

(No Model.)

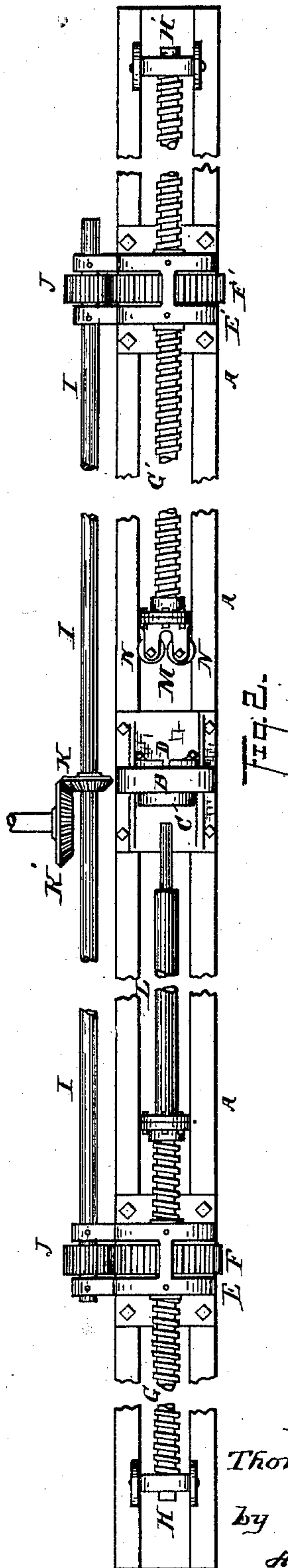
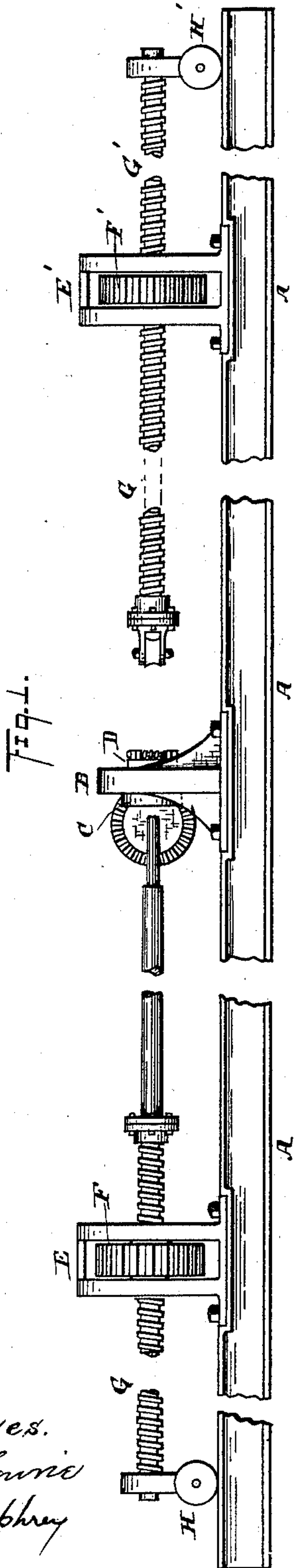
2 Sheets—Sheet 1.

T. J. BRAY.

MACHINE FOR COLD DRAWING METALLIC PIPE.

No. 441,927.

Patented Dec. 2, 1890.



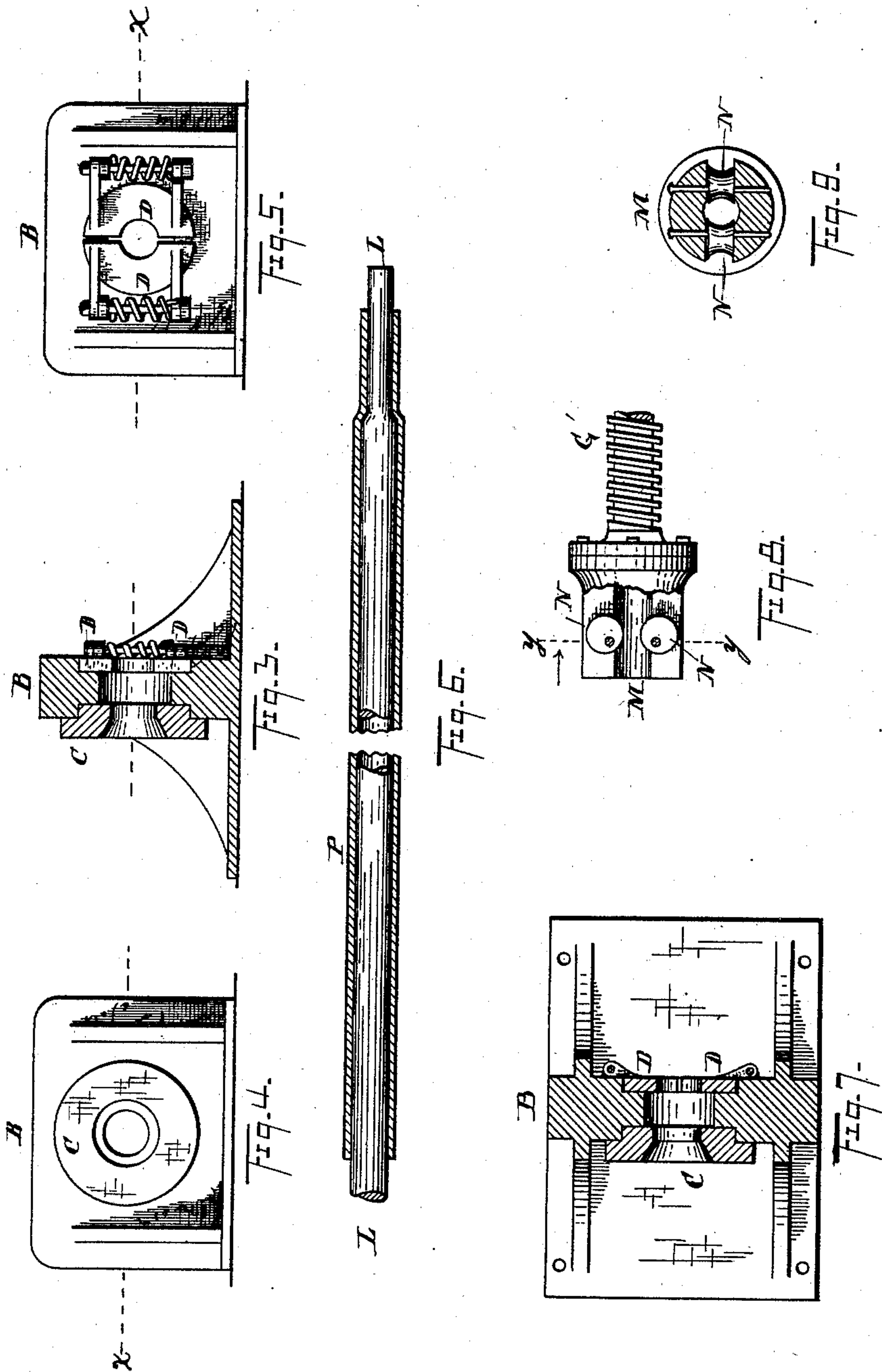
Witnesses.
Belle S. Louie
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2 Sheets—Sheet 2.

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Witnesses.

Charles S. Gowrie,
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Inventor.

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UNITED STATES PATENT OFFICE.

THOMAS J. BRAY, OF WARREN, OHIO, ASSIGNOR OF ONE-HALF TO THE
PAIGE TUBE COMPANY, OF SAME PLACE.

MACHINE FOR COLD-DRAWING METALLIC PIPE.

SPECIFICATION forming part of Letters Patent No. 441,927, dated December 2, 1890.

Application filed June 10, 1890. Serial No. 354,971. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. BRAY, a citizen of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented a certain new and useful Improvement in Machines for Cold-Drawing Metallic Pipe, of which the following is a specification.

My invention has relation to improvements in machines and devices for cold-drawing metallic pipe to reduce their internal and external diameters and compress the surfaces of the metal; and it has for its objects to provide devices by which the pipe to be reduced may be simultaneously drawn and forced through the die from opposite sides of the head-block, to secure a smooth and substantially polished surface for the interior and exterior of the pipe, to furnish simple and effective means for stripping the completed pipe from the mandrel, and, generally, to produce new and effective mechanism for securing the above results.

To the aforesaid objects my invention consists in the peculiar and novel mechanism and combination of parts hereinafter described, and then specifically claimed, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a side elevation of one form of my improved machine; Fig. 2, a plan of the same; Fig. 3, a vertical central longitudinal section of the head-block, showing attached parts; Figs. 4 and 5, an end elevation from opposite sides of the same; Fig. 6, a longitudinal elevation of a part of the mandrel and inclosing-pipe, shown in section; Fig. 7, a plan of the head-block, shown in section at the line *xx* of Figs. 3, 4, and 5; Fig. 8, a plan of the draw-head, a portion cut away to show the operative mechanism; and Fig. 9, a section of the same at the line *yy* of Fig. 8.

The operative parts of my machine shown in the application are mounted on a long bed A, preferably similar to a lathe-bed, and consist of a head-block B, situated substantially at the center of said bed and attached thereto by bolts or equivalent devices. In one face of

this head-block is a recess to receive the die-block C and in the opposite face a corresponding recess for the stripping-jaws D, hereinafter described. Substantially equidistant from the head-block B in each direction are bearings E E', similar in construction and attached to the frame A in substantially the same manner. Mounted in the bearings are gear-wheels F F', having hollow internally-screw-threaded axles. Meshing in these axles are screw-threaded shafts G G', each provided at its outer end with supporting-rollers H H', which run on the top of the frame A or other preferred surface.

Journaled in brackets extending from the bearings E E' is a counter-shaft I, bearing near each end pinions J J', which mesh in the wheels F F', and at its center a bevel gear-wheel K, which meshes with a driving-wheel K', operated by the driving mechanism.

On the inner end of screw-threaded shaft G is attached a mandrel L of the size for the interior of the pipe and having the inner end as shown and for a purpose to be stated.

Attached to the inner end of the screw-threaded shaft G is a draw-head M, consisting of two jaws, in which are eccentrically-mounted groove wheels or pulleys N N, so arranged that when the reduced end of the pipe, hereinafter mentioned, enters between them the retrograde movement of the draw-head will cause them to grasp it.

In the recess in the head-block B, toward the mandrel L, is a detachable die-block C, and in the opposite recess are stripping-jaws D, consisting of a pair of semicircular doors hinged to the head-block and constantly pressed inward by coiled springs on their hinge-pivot or by other approved or desired device.

In operation sections of malleable metallic pipe, as P, welded in the usual manner and of a size to readily slide on the mandrel L, are reduced at one end by forging or equivalent process to adapt them to fit on the reduced end of the mandrel L. These sections are then placed in an acid bath, which removes the coatings of oxides incident to such pipe, which process is termed by those skilled in the art as "pickling." A section of pipe is

then placed on the mandrel L and carried forward until the reduced end passes through the die-block C past the stripping-jaws D, which swing outward to permit its passage, and is grappled by the draw-head M. The screw-threaded shafts G G' are then simultaneously moved in unison by the counter-shaft I and operate severally to push and draw the pipe P, mounted on the mandrel L, through the die C, wherein its external periphery is forced inward and its internal periphery is compressed against the mandrel L. When the pipe P passes the stripping-jaws D, they close against the mandrel L back of the pipe. The motion of the same threaded shaft G is then reversed and the mandrel L drawn back through the die-block C and out of the pipe P, which is prevented from returning by the stripping-jaws D, and which has by reason of compression against the mandrel L and die-block C a polished inner and outer surface.

I do not intend by the description hereinbefore given to confine my invention to the exact devices shown in the accompanying drawings, as various changes may be made therein—as, for instance, beveled gear-wheels may be used in place of the wheels F F'; or worm-wheels actuated by a worm-gear be similarly employed, other stripping devices closing back of the pipe P may be substituted for the gate D, different draw-heads may be used to grasp the reduced end of the pipe and mandrel, and different actuating mechanism may be substituted for the screw-threaded axles of the wheels F F', the purpose of the foregoing specification being to illustrate one form of my invention, which I desire to protect by Letters Patent, and on which

I claim—

1. The combination, with a supporting-base and a head-block intermediately mounted thereon, arranged to receive a die-block and sustain stripping-jaws, of a mandrel and a draw-head disposed in alignment on opposite sides of said head-block and severally mounted on screw-threaded shafts, said shafts being mounted in revoluble screw-threaded bearings and arranged to simultaneously move in the same direction, substantially as shown and described.

2. A machine for cold-drawing metallic pipe, embodying a base, a head-block intermediately mounted thereon, bearing a die-block and stripping-jaws, a mandrel to form the interior of the pipe, a gripping device to retain the pipe on said mandrel, said mandrel and gripping device being severally mounted on screw-threaded shafts journaled in revoluble screw-threaded bearings and arranged to simultaneously move said mandrel and gripping device in the same direction, substantially as shown and described.

3. The combination, with a base and a head-

block intermediately mounted thereon and bearing a die-block, of a mandrel having a reduced end arranged to enter said die-block, and a gripping device arranged to seize the reduced end of said mandrel, said mandrel and gripping device being severally mounted on screw-threaded shafts journaled in revoluble screw-threaded bearings and arranged to simultaneously move said mandrel and gripping device in the same direction, substantially as shown.

4. The combination, with the head-block, the die-block mounted thereon, and the mandrel arranged to pass through said die-block and carry the pipe to be compressed, of a stripping device, as metallic plates, arranged to engage the end of the pipe and prevent its return with the mandrel in its retrograde movement, substantially as shown and described.

5. The combination, with a base, an intermediately-mounted head-block bearing a die-block, and a mandrel and gripping device disposed in alignment on opposite sides of the head-block, said mandrel and gripping device being severally mounted on screw-threaded shafts journaled in revoluble screw-threaded bearings, and arranged to simultaneously move said mandrel and gripping device in the same direction, of stripping-jaws mounted on said head-block and arranged to automatically close on the mandrel back of the pipe, substantially as shown and described.

6. The combination, with a supporting-bed and a head-block intermediately mounted thereon, of screw-threaded shafts mounted thereon on opposite sides of said head-block in revoluble screw-threaded bearings, and bearing, respectively, a mandrel and a gripping device, substantially as shown and described.

7. The combination, with the frame A and head-block B, bearing the die-block C and stripping-plates D, and the screw-threaded shafts G G', bearing, respectively, the mandrel L and draw-head M, of the gear-wheels E E', having internal screw-threads, as pinions J J', for simultaneously moving said wheels in the same direction, substantially as shown and described.

8. The combination, with the frame A, head-block B, bearing the die-block C and stripping-plates D, and the screw-threaded shafts G G', bearing, respectively, the mandrel L and gripping device M, of the gear-wheels F', having hollow internally-screw-threaded journals, and the counter-shaft I, bearing pinions J J', which mesh with said gear-wheels, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand.

THOS. J. BRAY.

In presence of—

H. A. MILLER,

H. R. GILBERT.