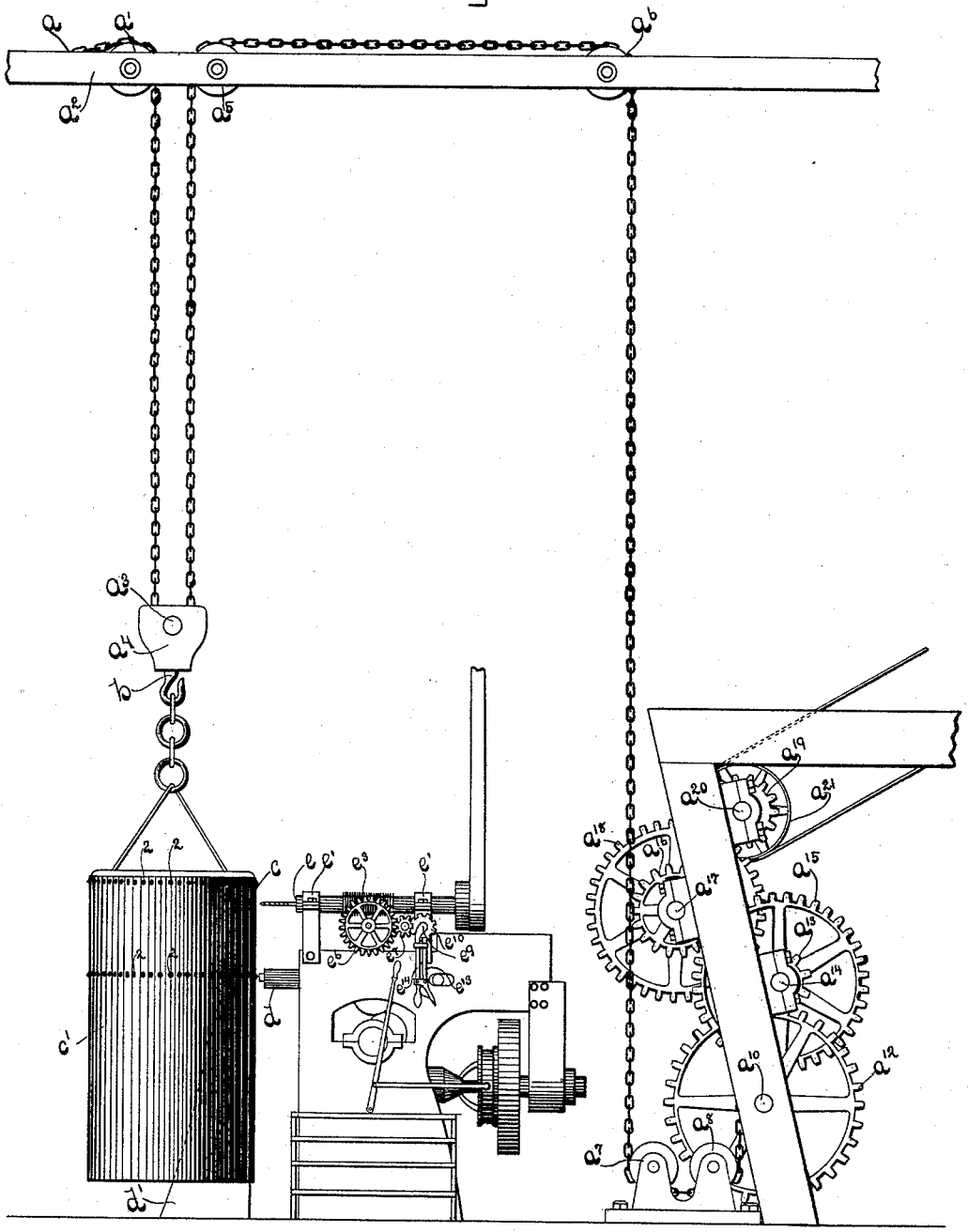
(No Model.) 2 Sheets—Sheet 1.

J. TETLOW.

APPARATUS FOR MAKING BOILERS.

No. 456,918. Patented July 28, 1891.

Fig: 1.



Witnesses:
Edward F. Allen.
Fred'k S. Greenleaf.

Inventor.
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(No Model.) 2 Sheets—Sheet 2.

J. TETLOW.

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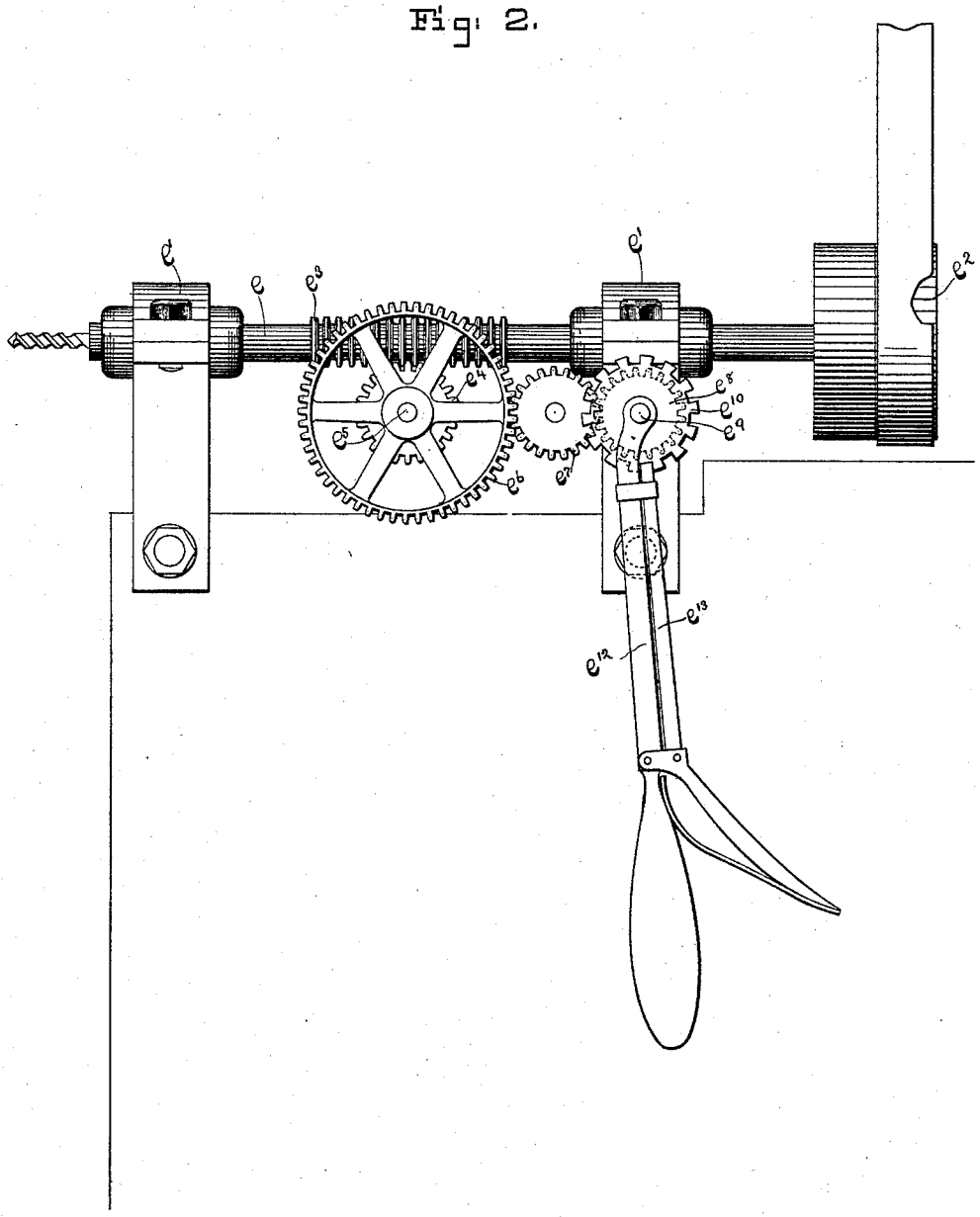
Fig. 2.



Witnesses:
Edward F. Allen
Fred S. Greenleaf.

Inventor:
James Tetlow.
by Crosby & Gregory. Attys.

UNITED STATES PATENT OFFICE.

JAMES TETLOW, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO THE ROBERTS IRON WORKS, OF SAME PLACE.

APPARATUS FOR MAKING BOILERS.

SPECIFICATION forming part of Letters Patent No. 456,918, dated July 28, 1891.

Application filed April 28, 1891. Serial No. 390,792. (No model.)

To all whom it may concern:

Be it known that I, JAMES TETLOW, of Cambridge, county of Middlesex, State of Massachusetts, have invented an Improvement in Apparatus for the Manufacture of Boilers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

In the manufacture of boilers it is now common to punch the holes for the rivets which join the several courses or sections, to then place one course or section having punched holes upon another also having punched holes, so that the said holes will register, and then to introduce and set the rivets. In practice, however, it is absolutely necessary that the courses or sections should fit one upon the other as snugly as possible, and when so made it is a very difficult matter to make the holes register, and as a matter of fact it is but seldom, if ever, that they do exactly register.

This invention has for its object to construct an apparatus for the manufacture of boilers by which the rivet-holes may be drilled, or, if desired, small punched holes may be reamed out after the courses or sections have been fitted or placed one upon another.

In accordance with this invention a suitable crane is employed by which the boiler or any two or more courses or sections thereof are held suspended. A riveting-machine of suitable construction is provided, the setting-tool and operating mechanism of which is located outside the suspended boiler and the stake or anvil of which is located inside the suspended boiler opposite the setting-tool. A suitable boring-machine—such as a drill or reamer—is also provided, which is herein shown as placed on top of the riveting-machine, said boring-machine being operated by any suitable means. Two courses or sections of the boiler having been fitted one upon the other are presented to the drill and a series of holes drilled, after which the said suspended courses or sections are presented to the riveting-machine and the rivets introduced and set. If desired, the holes may be punched of smaller diameter than required, the courses or sections then fitted together, and said punched holes brought to register as nearly as possible after which they are reamed out by a reamer to form the proper-sized hole.

Figure 1 shows in side elevation an apparatus for drilling and riveting boilers embodying this invention, and Fig. 2 an enlarged side view of the drill which I preferably employ.

The crane employed, as herein shown, consists of a chain a, attached to a fixed point, thence passing over a pulley a', supported by a beam a^2, thence down over a pulley a^3, journaled in a block a^4, thence up over a pulley a^5, journaled in the beam a^2, thence over a pulley a^6, journaled in the said beam, and thence down over pulleys a^7 a^8 and around a chain-wheel secured to a shaft a^{10}, to which shaft is secured a toothed wheel a^{12}, engaged by a pinion a^{13}, secured to a shaft a^{14}, to which shaft is secured a toothed gear a^{15}, engaged by a pinion a^{16}, secured to a shaft a^{17}, to which shaft is secured a toothed gear a^{18}, engaged by a pinion a^{19}, secured to a shaft a^{20}, to which shaft is secured a power-driven belt-pulley a^{21}, all said shafts having their bearings in suitable boxes supported by a suitable frame. A hook b is secured to the block a^4, from which are suspended the courses or sections of the boiler to be drilled and riveted. I have herein represented two such courses or sections, as c c', of the boiler suspended from the hook b.

The riveting-machine employed comprises the rivet-setting tool d, and means for operating it, all as usual, and the stake or anvil d', said tool d and stake or anvil being located one at the outside and the other at the inside of the boiler or courses or sections thereof to be riveted, and of suitable height to permit the said boiler or courses or sections thereof to be held suspended by the crane.

The boring-machine, herein represented as a drill consisting of the tool-holding spindle e, is mounted in suitable bearings e' e' and has secured to it a belt-pulley e^2, by which it is rotated. The spindle e is movable longitudinally in its bearings, and has formed on it a series of annular ribs e^3, which are engaged by a pinion e^4, secured to a shaft e^5, to which is secured a toothed wheel e^6, engaged by a pinion e^7, which is in turn engaged by a pinion e^8, (see dotted lines Fig. 2,) secured to

a shaft e^9, to which is fixed a notched wheel e^{10}. A hand-lever e^{12} is arranged loosely on the shaft e^9, which carries a locking device e^{13}, adapted to engage one or another of said notches. The drill thus described, for the purpose of supporting it in elevated position, is located on top of the riveting-machine. The boiler or two or more courses or sections thereof, as *c c'*, to be drilled are fitted together and are held suspended by the crane, as shown in Fig. 1, and when thus held the rivet-setting tool *d* and the drill-holding spindle *e'* are at the outside of said boiler, while the stake or anvil *d'* is at the inside thereof. The courses or sections being thus held suspended, the drill is operated to drill a series of holes, as 2, after which the courses or sections are lowered to present the same series of holes 2 to the rivet-setting machine that the rivets may be introduced and set. In joining the courses or sections together in order to hold them suspended, several holes may be punched and bolts passed through such holes, after which said bolts may be removed. Holes of less diameter than required may be punched in the courses or sections, which are thereafter brought to register with each other as nearly as possible when fitting the said courses or sections together, and the said courses or sections thus fitted together and having the punched holes, as described, are presented to the drill, or it may be simply a reamer, and said holes are reamed out to the proper diameter, and by such reaming are made to accurately register. The courses or sections are then lowered and the rivets introduced and set, as before described.

By the devices herein employed it will be seen that the rivet-holes may be made to accurately register, and that the rivets are introduced and set when the courses or sections are held by the same means employed for holding them when drilling, thereby materially saving time and labor in handling the heavy courses or sections, in addition to the advantages gained by having the rivet-holes accurately register.

I consider the reaming-tool as the equivalent of the drill.

I claim—

1. In an apparatus of the kind described, the combination of the following instrumentalities, viz: a crane for holding a boiler or courses or sections thereof suspended, a boring-machine for drilling or reaming rivet-holes through the joined or fitted courses or sections held suspended, and a rivet-setting machine for setting the rivets introduced in said drilled or reamed holes, all operating as described, and for the purposes set forth.

2. In an apparatus of the kind described, a crane for holding a boiler or courses or sections thereof suspended, combined with a boring-machine for drilling or reaming the rivet-holes through the joined or fitted courses or sections held suspended, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES TETLOW.

Witnesses:
BERNICE J. NOYES,
EDWARD F. ALLEN.