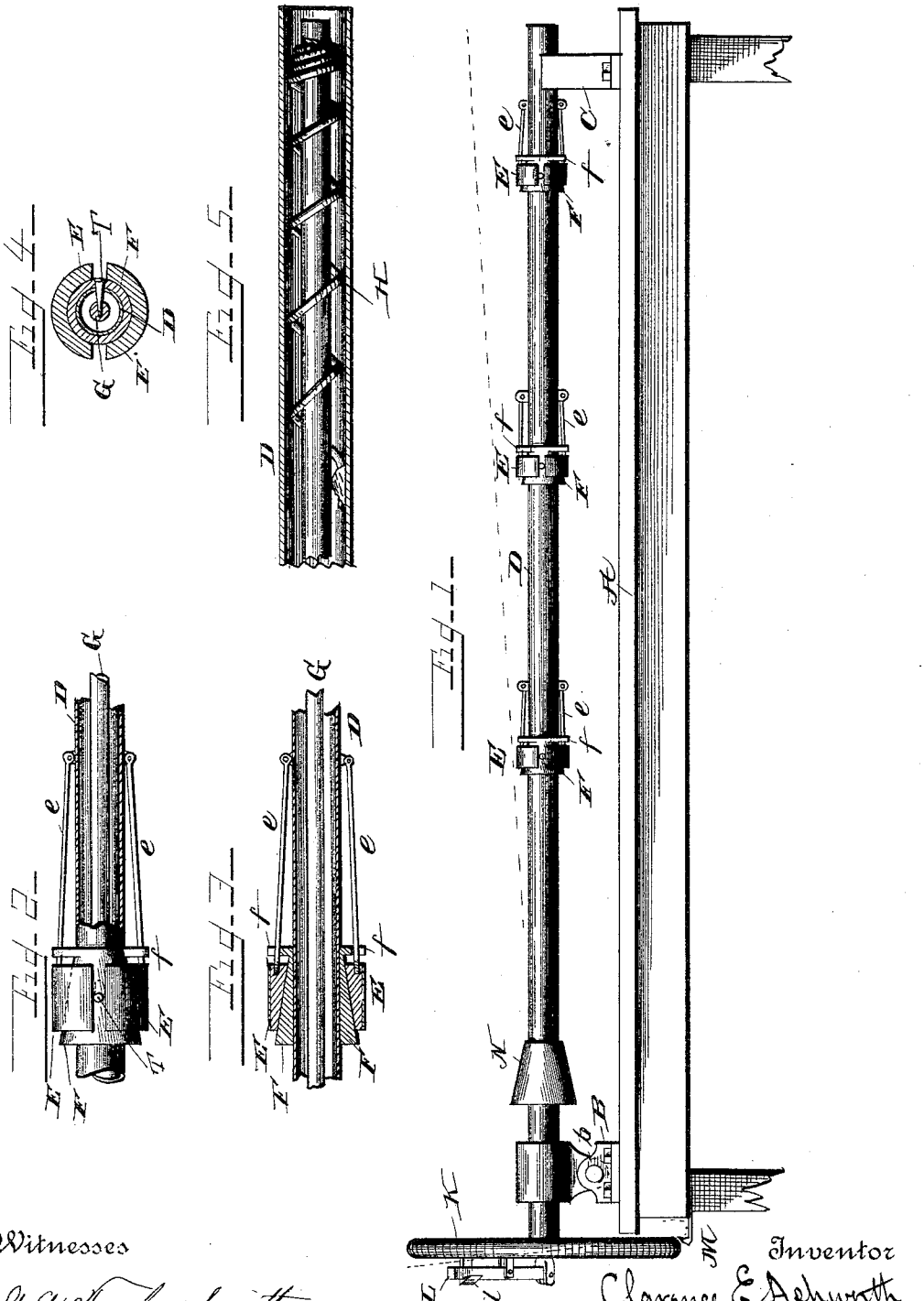
(No Model.)

C. E. ASHWORTH.

PIPE FORMING MACHINE.

No. 410,630. Patented Sept. 10, 1889.



Witnesses

G. A. Taubenschmidt

L. B. Whitaker

Inventor

Clarence E. Ashworth

By his Attorneys

Whitaker & Prout

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CLARENCE E. ASHWORTH, OF MINNEAPOLIS, MINNESOTA.

PIPE-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 410,630, dated September 10, 1889.

Application filed September 28, 1888. Serial No. 286,702. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE E. ASHWORTH, a citizen of the United States, and a resident of the city of Minneapolis, county of Hennepin, and State of Minnesota, have invented certain Improvements in Pipe-Forming Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to a device for holding sections of pipe or tubing while they are being united by soldering, riveting, or otherwise fastening the same at their adjacent edges.

The main features of my invention consist in a shaft provided with devices at intervals of its length, which are adapted to be expanded, and thereby made to grip the interior of the pipe or tube.

My improved device is also serviceable for straightening bent or twisted tubing and for other purposes where it is desired to hold one or more sections of pipe or tubing in position to be operated upon.

In the drawings I have illustrated one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

In the said drawings, Figure 1 is a side elevation of a bench or supporting-table, with my improved pipe-forming machine applied thereto. Fig. 2 is an enlarged view of one of the expansible grippers. Fig. 3 is a longitudinal view of the same. Fig. 4 is a cross-section of the same. Fig. 5 is a section of a portion of the central shaft of the apparatus, showing a spring located therein.

A represents the bench or table which supports the apparatus.

B and C are bearings secured to the table A, which serve to support the hollow shaft D. The bearing C engages the shaft D on the lower side only, and the bearing B is pivoted to swing and thereby allow the shaft to be raised and lowered out of and into engagement with the bearing C. In the drawings I have shown the bearing B provided with a flattened portion pivoted in ears *b*, secured to the table A.

The shaft D is provided at suitable intervals with segments E, which nearly or quite surround the said shaft-forming rings. These rings may consist of two or more segments E, and each segment is pivotally connected to the shaft D by means of a rod or link *e*, which is pivoted to the said shaft. I provide the shaft D with wedges F, which are adapted to engage the inner face of the rings, and when moved toward the same to expand said rings by moving the segments E farther from the shaft D. These wedges are provided with notched ears *f*, which engage the rods *e* of the segments and guide the wedges in their movement. In order to move the wedges F simultaneously and expand all of the rings together, I provide the interior of the hollow shaft D with a rod G, to which all of the wedges F are secured by means of screws or pins T, passing through slots formed in the shaft D, to permit of the longitudinal movement of said wedges, as best seen in Figs. 2 and 4.

In order to secure the longitudinal movement of the rod G, I provide a spring H, which is attached to said rod G at or near one end of the same, and connect said spring by suitable means with the shaft D. This spring is so arranged that it will force the rod in such a direction as will expand the segments E by means of the wedges F. One end of the shaft D is preferably provided with a balance-wheel K, by which motion may be imparted to the shaft D sufficient to revolve it several times to facilitate the operation of soldering the adjacent edges of pipe or tubing or for other purposes. The wheel K is here shown as being provided with a hand-lever L, pivoted thereto, one end of which is connected to the rod G. When said lever is operated, the rod will be moved longitudinally against the spring H, thereby compressing the same, and the rod G may be secured in this position by a spring locking-latch *l* on the wheel K.

I have shown the table A provided with a spring locking-latch M for engaging the wheel K when the opposite end of the shaft D is raised out of engagement with bearing C for holding said shaft in an elevated position while the sections of pipe or tubing are being placed over the shaft D. I have also shown the shaft D provided with a fixed cone-shaped collar N, which is adapted to receive one end of the pipe which is first placed over the shaft D to

secure the proper centering of the same. It will be seen that by making this collar cone-shaped I am enabled to accomplish this result.

The operation of the device is as follows: The shaft D is raised out of engagement with the bearing C and held in its elevated position by the spring-latch M, while the sections of pipe to be united are being placed over the shaft D. The first section will be engaged at one end by the cone-shaped collar N, and the other end will be engaged by the segments E of the expansible ring. The next section will engage two of the expansible rings, and so on, the distance between the rings being such that the adjacent ends of two sections of tubing will be engaged by the segments of one ring. The lever L is then released, and the spring H will force the rod G and wedges to move longitudinally of the shaft D, thereby expanding the segments E and forcing them to grip the pipes or tubing at the points of union. The sections of pipe may then be united by any preferred means. If by soldering, the wheel K may be rotated to facilitate the operation, as before described.

If it is desired to straighten a pipe which has been indented, the pipe is placed over the shaft D, with the indented portion over one of the expansible segments. When the spring H is released, the segments will expand and straighten the pipe or tube. When the lever L is operated, it will withdraw the wedges, forcing the segments to release the sections of pipe or tube, and at the same time compress the spring H, when the apparatus is in operative position.

What I claim, and desire to secure by Letters Patent, is—

1. In a pipe forming and straightening machine, the combination, with the supporting-shaft, of segments mounted thereon and secured thereto, and wedges for expanding said segments mounted on said shaft, adapted to slide longitudinally thereof and to engage the inner faces of said segments, substantially as described.

2. In a pipe forming and straightening machine, the combination, with the supporting-shaft, of segments mounted thereon and pivotally secured thereto, sliding wedges for expanding said segments mounted on said shaft, adapted to slide longitudinally thereof and to engage the inner faces of said segments, and an actuating-rod for moving said wedges, substantially as described.

3. In a pipe forming and straightening machine, the combination, with a hollow supporting-shaft provided with slots, of segments pivotally mounted on said shaft, sliding wedges for expanding said segments laterally, an actuating-rod capable of longitudinal movement through the hollow shaft, and connections between the said wedges and actuating-rod passing through the slots of the hollow shaft, substantially as described.

4. In a pipe forming and straightening machine, the combination, with the hollow supporting-shaft, of segments mounted thereon and pivoted thereto, sliding wedges for expanding said segments, a rod capable of longitudinal movement within said shaft for actuating said wedges, a spring connected to said rod and to said shaft for moving the rod in one direction, and a lever connected to the said rod for moving it in the opposite direction against the said spring, substantially as described.

5. In a pipe forming and straightening machine, the combination, with the hollow supporting-shaft, of segments mounted thereon and pivoted thereto, sliding wedges for expanding said segments, an actuating-rod for said wedges, a spring for moving said rod in one direction, a lever for moving said rod in the opposite direction and compressing said spring, and a locking device for said lever for holding the spring compressed, substantially as described.

6. In a pipe-forming device, the combination, with the supporting-shaft and expansible segments, of a conical centering-collar mounted on said shaft, substantially as described.

7. In a pipe forming and straightening machine, the combination, with the supporting-shaft mounted in suitable bearings, of segments mounted thereon and secured thereto, wedges for expanding said segments mounted on said shaft, adapted to slide longitudinally thereof and engaging the inner faces of said segments, said shaft being capable of rotating in its bearings, and thereby rotating said segments and wedges, substantially as described.

8. In a pipe forming and straightening machine, the combination, with the supporting-shaft provided with a balance-wheel, of bearings for said shaft, one of said bearings engaging said shaft on the under side only, the other of said bearings being pivoted, and a spring-latch for engaging said balance-wheel and holding said shaft in an elevated position, substantially as described.

CLARENCE E. ASHWORTH.

Witnesses:
C. F. ROGERS,
C. M. PARDOE.