

W. E. ZOELLER AND J. E. ULRICH.
CONVEYER ROLLER.

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1,362,910.

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Fig-1

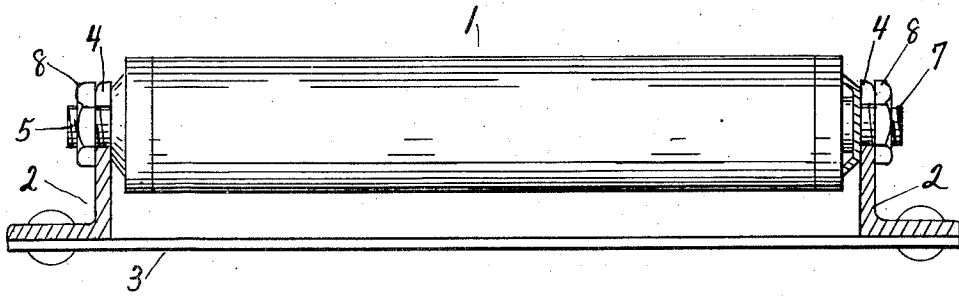
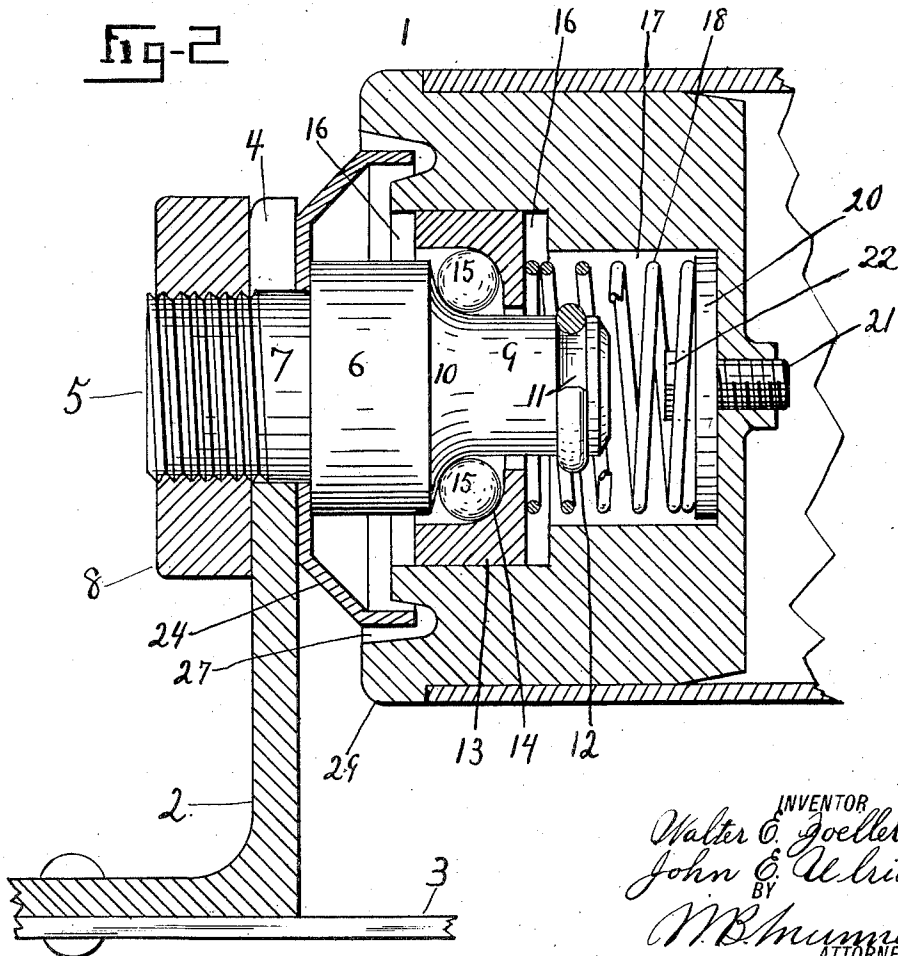


Fig-2



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CONVEYER-ROLLER.

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To all whom it may concern:

Be it known that we, WALTER E. ZOELLER and JOHN E. ULRICH, citizens of the United States, residing in the city of Louisville, county of Jefferson, and State of Kentucky, have invented a new and useful Improvement in Conveyer-Rollers, of which the following is a specification.

This invention relates to bearings for conveyer rollers and more particularly to that type used in connection with gravity conveyers.

A gravity conveyer comprises essentially a plurality of rollers arranged spaced distances apart along an incline of sufficient pitch that an object, such as a box, placed upon the roller will move down the incline under force of gravity, due to its own weight, contacting with and overcoming the inertia of successive rollers, as it advances. The speed at which a box will move down an incline depends upon the pitch of the track, the weight of the object, the inertia to be overcome in starting a roller and the friction of the bearings.

Gravity rollers are so designed that boxes of a given weight will be delivered at the lower end with a momentum which will permit them to be easily handled manually. The first box going down will move as planned, as will succeeding ones, if they are spaced far enough apart so that each roller will have come to a standstill after the passage of a box, before the next box contacts with it. If the rollers are in motion when succeeding boxes contact with them, the boxes will not lose any momentum in overcoming the inertia of the rollers, and consequently will accelerate, gaining upon the preceding boxes and the boxes will leave the conveyer so close together and with such force, that they will be difficult to handle.

An object of this invention is the provision of means for arresting the rotation of a roller, immediately after a box has moved off of it.

In gravity conveyers the spindles upon which the rollers turn are usually mounted in spaced rail supports, the spacing of which may vary slightly, such variance, or wear of the bearings is usually compensated for by adjusting the spindles, in the supports, longitudinally to or from the rollers.

Another object of this invention is the provision of means whereby any variance

in the alinement of the supports, or wear in the bearings will be automatically compensated for, or taken up.

With the foregoing and other objects in view, the invention consists of the novel construction and arrangement of parts illustrated in the accompanying drawing, which forms a part of this specification, wherein is set forth an embodiment of the invention, but it is to be understood that such changes and modifications may be resorted to as come within the scope of the appended claims.

In the accompanying drawing, wherein similar reference characters designate similar parts in the different views; Figure 1, is a side elevation of a conveyer roller embodying the invention, parts being shown in section; and Fig. 2, a fragmentary sectional view of one end of a roller showing the bearing at that end.

As illustrated herewith, the reference character —1— designates an ordinary tubular roller which is supported at its end by rails —2— which are angular in cross section and are held in spaced relationship by means of spaced tie bars —3—. The supporting rails are provided at suitable intervals along their length with alined vertical slots —4— extended in from the upper edge thereof and are adapted for the reception of spindles —5— which are removably, but non-adjustably secured therein. The spindles each comprise a cylindrical body —6— from one side of which, centrally thereof, a gudgeon —7— extends, which is threaded for a portion of its length. The gudgeons are adapted to fit in the slots 4, the body —6—, bearing against the inner side of the rail, and a jam nut —8— which fits on the threaded portion being screwed up against the outer side thereby firmly clamping the spindle in the desired position. A stem —9— extends from the other, or inner side of the body and is provided with a ball race —10—, which lies close up against the body, and with a circumferential groove —11— near the end thereof in which a divided spring ring —12— may be removably positioned. A cup bearing —13— provided with a ball race —14— is mounted on the stem and a plurality of balls —15— are positioned therein which are adapted to be engaged with the ball races. The internal diameter of the cup is such that the body —6—, of the spindle is freely received there-

in. The cup is freely movable on the stem, its longitudinal movement being so limited by the ring —12— that the balls may not escape. The roller is provided on each end with an axially disposed recess, or socket —16— adapted for the reception of the cups —13—, which are adapted to slide easily therein, the recess being of such depth as to permit of a limited longitudinal, or sliding movement of the cup therein, relative to the roller. A sub-recess or counter bore —17— is provided for the reception of a spring —18— which urges the cup forward toward the body of the spindle thereby maintaining the balls in engagement with the races regardless of any variation of the supporting rail relative to the end of the roller, or of wear of the bearings. If the rail sets in too close to the roller, the cup will be pushed in compressing the spring, if the rail sets out from the roller, thereby slightly withdrawing the spindle, the spring will push the cup out correspondingly. It will be seen that this construction will compensate for any slight variation in the alinement of the supporting rails, or wear in the bearings. The radius of the races is slightly greater than that of the balls, consequently the pressure of the spring forcing the cup toward the body of the spindle will cause the balls to climb the races thereby exerting a braking effect which serves to retard the rotation of the roller as long as there is no load on it, but when a load comes on the rollers the radial pressure exerted thereby on the balls will cause them to roll down the races forcing the cup back against the pressure of the spring until an equilibrium is established and the roller turns freely. As soon as the load passes from off the rollers, the radial pressure is removed, and the cup will again be forced forward thus applying the brake and checking the rotation of the roller. It is obvious that under varying conditions of pitch, in the track, and load, springs of different strength will be required, in some instances the springs may be changed, in other instances but slight adjustment may be necessary. To care for such cases, a disk —20— is provided, which lies in the bottom of the recess —17—, and upon which the inner end of the spring —18— rests. This disk is provided with a thread stem —21— which is operatively engaged in the floor of the recess, and is provided with means such as a head —22— adapted for the application thereto of a socket wrench, whereby the disk may be moved outward to compress and thereby increase the tension of the spring. A cup shaped dust guard —24—, provided with a central perforation in its bottom which fits over the gudgeon, is clamped between the body —6—, of the spindle and the supporting rail, its rim extending into an annular groove —27— in the end of the

roller a sufficient depth to exclude larger particles of extraneous matter. This dust cap in connection with the close fit of the body, —6—, of the spindle in the cup—13—, forms a very efficient protection for the ball bearings. The roller may be constructed in any suitable manner and of any suitable material, but preferably it is as illustrated, formed of a tube, in the ends of which plugs —29— are secured.

It is thought that from the foregoing description, persons skilled in the art pertaining thereto can make and use the same, and—

We claim:—

1. A roller having a cup shaped depression in each end thereof, spindles projecting into said depressions upon which the roller is adapted to rotate and means so constructed and arranged as to exert a braking, or retarding action on the roller when no load is imposed thereon.

2. A roller having a depression in each end thereof, a bearing spindle located at each end of said roller and projecting into said depression, a cup bearing disposed on the bearing spindle, anti-friction members positioned between the cup and the spindle, and means so constructed and arranged as to cramp the anti-friction members between the cup and spindle and thereby arrest the rotation of the roller when no load is carried thereon.

3. A roller having a cup shaped depression in each end thereof, spindles projecting into said depressions upon which the roller is adapted to rotate, and means positioned within the depressions and so constructed and arranged as to exert a braking or retarding action on the roller when no load is imposed thereon.

4. A roller having a cup shaped depression in each end thereof, a spindle located at each end of said roller and projecting into said depression, said spindle having an inclined race-way, a cup bearing slidably disposed on the spindle, bearing balls arranged between said cup and said race-way and means adapted to slide the cup toward the race way when no load is on the roller cramping the balls between the cup and the race-way thereby offering resistance to the rotation of the roller.

5. A roller having a depression in each end thereof, spindles projecting into said depressions upon which the roller is adapted to rotate, means disposed within the depression so constructed and arranged as normally to offer resistance to the rotation of the roller, and means whereby the imposition of a load on the roller will release said resistance and permit the roller to rotate freely.

6. A bearing for rotatable parts including a pair of members, one of said members

being stationary and the other rotatable, the stationary member including a spindle having a cylindrical portion and a tapering enlarged portion merging therewith, the other member comprising a shell having a hollow cylindrical portion and a taperingly decreasing portion merging therewith, said shell movable longitudinally thereof, balls interposed between the shell and spindle, and means arranged to force the shell along the spindle and thereby crowd the balls normally between the said tapering portions.

7. The combination with a support and a conveyer roller, of a bearing therefor comprising a spindle fixed to one of said parts and having a cylindrical free end gradually

increasing in size toward the point of fixation, a hollow shell supported by the other part and movable longitudinally thereof, said shell surrounding the spindle at its free end and having a bore provided with a cylindrical portion and a portion extending from the cylindrical portion and gradually decreasing in diameter away from the point of fixation of the spindle, balls between the spindle and shell, and a spring carried by the shell supporting part and urging the shell toward the point of fixation of the spindle.

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