

No. 771,454.

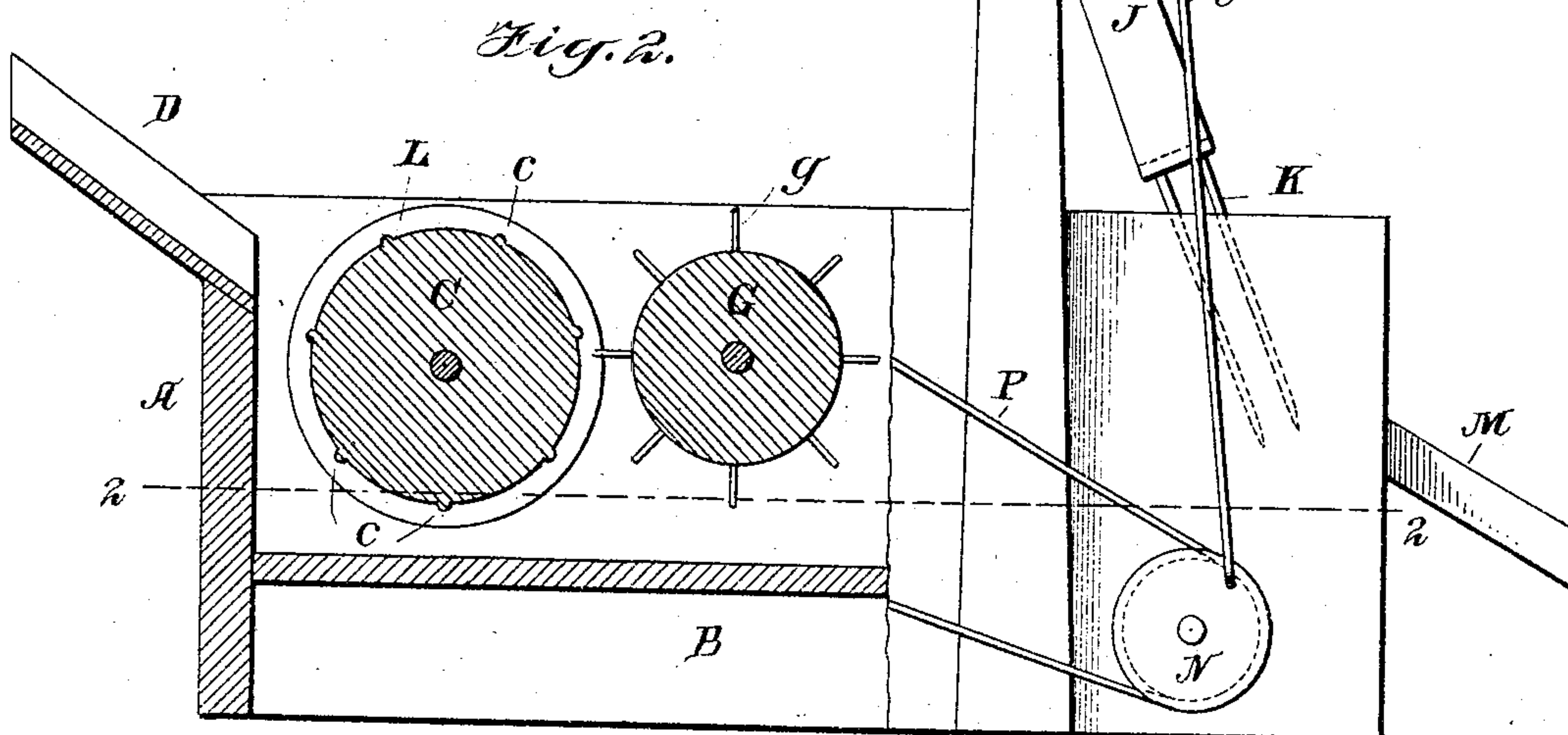
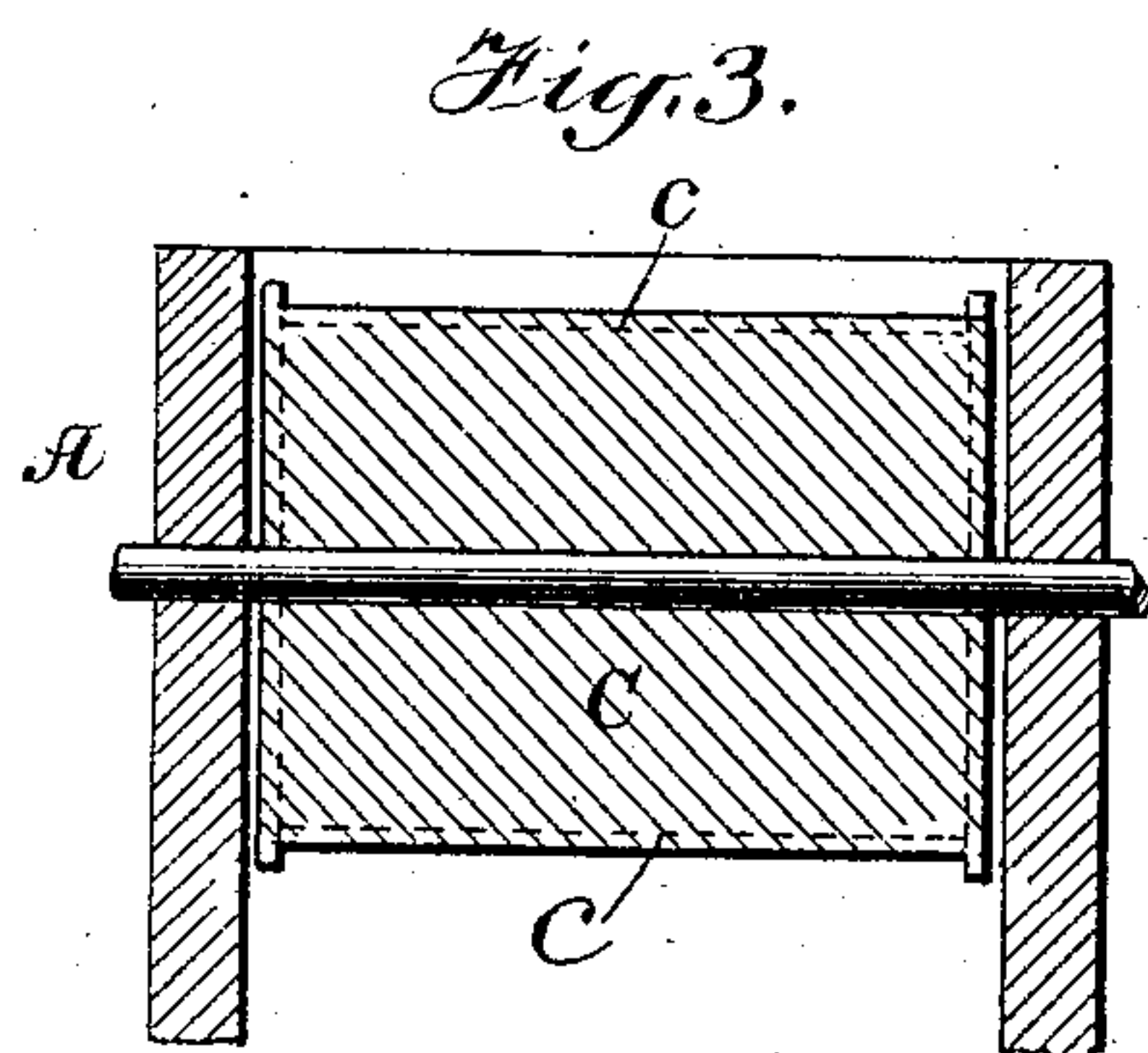
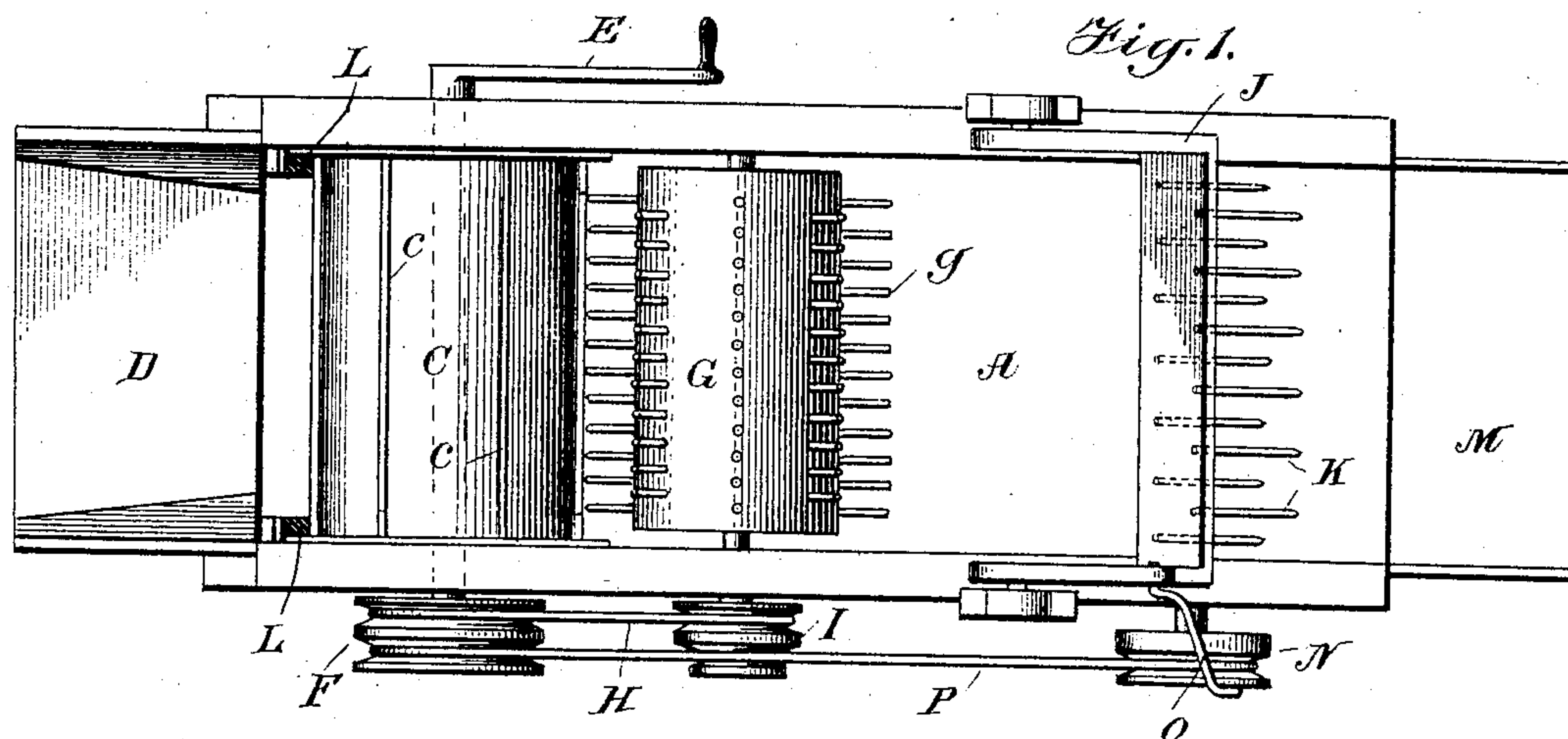
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R. BLAKE.

APPARATUS FOR EXTRACTING GOLD FROM AURIFEROUS SAND, &c.

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NO MODEL.



WITNESSES:

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APPARATUS FOR EXTRACTING GOLD FROM AURIFEROUS SAND, &c.

SPECIFICATION forming part of Letters Patent No. 771,454, dated October 4, 1904.

Application filed August 21, 1901. Serial No. 72,802. (No model.)

To all whom it may concern:

Be it known that I, ROBERT BLAKE, a citizen of the United States, residing in Madison, Morris county, in the State of New Jersey, have invented a new and useful Machine for Extracting Gold from Auriferous Sand and Gravel or Pulverized Rock, of which the following is a specification.

The subject of this invention is an improved machine for extracting gold from sand and other materials in a reduced and comminuted condition; and the more prominent object of the invention is to first effect the positive submergence of the gold-bearing material in a body of mercury and subsequently subject the material when it has risen above the mercury-surface to a back-and-forth agitating action, whereby the gold remaining in the material will be detached and permitted to descend within the mercury, and particles of the latter which may have been carried up by the material in rising above the mercury-surface will be released and caused to unite with the main body of mercury. By this means not only is the gold-separating operation thoroughly conducted, but serious loss of mercury is effectively prevented.

With the above and other purposes in view the improved machine comprises a horizontal tank adapted to contain a lower body of mercury, a revoluble cylinder being juxtaposed within the tank to immerse the gold-bearing material within the mercury, and a pivotally-suspended arm having lower agitating-teeth adapted for an arc movement back and forth above the level of the mercury, the arm and teeth being in such coactive relation with the cylinder that the teeth will move back and forth in the material in different horizontal planes after the material which has previously been depressed by the cylinder has risen to a plane immediately above the surface of the mercury.

There are other important features connected with the invention which, besides those alluded to, are clearly set forth in the subsequent detailed description.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a gold-extracting machine embodying my invention. Fig. 2 is a part vertical longitudinal sectional view and part side elevation of said machine, certain guard-brushes and immediate parts being omitted; and Fig. 3 is a vertical transverse sectional view through the submerging-cylinder and certain immediate parts.

Similar reference characters are employed to designate corresponding parts throughout the several figures where they occur.

A horizontally-extended tank A, resting on a foundation B, contains an amount of quicksilver, the normal level of which is indicated by the dotted lines 2 2, Fig. 2.

C is a transverse horizontal cylinder within the tank and more conveniently contiguous to one end thereof. The journals of this cylinder so bear in the tank sides and the diameter of the cylinder is such that a peripheral portion of said cylinder will always occupy a position below the plane of the normal mercury-level. The cylinder has projections *c* on its circumference. As intimated, the lower surface of the cylinder revolves in the quicksilver, and thus carries the gravel and sand delivered at the head of the tank by a chute D down into and through the quicksilver, so that every particle is brought into direct contact with the same for amalgamating treatment.

On one end of the shaft of the cylinder C is the crank E for giving motion to the cylinder, and on the opposite end is a pulley F for imparting a revolving motion to a cylinder G, also within the tank, through the medium of a belt H and pulley I. The cylinder G is mounted in such parallel relation with the cylinder C and is so revolved that numerous pins *g*, projecting from said cylinder G, will serve to dislodge and return to the quicksilver-bath such portions of the material as may adhere to the surface of the cylinder C and be carried up thereon out of the quicksilver. The pins *g* are effectively distributed

on the surface of the cylinder G by being arranged in staggered relation. This cylinder may be termed a "revolving" wiper or doctor.

J is an arm hung to pivotally depend with respect to the upper portion of the tank, said arm being provided at its lower end with teeth K, the length of both the arm and teeth being such that the latter in their lowest position will be maintained in a plane above the normal level of the quicksilver. This arm is designed to acquire an oscillating or pendulum-like motion through the medium of a belt P, running to the pulley N, which latter has a crank connection with a rod O, pivotally attached at its upper end to an eccentric projection of the frame.

L L are the brushes or other obstruction to prevent the gravel, sand, and water passing around the ends of the cylinder C.

The operation of the machine will be readily comprehended. The gold-bearing sand and gravel being delivered to the head of the tank by the chute D is carried down into and through the quicksilver by the revolving cylinder C, thus submerging the same and causing a large percentage of the gold to become amalgamated and settle to the bottom, where it may be subsequently secured. The cylinder C further acts to cause the material to pass beneath the same to the opposite side thereof, where the material rises through and above the quicksilver, in which location it is subjected to the agitating action of the teeth K, moving back and forth in the path of an arc, such movement of the teeth operating to loosen and open the material at different horizontal planes and also exert an overturning effect on the material. As a result, the gold and intermingled quicksilver that may have been carried up above the lower quicksilver mass will be liberated and permitted to settle into said mass, while the gravel, sand, &c., relieved of its valuable elements, is carried over the chute M to the dump.

It will be noted that the teeth K are arranged in two parallel transverse series, the teeth of one series alternating in position with respect to the teeth of the other series. This disposition of the teeth is advantageous, inasmuch as it reduces the capacity of said teeth for passing too freely through the material above the mercury and, on the other hand, permits the entire group of teeth to exercise to a certain degree a dragging effect on the material, and thereby serve for the more positive disturbance and overturning action of the same with a more thorough accompaniment of the liberation of the gold and mercury particles.

From the foregoing it will be seen that the improved machine is efficient and durable. Aside from the expense attendant upon the body of quicksilver used, which, however, al-

ways possesses a commercial value, the machine can be operated with great economy. The simplicity of the construction disclosed will conduce to portability.

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

1. In a machine of the character described, the combination with a tank adapted to contain a lower body of mercury and having a discharge located in a relatively elevated plane, of a horizontal cylinder transversely within said tank and adapted to have its lower portion immersed in the mercury, provision for supplying material to the tank, in front of the cylinder, a pivotally-suspended arm depending within the upper portion of the tank at the rear of the horizontal cylinder and between the latter and the discharge, said arm provided with a series of teeth extending transversely across the tank, the length of the arm and teeth conjointly being such that the teeth in their lowest position will be above the mercury, and means for actuating said cylinder for immersing the material in the mercury and causing said material to pass beneath the cylinder, and for oscillating the arm for causing the teeth to move back and forth in the path of an arc solely above the plane of the mercury-surface.

2. In a machine of the character described, the combination with a tank adapted to contain a lower body of mercury and having a discharge located in a relatively elevated plane, of a horizontal cylinder transversely within said tank and adapted to have its lower portion immersed in the mercury, provision for supplying material to the tank, in front of the cylinder, a pivotally-suspended arm depending within the upper portion of the tank at the rear of the horizontal cylinder and between the latter and the discharge, said arm provided with a plurality of series of teeth extending transversely across the tank, the teeth of one series alternating with those of the other, the length of the arm and teeth conjointly, being such that the teeth in their lowest position will be above the mercury, and means for actuating said cylinder for immersing the material in the mercury and causing said material to pass beneath said cylinder, and for oscillating the arm for causing the teeth to move back and forth in the path of an arc solely above the plane of the mercury-surface.

3. In a machine of the character described, the combination with a tank adapted to contain a lower body of mercury, of a transverse horizontal cylinder in said tank adapted to have its lower portion immersed in the mercury, and circularly-arranged guards L, L, secured to the inner sides of the tank and each having an annular horizontal flange over-

hanging and intimately embracing the contiguous end portion of the cylinder.

4. In a machine of the character described, the combination with a tank for containing a
5 body of quicksilver, of a cylinder therein for submerging the gold-bearing material within the quicksilver, and having guards L, L, a revolving wiper or doctor for dislodging the material carried upon said cylinder, a pivot-
10 ally-suspended arm having teeth depending

into the material, and means for oscillating said arm.

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

ROBT. BLAKE.

Witnesses:

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LOUISA B. HOPPING.