(No Model.)

# A. FARRENSTEINER.

## PIPE WELDING MACHINE.

No. 549,711. Patented Nov. 12, 1895.

Fig. 1

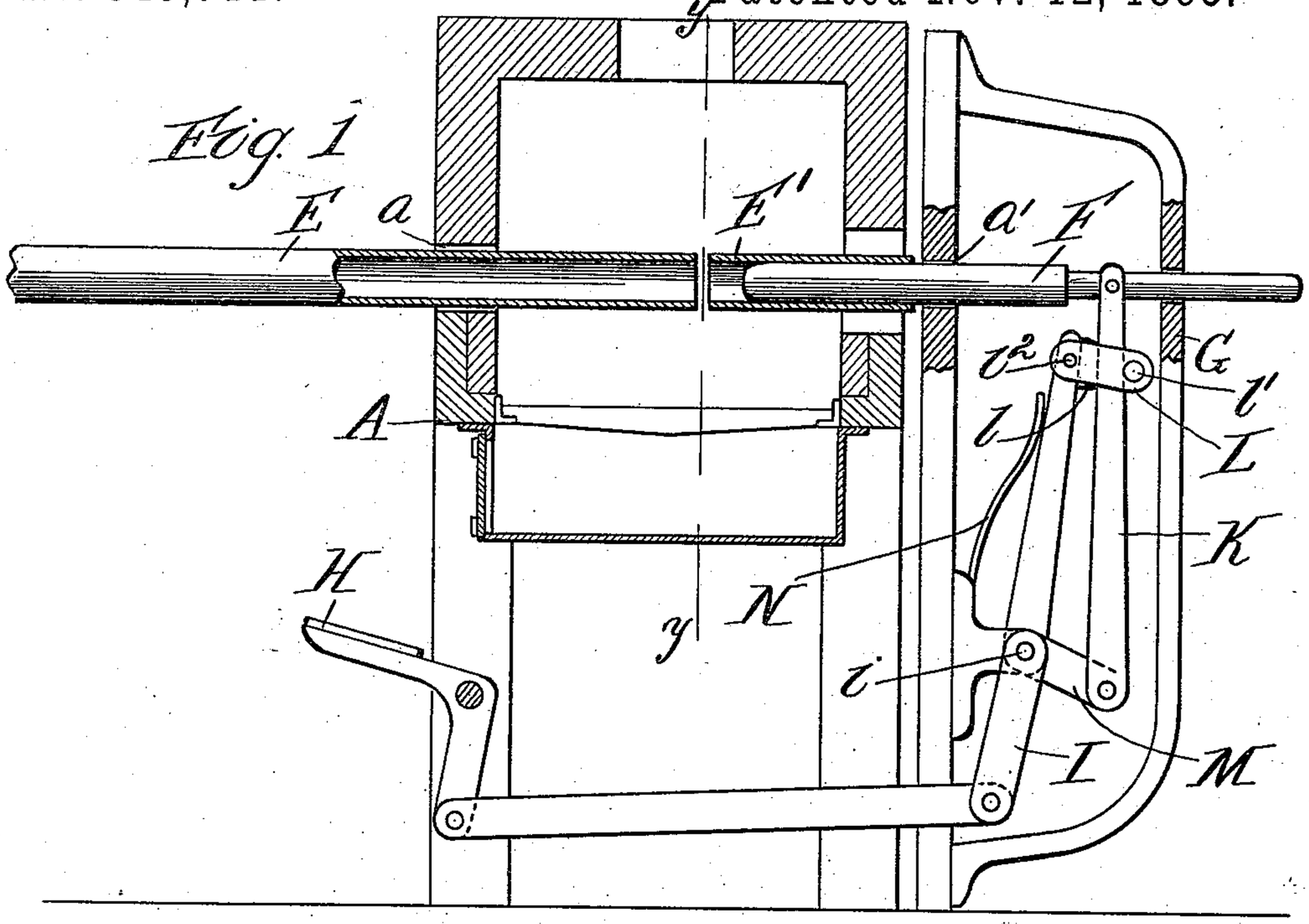



Fig. 2.

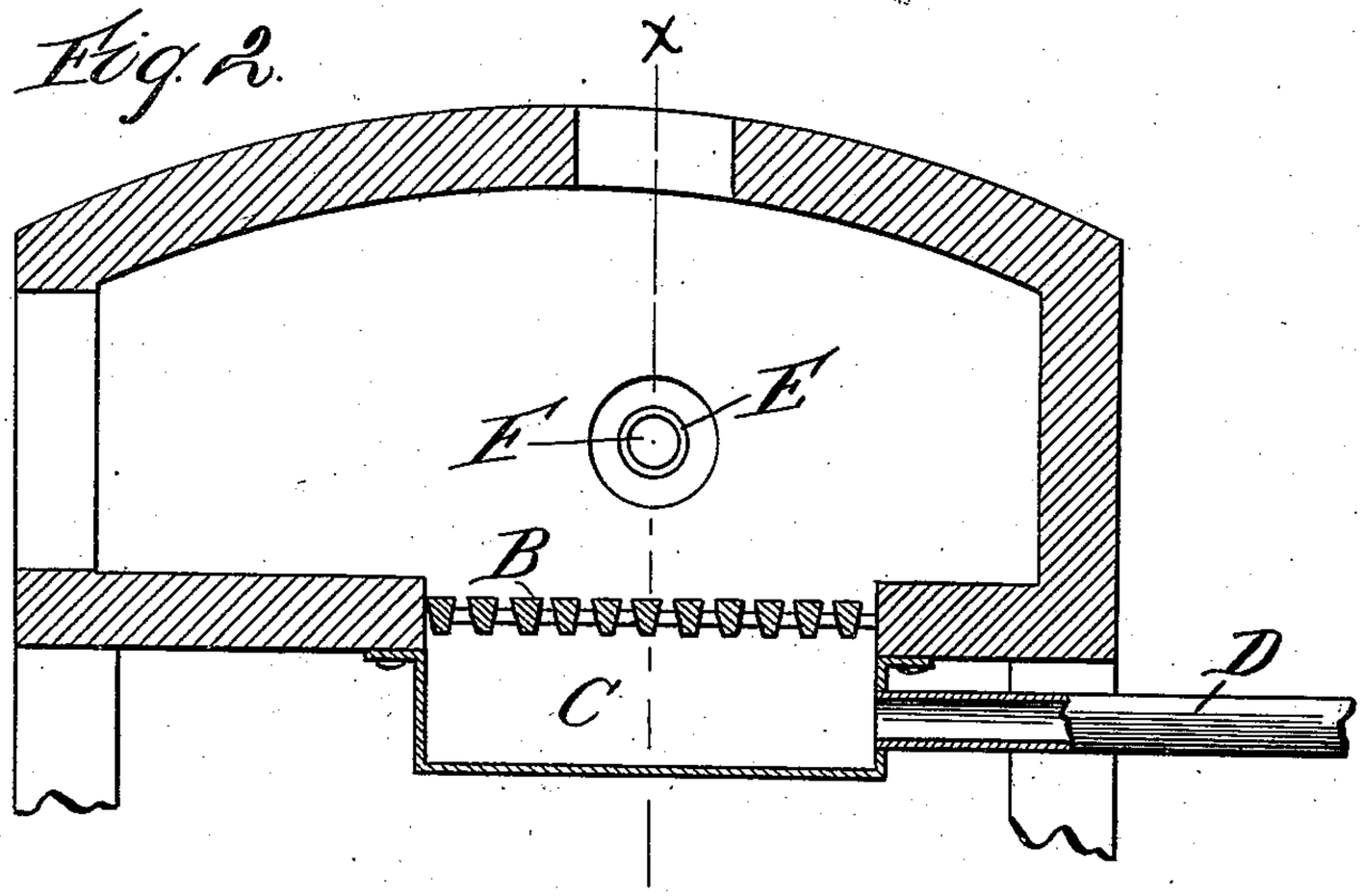
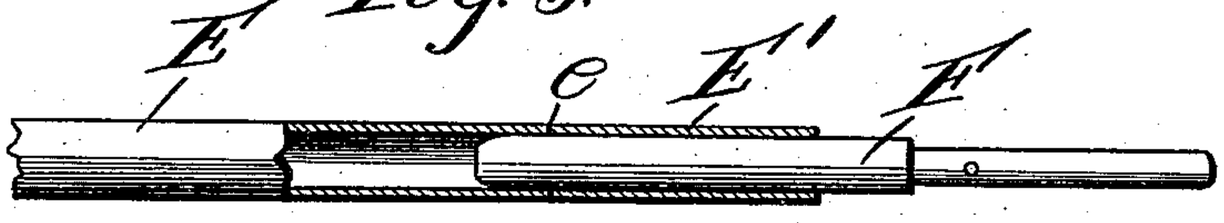



Fig. 3.

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# UNITED STATES PATENT OFFICE.

AUGUST FARRENSTEINER, OF CHICAGO, ILLINOIS.

## PIPE-WELDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 549,711, dated November 12, 1895.

Application filed June 26, 1895. Serial No. 554,075. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST FARRENSTEINER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Pipe-Welding Machines, of which the following is a specification.

The object of my invention is to avoid the slow and laborious hand process heretofore employed in welding pipes and to provide a simple and highly-efficient machine for such purpose.

In a machine characterized by my invention an arrangement is provided whereby the sections or lengths of pipe can be conveniently supported so as to bring their ends opposite one another and in true alignment over a fire, such as a bed of hot coals upon a suitable grate. One of these pipe lengths or sections thus arranged is supported by a longitudinally-reciprocating mandrel upon which the pipe-section is slipped to an extent to bring the forward end of the mandrel a little back of the end of the pipe-section which is to be united to the opposing end of the remaining piece of pipe. After the ends of the pipe-sections have become properly heated the mandrel is moved forward, so as to move forward the pipe-section which it supports and drive the end of such section against the opposing end of the remaining pipe-section. The mandrel also continues to move forward after such impact to an extent to pass the joint and thereby square up or render the latter smooth and true. As a preferred arrangement, the mandrel is operated by a compound lever and foot-treadle, although other suitable means could be employed.

In the accompanying drawings, Figure 1 is a vertical section through a machine embodying my invention, the plane of the section being on line *x*·*x* in Fig. 2. Fig. 2 is a vertical section through the upper portion of the machine on line *y y* in Fig. 1. Fig. 3 represents the pipe-sections and mandrel with the ends of the former united and the forward end of the mandrel moved beyond the joint.

The main frame A of the machine is provided with a grate B and an ash-box C and an air-blast pipe D for supplying the fire with blast air, so as to insure a suitably-hot fire. At one side of the frame is an opening or rest *a* for one of the pipe-sections E, which can be supported and extended over the fire, as in Fig. 1. At the opposite side of the frame is a suitable bearing or guide-opening *a'* for the reciprocating cylindrical mandrel F, which latter is also desirably steadied and guided by a bearing G.

The mandrel can be operated from a foot-treadle H through the medium of a suitably-arranged lever or levers, and to such end the treadle connects with a lever I, which is connected with a rod or bar K by link L. The rod K is at its upper end pivotally connected with the mandrel and at its lower end is pivotally connected with a swinging link or short arm M, which latter is conveniently hung upon the pivot *i*, which is provided for the lever I.

The link L is pivoted to the upper portion of lever I at $i^2$, and the rod or bar K is arranged to have an end play between bearings *l* and *l'*, the former being on bar or rod K and the latter on the link L, or both of such bearings can be on the link. The upper portion of the lever I is subject to a spring N, which tends to normally maintain the mandrel in its back position. The lever I can be in one piece or its upper and lower portions can be made separate and be rigidly united by the pivot *i*. By such arrangement suitable power can be conveniently applied for operating the rod or bar K, which latter will also slide between the bearings *l* and *l'*, so as to accommodate itself to the longitudinal movement of the mandrel.

In practice the pipe-section E' is slipped upon the mandrel and the pipe-section E is arranged opposite the pipe-section E', as in Fig. 1, and the opposing ends of the pipe-sections are then suitably heated by means of a fire upon the grate B. The operator then depresses the foot-treadle, so as to throw the mandrel forward. During the quick forward movement of the mandrel the end of pipe-section E' will be thrust against the opposing end of the stationary pipe-section E, whereby the two will be united by the impact and the movement of the mandrel will continue to an extent to carry its forward end beyond the pipe-joint *e*, as in Fig. 3, thereby interiorly smoothing and perfecting the joint, it being

also seen that the frictional contact of the mandrel with the pipe-section E′ will further force it against the pipe-section E during the terminal portion of the forward movement of the mandrel.

The pipe-section E can be held by hand or by any suitable mechanical means, it being observed that with the treadle arrangement the operator can conveniently hold the pipe-section E and at the same time operate the treadle. After thus uniting the pipes they can be rolled or otherwise treated to further perfect the welded joint.

Obviously the foregoing results could be attained by the converse of the mode of procedure or action hereinbefore described—that is to say, the mandrel could be held stationary and the pipe-section E could be thrust forward to an extent to cause it to forcibly abut against the pipe-section E′, and to continue its forward movement to an extent to also thrust the pipe-section E′ back upon the mandrel, and in such case the forward end of the mandrel would practically or in effect pass the joint *e*. I regard, however, the reciprocating mandrel as a matter of further improvement.

What I claim as my invention is—

1. A machine for welding together the ends of pipe-sections, comprising a mandrel upon which one pipe-section is supported and arranged to extend beyond the forward end of the mandrel, means whereby the other pipe-section can be arranged in alignment with the pipe-section upon the mandrel, means for bringing the end of one pipe section forcibly against the opposing end of the other pipe section and causing the forward end of the mandrel to pass the joint formed at the point of union between the ends of the pipes, and a support holding the mandrel at a point back of the pipe section thereon, and serving to back the mandrel as a means for permitting the within described relative end movement between the pipe-section and mandrel during the process of welding, substantially as set forth.

2. A machine for welding together the ends of pipe sections, comprising a mandrel upon which one pipe-section is supported and arranged to extend beyond the forward end of the mandrel, means whereby the other pipe section can be arranged in alignment with the pipe section upon the mandrel, means whereby the opposing ends of the pipe-sections can be heated, means for bringing the heated end of one pipe section against the opposing heated end of the other pipe section and causing the forward end of the mandrel to pass the joint formed at the point of union between the pipe sections, and a support holding the mandrel at a point back of the pipe-section thereon, and serving to back the mandrel as a means for permitting the within described relative end movement between the pipe-section and the mandrel during the process of welding, substantially as set forth.

3. A pipe welding machine comprising the reciprocating mandrel upon which one pipe section is arranged, means whereby another pipe section can be placed in alignment with the pipe section upon the mandrel, and means for moving the mandrel forward to an extent to force the end of the pipe section which it carries against the end of the other pipe section and also cause the forward end of the mandrel to pass the joint formed at the union of the pipe sections, substantially as set forth.

4. A pipe-welding machine comprising the reciprocating mandrel upon which one pipe section is arranged, means whereby another pipe section can be placed in alignment with the pipe-section upon the mandrel, means for heating the opposing ends of the pipes thus arranged, and means for moving the mandrel forward to an extent to bring the end of the pipe section which it carries against the end of the other pipe section and also cause the forward end of the mandrel to pass the joint formed at the union of the pipe-sections, substantially as described.

5. A pipe-welding machine comprising a frame provided with a reciprocating mandrel upon which one pipe-section can be placed, a rest for an opposing pipe-section, heating means arranged for heating the opposing ends of the pipes, a lever by which the mandrel is operated, and a foot-treadle for operating the lever, substantially as set forth.

6. A pipe-welding machine comprising a reciprocating mandrel for the purpose described, a vibratory lever, a rod pivotally connected with the mandrel and having a sliding connection with a swinging arm upon the lever, a swinging support for said rod, means for operating the lever, and means whereby a pipe-section can be held in alignment with a pipe-section upon the mandrel, substantially as set forth.

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