No. 873,219. PATENTED DEC. 10, 1907.

T. A. EDISON.

FEED REGULATOR FOR GRINDING MACHINES.

APPLICATION FILED JAN. 13, 1903.

Fig. 1.

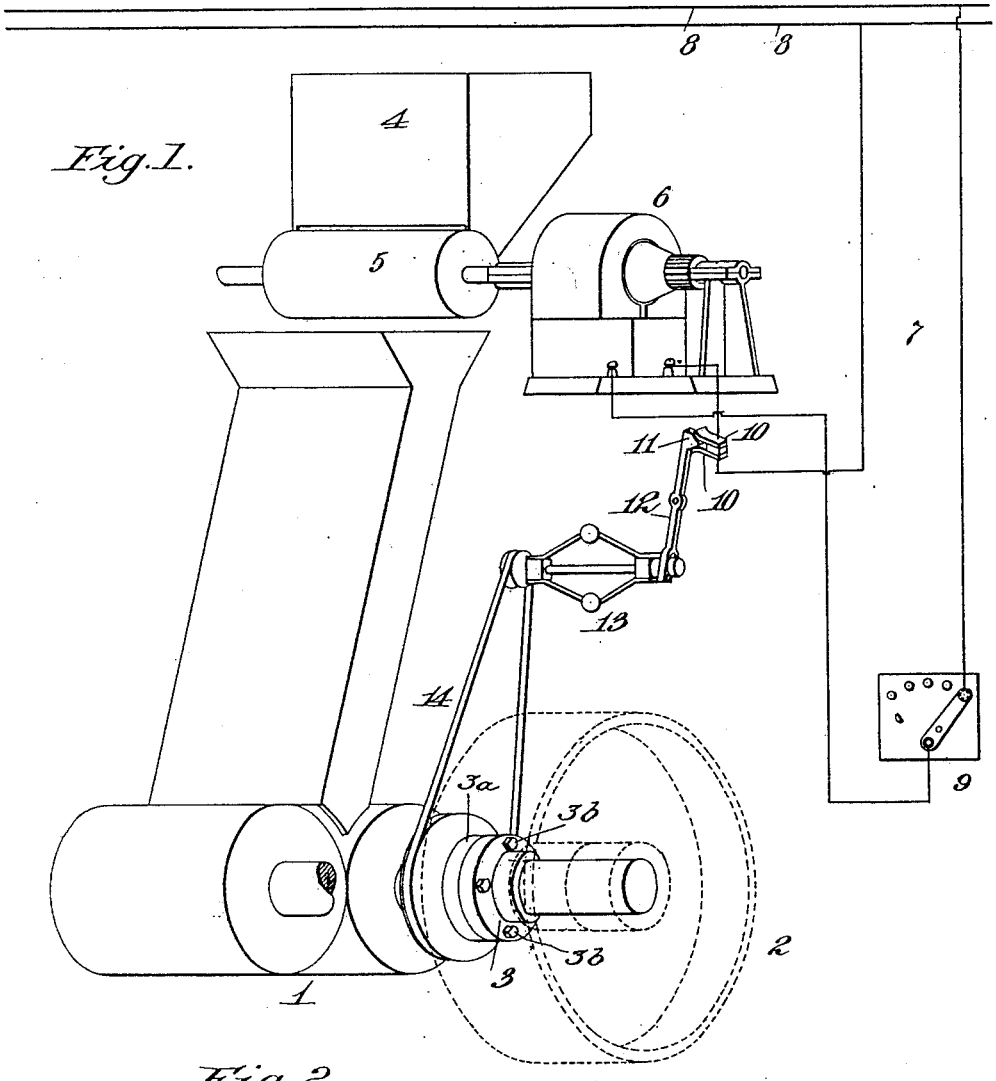
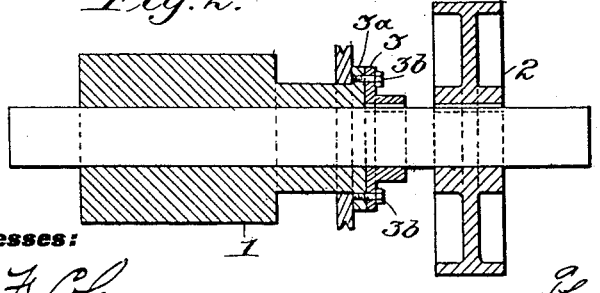


Fig. 2.



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FEED-REGULATOR FOR GRINDING-MACHINES.

No. 873,219. Specification of Letters Patent. Patented Dec. 10, 1907.

Application filed January 13, 1903. Serial No. 138,812.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, Orange, Essex county, New Jersey, have invented a certain new and useful Improvement in Feed-Regulators for Grinding-Machines, of which the following is a specification.

In the operation of grinding machines for the fine grinding of material in bulk, like Portland cement or cement mixtures, I prefer to supply the material to the grinding apparatus by means of a roller feed, although a feeding worm or screw or other mechanism for the purpose may be employed. In practice, foreign substances, like bolts, nuts, nails, and even wrenches, become accidentally mixed with the material to be ground, and are fed to the grinding rolls. The presence of these hard foreign substances in the material to be ground makes it desirable to drive the grinding rolls through a coupling equipped with shear-bolts, as is common, so that when a foreign substance reaches the rolls, the increased resistance results in a shearing of the bolts, thus permitting the grinding rolls to stop. I find in practice that it is desirable to provide the feed mechanism for the grinding rolls with a separate driving motor, the speed of which can be regulated so that the quantity of material supplied to the rolls can be adjusted independently of the latter. When such a separately driven feed mechanism is employed, it becomes highly important that the feed of material should be arrested when the coupling between the grinding rolls and its driving engine becomes sheared and the rolls stop, because otherwise a mass of material would be fed to the grinding rolls and would accumulate therein, increasing the difficulties incident to the removal of the foreign substance.

The purpose of the present invention, therefore, is to provide means by which a separately operated feed mechanism will be automatically arrested when the grinding rolls are stopped from any cause, as, for example, by the shearing of the driving coupling therefor due to the presence of any hard foreign substance tending to pass between the rolls.

In the drawings which accompany this specification, Figure 1 shows diagrammatically the preferred arrangement of means for carrying out the invention. Fig. 2 is a detail sectional view.

1, 1 represent the grinding rolls, of any suitable type, one of them being driven by a belt-wheel 2 and the other rotating frictionally. A shearing coupling of any suitable type is interposed between the driving mechanism and the driven roll, and arranged so that the bolts thereof will be sheared when the load on the rolls is greatly increased. This feature is shown in Fig. 2 wherein 3 is a circular plate keyed to the driving shaft and connected to the flange 3^a of the roll 1 by bolts 3^b. A hopper 4 is supplied with material, and is provided with a roller or other feed 5 at its bottom, by means of which material will be fed to the grinding rolls.

The feed mechanism is operated by a motor 6 of any suitable type, an electric motor being shown. This electric motor is illustrated as being connected in a circuit 7 across the mains 8, 8, an ordinary rheostat or starting box 9 being included in the circuit for regulating the speed of the motor. The circuit 7 includes the contacts 10, 10 arranged to be normally closed by a bridging contact 11 carried on a lever 12 which is shown as centrally pivoted. This lever is operated by a centrifugal governor 13 rotated by a belt 14, driven by one of the grinding rolls 1. In consequence, it will be understood that when the shearing coupling operates to permit of the stoppage of the grinding rolls 1, the governor balls will be moved inwards, operating the lever 12, and breaking the circuit 7 so as to stop the motor. When the grinding rolls are again started, the governor balls will be moved outwards centrifugally, closing the circuit 7 between the contacts 10, and permitting the motor to be again started and its speed controlled by means of the rheostat 9.

Having indicated the preferred way in which my invention may be carried into effect, many other arrangements for securing the desired result by analogous means will be obvious to those skilled in the art.

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

1. In grinding apparatus, the combination with grinding rolls and means including a motor for driving the same, of feed mechanism for supplying material to said rolls, a separate motor for operating the feed mech-

anism, and means controlled by one of the grinding rolls for automatically stopping the last named motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

2. In grinding apparatus, the combination with grinding rolls, a driving shaft, means including a motor for driving said shaft and a shearing connection between the driving shaft and grinding rolls, of feed mechanism for supplying material to the grinding rolls, a separate motor for operating the feed mechanism, and means controlled by one of the grinding rolls for automatically stopping the last named motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

3. In grinding apparatus, the combination with grinding rolls, and means including a motor for driving the same, of feed mechanism for supplying material to said rolls, a separate motor for operating the feeding device, means for controlling the speed of the motor, and means controlled by one of the grinding rolls for automatically stopping the last named motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

4. In grinding apparatus, the combination with grinding rolls and means for driving the same, of feed mechanism for supplying material to the rolls, an electric motor for operating the feeding device independently of the rolls, and means connected with said grinding rolls for automatically breaking the circuit to said motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

5. In grinding apparatus, the combination with grinding rolls and means for driving the same, of feed mechanism for supplying material to the rolls, an electric motor for operating the feeding device independently of the rolls, and a centrifugal governor connected with said grinding rolls for automatically breaking the circuit to said motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

6. In grinding apparatus, the combination with grinding rolls and means for driving the same, of feed mechanism for supplying material to the rolls, an electric motor for operating the feeding device independently of the rolls, a rheostat for controlling the speed of the motor, and means connected with said grinding rolls for automatically breaking the circuit to the motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

7. In grinding apparatus, the combination with grinding rolls and means for driving the same, of feed mechanism for supplying material to the rolls, an electric motor for operating the feeding device independently of the rolls, a rheostat for controlling the speed of the motor, and a centrifugal governor connected with said grinding rolls for automatically breaking the circuit to the motor when rotation of the grinding rolls is arrested, substantially as and for the purposes set forth.

8. In grinding apparatus, the combination with grinding rolls and means including a motor for driving the same, of feed mechanism for supplying material to the rolls, a separate motor for operating the feed mechanism, and means connected with said grinding rolls for automatically stopping the last named motor when rotation of the grinding rolls is arrested, substantially as set forth.

9. In grinding apparatus, the combination with grinding rolls, a driving shaft, means including a motor for driving said shaft and a shearing connection between the driving shaft and grinding rolls, of means for supplying material to the grinding rolls, a separate motor for operating the feed mechanism, and means connected with said grinding rolls for automatically stopping the last named motor when rotation of the grinding rolls is arrested, substantially as set forth.

This specification signed and witnessed this 18th day of Dec. 1902.

THOMAS A. EDISON.

Witnesses:
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