

No. 633,389.

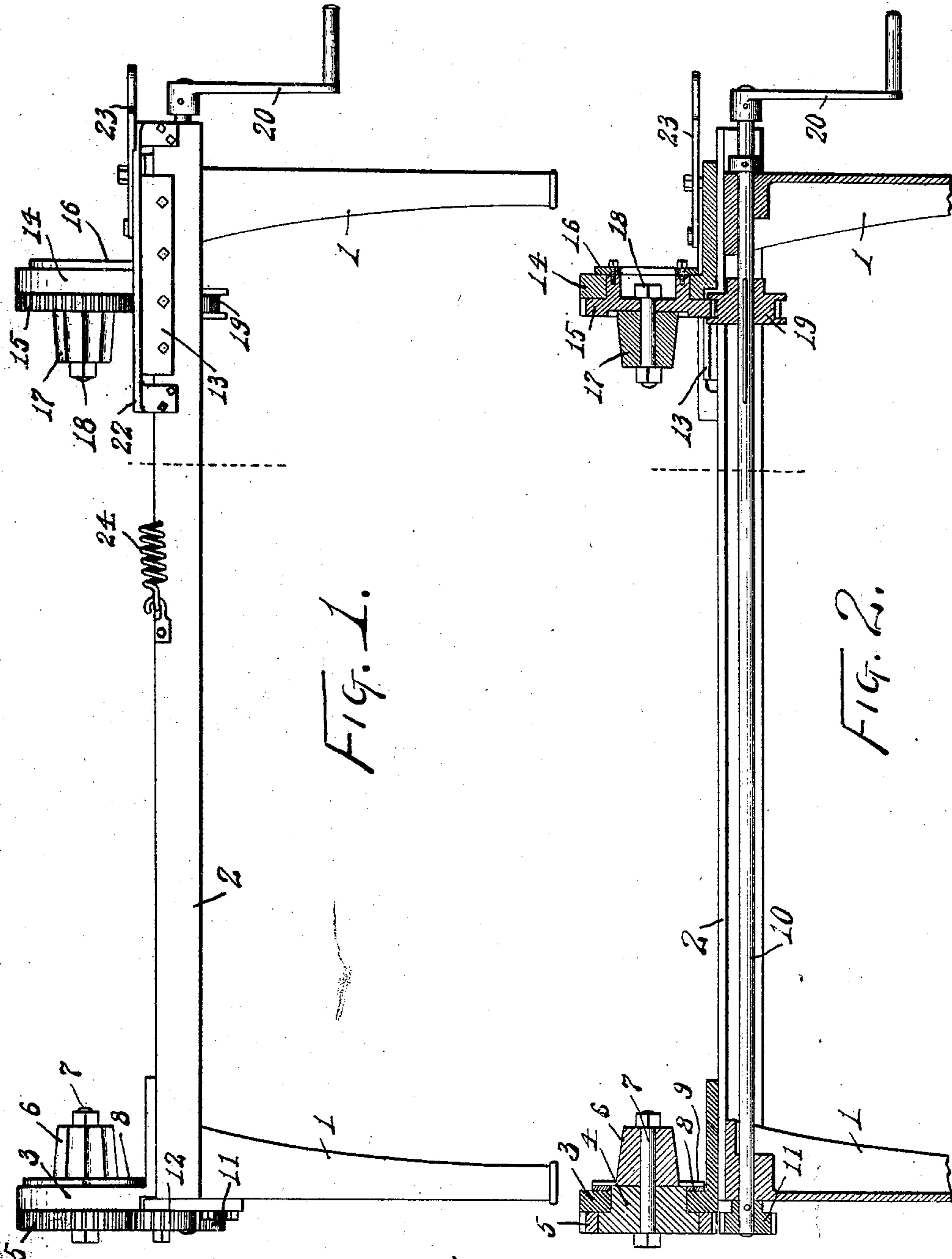
Patented Sept. 19, 1899.

W. M. REYNOLDS.
PIPE TWISTING MACHINE.

(Application filed June 21, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
E. R. Shipley.
M. S. Belden.

William M. Reynolds Inventor
by James W. See
Attorney

No. 633,389.

Patented Sept. 19, 1899.

W. M. REYNOLDS.
PIPE TWISTING MACHINE.

(Application filed June 21, 1899.)

(No Model.)

2 Sheets—Sheet 2.

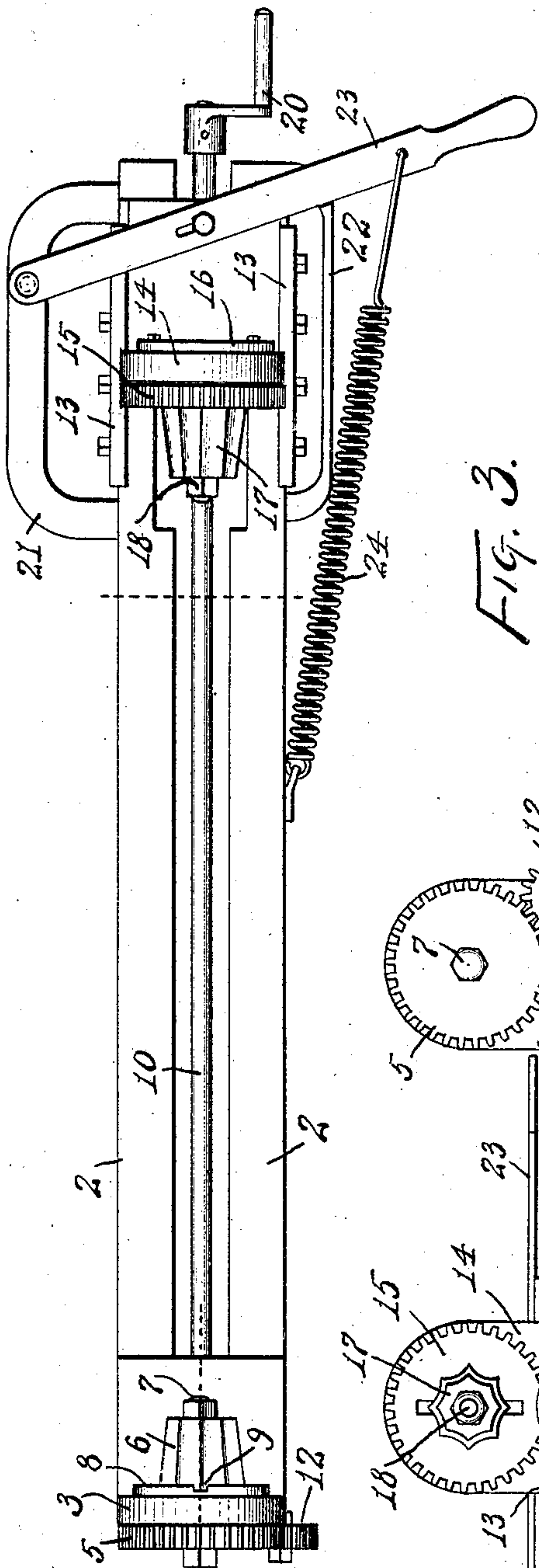


FIG. 3.

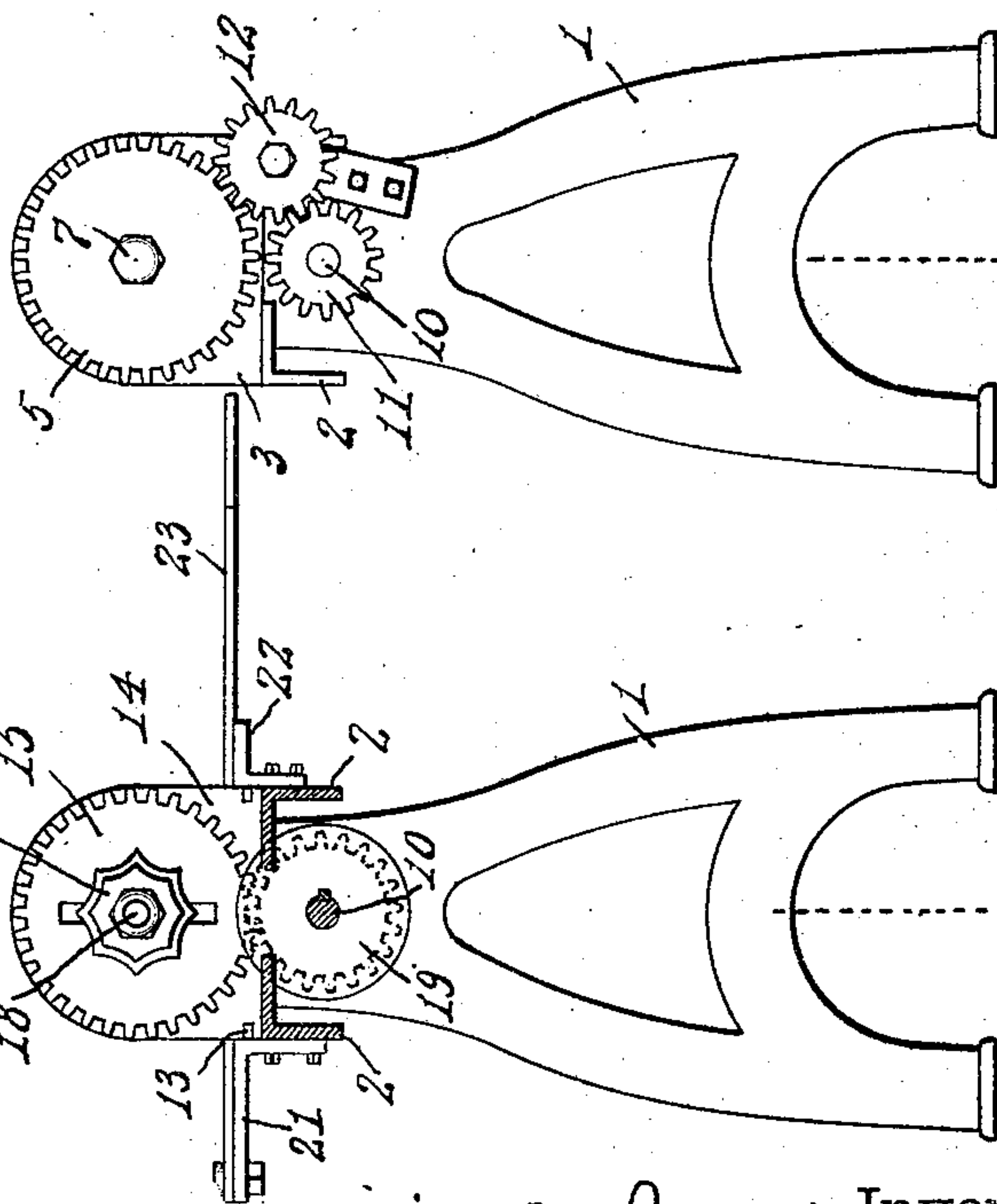


FIG. 4.

FIG. 5.

Witnesses:
E. Shipley.
M. S. Belden.

William M. Reynolds Inventor
by James W. See
Attorney

UNITED STATES PATENT OFFICE.

WILLIAM M. REYNOLDS, OF CINCINNATI, OHIO, ASSIGNOR TO THE
AMERICAN STEEL ROOFING COMPANY, OF SAME PLACE.

PIPE-TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 633,389, dated September 19, 1899.

Application filed June 21, 1899. Serial No. 721,291. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. REYNOLDS, a citizen of the United States, residing at Cincinnati, Hamilton county, Ohio, have invented certain new and useful Improvements in Pipe-Twisting Machines, of which the following is a specification.

This invention pertains to improvements in machines for twisting corrugated sheet-metal pipes.

The manufacture of corrugated twisted sheet-metal pipes in the manner contemplating the employment of my present machine may be briefly described as, first, forming a cylindrical sheet-metal pipe by rolling and seaming a sheet whose ends are cut on bevels, so as to form helical extremities to the pipe; second, longitudinally corrugating the pipe, and, third, twisting the corrugated pipe, the twisting operation, causing one member of the seam to creep endwise with reference to the other member, whereby the helical quality at the end of the pipe disappears. The present machine is for twisting the pipe.

My improved machine will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine, a portion of spring 24 being omitted; Fig. 2, a vertical longitudinal section of the same; Fig. 3, a plan of the same; Fig. 4, an elevation of the tail end of the machine, the tail end being at the left in Figs. 1, 2, and 3; and Fig. 5, a vertical transverse section of the machine viewed in the same direction as Fig. 4.

In the drawings, 1 indicates the legs of the machine; 2, a pair of angle-bars disposed parallel and secured at their ends to the legs and forming the bed-plate of the machine; 3, the tail-stock, secured at one end of the bed-plate; 4, the tail-spindle, journaled in the tail-stock; 5, a spur-gear fast on the tail-spindle; 6, a tapering corrugated plug secured removably against the inner face of the tail-spindle concentric with the journal thereof and projecting toward the opposite end of the machine; 7, a bolt passing axially through the tail-spindle and plug 6 and serving to secure the plug removably to the tail-spindle; 8, a collar

on the inner end of the tail-spindle; 9, a tongue and groove diametrically disposed in the facial joint between the tail-spindle and plug 6 and serving as a dog, by means of which the plug is forcibly turned by the tail-spindle, the illustration showing the groove as being formed in the tail-spindle and the tongue as being formed on the plug; 10, a longitudinal shaft mounted in the framing parallel with the axis of the tail-spindle and extending from one end of the machine to the other; 11, a pinion on the tail end of said shaft in the vertical plane of gear 5; 12, an idle intermediate gear running loose on a stud at the tail end of the framing, this gear engaging pinion 11 and gear 5 and serving to cause the tail-spindle to turn in the same direction as shaft 10; 13, a pair of angle-irons secured to the head end of the bed-plate and forming slide-guides for the head-stock; 14, the head-stock, mounted for sliding motion on guides 13; 15, a head-spindle journaled in the head-stock and having a gear similar to that of the tail-spindle; 16, a collar on the outer end of the head-spindle; 17, the head-plug, similar to tail-plug 6 and having similar tongue-and-groove engagement with its spindle; 18, the axial bolt for coupling the head-plug to the head-spindle; 19, a pinion splined on shaft 10 and shrouded to and engaging directly with the gear of the head-spindle, whereby the two spindles move longitudinally with the head-stock and turn in opposite directions as shaft 10 is turned; 20, a hand-crank on shaft 10; 21, a fulcrum-brace secured at one side of the head of the bed-plate; 22, a stop-brace secured at the opposite side of the head of the bed-plate and having a notch at its outer end; 23, a hand-lever fulcrumed on brace 21 and pivoted to head-stock 14 and projecting outwardly over brace 22 and adapted to lie in the notch of the latter brace when moved to outward position, and 24 a spring engaging the bed-plate and lever 23 and serving to urge the lever and head-stock toward the tail-stock.

The corrugated sheet-metal pipe to be twisted is, as before intimated, so formed as to have helical ends offsetting at the seam of the pipe. The plugs 6 and 17 are of such size and contour as to partly enter the ends

of the pipe. The distance between the two plugs is to be such as to readily admit the length of pipe when the head-stock is in its retracted position with the lever in the notch.

5 The corrugated pipe being taken in hand is to have its tail end placed into engagement with tail-plug 6, its head end then being brought into alinement with head-plug 17, after which lever 23 is raised from its notch in stop-brace
10 22, the lever then being swung to the left till head plug 17 enters the head end of the pipe, the spring serving to produce this advancing motion of the head-stock as soon as the lever is released from the notch. The pipe is thus
15 brought into engagement with the two plugs, the spring tending to urge the head-plug toward the tail-plug. The hand-crank is now turned the desired number of turns for twisting the pipe. During this twisting operation
20 one end of the pipe is turned in one direction, while the other end is turned in the other direction, one of the seam members of the pipe creeping to the left, while the other member creeps to the right, the helical ends of the pipe
25 formed by the offsets of the seam becoming neutralized by the creeping of the seam members, the pipe ends readjusting themselves endwise upon the plugs as the twisting progresses, the spring constantly moving the
30 head-stock toward the tail-stock to keep the plugs into proper tight engagement with the pipe ends as the character of the pipe ends change from the helical to the plane and as the pipe becomes shortened by the twisting operation. The pipe thus becomes uniformly
35 twisted and without any distortion of its ends where they are engaged by the plugs. The twisting having been completed, the lever is swung to the right and into engagement with
40 its notch in the stop-brace, thus retracting the head-stock and permitting the removal of the finished pipe and leaving the machine in condition for the reception of the next pipe.

The plugs are removable from their spindles in order that plugs may be selected and employed suited to the size of pipe to be twisted.

I claim as my invention—

1. In a pipe-twisting machine, the combination, substantially as set forth, of a pair of tapering corrugated plugs arranged in a common axial line, a head-stock carrying one of said plugs and adapted for movement to and from the other plug, and means for rotating
55 said plugs relative to each other.

2. In a pipe-twisting machine, the combination, substantially as set forth, of a pair of tapering corrugated plugs arranged in a common axial line, a head-stock carrying one of
60 said plugs and adapted for movement to and from the other plug, means for rotating said plugs relative to each other, and a spring arranged to urge one of said plugs toward the other.

65 3. In a pipe-twisting machine, the combination, substantially as set forth, of a pair of tapering corrugated plugs arranged in a com-

mon axial line, a head-stock carrying one of said plugs and adapted for movement to and from the other plug, and means for rotating
70 said plugs simultaneously in opposite respective directions.

4. In a pipe-twisting machine, the combination, substantially as set forth, of a pair of tapering corrugated plugs arranged in a common axial line, a head-stock carrying one of
75 said plugs and adapted for movement to and from the other plug, means for rotating said plugs simultaneously in opposite respective directions, and a spring arranged to urge one
80 of said plugs toward the other.

5. In a pipe-twisting machine, the combination, substantially as set forth, of a bed-plate, a tail-stock secured thereto, a tail-spindle arranged for rotation in said tail-stock, a
85 tapering corrugated plug secured to said tail-spindle, a head-stock mounted for sliding motion on the head end of the bed-plate, a head-spindle journaled therein, a tapering corrugated plug secured to said head-spindle,
90 a shaft mounted longitudinally in said bed-plate, gearing connecting said shaft with said spindles so as to turn the spindles in opposite relative directions, and a hand-lever connected with the head-stock and adapted to move
95 it longitudinally relative to the bed-plate.

6. In a pipe-twisting machine, the combination, substantially as set forth, of a bed-plate, a tail-stock secured thereto, a tail-spindle arranged for rotation in said tail-stock, a
100 tapering corrugated plug secured to said tail-spindle, a head-stock mounted for sliding motion on the head end of the bed-plate, a head-spindle journaled therein, a tapering corrugated plug secured to said head-spindle,
105 a shaft mounted longitudinally in said bed-plate, gearing connecting said shaft with said spindles so as to turn the spindles in opposite relative directions, a hand-lever connected with the head-stock and adapted to move it
110 longitudinally relative to the bed-plate, and a spring connected with said head-stock and tending to urge it toward the tail-stock.

7. In a pipe-twisting machine, the combination, substantially as set forth, of a bed-plate, a tail-stock secured thereto, a tail-spindle arranged for rotation in said tail-stock, a
115 tapering corrugated plug tongue-and-grooved to said tail-spindle, a head-stock mounted for sliding motion on the head end of the bed-plate, a head-spindle journaled therein, a tapering corrugated plug secured to said head-spindle, a shaft mounted longitudinally in said bed-plate, gearing connecting
120 said shaft with said spindles so as to turn the spindles in opposite relative directions, a hand-lever connected with the head-stock and adapted to move it longitudinally relative to the bed-plate, and axial bolts engaging the spindles and tapering plugs.

WILLIAM M. REYNOLDS.

Witnesses:

J. W. SEE,
JAMES FITTON.