Feb. 4, 1941. J. WÖLZ 2,230,316

SIEVE AND CONVEYER

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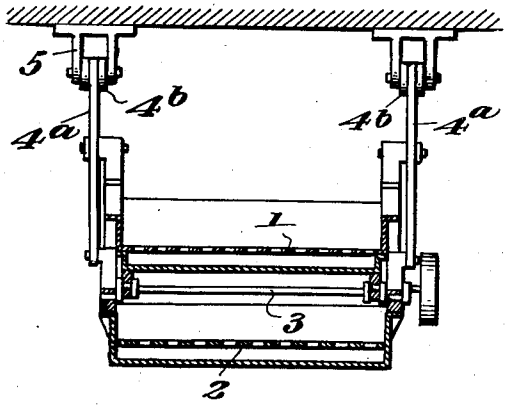


Fig. 8.

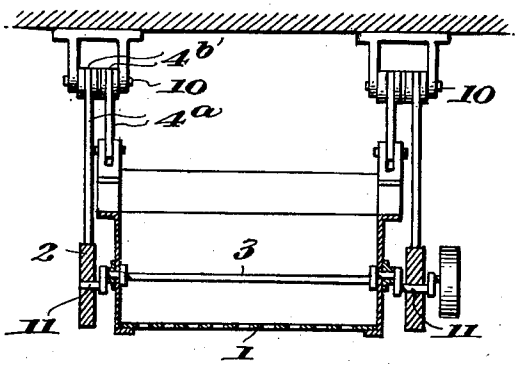
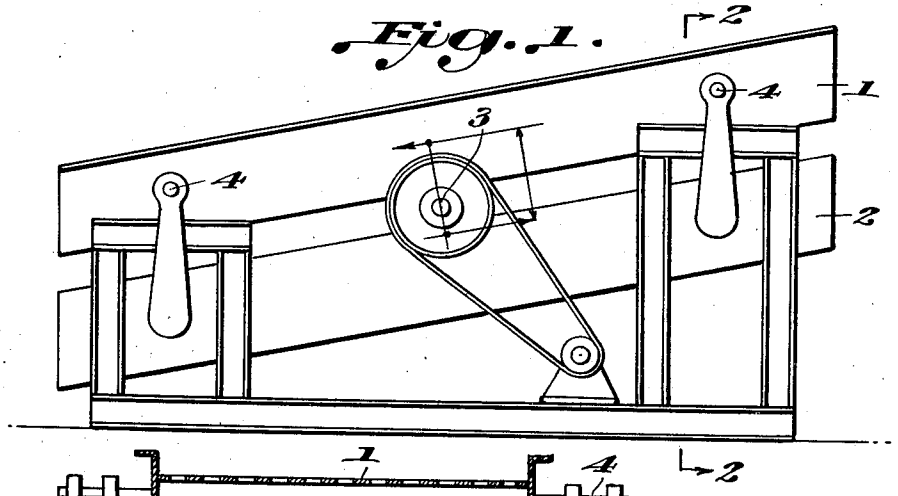


Fig. 10.

Fig. 1.



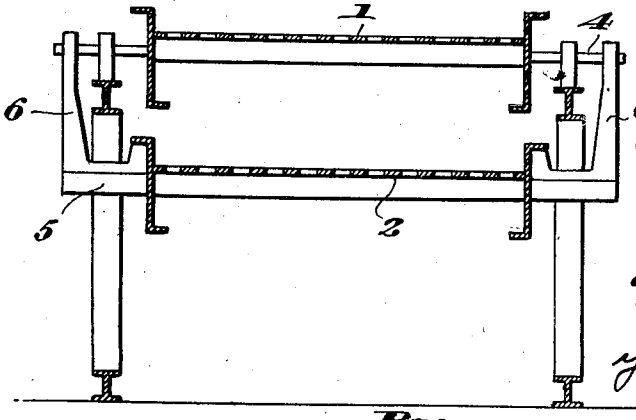


Fig. 2.

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Feb. 4, 1941. J. WÖLZ 2,230,316

SIEVE AND CONVEYER

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Fig. 3.

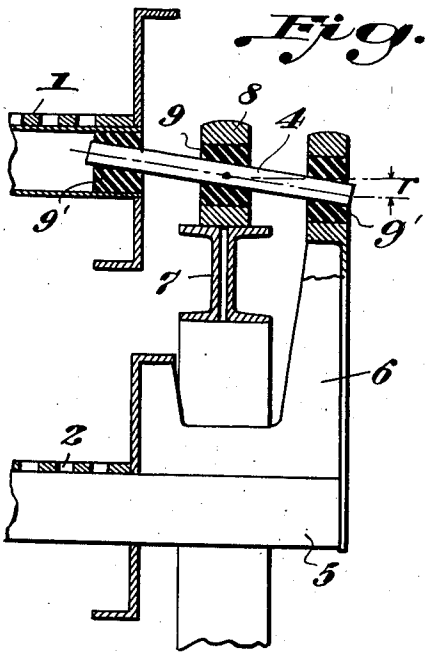
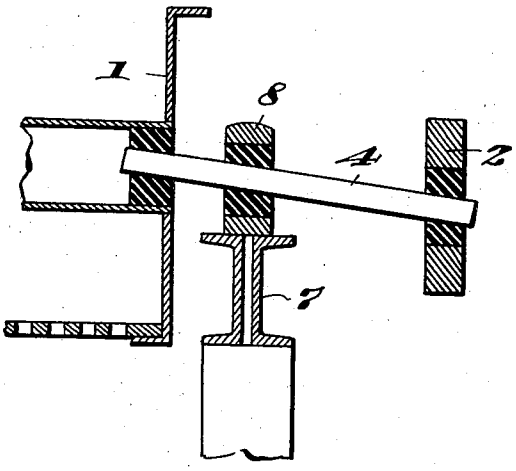


Fig. 6.



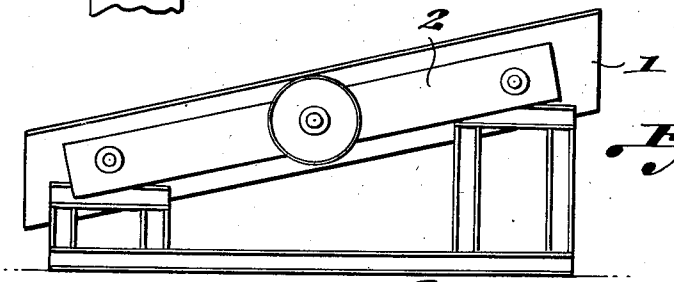


Fig. 4.

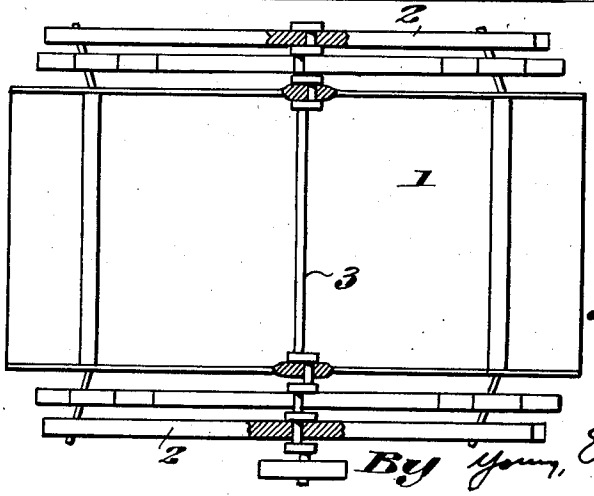


Fig. 5.

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SIEVE AND CONVEYER

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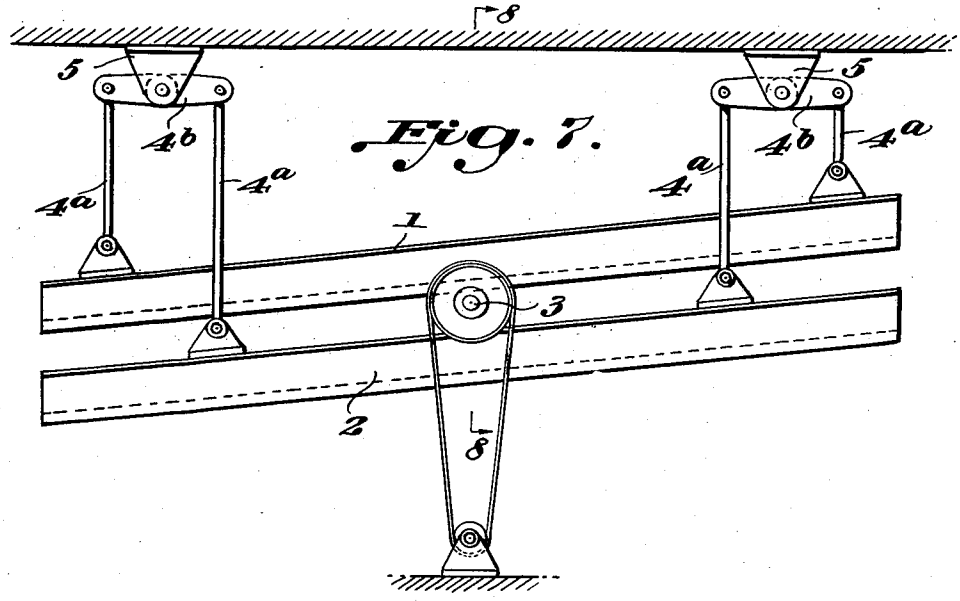


Fig. 7.

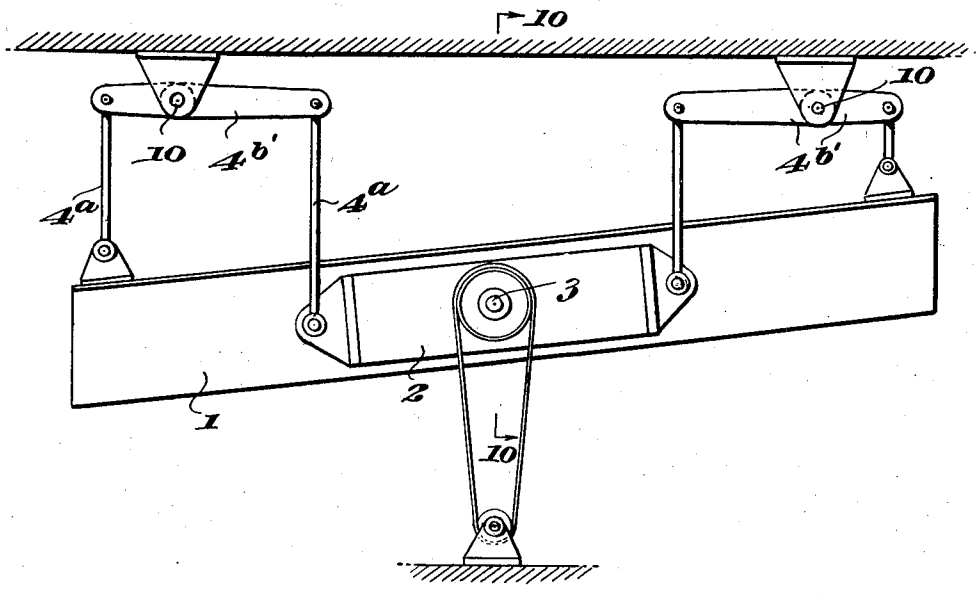


Fig. 9.

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Patented Feb. 4, 1941 2,230,316

UNITED STATES PATENT OFFICE

2,230,316

SIEVE AND CONVEYER

Josef Wölz, Bochum, Germany, assignor to the firm Westfalia - Dinnendahl - Groppel A.-G., Bochum, Germany

Application December 20, 1937, Serial No. 180,876
In Germany February 10, 1936

10 Claims. (Cl. 74—26)

The invention relates to sieves and conveyers of the kind in which two bodies are actuated by cranks set 180° apart, and move in opposite directions in a circular or elliptical path. According to the invention the two bodies are actuated, without elastic means serving for the storage of power, by a horizontal crank shaft at or near the horizontal axis of gravity of the two bodies, with double armed, horizontally mounted rockers connecting the two bodies near their ends.

The principal advantage of the invention is that it enables a balance of inertia to be obtained, without elastic means serving for the storage of power.

Preferably the shaft is supported only by the two bodies, without having bearings in a fixed frame. This enables the throw of the bodies to be altered by changing the relative lengths of the rocker arms, which cannot be done if the shaft is mounted in fixed bearings. Such fixed bearings for the shaft also have the disadvantage that under heavy load the sieve tends to set up vertical vibrations.

A further advantage is obtained by the invention if the rockers, mounted elastically at their pivots in known manner, are elastically engaged with the moving bodies. No lubrication is then required at the joints, and there is no knock. The rockers may be arranged so that they can perform a wobble movement to ensure the regular opposite movement of the bodies, but a simpler method is to arrange that the rockers can only rotate in vertical planes and are connected to the bodies by links which can also only rock in vertical planes.

Examples of apparatus according to the invention are shown diagrammatically in the accompanying drawings, in which:

Figure 1 is a side view of the apparatus,

Fig. 2 is a cross-sectional view of the apparatus taken on line 2—2 of Fig. 1,

Fig. 3 is a sectional view of one of the rockers on an enlarged scale,

Fig. 4 is a side view of a modified construction,

Fig. 5 is a plan view of the construction of Fig. 4,

Fig. 6 is a sectional view of one of the rockers of the construction of Figs. 4 and 5 on an enlarged scale,

Fig. 7 is a side view of a further modified construction,

Fig. 8 is a cross-sectional view of the apparatus of Fig. 7 taken on line 8—8 of Fig. 7,

Fig. 9 is a side view of a still further modified construction, and

Fig. 10 is a cross-sectional view of the apparatus of Fig. 9 taken on line 10—10 of Fig. 9.

Referring first to the construction shown in Figs. 1 to 3, there are two inclined sieves or bodies 1, 2, engaged with cranks on a horizontal crank shaft 3 which is at or near the horizontal axis through the centre of gravity, the cranks being at an angle of 180° to each other so that the sieves swing in circular paths, in opposite directions. The shaft has no bearings in the fixed frame of the apparatus, and is supported only by the sieves 1 and 2. Near their ends the sieves are supported by double armed horizontal or approximately horizontal rockers 4, the lower sieve 2 being carried by rigid tubes or bars 5 having brackets 6 thereon, connected to the outer ends of the rockers. The rockers are mounted upon fixed beams 7, in eyes 8 within which they are fitted with elastic sleeves 9, e. g. of rubber, and the ends of the rockers engage into similar sleeves 9' carried by the sieve 1 and brackets 6. The rockers perform a wobble movement, their ends travelling in circular paths of the radius r (Fig. 3).

With the arrangement shown in Fig. 1 the upward and downward movements of inertia are balanced, but a torque component operates when the sieves are moving in the directions indicated by the arrows in Fig. 1. This is avoided with the arrangement shown in Figs. 4 to 6, where there is a single sieve 1, the element 2 of the system consisting of lateral balance weights 2 carried by the rockers 4. The weights fully balance the sieve, both at rest and when working. This can be done with weights which are heavier or lighter than the sieve, the arms of the rockers being so proportioned with respect to the eyes 8 as to establish the balance.

Figs. 7 and 8 show a construction in which brackets 5 support double armed rockers 4b having links 4a suspended from their ends, the sieves being carried by the links. The brackets are fixed to the ceiling of the work-room, or to an elevated beam. The shaft is between the two sieves, near the horizontal axis through the centre of gravity.

Figs. 9 and 10 show a modification in which weights 2 are substituted for the lower sieve. The shaft passes through the horizontal axis of gravity of the moving bodies. The rockers 4b' in this example are pairs of single armed levers fixed to short shafts 10.

Instead of suspending the sieves as shown in

Figs. 7 to 10 the brackets may be below the sieve or sieves fixed to the floor or a low frame, with the links extending upwards. The bearings 11 (Fig. 10) may be plain bearings, but elastic liners may be used therein, not to allow wobble but to enable lubrication to be dispensed with.

I claim as my invention:

1. A vibratory sieve or conveyer comprising a pair of bodies, a plurality of double armed rockers for supporting the pair of bodies in spaced relationship to each other, and a crank shaft mounted directly in one of the bodies for imparting a vibratory action to the bodies on the rockers so that they will describe a curved path.

2. A vibratory sieve or conveyer comprising a body, a plurality of double armed rockers for supporting the body at one end of each of the rockers, a counterweight mounted on the other end of the rockers, and a crank shaft for imparting a vibratory action to the body on the rockers so that it will describe a curved path.

3. A vibratory sieve or conveyer according to claim 1, in which the bodies describe a circular path at an angle of 180° to each other.

4. A vibratory sieve or conveyer according to claim 1, in which the bodies describe an elliptical path at an angle of 180° to each other.

5. A vibratory sieve or conveyer according to claim 1, in which elastic mounting means are provided for each rocker at a pivot point for the rocker and at the body.

6. A vibratory sieve or conveyer according to claim 1, in which each rocker is in the form of a lever pivoted between the ends so that the lever will rock in a vertical plane.

7. A vibratory sieve or conveyer according to claim 1, in which each rocker is in the form of a lever pivoted between the ends so that the lever will rock in a vertical plane, and in which a pair of links are provided for each lever, each link being connected to one end of the lever and to one of the bodies.

8. A vibratory sieve or conveyer according to claim 1, in which the crank shaft is horizontally mounted in its respective body.

9. A vibratory sieve or conveyer according to claim 1, in which the double armed rockers are each mounted on an approximately horizontal axis at a point on each body and at a fixed point.

10. A vibratory sieve or conveyer according to claim 1, in which the vibratory action of one of the bodies by the double armed rockers is imparted to the other body.

JOSEF WÖLZ.