(No Model.)

C. P. HIGGINS.

TUBE PUNCHING MACHINE.

No. 337,330. Patented Mar. 2, 1886.

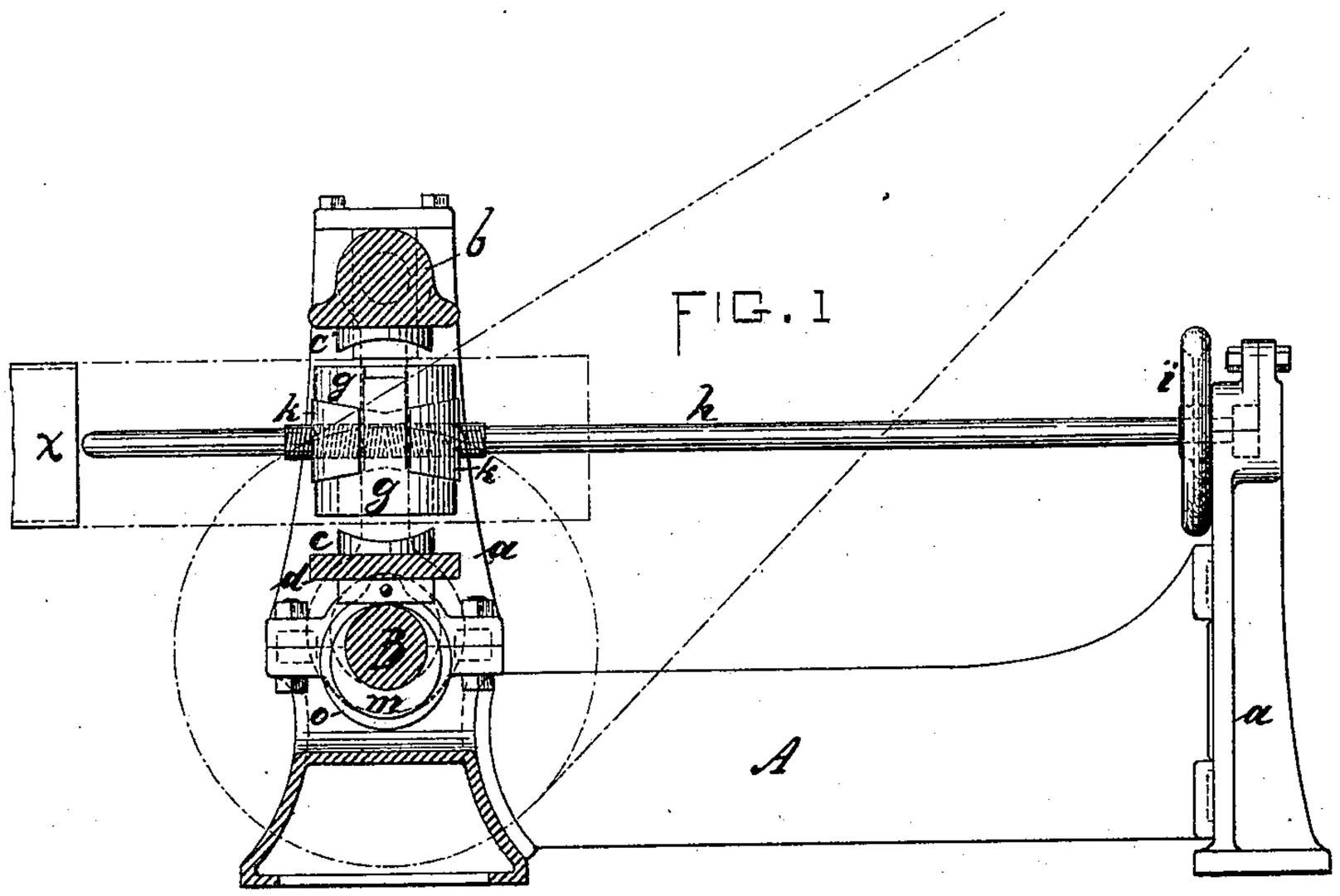

FIG. 1

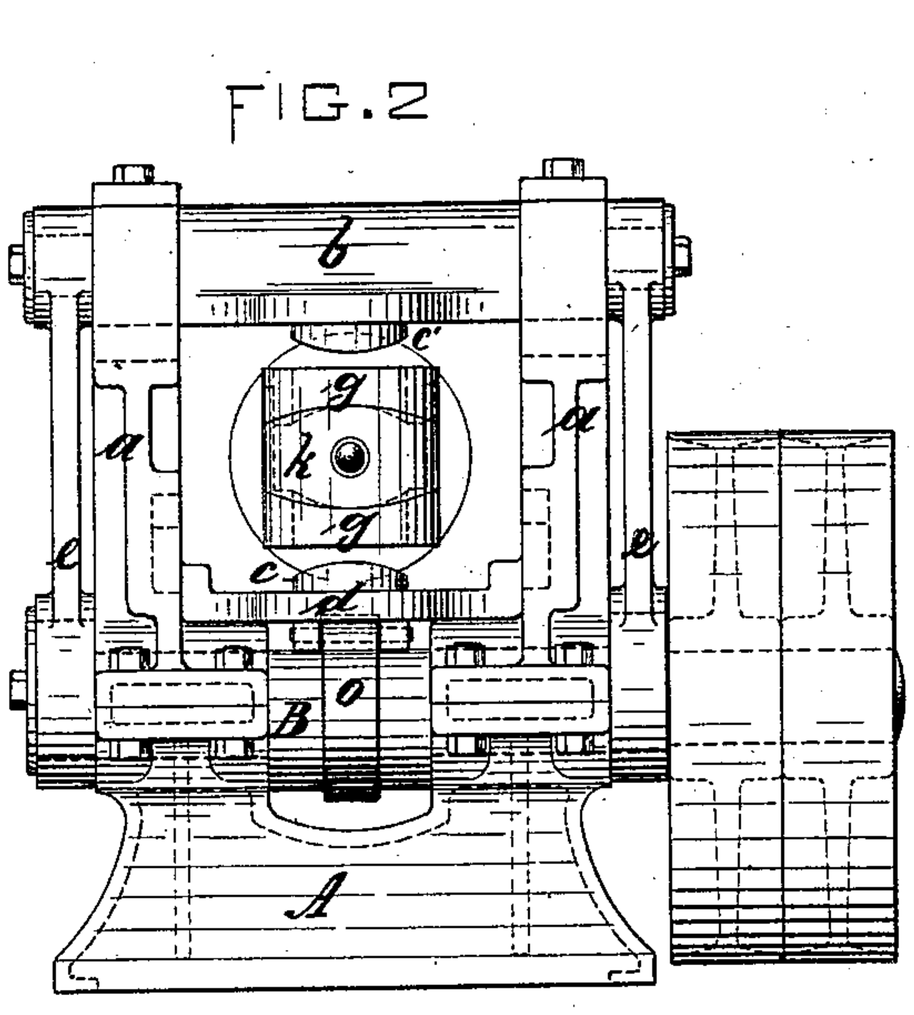

FIG. 2

WITNESSES:

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TUBE-PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 337,330, dated March 2, 1886.

Application filed November 6, 1885. Serial No. 182,019. (No model.)

To all whom it may concern:

Be it known that I, CAMPBELL P. HIGGINS, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented a new and useful Improvement in Machines for Punching Holes Through the Sides of Long Tubes or Pipes, of which the following is a specification, reference being had to the accompanying drawings, forming a part of the same, in which—

Figure 1 is a side view partly in section, and Fig. 2 an end elevation of a machine embodying my invention.

In the present instance this invention is designed to punch holes in one or opposite sides of long tubes or pipes for the reception of branch pipes, and to form hand-holes on the opposite side of the tube directly in front of the openings to which the branch pipes are connected.

In the drawings a machine is illustrated in which the frame-work is composed of a base, A, standards *a*, and cross-beam *b*, the operative parts of the machine consisting of a driving-shaft, B, upon which is journaled a punch-carrier, *d*, and eccentrics *e e*.

c c' represent the punches, the lower one, *c*, being connected with the driving-shaft B by means of the carrier *d* and strap *o*, that engages with an eccentric or cam upon the shaft B, and by means of which the punch *c* is operated. The punch *c'* is connected to the cross-bar *b* and derives its movement through the eccentrics *e e*, and connected cross-bar *b*, that is adapted to slide vertically within the standards *a a*.

The mandrel is composed of the parts *g g*, that form the dies, and the intermediate wedge-blocks, *k k*, and is carried and adjusted upon the rod *h*, the latter being connected to the frame of the machine and operated by the hand-wheel *i*. The parts *g g* of the mandrel that form the dies are constructed with inclined surfaces converging toward the center and corresponding with the opposite acting-faces of the interposed wedge-blocks *k k*, as shown in Fig. 1. These wedge-blocks are designed to spread the dies laterally in contact with the interior of the pipe, and are operated by revolving the rod *h*, the wedge-blocks being respectively connected therewith by a right and left screw-thread, that causes the blocks to advance toward each other in the operation of spreading the dies, or by a reverse motion of the rod *h* to separate the same when the mandrel is relaxed.

In operation the tube or pipe *x* is placed over the mandrel, as shown in dotted lines, Fig. 1, and the dies *g g* are then forced firmly against the interior surface by turning the rod *h*, when, by a single revolution of the driving-shaft B, the punches *c c'* are advanced, and simultaneously punch holes in opposite sides of the pipe and return to their normal or starting point. The mandrel dies may now be relaxed and the pipe adjusted to be punched at other desired places.

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

In a machine for punching holes in tubes, the combination of a pair of punches arranged to operate upon opposite sides of the tube, a pair of internal dies arranged within the tube, and a wedging device arranged between said dies, to spread them against the interior surfaces of the tubes.

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Witnesses:
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