No. 842,813. PATENTED JAN. 29, 1907.

J. J. RIDGWAY.

IDLER FOR BELT CONVEYERS.

APPLICATION FILED APR. 3, 1906.

Fig. 1.

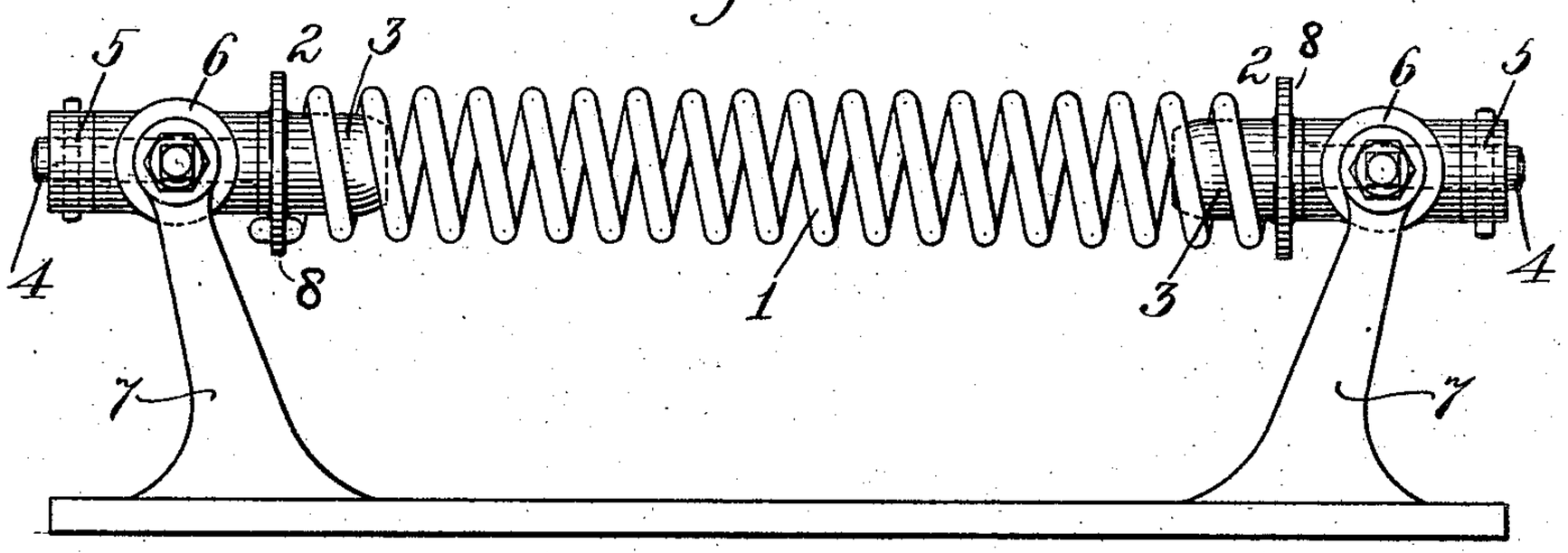
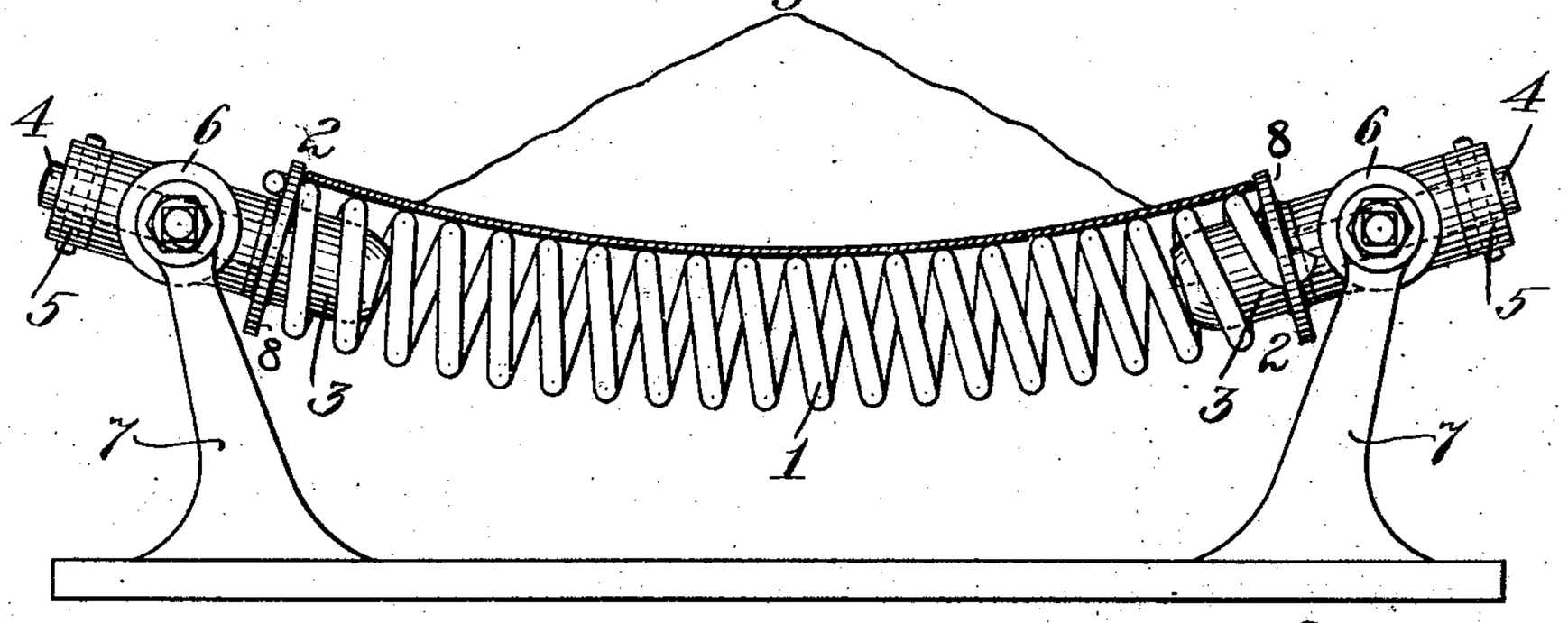


Fig. 2.



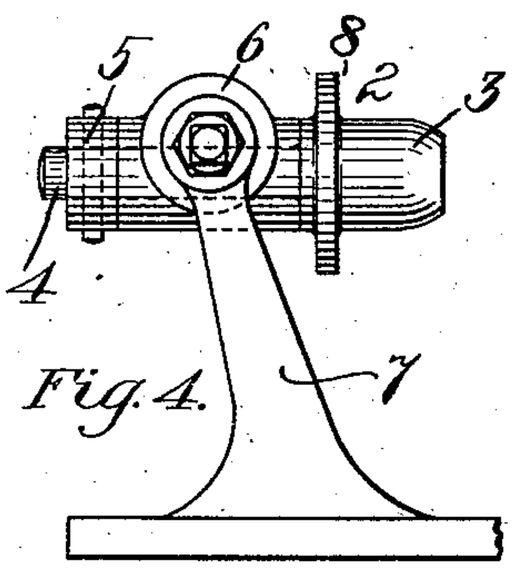


Fig. 4.

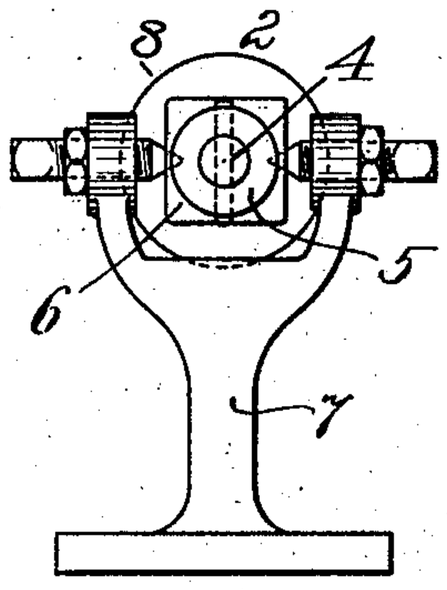


Fig. 3.

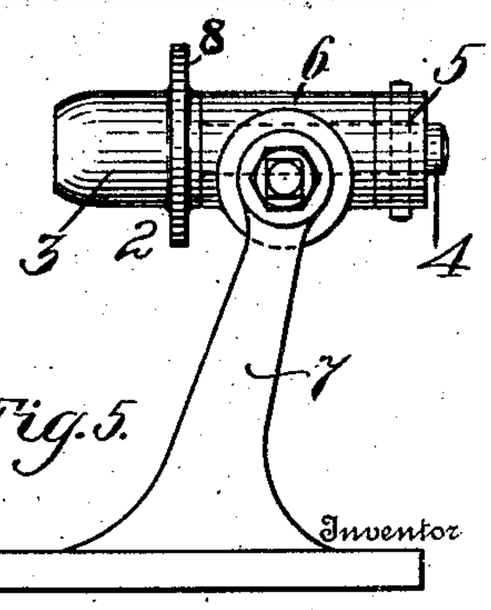


Fig. 5.

Inventor

Witnesses

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JOHN J. RIDGWAY, OF ROSEBANK, NEW YORK.

IDLER FOR BELT CONVEYERS.

No. 842,813. Specification of Letters Patent. Patented Jan. 29, 1907.

Application filed April 3, 1906. Serial No. 309,650.

To all whom it may concern:

Be it known that I, JOHN J. RIDGWAY, of Rosebank, county of Richmond, in State of New York, have invented and produced certain new and useful Improvements in Idlers for Belt Conveyers, of which the following is a specification.

The transportation of material of all kinds by means of moving belts supported by rotatable rollers is an extensive practice in all branches of the arts. When this device is applied to the carrying of granulated material, the amount which can be transported is limited by the tendency of the material to spread to the edge of the belt and fall from it. No greater amount can be carried than that which will form a pile highest in the center of the belt and having an angle of repose under the operating conditions of the belt insufficient to cause the edge of the pile to extend to the edge of the belt. In order to increase the capacity of a given width of belt, it is common practice to raise the edges of the belt above the center by means of inclined rollers, usually termed "troughing-idlers." When this is done, it is obvious that a greater amount of material can be placed on belt before the edges of the pile will extend to the edges of the belt.

When troughing-idlers consisting of two or more pulleys turning on axes inclined to one another are used, the belt is forced by its weight and that of its load to make a bend at the point where the surfaces of the pulleys meet as each portion of the belt passes over the idlers, while between them the belt will take a flatter and more evenly-distributed curve. A bending strain due to a forward and back motion is therefore put on that portion of the belt which registers with the meeting angle of the pulleys as many times per minute as the distance between idlers is contained in the speed of the belt per minute. The result of this repeated strain concentrated along a line of the belt is the rapid destruction of the belt on this line long before other portions of the belt are worn out. A variety of devices for adding to the strength or increasing the pliability of the belt at these points of greatest wear have been tried with varying degrees of success.

My invention is an improvement in troughing-idlers, by means of which the bending strain of troughing is evenly distributed over the width of the belt, so that all parts will wear at the same rate.

It consists in the substitution for the pulleys set at an angle ordinarily used of a flexible roller supported at the ends and which will bend under the weight of the belt and its load to a smooth catenary having no point of sharp flexure.

My invention is illustrated by the drawings which accompany and form a part of this specification.

In these drawings, Figure I is a side elevation of the idler without load. Fig. II is a side elevation of the idler with belt and load. Fig. III is an end elevation showing a method of support, and Figs. IV and V are side elevations showing variations in the relative locations of the supporting parts.

The idler consists of a flexible roller I, formed, preferably, of a steel spring. Each end of this roller I is secured to a rotatable hub 2, which consists of a boss 3, having means for engaging the ends of the spring 1, a shaft 4, and collar 5. Said hub 2 is journaled in a box 6, pivotally mounted in supporting-bracket 7. The boss 3 has a flange 8, which serves as a guide to keep the belt in a central position. From the above description of the construction of this idler it will be obvious that the bending of the roller and the troughing of the belt will vary in relation to the load. A greater load will produce a greater troughing and a lighter load a less. As the troughing increases the spring is extended in proportion to the difference between its length when straight and the length of the arc into which it is bent by the load, so that there will be a fixed depression of the roller for every load on the belt.

In order to vary the amount of troughing for a given load, a greater or less initial strain may be put upon the spring or the pivots about which the journal-box 6 rotates may be located above or below the axis about which the hub 2 rotates, as illustrated in Figs. 4 and 5. In Fig. 4, where the pivot is located above said axis, the end of the spring will move in an outward direction as the center moves downward, and the requisite extension of the spring to produce the tension necessary to support a given load will be produced with a less deflection than in the construction shown in Fig. 1. In Fig. 5 the reverse will be true, as the ends of the spring

move inward as its center moves downward, and more deflection of the roller will be necessary to produce the tension required to support the load.

The form of the parts of my device may be varied and mechanical equivalents substituted without modifying my invention.

Having thus described fully my invention, I claim, and desire to secure by Letters Patent of the United States, the following:

1. In a belt-conveyer support, the combination of a roller, consisting of a spiral spring, journals for said roller, means for attaching said spring to said journals, journal-boxes and supporting means, substantially as described.

2. In a belt-conveyer support, the combination of a flexible roller, supporting means, and journal-boxes for said roller, pivotally secured to said supporting means, substantially as described.

3. In a supporting device for belt conveyers, the combination of a flexible roller, supporting means, inflexible ends for said roller, secured in rotational relation to said supporting means by pivoted bearings, substantially as described.

4. In a supporting device for belt conveyers, the combination of a flexible roller, supporting means and bearings for said roller, pivoted to said supporting means out of the line of the axis of rotation of said roller, substantially as described.

5. A belt-conveyer support consisting of a spiral spring, hubs secured thereto and supported in rotational relation by pivoted bearings, substantially as described.

6. A belt-conveyer support consisting of a spiral spring, hubs secured thereto, guide-flanges and supporting means, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of the two subscribing witnesses.

JOHN J. RIDGWAY.

Witnesses:
F. W. SHUMANN, Jr.,
R. P. H. STAUB, Jr.