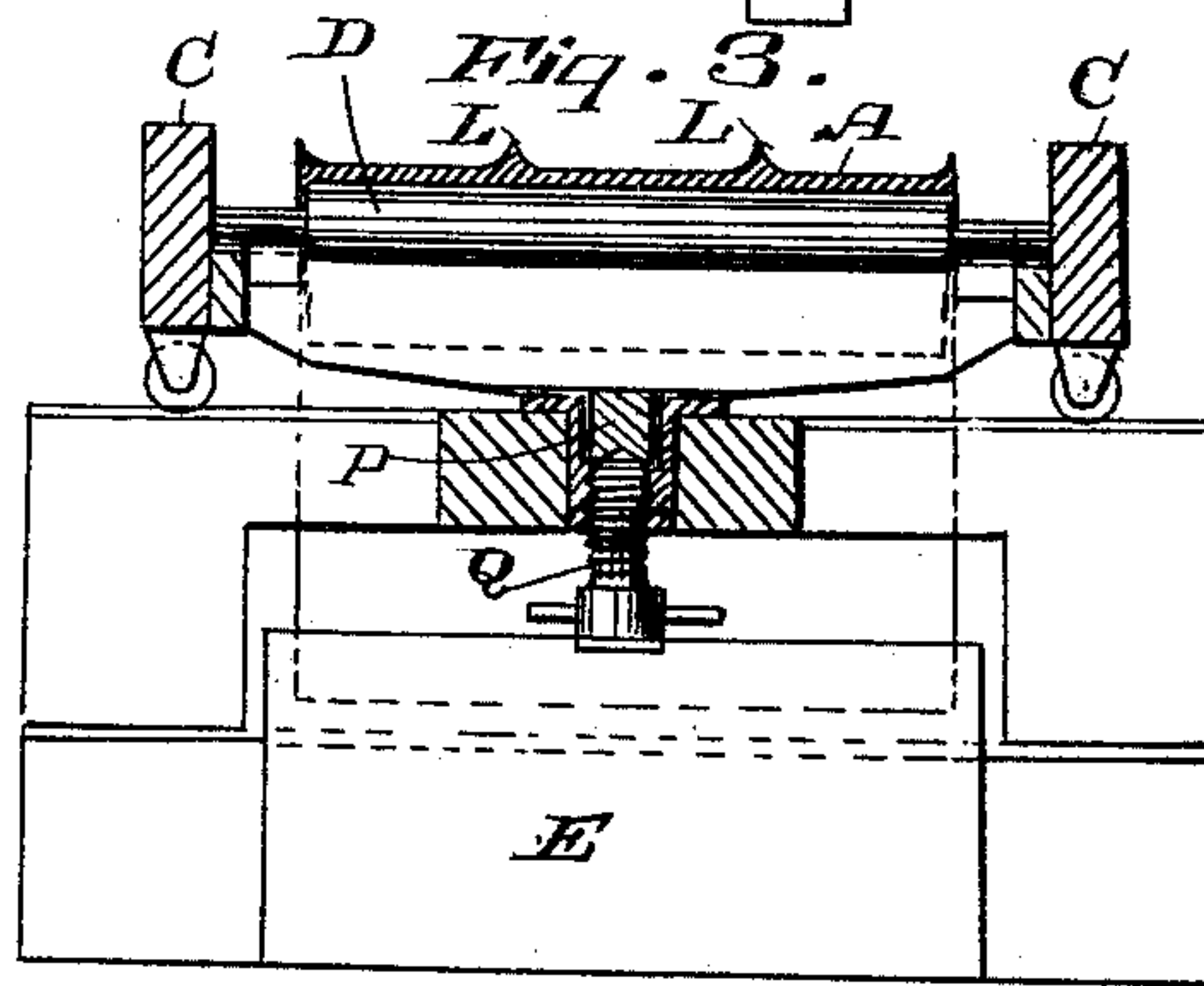
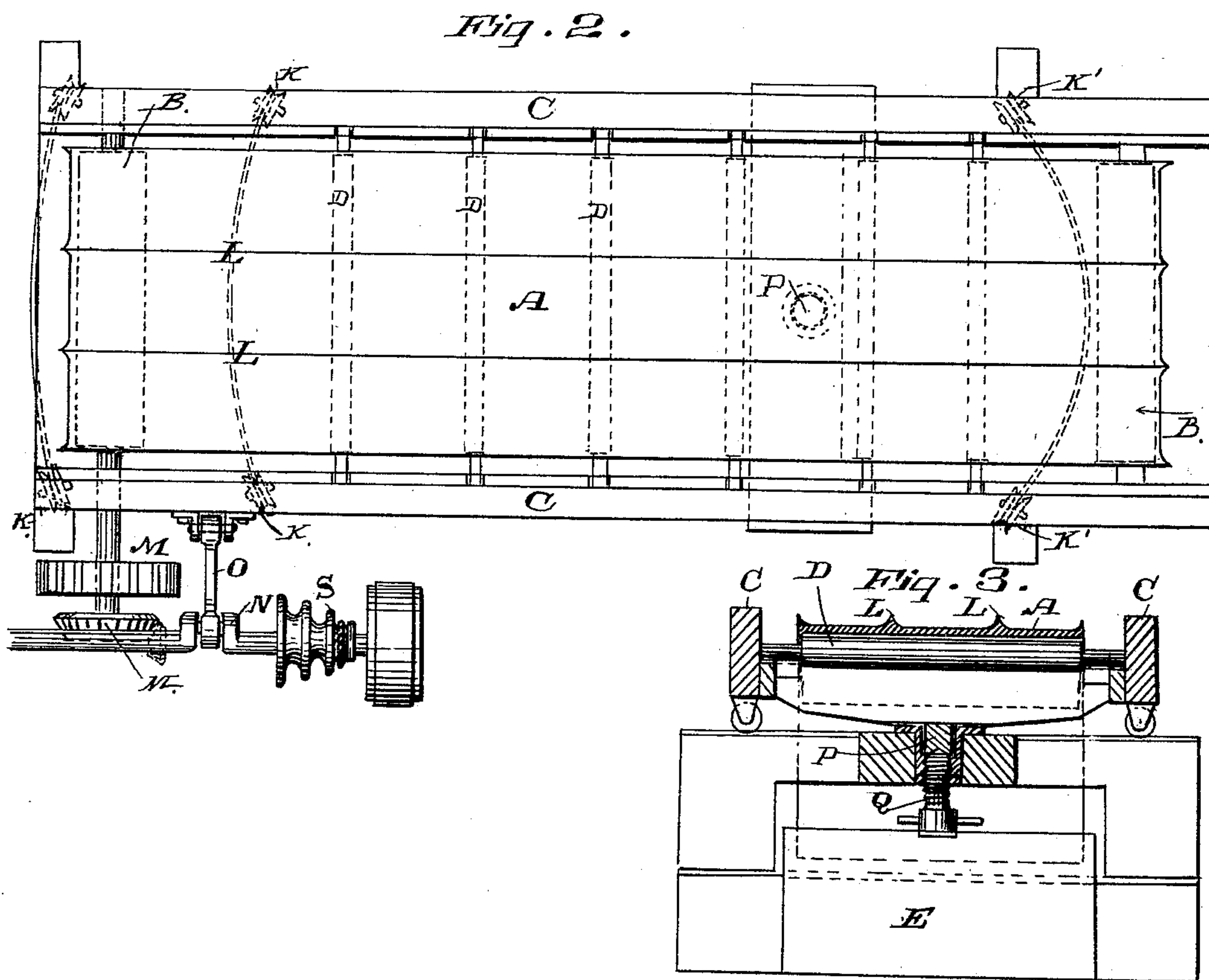
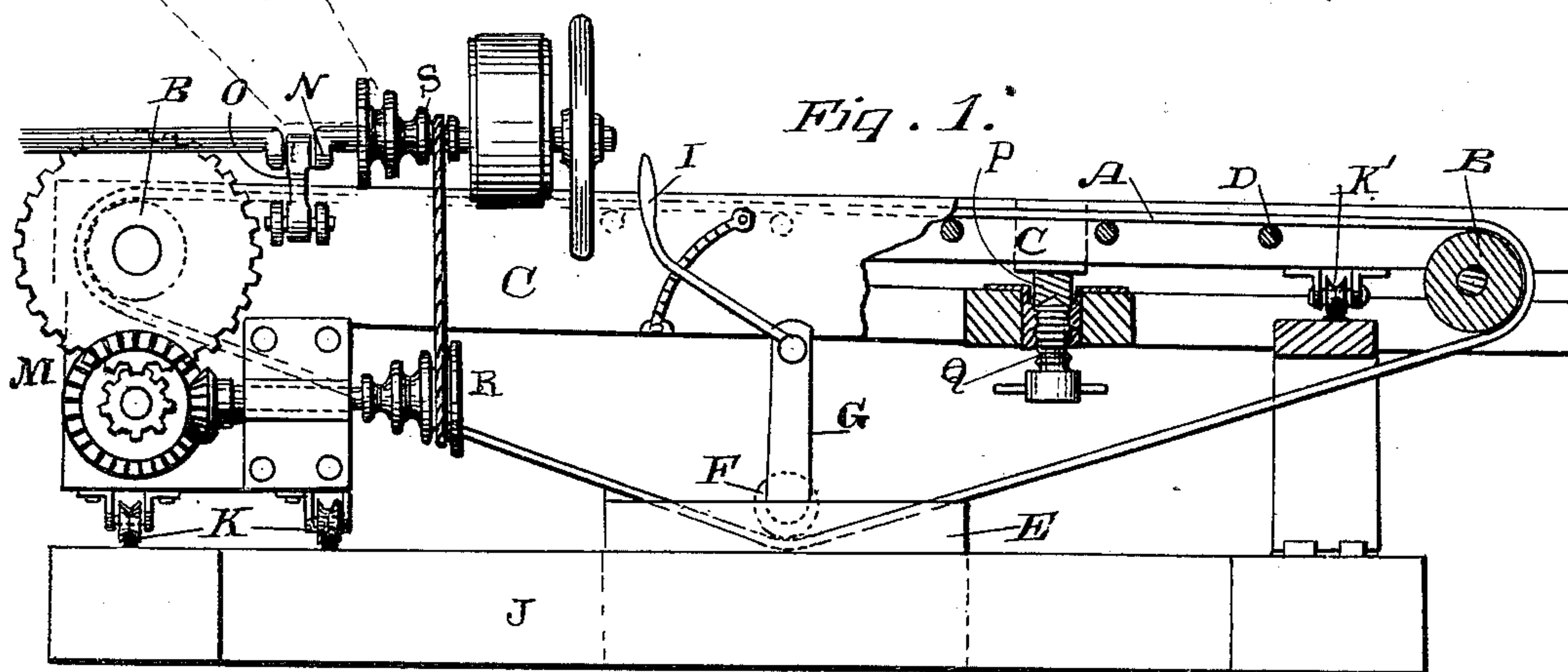


(No Model.)

J. GRAY.
ORE CONCENTRATOR.

No. 415,454.

Patented Nov. 19, 1889.



Witnesses,
Geo. H. Strong,
J. H. Housh

Inventor,
James Gray,
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attys

UNITED STATES PATENT OFFICE.

JAMES GRAY, OF CAMPTONVILLE, CALIFORNIA.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 415,454, dated November 19, 1889.

Application filed October 15, 1888. Serial No. 288,147. (No model.)

To all whom it may concern:

Be it known that I, JAMES GRAY, of Camptonville, Yuba county, State of California, have invented an Improvement in Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of concentrators in which an endless belt is extended over drums at different levels, so as to travel slowly in an inclined plane and receive the material which is to be concentrated and separated; and my invention consists of the constructions and combinations of devices, which I shall hereinafter fully describe and claim.

Figure 1 is a side elevation of the belt and its supporting drums and adjusting mechanism, showing a section of the left end. Fig. 2 is a plan view. Fig. 3 is a transverse vertical section taken through the pivotal point.

A is a belt, which is made of rubber or other flexible material of any suitable or desired length and width, and it passes over drums B B at opposite ends, these drums being journaled in the frame-work C at different levels, so that the upper surface of the belt will travel at a small inclination. The upper part of the belt is supported by small rollers D, which prevent its sagging, and the lower part is carried downward through a tank E, into which it is caused to dip by means of a roller F, so that as the lower part of the belt passes through the water in the tank the sulphurets or accumulations upon its surface are washed off and deposited in the tank.

The standard G, which supports the roller F, is adjusted by means of a lever I and a rack, so that by turning said lever the tension upon the belt may be increased at will.

The frame-work upon which the belt and the portions just described are supported is itself supported upon a secondary frame J, and has anti-friction rollers K at the head end of the machine and other rollers K' at the tail end, the said rollers being journaled upon the frame J, so that when moved from side to side these rollers will travel upon tracks or guides upon the frame J, so as to allow it to move easily. The upper surface of the belt is divided into as many longitudinal channels as may be desired by means of raised ribs L, and the belt may be made of

any desired width by reason of these channels, which separate the pulp or material deposited upon the belt into comparatively small quantities, which can be better acted upon than when the material is spread over the full width of the belt. The belt is caused to travel slowly up the incline by means of gearing, belt-pulleys, or other suitable mechanical devices, as shown at M, and the pulp to be treated is deposited at any desired point near the upper end of the belt with a sufficient quantity of water to thin it down.

In order to agitate the material, I have employed a crank N and pitman O, which connects the crank with the side of the belt-carrying frame near one end, and this frame is supported in addition to the friction-rollers, above described, upon a vertical pivot-pin P at some point between the ends of the belt.

By this construction it will be manifest that when one end of the belt-frame is moved to one side by the crank the opposite end will move in the other direction by reason of the intervening pivot-pin and the device will be supported and steadied by the anti-frictional rollers K, above described. I am thus enabled to break up the sand-bars which have a tendency to form if a single side motion is given to the concentrator, these bars forming in a peculiar way across the surface of the traveling belt and interfering with the proper separation of the sulphurets or heavier valuable material from the sand.

By my construction it will be seen that the upper end of the table will have the most vibration, the vibration decreasing until at a point about the pivot there is comparatively little or no motion. Then from that point to the lower end of the belt the motion again increases and in an opposite direction from the motion of the upper part of the belt. The opposite movements of the belt-surface will break up any bars or deposits which may form upon the belt.

The angle at which the belt travels is regulated and adjusted by means of a screw Q, which is so fixed as to act upon the vertical pivot-pin and through it to change the inclination of the frame which carries the belt.

The gearing by which the belt is caused to travel and by which the oscillation of the frame-work is produced may be driven in

various ways. In the present case the shaft through which movement is transmitted to the gearing has a pulley R upon it, which is driven by a belt from the pulley S upon a shaft which is situated in line above the pulley R, so that although the frame-work and the pulleys upon it receive a certain oscillating motion the movement is so slight that the tension of the driving-belt extending between R and S is not materially altered.

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

1. In a concentrator, the combination of the endless traveling belt, the drums at opposite ends, over which it passes, a frame-work upon which said drums and the driving mechanism are supported, and a vertical pivot or fulcrum pin about which said frame-work and belt are oscillated by a crank or eccentric, said fulcrum being situated at a point intermediate between the ends of the traveling belt, substantially as herein described.

2. The endless traveling belt, the drums at

opposite ends about which it passes, and a driving mechanism, the frame-work upon which the said drums and mechanism are supported, guides at opposite ends of the frame-work, and rollers traveling on said guides, in combination with a vertical pivot or fulcrum pin about which the frame-work and belt are oscillated, and the crank or eccentric by which the oscillation is effected, substantially as herein described.

3. The combination of the endless traveling belt, the frame C, the vertical fulcrum or pivot pin between the ends of the belt, and oscillating and rotating mechanism, in combination with an adjusting-screw, whereby the angle of the belt may be changed, substantially as herein described.

In witness whereof I have hereunto set my hand.

JAMES GRAY.

Witnesses:

S. H. NOURSE,
J. H. BLOOD.