

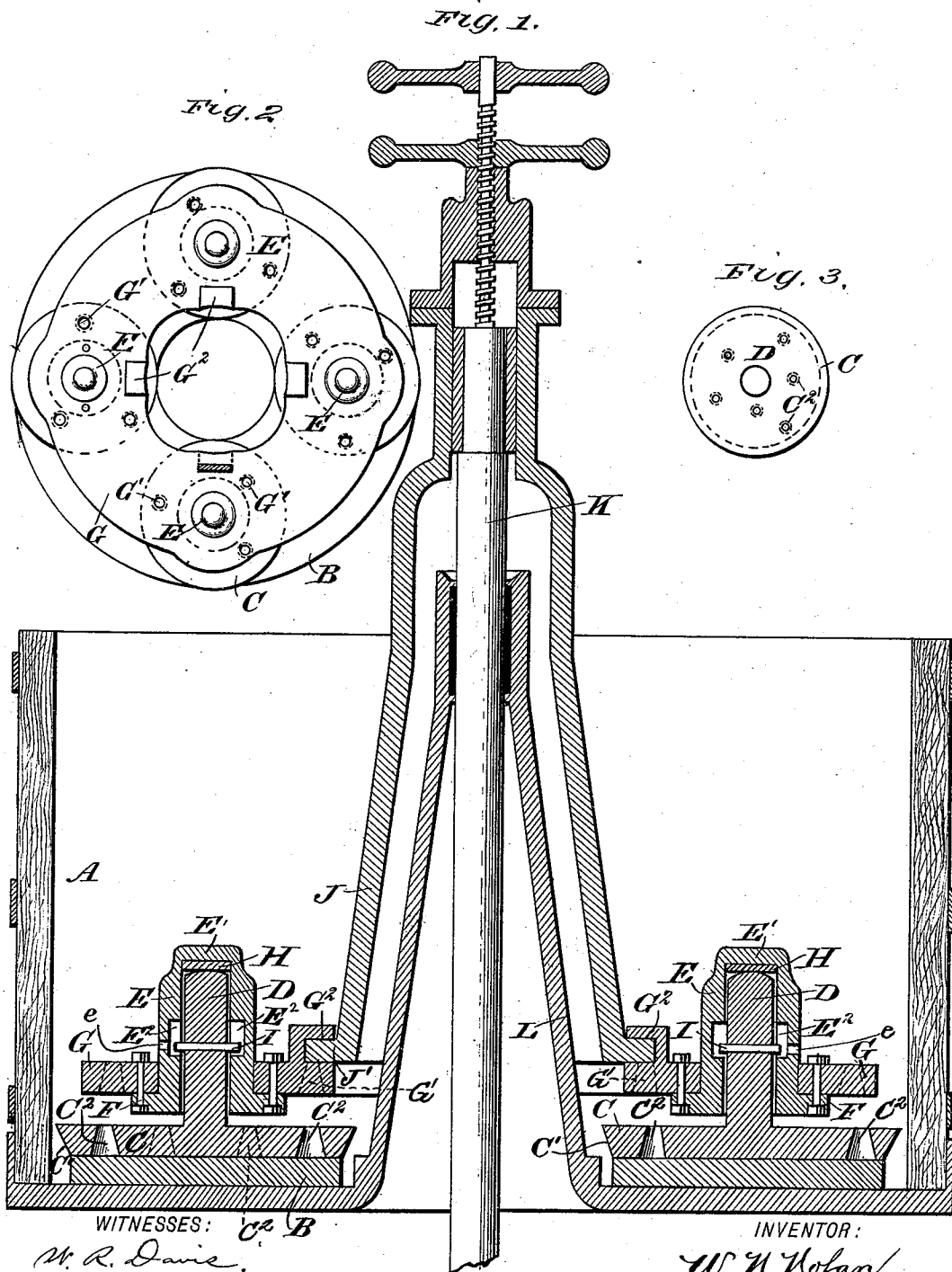
(No Model.)

W. N. NOLAN.

MULLER FOR GRINDING OR AMALGAMATING MILLS.

No. 512,893.

Patented Jan. 16, 1894.



WITNESSES:
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WALTER N. NOLAN, OF EL ORO, MEXICO.

MULLER FOR GRINDING OR AMALGAMATING MILLS.

SPECIFICATION forming part of Letters Patent No. 512,893, dated January 16, 1894.

Application filed May 6, 1891. Renewed October 25, 1893. Serial No. 489,134. (No model.)

To all whom it may concern:

Be it known that I, WALTER N. NOLAN, of El Oro, Tultenango, Mexico, have invented a new and Improved Muller for Grinding or Amalgamating Mills, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved muller designed for use in grinding or amalgamating mills, and which is simple and durable in construction, very effective in operation, and adapted for both grinding and amalgamating purposes.

The invention consists of certain parts and details and combinations of the same, as will be described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement as applied. Fig. 2 is a reduced plan view of the muller; and Fig. 3 is a plan view of one of the shoes.

The grinding or amalgamating mill is provided with the usual pan A, formed on its bottom with a die ring B, on which are adapted to travel a series of shoes C, each having a beveled rim C', and a series of conical feed apertures C², as is plainly illustrated in the drawings, the smaller end being at the top surface of the shoe. Each of the shoes C is formed with a central stud or shaft D, mounted to revolve in a hub E, projecting from a circular plate F, bolted or otherwise secured to the under side of a carrier G, preferably made in ring shape, as is plainly illustrated in the drawings. The upper end of the shaft D is rounded and abuts on the under side of a washer H held in the closed end E' of the hub E.

In the carrier G are arranged cone-shaped apertures G', registering with the apertures C² and through which the pulp is introduced, to pass on to the revolving shoe, and through the tapering apertures C² therein, between the lower surface of the shoe and the die ring B, so as to be ground.

In the upper end of the stud or shaft D is held a pin I, adapted to engage at its projecting ends the grooves E² formed in the hub E, so that when the carrier G is raised the shoes

are raised likewise when the ends of the pins engage the lower ends of the grooves. The pins I are inserted into the transverse apertures in the shaft through transverse apertures e in the hubs E intersecting the said grooves E². The carrier G is provided on its top with sockets G², engaged by the outwardly-extending flanges J', of the upwardly-extending hollow frame J, held on the shaft K, mounted to revolve and passing through a stuffing box in the upper end of the hollow offset L, extending into the frame J from the bottom of the pan, as plainly shown in Fig. 1. When the carrier G is revolved in one direction, the shoes C travel in an opposite direction, on account of the friction on the periphery of the die ring B being considerably more than at the center of the shoe.

By the shoes revolving in the direction opposite to the movement of the carrier G, the grinding capacity of the muller is greatly increased over that of mullers now in use. The shoes are free to slide upward in their hubs E to admit more or less pulp between the grinding surfaces.

The weight of the muller and hubs bears on the upper ends of the shafts D thus pressing on the latter as well as on the shoes, so that the lower faces of the shoes are brought in contact with the material on the top surface of the die ring when the muller is lowered the proper distance. The friction of the shoe shafts is greatly reduced by having their upper ends rounded as described and shown.

The pulp is introduced into the pan and passes under the shoe in the usual way, and the conical shaped apertures in the muller and also in the shoes, keep up a constant supply of pulp beneath the surfaces of the latter and the die ring B. Four of these shoes attached to a muller will grind the pulp finer in one hour than the common form of muller, with ten heavy positive shoes, will in four hours, and the power required to operate the former is no more than that of the latter; consequently mills can have coarse screens on the batteries and do the grinding in their pans, thereby saving time and money.

The muller, on account of its peculiar shape and construction, gives a rapid motion to the pulp, both when grinding and amalgamating.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The shoe C, comprising a horizontal disk provided with a central vertical stem D on its upper face and with feed apertures extending through it from face to face, substantially as set forth.
2. The flat disk like shoe C having an integral stem D on its upper face, a beveled periphery C', and a series of conical feed apertures C² extending through the shoe from face to face, substantially as set forth.
3. The combination with the hub having an internal annular recess, and means for attaching it, of a flat disk-like shoe having a central vertical stem entering the hub and provided with a transverse pin or projection entering the annular groove and holding the shoe in place, substantially as set forth.
4. The combination with the carrier having a series of apertures, of a series of hubs inserted through the apertures from below and having attaching flanges or plates F bolted to the carrier, a series of rotary disk-like shoes provided centrally on their upper faces with stems held within the said hubs, substantially as set forth.
5. In a miller, the annular carrier G, formed with a series of hub receiving apertures and

on its upper face adjacent to its central aperture with attaching sockets G², substantially as set forth.

6. The combination with the rotary frame having outwardly projecting flanges at its lower end, of the annular carrier having sockets G² on its upper face receiving said flanges, and shoes operated by the carrier, substantially as set forth.

7. A grinding and amalgamating mill, comprising the pan A having a die ring B and a central vertical hollow offset L, the drive shaft extending up through said offset, the hollow frame J mounted on the shaft, inclosing the said offset and provided at its lower end with a series of outward projecting flanges J', around its lower end, the annular carrier having a series of sockets G² receiving said flanges and provided with a series of apertures, vertical hubs E secured in said apertures, and the disk-like shoes resting at their lower faces on the ring B and provided with central vertical stems supported and rotating in the hubs, substantially as set forth.

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Witnesses:

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