No. 700,118. Patented May 13, 1902.

H. W. HATHORN.

PIPE OR TUBE SAWING MACHINE.

(Application filed May 2, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

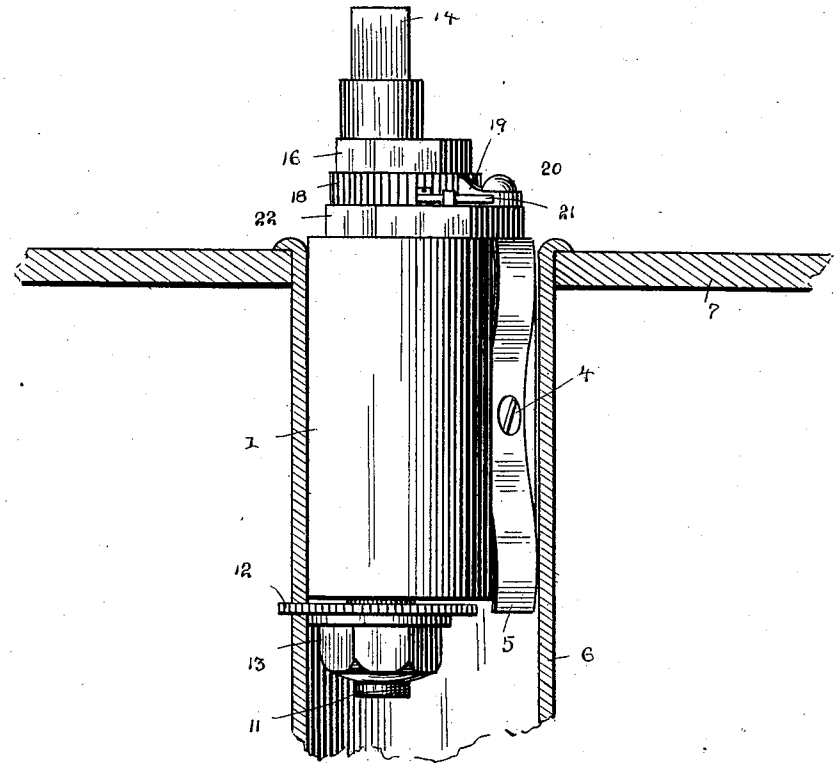
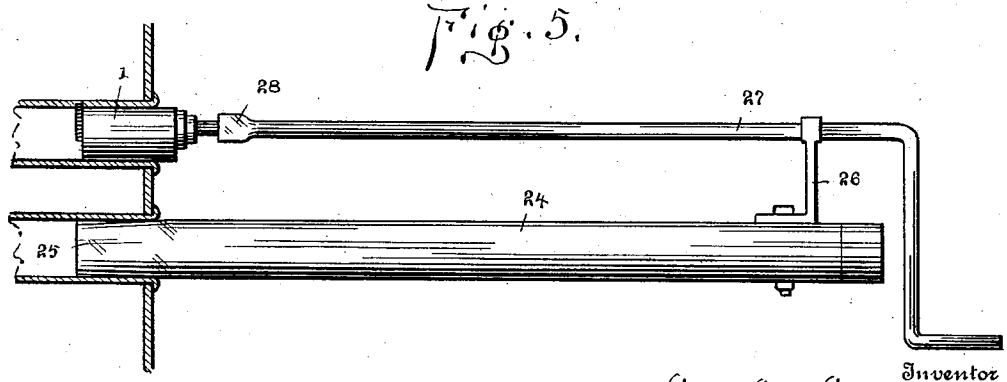


Fig. 5.



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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

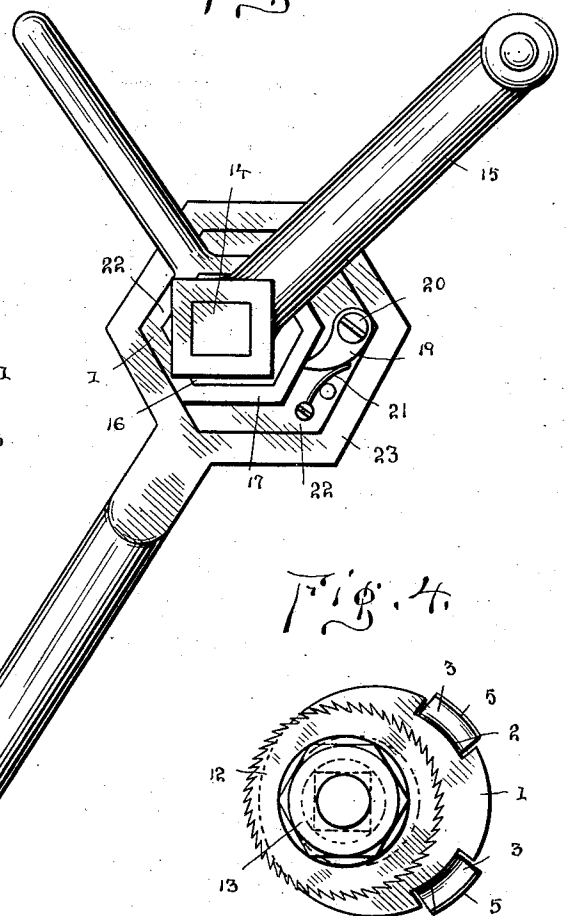


Fig. 3.

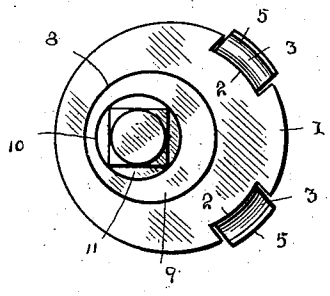


Fig. 4.

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UNITED STATES PATENT OFFICE.

HENRY W. HATHORN, OF MASON CITY, IOWA.

PIPE OR TUBE SAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 700,118, dated May 13, 1902

Application filed May 2, 1901. Serial No. 58,492. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. HATHORN, a citizen of the United States, residing at Mason City, in the county of Cerro Gordo and State of Iowa, have invented new and useful Improvements in Pipe or Tube Sawing Machines, of which the following is a specification.

This invention relates to tube-sawing machines, the principal object of the invention being to provide a simple and convenient machine by means of which pipes or tubes may be sawed in two from the interior and in such a manner as to leave the several ends of the tube perfectly smooth in order that the sections of the tube may be removed through the holes formed for the reception thereof in the tube-sheet or head of a boiler or other supporting-plate in which the tubes are located, thus obviating the necessity for recutting the ends of the tube preparatory to removing or reinstating the same.

With the above general object in view the invention consists in the novel construction, combination, and arrangement of parts hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a section through a tube, showing the machine in operative position therein. Fig. 2 is a plan or end view of the machine, showing the operating cranks and wrenches applied. Fig. 3 is a plan or end view of the machine, omitting the cranks and the wrenches. Fig. 4 is a view of the opposite end of the machine from that shown in Fig. 3. Fig. 5 is a detail elevation of the machine, showing the manner of supporting the operating crank-shaft and also showing a plurality of tubes or flues in section.

Like numerals of reference designate corresponding parts in all figures of the drawings.

The tube-sawing machine contemplated in this invention comprises, essentially, an outer casing or body 1, which is preferably cylindrical and provided at one side with mortises 2, in which are received a pair of positioning-springs 3, preferably secured about centrally to the body 1 by means of screws or other suitable fasteners 4 and having their opposite ends flared or deflected outwardly, as shown at 5, adapting the springs to bear against the inner surface of the pipe or tube 6 to be sawed for holding the opposite side of the body 1 snugly against the inside of the tube, as clearly shown in Fig. 1, in which the tube 6 is shown as connected with a tube-sheet 7, as in the ordinary construction of boilers.

The cylindrical body 1 is provided with an eccentric longitudinal bore 8, in which is rotatably mounted an eccentric bearing 9. The bearing 9 is in turn provided with an eccentric bore 10, in which is received the rotatable mandrel 11, which carries the saw, the latter being indicated at 12 as mounted fast on the mandrel 11 and held thereon by means of a retaining-nut 13.

The mandrel 11 is provided at one end with a wrench-engaging portion 14, adapted to receive a suitable wrench or crank-handle 15, (illustrated in Fig. 2,) whereby rotary motion is imparted to both the mandrel 11 and the saw 12. The eccentric bearing 9 is provided at one end with a polygonal face extension 16 to receive an operating-wrench 17, and said eccentric bearing is further provided with ratchet-teeth 18, adapted to be engaged by a dog 19, pivotally mounted at 20 on the head of the body 1 and normally held in engagement with the ratchet-teeth 18 by means of a spring 21, as illustrated in Figs. 1 and 2. The body 1 is provided at one end with wrench-engaging surfaces 22, adapted to receive a wrench 23, (illustrated in Fig. 2,) whereby the body of the machine may be turned within the tube as the sawing operation proceeds.

In operation the mandrel and the eccentric bearing are turned by means of the wrenches described, so as to draw the saw 12 within the plane of the outer surface of the body 1. The machine is then inserted in the tube, as shown in Fig. 1, after which the eccentric bearing is partially turned, so as to force the teeth of the saw into engagement with the interior of the tube to be sawed and compress the spring 5. The operating-crank is then placed upon the squared end of the mandrel and rotary motion is imparted to the saw, which cuts into the tube and is fed forward by the springs 5, when the saw shall have cut through the wall of the tube or pipe. The wrench 23 is then placed upon the body of the machine, and said body is thereby turned slowly, while at the same time the saw is being revolved by means of the operating-crank 15. This op-

eration is continued until the pipe or tube has been completely severed, after which the saw is moved inward toward the center of the body 1 by means of the wrench 17 and operating-crank 15. By arranging the saw and operating the same in the manner set forth the pipe or tube is severed so as to leave perfectly clean and smooth edges, free from any bur, thus enabling the pipe-sections to be withdrawn through the opening in the tube-sheets or other supports with which the extremities of the pipes or tubes are connected.

In order to provide for properly positioning the machine with respect to the flues or tubes of boilers, I employ a support 24, which may be either in the form of a solid rod or tube having one end tapered, as at 25, for insertion in one of the tubes or flues of the boiler, as shown in Fig. 5. At its outer end the support 24 is provided with a bearing-post 26, in which is journaled an operating crank-shaft 27, which corresponds with the operating-crank 15, (illustrated in Fig. 2,) said crank-shaft having an end socket 28, adapted to fit the squared end of the saw-mandrel. The tapered end of the support 24 is driven tightly into the end of an adjoining tube, and thereby forms a rigid bearing at 26 for the operating-crank 27, leaving the hands free to operate the machine.

The saw employed may either be square or beveled, so that it is adapted to produce either a square cut or a beveled cut, in the latter instance leaving the tubes with a flare, adapting them to be the more readily welded. The machine instead of being driven by hand may be operated by any suitable motive power connected therewith by a flexible shaft or other form of gearing. A steam, compressed-air, or electrically-operated motor or any other preferred form of motor may be employed for driving the machine, as convenience may dictate.

I do not desire to be limited to the details of construction hereinabove set forth, but reserve the right to change, modify, or vary the construction in the scope of the appended claim.

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

A tube-sawing machine comprising a cylindrical and revoluble body, an eccentric bearing rotatably mounted in the body, a revoluble mandrel mounted eccentrically within the bearing, means for revolving the body, bearing and mandrel independently of each other, a ratchet upon the bearing, a pawl upon the body adapted to engage the ratchet, and a saw upon the mandrel, and a spring secured to the body and adapted to press the saw against the tube to be cut and hold the body in operative position.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY W. HATHORN.

Witnesses:
A. WILONZO WILLSON,
WM. H. HATHORN.