

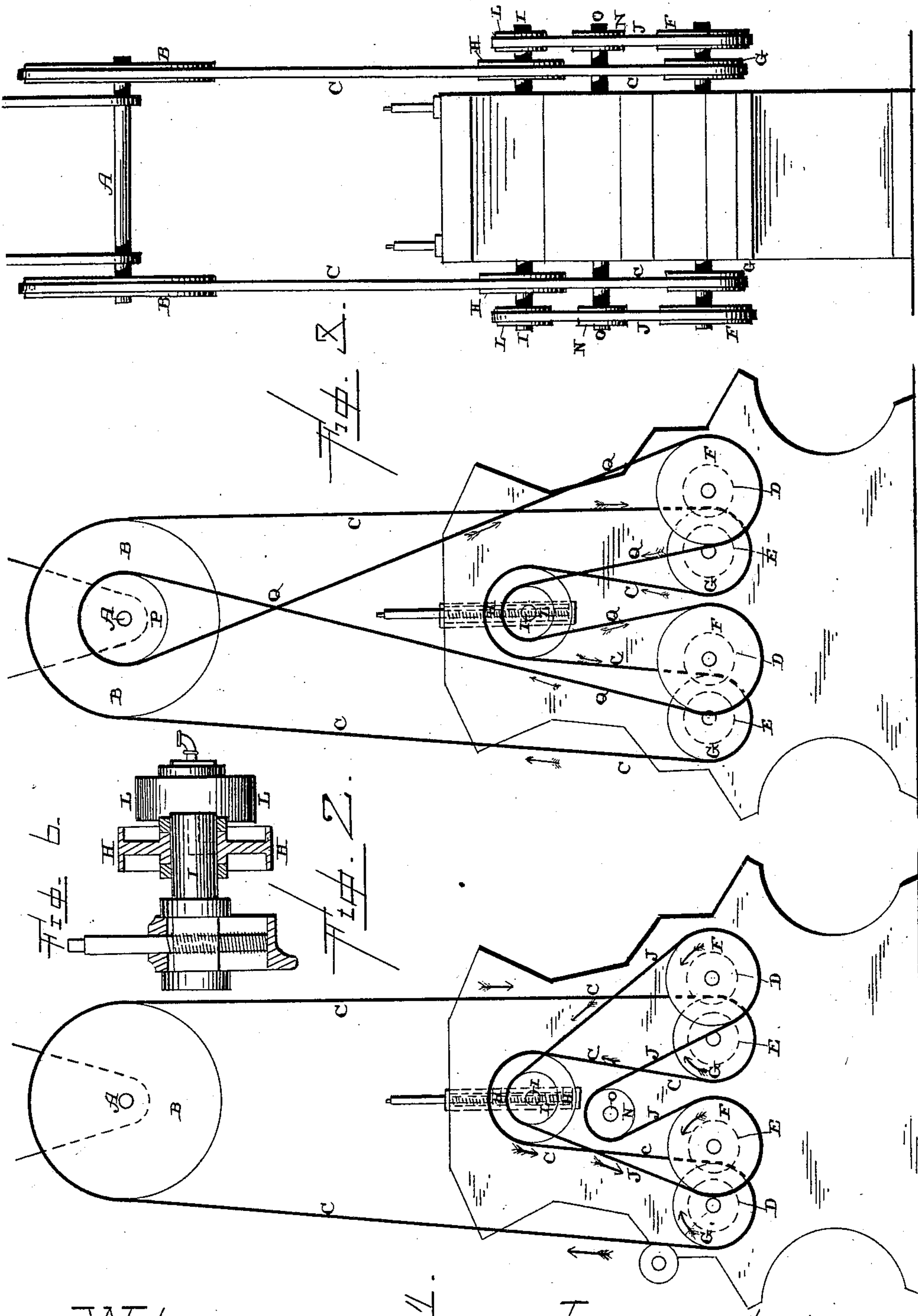
(No Model.)

2 Sheets—Sheet 1.

M. MASTERS.
REDUCTION ROLLER MILL.

No. 400,929.

Patented Apr. 9, 1889.



WITNESSES.

R. T. Gardner,
Edm. P. Ellis,

INVENTOR.

M. Masters,
per F. A. Lehmann,
att'y.

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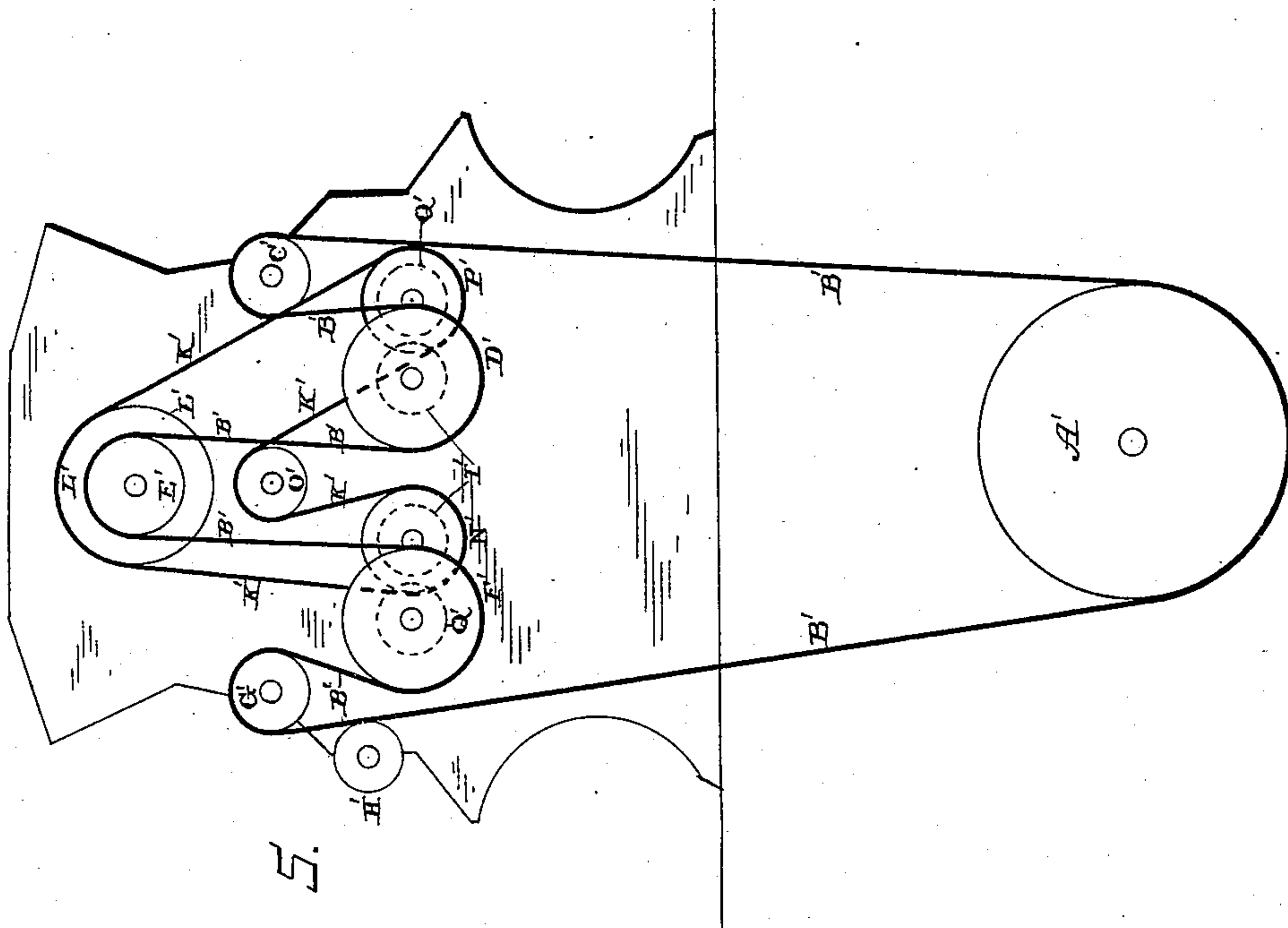


Fig. 5.

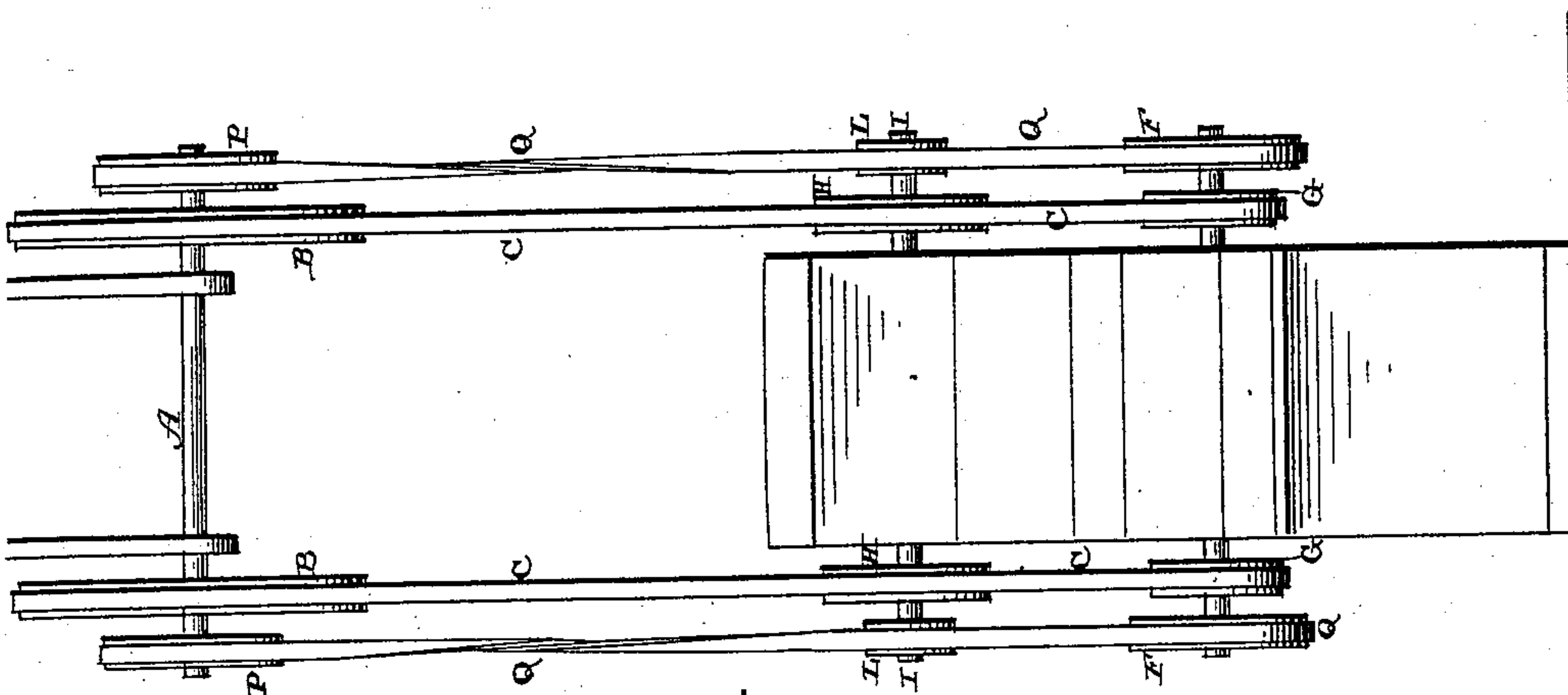


Fig. 4.

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UNITED STATES PATENT OFFICE.

MILES MASTERS, OF BUREAU, ILLINOIS.

REDUCTION ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 400,929, dated April 9, 1889.

Application filed November 21, 1887. Serial No. 255,800. (No model.)

To all whom it may concern:

Be it known that I, MILES MASTERS, of Bureau, in the county of Bureau and State of Illinois, have invented certain new and useful Improvements in Reduction Roller-Mills; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in reduction roller-mills.

The objects of my invention are to drive the driving-belts from a shaft overhead, so that an upward pull will be exerted by the belts upon the rolls and thus reduce the friction and wear upon the journals, to secure a solid fulcrum for the grinding-rolls, to provide for an equal strain and wear upon all the boxes and journals, and to cause a more positive and a better means for keeping the rolls parallel with, level, and in train with each other at their points of contact than has heretofore been done.

Figure 1 is an end view of a roller-mill to which my invention is applied. Fig. 2 is a similar view showing a slightly-different arrangement of the driving-belts. Figs. 3 and 4 are side elevations of the mills shown in Figs. 1 and 2. Fig. 5 shows an arrangement of parts in which the shaft is arranged below the mill. Fig. 6 is a detail view showing the tightener-pulleys.

A represents the driving-shaft overhead, and B the driving-pulleys secured thereto for driving the belts C. There is a driving-pulley B and a belt C for driving each of the ends of the pair of rolls E simultaneously, as shown in Figs. 3 and 4. Each of the mills shown is provided with two pairs of reducing-rolls, D E, each pair of rolls being provided with pulleys F G at each of their ends. The belt C passes down under one of the pulleys G, then up over a pulley, H, on the counter-shaft I, which extends entirely through the machine above the plane of the rolls or above the machine, then down under the second pulley G, and up over the pulley B. The rolls E, which revolve in contact with the rolls D and are provided with suitable pulleys G, are

driven in opposite direction to the rolls D by means of the belt J, which passes over a pulley, L, on the counter-shaft I, down under one of the pulleys F, then up over a pulley, N, on a shaft, O, which extends entirely above or through the machine-frame above the rolls, then down under the other pulleys F, and back over the pulley L.

It will be seen that, by arranging the driving-shaft overhead, in contradistinction to placing it under the machine, the whole upward strain or pull of the two belts C J is exerted in raising all the rolls D E at each end simultaneously, and thereby decreasing the amount of wear and friction upon their boxes about equal to the weight of the rolls and the pulleys connected thereto. While the rolls are reducing the grain or other substance, the tendency is to climb upward, which brings the greatest pressure to hold them in place on the part of the cap, a little above the centering-line of the journal-box. This point forms the natural fulcrum of the working-rolls. By placing the driving-shaft above the roller-mill the strain of the belts helps to hold the rolls solidly up against the caps in the position the rolls naturally take when grinding, and by thus holding them up against this fulcrum the tendency to tremble or vibrate is entirely avoided, and the mill produces a more even meal or flour. As the belts are used at each end alike, pulleys and belts one-half the usual width may be used.

In Fig. 2 a slightly-different arrangement of parts is shown. The belt C operates in exactly the same manner; but on the shaft A are placed additional pulleys P, from which crossed belts Q extend. These belts Q pass down under the pulleys F, up over the pulleys L on the shaft I, then down under the pulleys F, and then back to the pulleys P. If desired, the shaft I and its pulleys H L may be made vertically adjustable by means of screws or any similar well-known devices, and thus the pulleys H L be used as tighteners for the belts, so that any desired amount of tension can be placed upon them. It is immaterial whether the belts used in driving the rolls D are arranged as shown in Figs. 1 or 2, in both cases the operation being the same.

In Fig. 3 the pulleys on the rolls are driven from one main driving-shaft at each end,

which shaft may be placed either above or below the rolls, but preferably above. The pulleys, as shown, are of unequal size, to secure any desired differential motion, and by having the ends of two of the roll-shafts project outward a suitable distance from the side of the frame the belts are prevented from interfering with each other.

In Fig. 4 the positions of the pulleys on both ends of the rolls and the driving-shaft correspond with the arrangement of parts as shown in Fig. 2. In Fig. 1, if so desired, the shaft O, upon which the pulleys N are placed, may be used as the belt-tightener instead of the shaft I. If the shaft I is used as the tightener, both belts will be tightened at the same time, whereas if the shaft O is used only the belts J will be tightened. The belts J receive their power entirely from the pulleys L on the shaft I, which are driven by the belts C.

In Fig. 5 is shown a very convenient plan to place on rolls already in the mill where it is not convenient or desirable to place the driving-shaft above the machine. The belt B' passes from around the pulley A' on the driving-shaft placed below the machine, up over the pulley C', down under the pulley D', up over the pulley E', downward under pulley F', up over the pulley G', and past the belt-tightener H', down around the pulley A', and operates the two rolls I' in one direction. The belt K' passes from around the pulley L', down under the pulley N', up over the tightener-pulley O', down under the pulley P', back over the pulley L', and thus operates the two rolls Q' in an opposite direction from the two rolls I'. The belts have an upward draw on the roll-journals, as will be readily seen.

My invention may be applied to single or two roll mills, as well as to double rolls or those having a multiplicity of rolls. Any arrangement where the power is applied at both ends of the rolls simultaneously, or with an upward tension or draw of belt from the weight of rolls, will not be a departure from my invention.

Having thus described my invention, I claim—

1. In a roller-mill, the rolls provided with pulleys upon each of their ends, in combination with driving-pulleys and the driving-belts which are applied to the roll-pulleys from above, whereby all of the rolls are driven with an upward pull simultaneously or alike from each end, substantially as shown.

2. The combination of the driving-shaft provided with pulleys and located above the plane of the rolls, and suitable driving-belts extending from the pulleys, with the grinding-rolls provided with pulleys upon each of their ends, and around which the driving-belts pass, and a counter-shaft which extends through the frame and is provided with pulleys upon each of its ends, and around which the driving-belts also pass, whereby the rolls are driven from each end alike from above, substantially as described.

3. The combination of the driving-shaft A, provided with a driving-pulley, B, the two driving-belts, with the grinding-rolls, each provided at each end with a pulley, and a counter-shaft which extends through or above the frame and is provided with pulleys at each end, and around which both of the belts pass, substantially as set forth.

4. The combination of the driving-shaft provided with driving-pulleys, the two driving-belts, reducing-rolls provided with driving-pulleys at each end, a counter-shaft which extends through or above the frame and is provided with pulleys at each end, and around which pulleys the two belts pass, and adjusting devices for the counter-shaft, whereby the pulleys upon the ends of the counter-shaft can be adjusted freely, so as to tighten the two driving-belts, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

MILES MASTERS.

Witnesses:

JEFF DURLEY,
ROSALIA DURLEY.