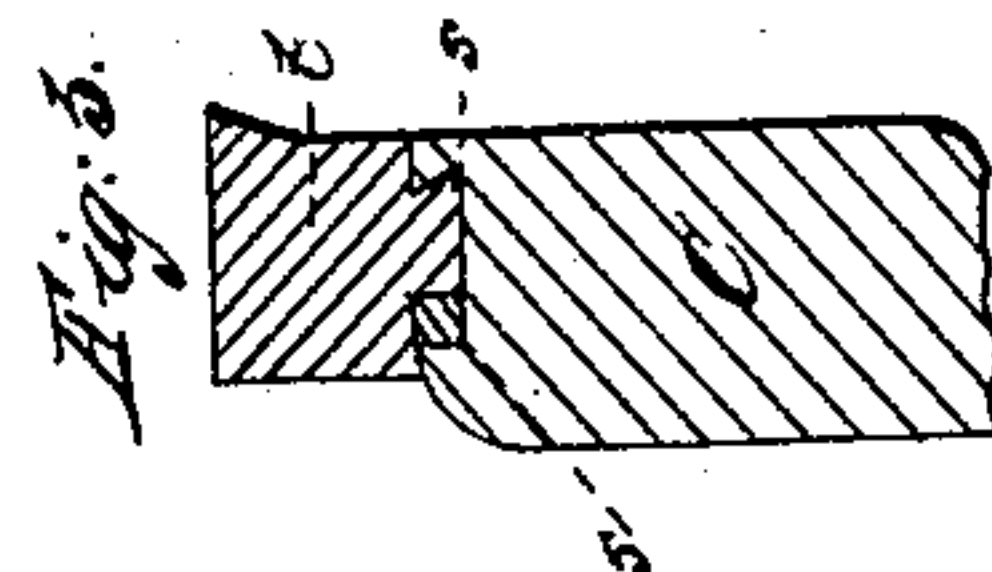
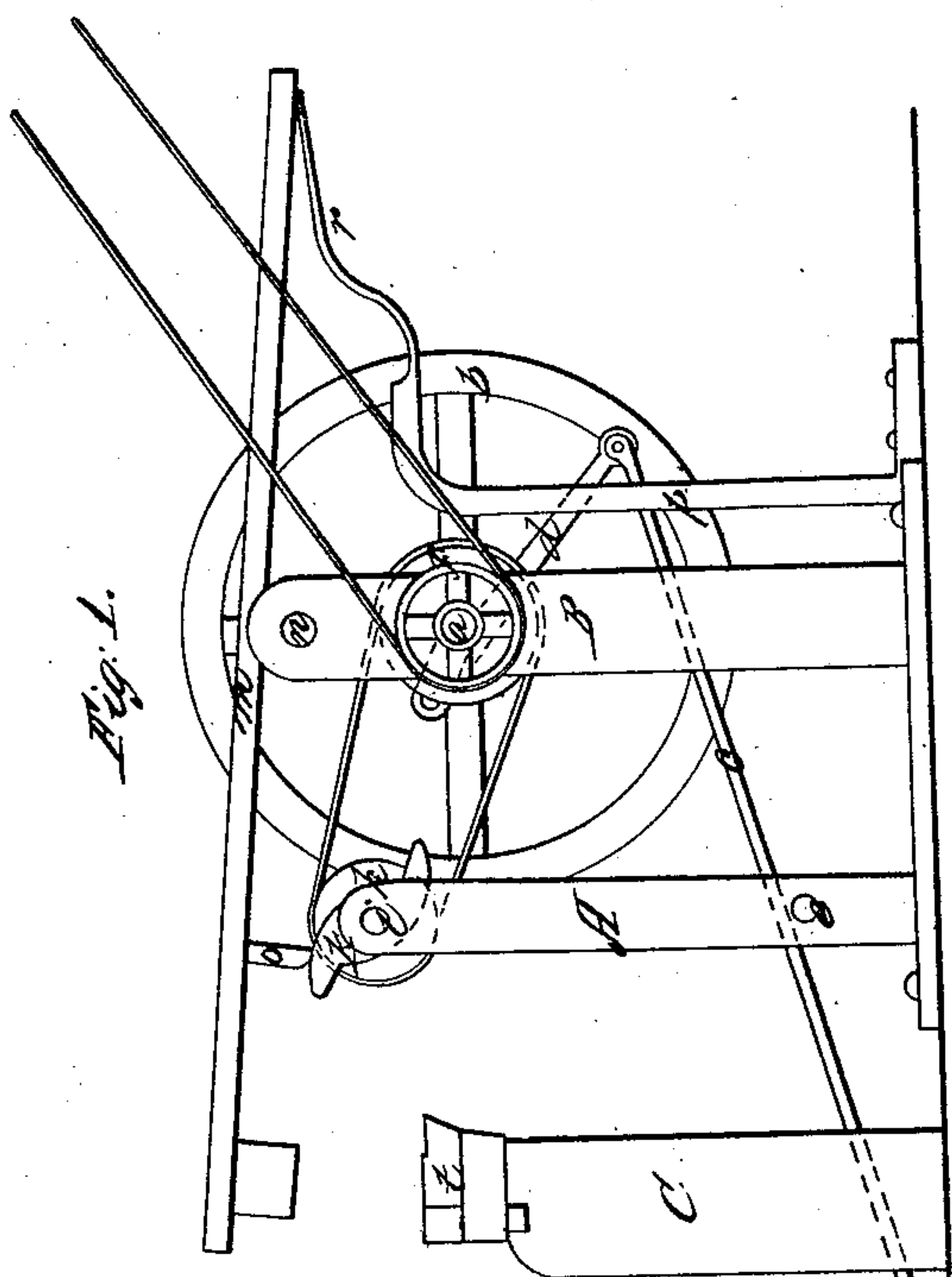
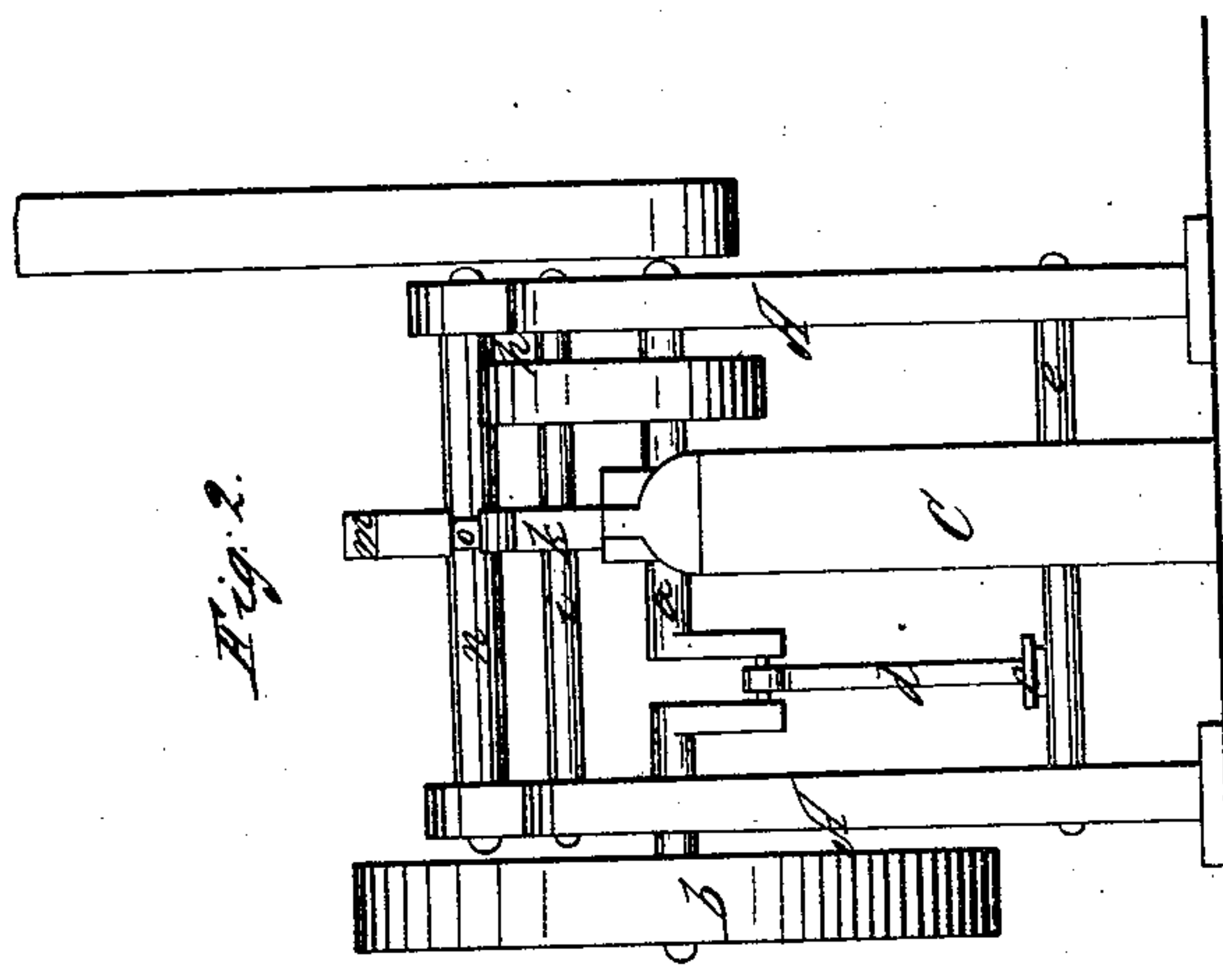


I. & I. Andrews.

Oliver.

N^o 60,458.

Patented Dec. 18, 1866.



Witnesses:

*William H. Clifford
Henry C. Horstman*

Inventors:

*Leonard Andrews
Ira Andrews.*

United States Patent Office.

IMPROVEMENT IN BLACKSMITHS' FORGING APPARATUS.

LEONARD AND IRA ANDREWS, OF BIDDEFORD, MAINE.

Letters Patent No. 60,458, dated December 18, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, LEONARD ANDREWS and IRA ANDREWS, both of Biddeford, in the county of York, and State of Maine, have invented a new and improved Helve Hammer; and we hereby declare the following to be a full, clear, and exact description thereof, which will enable others to make and use our invention, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of our invention.

Figure 2, an end elevation of the same.

Figure 3 illustrates the method of securing the anvil.

The same letters refer to like parts in each of the figures.

One of the objections to the use of helve hammers in common blacksmiths' shops, or in shops where iron is worked, where not more than one or two persons are employed, is that the attention of two or more persons is required to drive the machine. This is the case where the machine is moved by hand, or where it is operated by water or steam; in the former case the services of one person being necessary to turn the machine, in the latter to attend the water gate or steam valve, and a second to manipulate the iron submitted to the operation of the machine. One of the objects of our invention is to produce a combination of machinery for this means, which can be operated by a single person at the same time that he superintends the iron submitted to the hammer.

Reference to the drawings will show the construction of our invention.

A B show two upright frames, C the post upon which the anvil is located. In the frame, B, is set the crank-shaft, *a*, having the balance-wheel, *b*. The crank-shaft is connected with the treadle, *c*, by the link, *d*. The treadle oscillates upon the cross-bar, *e*, which turns in holes made near the bottom of the frame, A, as seen in the drawing. The end of the treadle to which the foot is applied is near the base of the post, C, upon which the anvil is placed; thus the same person operating the machine can manipulate the iron. Rigidly attached to the crank-shaft, *a*, is the truck, *f*; from this a band communicates with the truck, *h*, on the shaft, *i*, in the frame, A; thus the motion received from the treadle and imparted to the crank-shaft, *a*, is given to the shaft, *i*. Upon this shaft, *i*, is the cam, *k*, rigidly attached thereto. The hammer, *m*, swings on the bar, *n*, in the top part of the frame, B. Over the cam, *k*, the hammer has a small projection from its under side which works over the cam, and by whose contact with the cam the hammer is lifted and let fall; *o* is the projection; *p* shows an upright having a spring, *r*, to receive the back end of the hammer and to give to the blows of the hammer additional force. The form of the spring is seen in the drawing. The anvil, *t*, is secured to the post, C, by having a dove-tailed projection fitting into a slot and being held by a removable dove-tailed plug; these are seen at *s*. The operator, standing by the post, C, can give motion to the hammer by pressing the foot upon the treadle. Thus one person can work the machine. The movement of the treadle is communicated to the crank-shaft by the link, *d*, from the truck, *f*, to the truck, *h*, by the band; lifts and lets fall the hammer by the cam, *k*.

We are aware of Letters Patent, numbered No. 9,942, granted to William Van Anden, August 16th, 1853; but this invention operates differently from ours, and embraces a different arrangement of devices. We do not claim a trip hammer so constructed that by the motion of a cam, a spring is brought to bear more or less upon the hammer-shaft to increase the blow of the hammer; the cam at the same time raising the hammer. We are also aware of Letters Patent, numbered No. 27,804, issued to David Howell, April 10th, 1860; but we do not claim a sliding curved cam, feathered shaft, sliding clutch, and rod to admit of varying the stroke of the hammer while in motion. Letters Patent, numbered No. 30,080, issued to Alexander Merton, September 18th, 1860, are also essentially different from ours. Our invention has a different object and intended use from the above specified patents.

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

The arrangement of the treadle *c*, link *d*, crank-shaft *a*, balance-wheel *b*, truck *f*, shaft *i*; having the truck *h*, and cam *k*, hammer *m*, and anvil *t*, in order to constitute, when the trucks *f* and *h* are connected by a belt, a machine which can be operated by a single person, in the manner herein set forth, and working as described.

LEONARD ANDREWS,
IRA ANDREWS.

Witnesses:

WILLIAM H. CLIFFORD,
HENRY INMAN.