

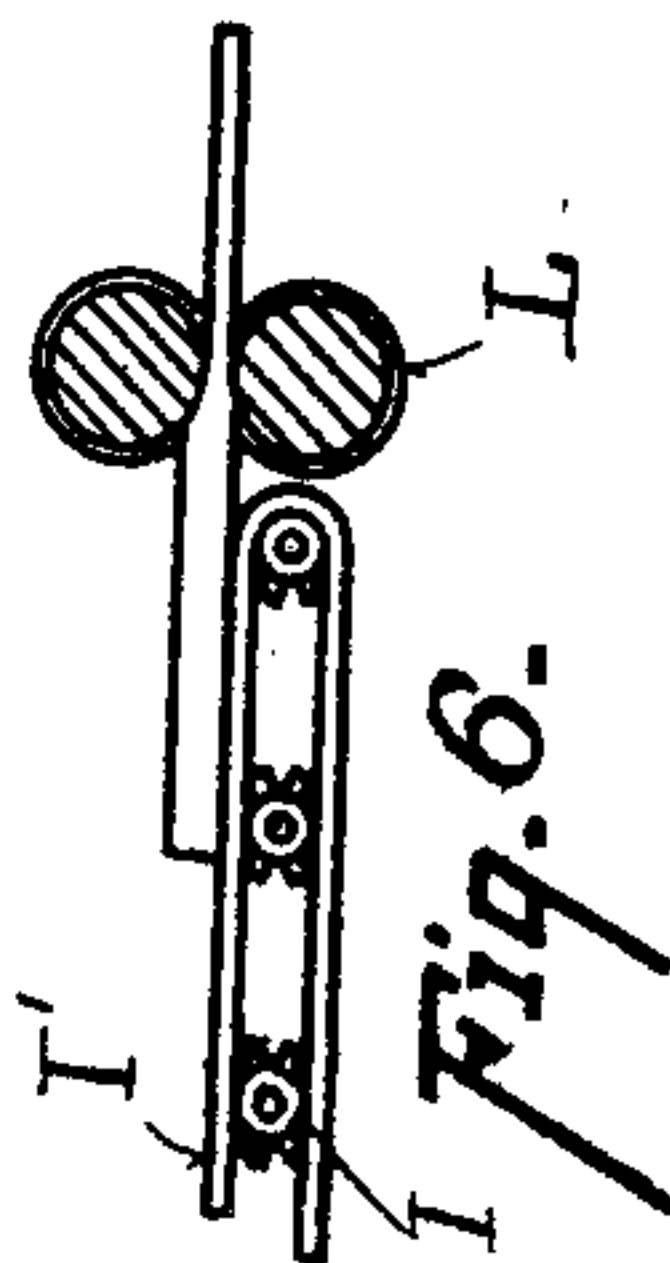
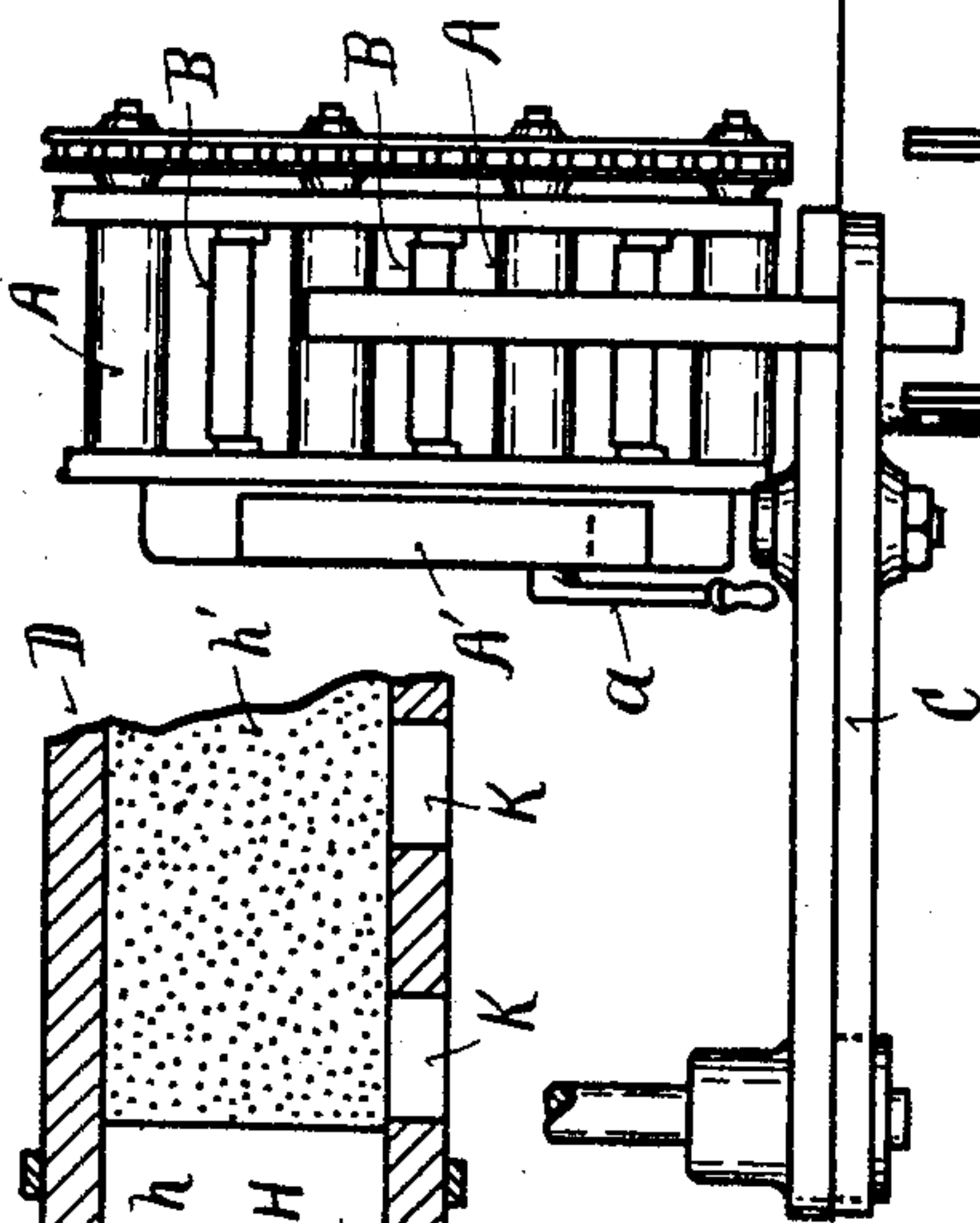
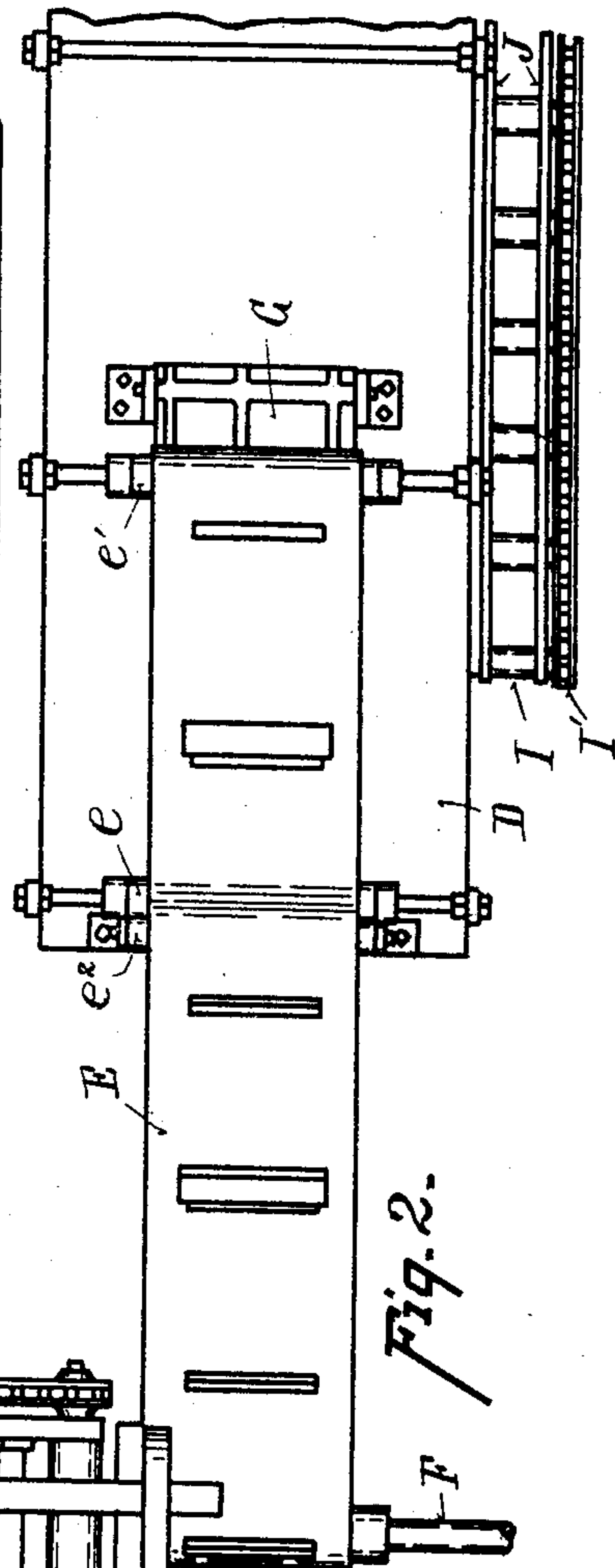
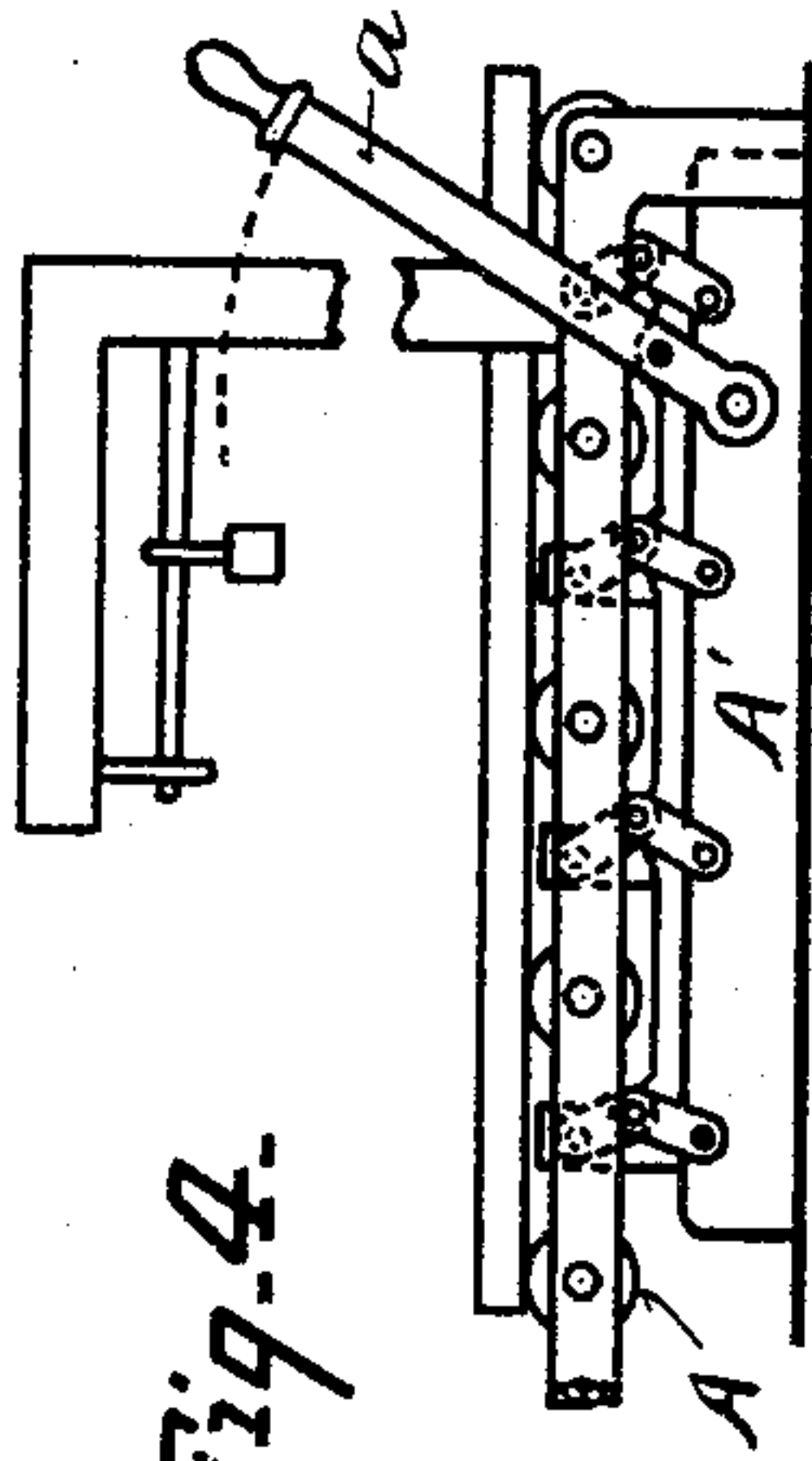
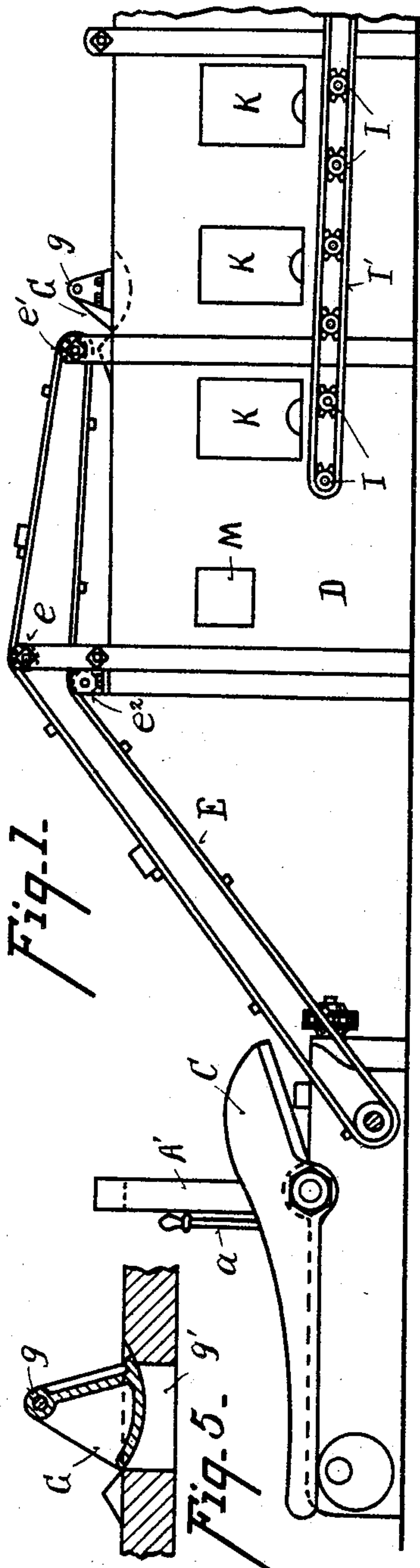
No. 771,220.

PATENTED OCT. 4, 1904.

J. W. ARNOLD.
APPARATUS FOR TREATING IRON.

APPLICATION FILED FEB. 16, 1903.

NO MODEL.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES WALTER ARNOLD, OF COVINGTON, KENTUCKY.

APPARATUS FOR TREATING IRON.

SPECIFICATION forming part of Letters Patent No. 771,220, dated October 4, 1904.

Application filed February 16, 1903. Serial No. 143,691. (No model.)

To all whom it may concern:

Be it known that I, JAMES WALTER ARNOLD, a citizen of the United States, residing at the city of Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Apparatus for Treating Iron; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improved apparatus for treating iron or steel.

One of its objects is to provide apparatus whereby the hot iron from the muck-rolls may be delivered direct to the reheating-furnace while still hot.

Another object is to provide means for automatically feeding the reheated metal to the finishing-rolls.

Another object is to provide means whereby the hot bars from the muck-rolls may be weighed and cut into sections before being reheated.

Another object is to provide an improved furnace for reheating the metal.

It also consists in certain details of form, combination, and arrangement, all of which will be more fully set forth in the description of the accompanying drawings, in which—

Figure 1 represents a side elevation of my improved apparatus in position for use. Fig. 2 represents a top plan view of the same. Fig. 3 is a horizontal sectional view through the furnace on line *vv* of Fig. 1. Fig. 4 is a detail of the mechanism for weighing the bars before cutting into sections. Fig. 5 is a vertical section through the charging-door. Fig. 6 is a detail of the finishing-rolls and conveyer thereto.

The practice heretofore has been to allow the bars from the muck-rolls to cool and after which they are cut into sections and fed by hand to a reheating-furnace and then by hand to a set of finishing-rolls. By my improved apparatus the hot bars from the muck-rolls are delivered upon a set of power-driven rolls A, by means of which they are brought to a position above the scales A'. Upon throwing the lever *a* the bars B of the scale-

platform are elevated, so as to lift the bar off the rolls A until the weight of the bar is ascertained. The lever is then brought back to its original position, depositing the bar again upon the rolls A, which feed it to the shears C, which cut the bar into sections of suitable length to be fed to the reheating-furnace D. These sections or billets as they leave the shears drop upon an endless belt or apron E, passing over the idle rolls *e e' c'* and being driven by power applied to shaft F. This belt carries and delivers the billets to an automatically-operated charging-door G. This door may be located in the side wall of the furnace, but is preferably located in the crown of the furnace, as shown in Fig. 1. The door is pivoted at *g* and weighted, so as to normally close the opening *g'*. When the billets are deposited on the door, however, it automatically opens and permits the bar to drop onto the hearth H. The hearth is preferably composed of a rigid section *h*, adapted to withstand without injury the impact of the billets, and one or more sections *h'* of loose friable material upon which the billets are disposed until sufficiently heated to be passed to the finishing-rolls.

I represents a series of rolls driven by power through a chain belt I' and supported in a frame J. When the billets are sufficiently heated, they are withdrawn through the doors K and placed on the rolls I, by means of which they are fed to the finishing-rolls I.

M represents the stoking-door, through which the furnace-fire is maintained.

N represents the grate, and N' the fire-bridge of ordinary construction.

It is obvious that my improved apparatus, while particularly adapted for charging and treating hot bars direct from the muck-rolls, may also be employed to advantage in charging cold bars into the furnace; also, that the mechanism shown is capable of considerable modification without departing from the principle of my invention.

Having described my invention, what I claim is—

1. In a heating-furnace, a charging-passage, a door normally closing said passage, and

adapted to automatically open to deposit the metal delivered thereto upon the hearth, and to again close the passage; and a power-driven carrier adapted to carry and deliver the metal to the charging-door.

2. An apparatus for treating iron interposed between the muck-rolls and the finishing-rolls, consisting of feeding-rolls to convey the bars direct from the muck-rolls, shears to sever the bars so conveyed into sections, a conveyer to convey and discharge said sections into the reheating-furnace, a reheating-furnace, and rolls between said furnace and the finishing mechanism, whereby the metal is advanced from the muck-rolls to the finishing mechanism without substantial loss of its original heat.

3. An apparatus for treating iron, interposed between the muck-rolls and the finishing-rolls, consisting of feeding-rolls to convey the bars from the muck-rolls, scales to lift the bars from said rolls to weigh the same, shears to sever the bars so conveyed and weighed into sections, a conveyer to convey and discharge said sections into the reheating-furnace, a reheating-furnace, and rolls between said furnace and the finishing mechanism, whereby the metal is advanced from the muck-rolls to the finishing mechanism without substantial loss of its original heat.

4. An apparatus for treating iron interposed between the muck-rolls and the finishing-rolls, consisting of rolls to convey the bars direct from the muck-rolls, shears to sever said bars into sections, a conveyer to convey and discharge said sections into the reheating-furnace, and a reheating-furnace, whereby the metal from the muck-rolls is advanced through the reheating-furnace to the finishing mechanism without substantial loss of its original heat.

5. An apparatus for treating iron, interposed between the muck-rolls and the finishing-rolls, consisting of feeding-rolls to convey the bars direct from the muck-rolls, scales to lift the bars from said rolls to weigh the same, shears to sever said bars into sections, a conveyer to convey and discharge said sections into the reheating-furnace, and a reheating-furnace, whereby the metal from the muck-rolls is advanced through the reheating-furnace to the finishing mechanism without substantial loss of its original heat.

In testimony whereof I have signed my name in the presence of two subscribing witnesses.

JAMES WALTER ARNOLD.

Attest:

ED C. KELLEY,
A. E. STRICKLETT.