical arrangement of the machine permits moving the blank-carriage in the same direction as gravity acts, and consequently its weight and frictional resistance will not produce the irregularities of action that a horizontally-moving carriage may have. This results in drawing the seam of the blank between the welding-rolls with regularity and steadiness, which is important to forming a good seam. The machine may of course be arranged horizontally, though the vertical position is preferred.

Mounting the blank-carriage as also the power-cylinder of the welding-rolls upon the arms are also important features, for with such an arrangement of these parts the spring of the arms is easily compensated and the application of the welding pressure regularly and uniformly made. By these means blanks of large dimensions and unusual thicknesses may be more successfully worked than in the common forms of machines used for similar purposes.

What is claimed as new is—

1. The herein-described machine, consisting of the vertically-arranged arms A B, provided at their upper free ends with welding-rolls.

2. The herein-described welding-machine, consisting of the vertically-arranged arms A B, welding-rolls journaled in said arms, and a vertically-moving blank-carriage.

3. The combination of the vertically-arranged arms A B, the blank-carriage mounted upon one of said arms, and the carriage-operating power-cylinder, the welding-rolls, and the power-cylinder for adjusting them.

4. The combination of the arms A and B, the blank-carriage mounted and moving on one of said arms, the power apparatus for operating the same, the welding-rolls L and M, and the power apparatus P Q R, for adjusting the roll M.

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