(No Model.)

E. E. PROTHEROE.

ROLLER MILL BELT FEED.

No. 587,606. Patented Aug. 3, 1897.

Fig 1.

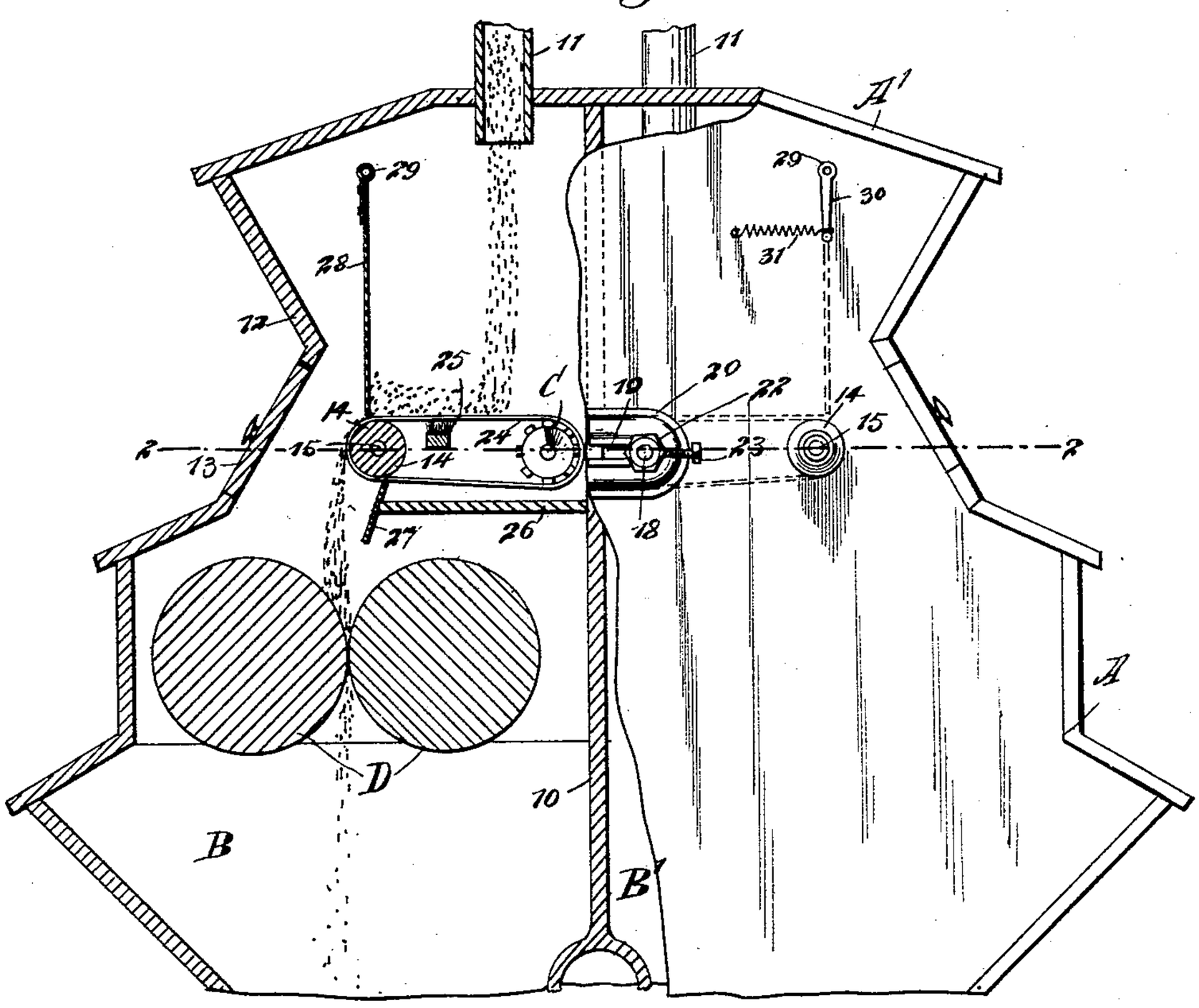


Fig. 2.

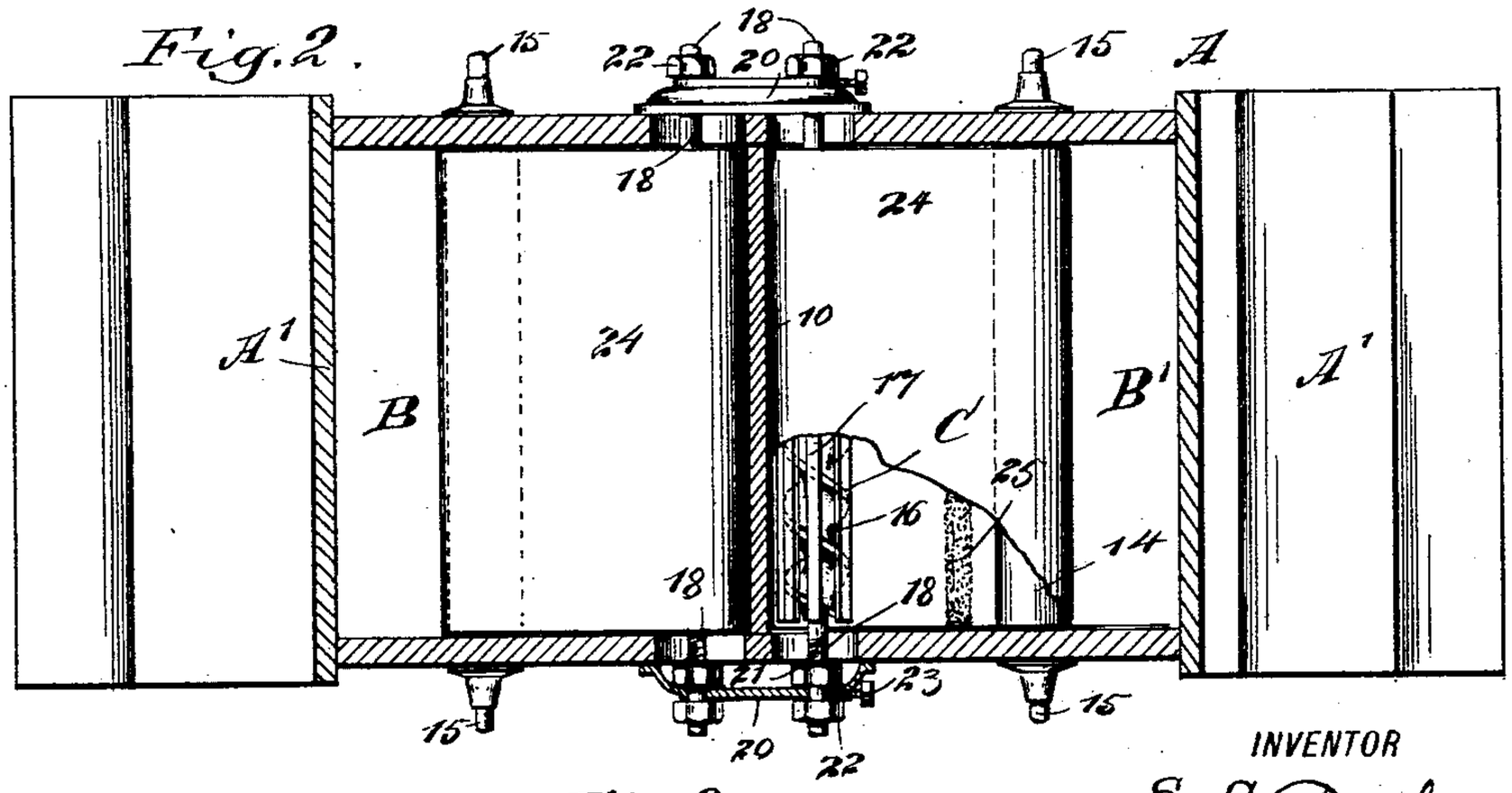
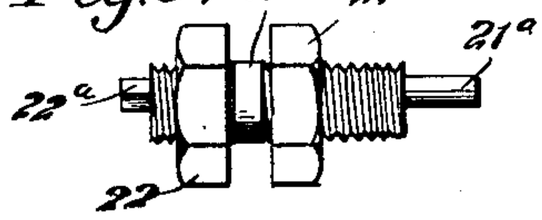


Fig. 3.



WITNESSES:

L. N. Legendre.

J. Fredericks.

INVENTOR

E. E. Protheroe

BY

Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

EVELYN EDWARD PROTHEROE, OF BRODHEAD, KENTUCKY.

ROLLER-MILL BELT-FEED.

SPECIFICATION forming part of Letters Patent No. 587,606, dated August 3, 1897.

Application filed August 12, 1896. Serial No. 602,524. (No model.)

To all whom it may concern:

Be it known that I, EVELYN EDWARD PROTHEROE, of Brodhead, in the county of Rock Castle and State of Kentucky, have invented a new and Improved Roller-Mill Belt-Feed, of which the following is a full, clear, and exact description.

My invention relates to a belt-feed for roller-mills, purifiers, and like machinery.

The object of the invention is to construct a simple, durable, and economic feed the adjusting devices whereof are at the outside of the machine, away from the rusting influence of the hot moist air of the internal parts.

Another object of the invention is to provide a regulating-gate in connection with the belt-feed that will so control the stock that the latter will accummulate in predetermined quantities the full width of the belt at its delivery end, finally overcoming the resistance of the gate and dropping in an even sheet to the grinding-rolls.

Another object of the invention is to provide a feed that will not choke and wherein any of the stock that may escape from the belt-feed will be automatically returned.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a partial side elevation and partial vertical section through the upper portion of the roller-mill. Fig. 2 is a section taken substantially on the line 2 2 of Fig. 1, and Fig. 3 is a detail view of one of the adjusting-bearings for the conveyer.

The roller-mill A may be of any approved type, and its upper housing or upper section A′ is shown as provided at front and rear with inwardly-inclined angular walls 12, having doors 13, whereby the interior of the mill is rendered accessible, and said mill is shown at its upper end as divided into two chambers B and B′ by means of a partition 10. A conducting-chute 11 is made to enter the top portion of each of these chambers, as shown in Fig. 1. Opposite the doors 13 a roller 14 is transversely journaled in each of the chambers B and B′, and these rollers are secured on shafts 15, which are journaled in the sides of the mill and are driven by any suitably-applied power. The interior arrangement of each chamber is the same, and in each of said chambers a second roller C is located adjacent to the partition 10 and at the rear of and practically in horizontal alinement with the front roller 14. The rear roller C, which is the driven roller, combines with it a conveyer, the said roller comprising, as shown in Fig. 2, a screw center 16 and slats 17, which are secured upon the outer edges of the screw, extending longitudinally of the same.

The roller C is of sufficient length to extend from one side of the mill to the other, and its ends or trunnions are bored to receive the inner extremities of screws 18, which serve as bearings for the roller, enabling the roller C to be readily revolved. The screw-bearings of the conveyer-roller C extend out beyond the sides of the mill through slots 19, formed in boxes 20, secured to the outer side face of the mill, and one box at each side will serve as guides for the adjustment of the conveyer-rollers of each chamber B and B′.

Each screw-bearing is provided with a lock-nut 21, placed between the box in which the bearing is located and the outer side wall of the mill, having bearing against the box, while a second nut 22 is placed at the outer end of each screw-bearing, as is best shown in Fig. 2. In this manner the bearings may be made to contact more or less firmly against the roller. The conveyer-rollers C are adjustable in an inwardly or lateral direction through the medium of adjusting-screws 23, located in the ends of the boxes 20, and a belt or apron 24 is made to pass around the driving-roller 14 and opposing conveyer-roller C. The conveyer-rollers may be removed from the machine without interfering with the other parts by simply taking off one of the boxes.

The belt or apron 24 should have vertical movement at the back, and this is preferably accomplished by forming the inner ends 21ª of the screw-bearings 18 eccentrically to their bodies, so that by turning the screws the conveyer-rollers C may be raised or lowered. The

outer ends 22^a of the screws are usually squared, so that they may be held by a wrench while the nuts are being loosened or tightened.

An oil-passage may be bored the full length through the bearings 18, and a suitable oil-cup may be connected with the bore, if desired.

A brush 25 is supported between the stretches of the apron 24, the said brush being arranged to remove any material from the inner face of the belt that may cling thereto, and below each belt 24 a platform 26 is erected, provided with an inclined facing-board 27, and the facing-board 27 is ordinarily brought over the space between the crushing-rollers D of the mill in the chamber in which the platform is located, as shown in Fig. 1. A regulating-gate 28 is placed above or at the outer end of each of the conveyer-aprons 24, the lower ends of the regulating-gates being free and their upper ends attached to a shaft 29, journaled in the sides of the mill. Normally these gates are in a vertical position, as illustrated in Fig. 1, and at one or both ends of each gate-shaft 29 a crank-arm 30 is secured, having a spring or equivalent tension device attached, the said spring device being likewise secured to the casing of the mill back of the crank-arms 30, as shown also in Fig. 1, so that the springs or tension devices will offer resistance to the outward movement of the gates, and this resistance may be increased or decreased by increasing or decreasing the tensional qualities of the springs 31.

The stock entering at the chutes 11 falls perpendicularly on the moving belts or conveyers 24. The friction of the stock resting on the belt brings to bear the full weight of the stock against the swinging or regulating gates, and the stock remains in contact with the gates until a sufficient quantity has accummulated to overcome the strength of the tension devices 31, whereupon the gates open, preventing any further accummulation of stock, and the stock will then be delivered to the grinding-rollers D in an even sheet the full width of the grinding-surface of said rollers, a much desired result much sought after since the advent of the roller-mill, but not hitherto attained. The gates should be regulated to retain just a sufficient amount of stock to form a mound, the base of the same being equal to the width of the hopper.

It is evident that a feed constructed as above described will not choke, since every additional ounce of stock will contribute its full weight to influence the regulating-gate, increasing the pressure on the gate, so as to force the latter open proportionately.

Any of the stock that may be spilled over the edge of the conveyer will be caught by the conveyer on the inner roller C and conducted to the platforms 26; but the spilling of the stock is practically prevented by suitable packing, which packing may consist of wooden strips provided with strips of sheepskin having some of the wool thereon, the wool being placed to touch the belt lightly from the back curve of the belt to the front curve.

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

1. In a belt-feed for roller-mills and the like, the combination, with a supporting-roller for the conveyer-belt, having sockets in its ends, of a casing in which the roller is contained, boxes secured to the casing, and adjustable bearings passed through said boxes, each bearing consisting of a screw provided with nuts arranged for engagement with the inner and the outer faces of the boxes and terminating at their inner ends in eccentric tips, which tips enter the sockets in the roller, as and for the purpose set forth.

2. In a feed for roller-mills and the like, a belt-supporting roller having a screw body and sockets at its ends, and adjustable supports for the said roller, consisting of screws having locking-nuts and inner ends eccentric to the body of the screws and adapted to enter the sockets in the ends of the roller, substantially as described.

3. In a belt-feed for roller-mills and the like, the combination with an endless belt, of rollers supporting said belt, one of which rollers has its body portion shaped as a screw, forming a conveyer, and a platform located beneath the belt, receiving material from the conveyer-roller, which material is that escaping over the edges of the belt, as set forth.

4. In a belt-feed for roller-mills and the like, the combination, with an endless belt, rollers supporting said belt, one of which rollers has its body portion shaped as a screw, forming a conveyer, of a platform located beneath the belt, receiving material from the roller conveyer, which material is that escaping over the edges of the belt, and a tension-controlled gate pivoted above the belt, the free end of the gate being located over the delivery end of the belt in close proximity thereto, as and for the purpose specified.

5. In a belt-feed for roller-mills and the like, the combination, with a belt, of a roller supporting one end of the belt, comprising a screw body and slats attached to the outer face of the screw, extending longitudinally thereof, a bearing for the said roller, and means for adjusting the said bearing, substantially as shown and described.

6. In a roller-mill or the like, a belt-supporting roller, comprising a feed-screw and slats extending longitudinally of the said screw, screw-bearings removably engaging the ends of the roller, boxes in which the bearings are located, locking devices carried by the bearings, and an adjusting device arranged to move the bearings laterally in their boxes, as and for the purpose specified.

EVELYN EDWARD PROTHEROE.

Witnesses:
R. S. MARTIN,
W. A. CARSON.