M. LEITCH.

MECHANICAL MOVEMENT FOR PRODUCING A DIFFERENTIAL SPEED BETWEEN DRIVING AND DRIVEN MEMBERS.

APPLICATION FILED OCT. 24, 1910. RENEWED OCT. 23, 1911.

1,027,134.

Patented May 21, 1912.

3 SHEETS—SHEET 1.

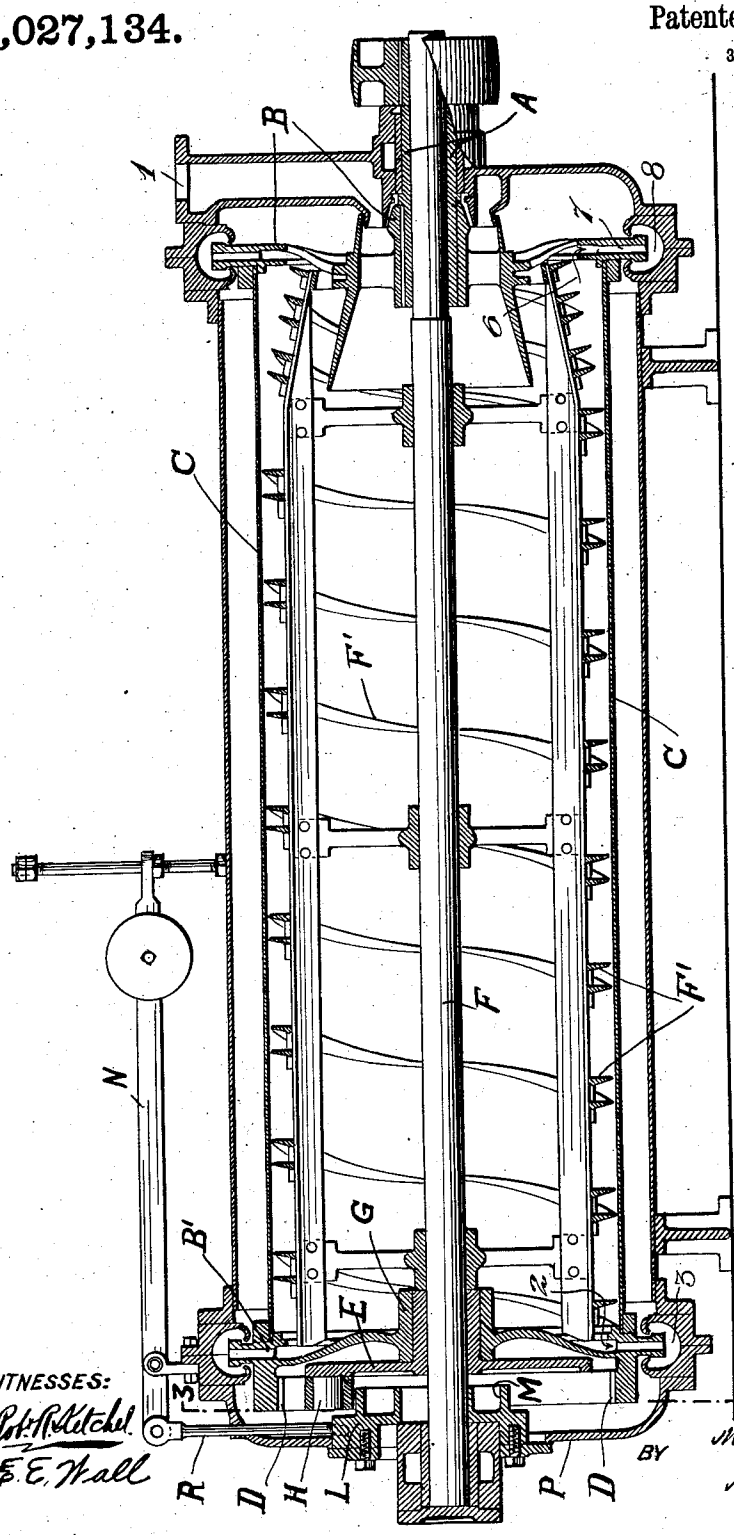

FIG. 1.

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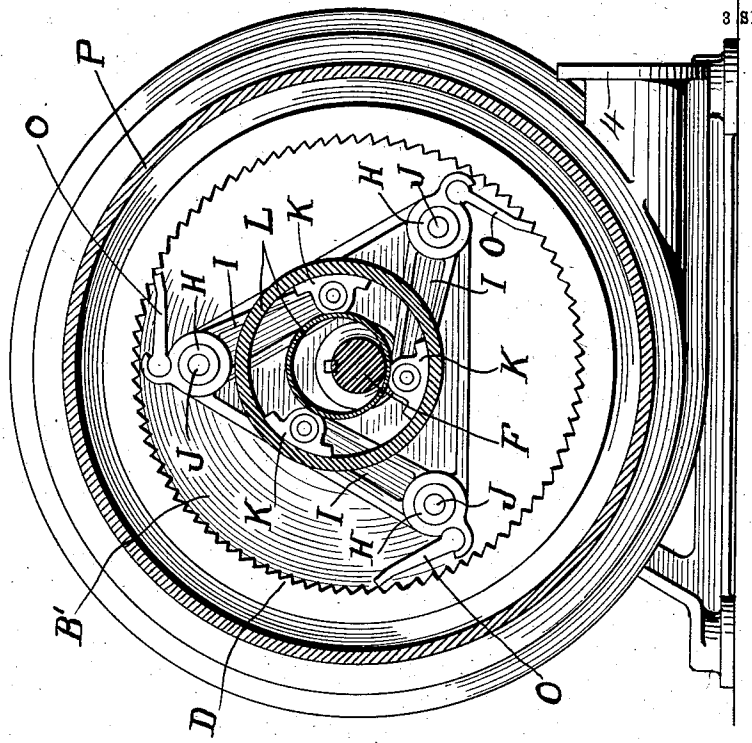

FIG. 3.

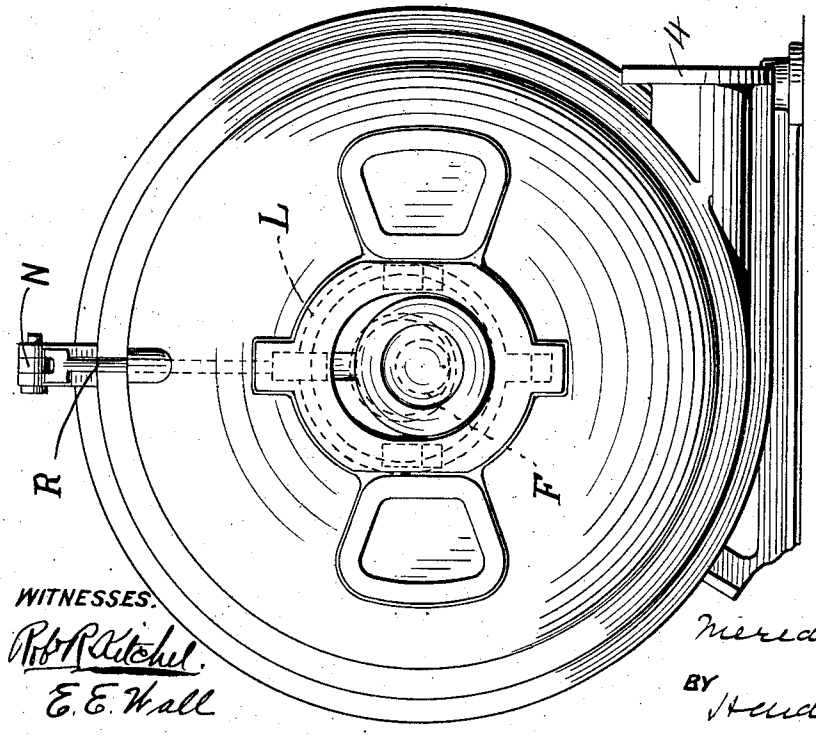

FIG. 2.

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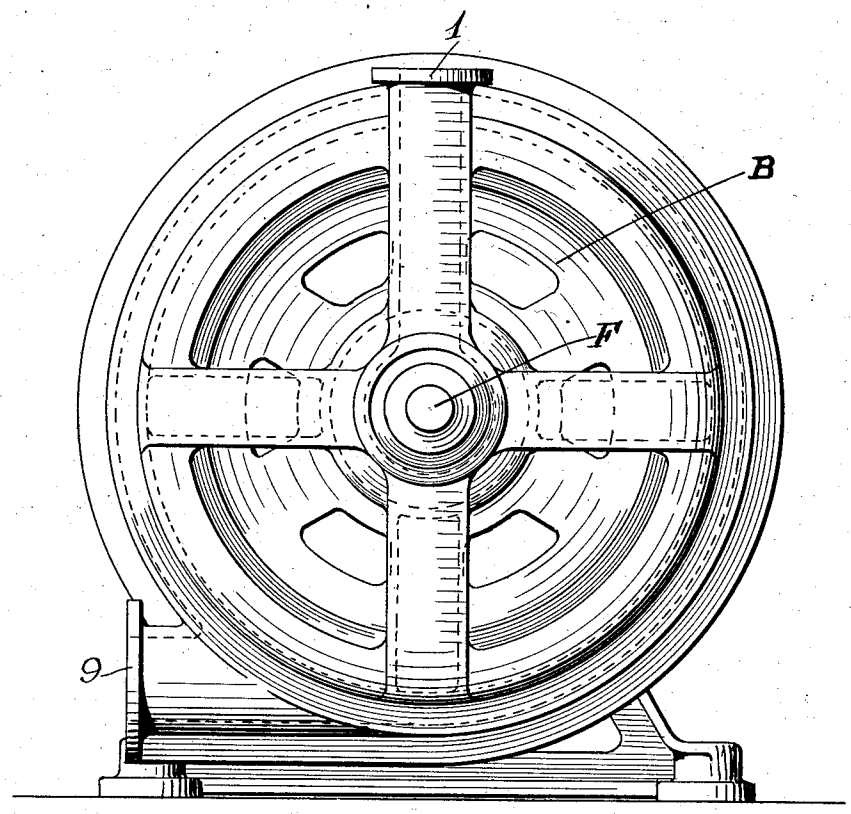

FIG. 4.

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UNITED STATES PATENT OFFICE.

MEREDITH LEITCH, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO FRANCIS J. AREND, OF NEW YORK, N. Y., AND JOHN BERNSTROM, OF STOCKHOLM, SWEDEN.

MECHANICAL MOVEMENT FOR PRODUCING A DIFFERENTIAL SPEED BETWEEN DRIVING AND DRIVEN MEMBERS.

1,027,134. Specification of Letters Patent. **Patented May 21, 1912.**

Application filed October 24, 1910, Serial No. 588,590. Renewed October 23, 1911. Serial No. 656,081.

To all whom it may concern:

Be it known that I, MEREDITH LEITCH, a citizen of the United States, residing at Springfield, county of Hampden, and State of Massachusetts, have invented a new and useful Improvement in Mechanical Movements for Producing a Differential Speed Between Driving and Driven Members, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention is particularly adapted for use in that class of continuous centrifugal machines for the separation of solids and liquids, which comprises a revolving cylinder in which the separation takes place, through which the liquid or semi-liquid passes in one direction. In the interior of the cylinder are conveyers or scrapers which are revolved at a differential speed from that of the cylinder. My invention is applicable to driving the conveyer or scrapers in this manner from the cylinder.

I will first describe the embodiment of my invention illustrated in the accompanying drawings, in which this mechanical movement is used with such a centrifugal machine as has just been described.

In the drawings: Figure 1 is a longitudinal section of a continuous solid liquid centrifugal separator embodying my invention; Fig. 2 is an end view of the left hand end of the machine. Fig. 3 is a section on line 3—3, Fig. 1. Fig. 4 is an end view of the right hand end of the machine of Fig. 1.

C is the revolving cylindrical casing of the centrifugal separator having the heads B and B′. The hollow shaft A for rotating the cylinder is rigidly attached to the cylinder head B.

D is a ratchet wheel, rigidly mounted on the cylinder head B′, and therefore revolves at the same speed as the cylinder C.

F is the shaft carrying the conveyer F′. Keyed to this shaft F is the fulcrum disk E, having hub E′ on the outside of which is mounted the hub G of the cylinder head B′. The disk E is provided with the fulcrums H on which are mounted the levers I. To the outer ends of the levers I are fitted pawls O which engage the teeth of ratchet wheel D. The inner ends of the levers I are provided with shoes K which rest in the groove M of eccentric L. The shoes K are mounted on the cylindrical projections J which are integral with the levers I. The eccentric L is mounted in the bearing support P so as not to be rotatable, it is, however, supported by the rod R and the weighted lever N so that eccentricity may be decreased by lifting of the lever N, or when too great downward pressure is exerted by the shoes K as they revolve.

In the revolution of the cylinder the inner ends of the levers have an oscillating movement, which causes the pawl in contact with the face of one of the ratchet teeth to exert pressure against the tooth. This force causes the fulcrum pin in which the lever is mounted to advance and the disk E and conveyer to revolve with relation to the cylinder C. The effort of each lever and pawl movement is to cause this rotating effect during half a revolution, that is 180 degrees. There being three levers, however, the work must be divided up between the three pawls and the result is that each pawl exerts through 120 degrees, the final result being that the rotating movement of the conveyer is practically constant and there is no shock when the advancing pawl comes in contact with the tooth.

Should the conveyer screw become bound in the cylinder from any cause as for instance too rapid feeding of the machines, the ratchet driving mechanism will not be broken as would be the case with the gears, but would cease to operate. The pressure of the shoes K on the eccentric would force it to a more concentric position and the levers would not oscillate sufficiently to carry the pawls over the next tooth. This movement of the eccentric would lift the long end of the weighted lever to which a feed controlling valve may be attached and re-

duce or shut off entirely the supply of raw material and consequently the output of the machines would be unaffected. To start the conveyer again, pressure applied by hand to the lever will again bring the eccentric to full stroke, and consequently cause the conveyer to again rotate with relation to the cylinder. This being done the feed may again be restored.

In the machine shown, the material a mixture of solids and liquid is fed into the inlet 1 on the right hand head of the apparatus. The liquid passes to the left hand end, and the solids through the action of the conveyers, are carried to the right hand end. The liquids pass out in the direction of the arrow 2 into the passage 5 leading to the chamber 3 which communicates with the outlet 4. The solids pass in the direction of the arrow 6 into and through the passage 7 into the chamber 8 in communication with the solids outlet 9.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. As a mechanical movement, in combination, rotatable driving and driven members, one of said members carrying a ratchet, the other carrying a fulcrum support, one or more levers fulcrumed on said support, and an eccentric with reference to which said driving and driven members rotate, said levers provided with means for coaction with said ratchet and with means for coaction with said eccentric.

2. As a mechanical movement, in combination, rotatable driving and driven members, one of said members carrying a ratchet, the other carrying a fulcrum support, one or more levers fulcrumed on said support, an eccentric of variable throw and with reference to which said driving and driven members rotate, said levers provided with means for coaction with said ratchet and with means for coaction with said eccentric, and means acting on said eccentric tending to counteract the tendency of said levers to vary the throw of such eccentric.

3. As a mechanical movement, in combination, rotatable driving and driven members, having a common axis of rotation, and power-transmitting mechanism for causing said driven member to rotate with reference to the driving member and comprising disengaging means, controlled by the resistance against which said driven member rotates with reference to the driving member, and arranged to check transmission of power through such mechanism from the driving to the driven member when such resistance becomes excessive.

4. As a mechanical movement, in combination, a rotating driving member carrying a ratchet, a driven member, carrying a fulcrum disk, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, shoes carried by said levers on the opposite side of said fulcrum, and a non-rotatable eccentric with which said shoes contact.

5. As a mechanical movement, in combination, a rotating driving member carrying a ratchet, a driven member, carrying a fulcrum disk, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, a non-rotatable eccentric with which the levers, on the side of the fulcrum opposite to that of the pawls, contact.

6. As a mechanical movement, in combination, a rotating driving member carrying a ratchet, a driven member, carrying a fulcrum disk, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, shoes carried by said levers on the opposite side of said fulcrum, and a non-rotatable but vertically movably supported eccentric with which said shoes contact.

7. As a mechanical movement, in combination, a rotating driving member carrying a ratchet, a driven member, carrying a fulcrum disk, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, a non-rotatable but vertically movably supported eccentric with which the levers, on the side of the fulcrum opposite to that of the pawls, contact.

8. In combination, a rotatable cylinder, a conveyer within said cylinder, a ratchet rotating with said cylinder, a fulcrum disk operatively connected with said conveyer, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, shoes carried by said levers on the opposite side of said fulcrum, and a non-rotatable eccentric with which said shoes contact.

9. In combination, a rotatable cylinder, a conveyer within said cylinder, a ratchet rotating with said cylinder, a fulcrum disk operatively connected with said conveyer, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, a non-rotatable eccentric with which the levers on the side of the fulcrum, opposite to that of the pawls, contact.

10. In combination, a rotatable cylinder, a conveyer within said cylinder, a ratchet rotating with said cylinder, a fulcrum disk operatively connected with said conveyer, levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, shoes carried by said levers on the opposite side of said fulcrum, and a non-rotatable but vertically movably supported eccentric with which said shoes contact.

11. In combination, a rotatable cylinder, a conveyer within said cylinder, a ratchet rotating with said cylinder, a fulcrum disk operatively connected with said conveyer,

levers fulcrumed on said disk, pawls carried by said levers coacting with said ratchet, a non-rotatable but vertically movably supported eccentric with which the levers on the side of the fulcrum, opposite to that of the pawls, contact.

In testimony of which invention, I have hereunto set my hand, at Springfield, Mass., on this first day of October, 1910.

MEREDITH LEITCH.

Witnesses:
C. W. WEBB,
F. K. FEARNSIDE.