

May 22, 1923.

1,455,907

A. C. DAMAN
VIBRATING TROMMEL SCREEN
Filed June 20, 1922

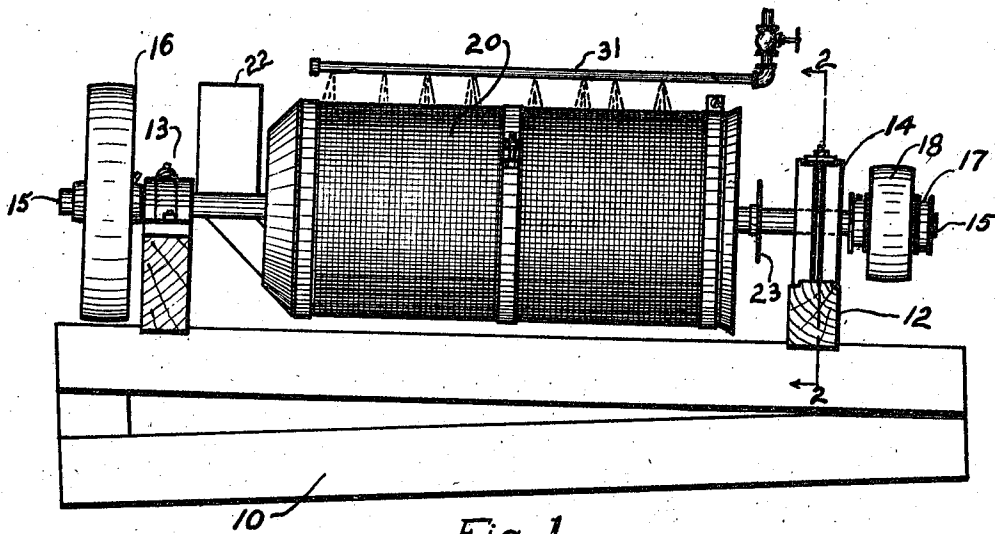


Fig 1.

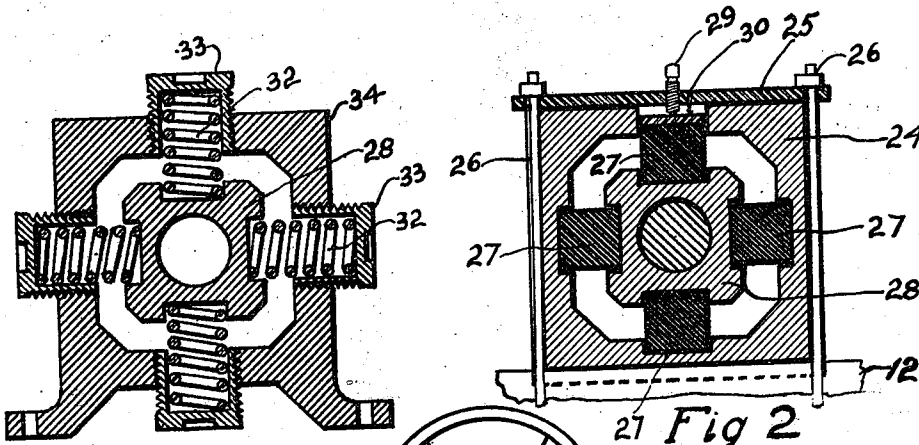


Fig 4

Fig 2

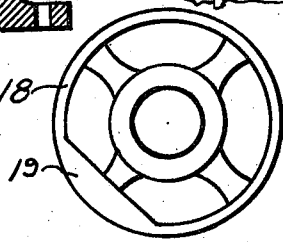


Fig 3

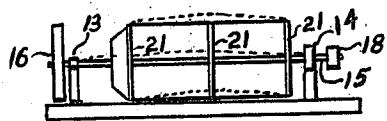


Fig 5

INVENTOR
ARTHUR C. DAMAN
ATTORNEY
W. H. Hall

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UNITED STATES PATENT OFFICE.

ARTHUR C. DAMAN, OF DENVER, COLORADO.

VIBRATING TROMMEL SCREEN.

Application filed June 20, 1922. Serial No. 569,610.

To all whom it may concern:

Be it known that I, ARTHUR C. DAMAN, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Vibrating Trommel Screens, of which the following is a specification.

This invention relates to the class of screens known as trommel screens and has for its principal object the provision of a screen of this character in which a violent vibratory motion is imparted to the screen in addition to the revolving motion.

A further object resides in the simple manner in which this vibratory motion is obtained, without the use of eccentrics, cranks, connecting rods or other wearing and expensive parts.

Other objects reside in the detail construction of the device which lead to efficiency, simplicity and economy and which will become apparent from the following detailed description.

In the following description reference is had to the accompanying drawing which forms a part hereof. In the description and in all views of the drawing like parts are designated by like numerals.

In the drawing:

Fig. 1 is a side elevation of the complete vibrating trommel screen.

Fig. 2 is a section taken, through what is designated as the floating bearing, on the line 2-2, Fig. 1.

Fig. 3 is a detail view of the pulley used to transmit the vibratory movement to the screen.

Fig. 4 is a detail cross section through an alternate form of floating bearing.

Fig. 5 is a diagrammatic view illustrating the vibration of the shaft and screen independent of any movement of the floating bearing.

Let the numeral 10 designate a screen foundation adapted to hold the screen at an incline. Mounted on foundation 10 are two bearing blocks 11 and 12, upon which are mounted journal boxes 13 and 14 respectively, in which is journaled a shaft 15.

Box 13 is of the type of self aligning bearings which allow angular movement of the shaft in relation to the bearing supports. Box 14 is of special construction and is one of the features of the invention.

Secured to the extremity of the shaft 15

nearest the box 13 is a belt pulley 16, by means of which shaft 15 is revolved; rotatably mounted on the opposite extremity of the shaft 15, between shaft collars 17, is a loose pulley 18 of special design. Loose pulley 18 is unbalanced by means of a weight 19 placed towards its periphery.

Fixedly mounted on the shaft 15, between the boxes 13 and 14 is a trommel screen 20. Screen 20 is rigidly secured to shaft 16 by means of three spiders 21 (indicated in Fig. 5); one of which is located at the mid-point of the screen and one at each extremity thereof. Both ends of the screen are open; material being fed in at the higher end, by means of a chute 22; the finer particles being discharged through the screen, and the coarser, through the open lower end in the usual manner with screens of this type. A shield 23 is secured to the shaft 16, opposite the open end, to prevent the entrance of foreign material from the screen into the box 14.

Box 14 comprises a housing 24, which is secured by means of a top plate 25 and bolts 26 to the bearing block 12. A groove is provided in each side of the housing 24 for the passage of the bolts 26 and a groove is also formed in the lower side to fit over the bearing block 12.

Suspended within the housing 24 by means of series of cushions 27, formed of rubber or other resilient material, is a shaft bearing, 28, which carries the shaft 15. The tension in the upper and lower cushions 27 may be regulated by means of a tension screw 29, threaded through the top plate 25 and bearing against a pressure plate 30 which in turn bears against one of the cushions 27.

A washer or spray pipe 31 may be used in connection with the screen if desired.

In operation the screen 20 is slowly revolved by means of pulley 16; at the same time unbalanced pulley 18 is revolved rapidly. The rapidly revolving weight 19 causes the extremity of the shaft 15 to gyrate rapidly, because of its flexible mounting in the box 14, and imparts a vibration to the screen in addition to the revolving motion imparted by the pulley 16. This facilitates the passage of the fines through the meshes of the screen and greatly increases the capacity of the screen.

By tightening the screw 29 the vertical component of vibration is reduced and the shaft caused to gyrate in an oval path. This causes the resultant force of the vibration

to always be at an angle to the screen face and facilitates the sifting.

In addition to the vibration caused by the gyratory motion of the shaft there is a secondary vibration caused by the slight bending of the shaft itself. This vibration would be apparent even were the floating bearing 28 prevented from moving, and is one of the features of the invention as it greatly increases the capacity. This vibratory motion is shown in exaggeration in the diagram in Fig. 5.

The centrifugal force of the rapidly revolving weight 19 on the pulley 18 causes the shaft to bend or flex slightly between its points of support viz. boxes 13 and 14; the axis of the shaft rapidly revolving around the center line of the screen. This motion when opposed to the revolving of the shaft itself causes a violent agitation of the material being screened.

In Fig. 4 an alternate form of floating bearing is shown. In this form the bearing 28 is supported by a series of helical springs 32, carried in adjusting caps 33 threaded into a housing 34. The caps 33 can be so adjusted as to vary the compression in the springs 32 and limit and control the vibrations of the screen as desired.

While I have described and illustrated herein a specific form of my improvement I wish it understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. A trommel screen comprising a shaft, one extremity of said shaft being carried in a pivoted bearing, the opposite extremity in a flexibly mounted bearing; a cylindrical screen rigidly mounted on said shaft between said bearings; means for causing said shaft to gyrate in said flexibly mounted bearing and means for causing said shaft to simultaneously revolve.

2. A trommel screen comprising a shaft, one extremity of said shaft being carried in a pivoted bearing, the opposite extremity in a flexibly mounted bearing; a cylindrical screen rigidly mounted on said shaft between said bearings; an unbalanced member loose-

ly mounted on said shaft adjacent to said flexibly mounted bearing and means for revolving said unbalanced member independent of, but simultaneously with, said shaft.

3. A trommel screen comprising a shaft, one extremity of said shaft being carried in a pivoted bearing, the opposite extremity in a flexibly mounted bearing; a cylindrical screen rigidly mounted on said shaft between said bearings; an unbalanced pulley loosely mounted on said shaft adjacent to said flexibly mounted bearing and a second balanced pulley fixedly mounted on said shaft adjacent to said flexibly mounted shaft.

4. A trommel screen comprising a cylindrical screen rigidly secured to and surrounding a central shaft; a pivoted bearing supporting one extremity of said shaft; a flexibly mounted bearing supporting the opposite extremity of said shaft, said flexibly mounted bearing comprising a bearing flexibly supported in a housing and free to move radially with said shaft; means for causing said shaft to gyrate in said flexibly mounted bearing and independent means for simultaneously revolving said shaft.

5. A trommel screen comprising a cylindrical screen rigidly secured to and surrounding a central shaft; a pivoted bearing supporting one extremity of said shaft; a flexibly mounted bearing supporting the opposite extremity of said shaft, said flexibly mounted bearing comprising a bearing flexibly supported in a housing and free to move radially with said shaft; means for regulating said radial movement; means for causing said shaft to gyrate in said flexibly mounted bearing and independent means for simultaneously revolving said shaft.

6. A trommel screen comprising a horizontal semi-flexible shaft supported on two fixed bearings, said bearings being adapted to allow angular movement of the shaft; a cylindrical screen concentrically surrounding and rigidly mounted on said shaft between said bearings, said screen being adapted to flex with said shaft; means for causing said shaft and screen to flex between said bearings and means for causing said shaft and screen to revolve.

In testimony whereof I affix my signature.
ARTHUR C. DAMAN.