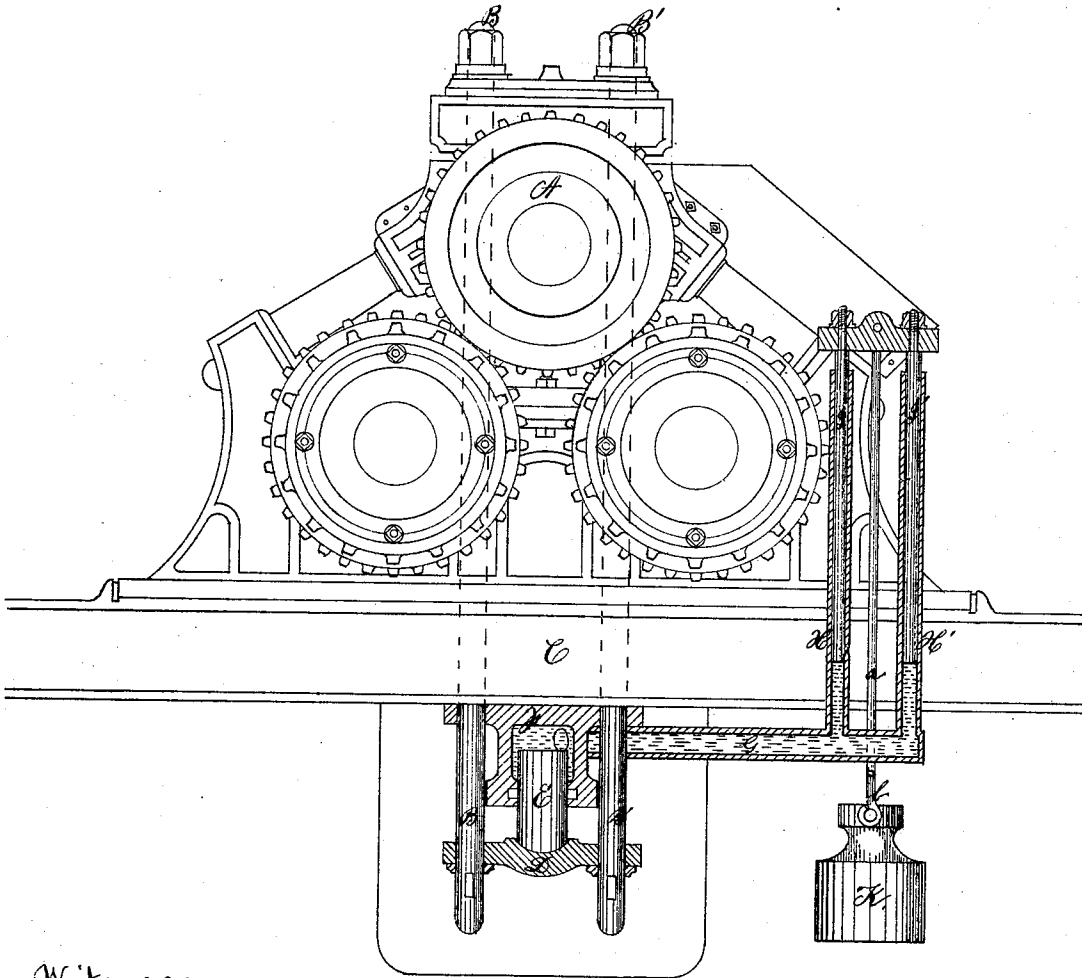


JOHN S. McDONALD.

Hydraulic Pressure-Regulators.

No. 128,235.

Patented June 25, 1872.



Witnesses

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JOHN S. McDONALD, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN HYDRAULIC PRESSURE-REGULATORS.

Specification forming part of Letters Patent No. 128,235, dated June 25, 1872.

Be it known that I, JOHN S. McDONALD, of the city of New Orleans and State of Louisiana, have invented a Pressure-Regulator; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the drawing annexed constituting a part of this specification.

My improvement relates to a simple hydrostatic pressure regulating apparatus, by the application of which the bearings which are made to support heavy machinery, shafting, or the journals of ponderous iron rollers will be allowed a limited vertical adjustability to any irregularity of pressure to which in practice they may be subjected.

While the application of my device for the purposes above indicated may be advantageously made to many classes or kinds of machinery, it is more especially designed to be used in connection with sugar-cane crushing-mills, to the end of securing thereby uniformity and regularity of pressure under all circumstances of "light" or of "heavy feed" of the cane to the crushing-mill, a contingency for which, in practice, experience has demonstrated the necessity of making the most ample provision.

Engineers familiar with the management and working of cane-crushing mills can readily comprehend the utter impossibility of securing from the unskilled labor which they are necessarily compelled to employ upon the sugar plantations of the South, and of other sugar-producing countries, a uniform and regular feeding of the cane-stalks to the crushing-rollers, and the injurious consequences resulting therefrom. Overfeeding or overcrowding the mill with cane-stalks will in most cases either cause the breakage of some of its parts, or result in choking it up to the extent of bringing it and the machinery connected therewith to a full stop. On the other hand a too moderate feeding of the cane-stalks to the mill, the rollers of which have been regulated for a certain prescribed and regular feed, will not secure the thorough pressing of the cane to the extent of extracting the juice therefrom. Under these circumstances it becomes necessary to adopt some means by which the objectionable difficulties above enumerated may be obviated.

The object which I have in view by the ap-

plication of my device to a crushing-mill is to secure at all times an equal pressure upon the cane-stalks, whether the same be fed to the mill to the utmost of its capacity, whether but a limited quantity be fed thereto, or whether but a single stalk be subjected to its operations.

For this purpose it is necessary to apply my device only to the bearings of the two journals of the top roller as partially exhibited upon the accompanying drawing to which reference must be made in order to a more thorough appreciation of the peculiar features embraced therein, and whereon it is shown as applied to practice in connection with a set of sugar-cane crushing-rollers.

On the drawing, A shows the top roller of an ordinary cane-crushing mill, while B B' are the housing-bolts by which this roller is held to its bearings when in operation and subjected to pressure. The said bolts B B', as will be perceived, pass downward and entirely through the bed-plate C, beyond the base of which they are prolonged sufficiently to receive and hold in position the bed-plate D of the regulator. The upper surface of this bed-plate has a socket for the reception and maintenance in position of the solid cylindrical plunger or piston E, which is inserted within the chamber of the liquid cylinder F, the solid inclosed end of which in practice is made to bear upward against the lower side of the bed-plate C, of the crushing-mill. Connected with the interior of the said liquid chamber of the cylinder F is a horizontal pipe, G, to the outer extremity of which are connected the upright hollow pipes or tubes H H', which receive the pistons I I' fitting closely therein and resting upon the surface of any suitable liquid with which it will be necessary to fill the pipes H H' and G, and the liquid chamber therewith connected. The upper extremity of the pistons I I' are connected by a cross-head firmly secured thereto, and from which, by means of the rods *a* and *b*, is suspended a weight, K. This weight must be of a capacity to correspond with the amount of pressure to which it is required to subject the rollers when in operation. The extent of vertical movement or vertical adjustability of the roller A, may be easily regulated by the amount of liquid placed within the chamber of the cylinder F,

as will readily be perceived by an examination of the drawing. It is moreover obvious that the weight K, which is made to press the pistons I I' upon the liquid within the pipes H H', will make said liquid operate upon the upper surface of the plunger E, which will be raised or depressed in proportion to the amount of pressure to which it may be subjected by the cane which is made to pass between the crushing-rollers; and as the plunger is raised or depressed in the manner indicated, it follows as a resulting consequence that the housing-bolts B B' will be correspondingly raised

or lowered, and with them the roller A of the crushing-mill.

Having described my invention, what I claim, and desire to secure by Letters Patent, is the following claim:

The hydrostatic pressure-regulator herein described and consisting of the liquid cylinder F, plunger E, bed-plate C, pipes G and H H', with the pistons I I', and weight K, for the purposes set forth.

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