

May 20, 1952

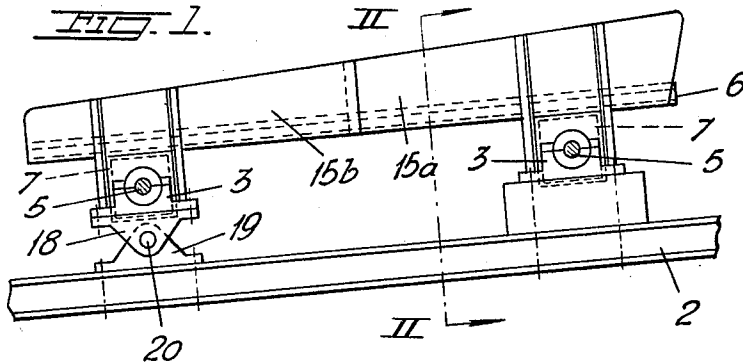
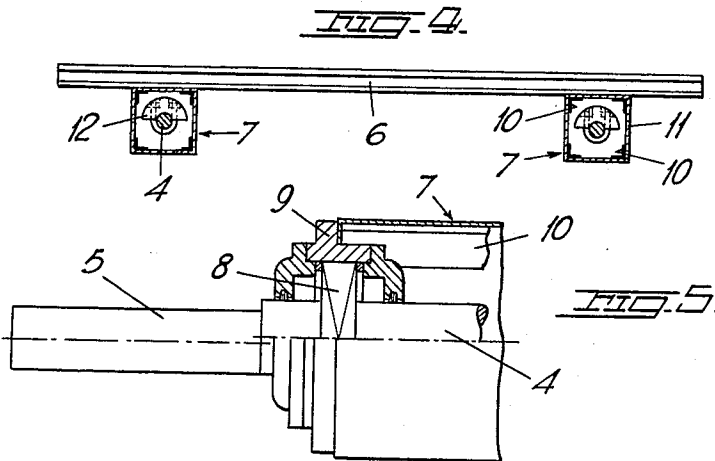
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2,597,503

SHAKING SCREEN

Filed Feb. 10, 1948

2 SHEETS—SHEET 1



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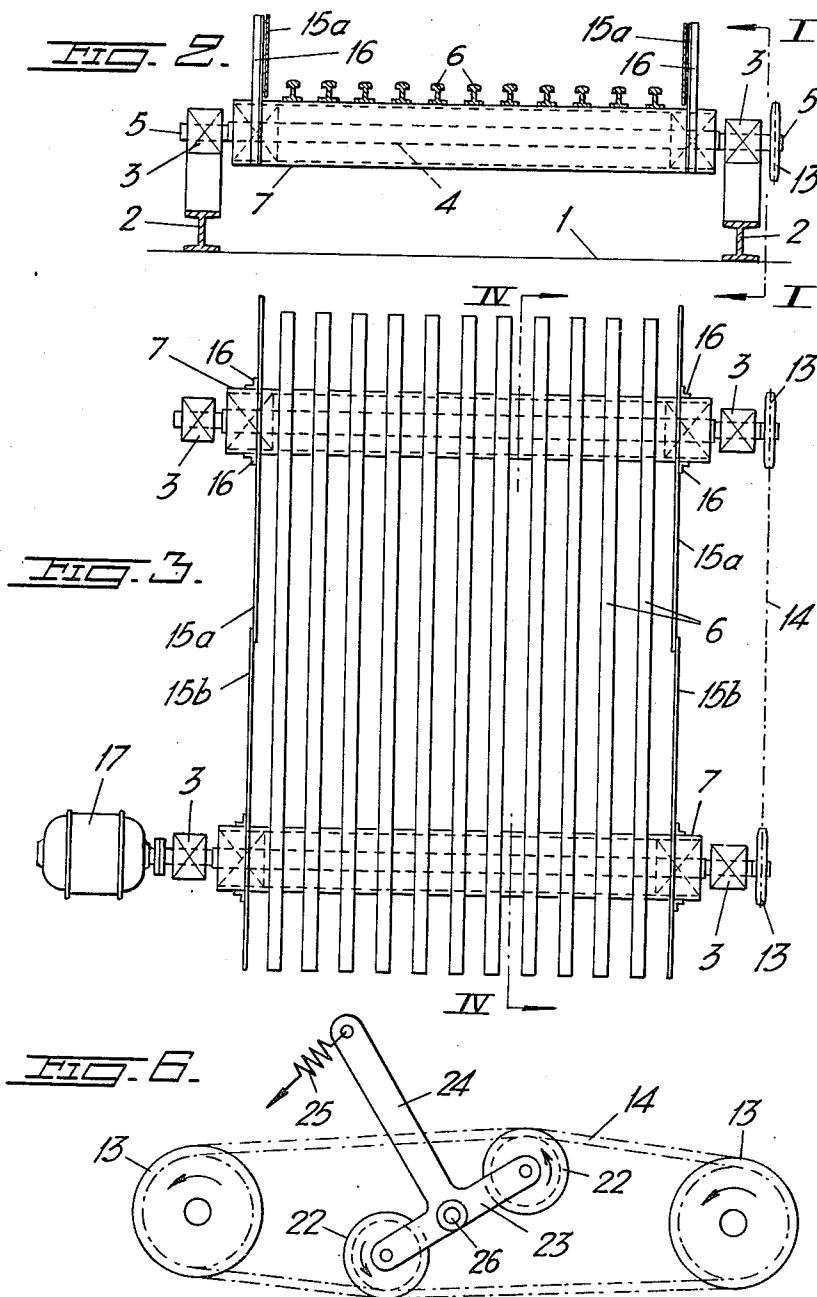
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2 SHEETS—SHEET 2



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UNITED STATES PATENT OFFICE

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SHAKING SCREEN

John Lars Arvid Larsson, Nockeby, near
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2 Claims. (Cl. 209—367)

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The present invention relates to shaking screens, particularly to such screens of the kind in which the screen at both ends is connected to eccentric driving means rotating synchronously and in phase and imparting a vibratory movement to the screen during which the entire screen surface remains substantially parallel to itself.

In such screens one has hitherto constructed the screen with a closed rectangular frame to which the screen member proper, such as a wire gauze member is clamped.

In investigations as made I have found that considerable advantages may be obtained by departing from the customary construction comprising a closed supporting frame for such screens and instead mounting the screen on two beams freely mounted in which eccentric driving shafts with associated counterweights are journaled. Hereby not only a reduction of the weight of the entire screen is obtained in that the longitudinal parts of the supporting frame previously used are eliminated but in addition also the operation becomes safer in that the hitherto most common cause for interruptions of operation, namely frame breakage is entirely eliminated. If the beams used according to invention with their associated eccentric shafts and counterweights are subjected to breakage then these beams and their associated shafts and counterweights may be removed individually as a unit and be replaced by a corresponding new unit. Another advantage of the invention is that a perfect balancing of the screen can be obtained by using the separate supporting beams rigidly connected to the screen.

The invention relates also to some improvements in the supporting beams in question particularly set forth hereinbelow.

On the accompanying drawings there are illustrated some embodiments of the invention.

Fig. 1 shows a side elevation of the present shaking screen, partly in section along line I—I in Fig. 2.

Fig. 2 shows a section along line II—II in Fig. 1.

Fig. 3 shows a top plane view of the screen.

Fig. 4 shows a section along line IV—IV in Fig. 3.

Fig. 5 shows a detail for illustrating the mode of journaling the eccentric shafts in the box or drum shaped supporting beams.

Fig. 6 shows a chain tensioner to prevent phase shifting between the two eccentric shafts.

The screen is carried by a base 1 by means of longitudinal beams 2 and plummer blocks 3 in

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which shafts 4 are journaled by means of pins 5 eccentric thereto. The shafts 4 carry the screen proper (which in the embodiments shown is formed of a plurality of longitudinal bars 6 parallel to each other and spaced at a suitable distance) by means of a box beam 7 adjacent each end of the screen 6.

The shafts 4 may be journaled in these box beams as shown in Fig. 5 by ball bearings 8 at each end of the box beam 7 which ball bearings are mounted in housings 9.

The box beams 7 proper may be constructed as shown in section in Fig. 4 in which each box beam 7 comprises a body of four longitudinal angle irons 10 surrounded by sheet metal 11.

Fig. 4 shows also the arrangement of the counterweights 12 on the shafts 4 within the box beams 7.

The bars 6 rest at top of the two beams 7 and are rigidly connected thereto, preferably by bolt connections, not shown, whereby a complete balancing of the entire screen by suitable proportioning and mounting of the counterweights 12 is enabled.

As may be seen from Fig. 3 the two eccentric shafts 4—5 are connected to each other by a chain 14 passing over chain wheels 13 but any other device which secures that the two shafts 4—5 rotate synchronously and in phase may obviously be used within the scope of the invention.

As may be seen from the foregoing each box beam 7 with its associated shaft 4—5 and counterweight 12 forms an assembly or unit. Should for some reason during the operation of the screen such a unit (4—5—7—12) fail then it may be demounted as a unit for repair and be substituted by a corresponding spare unit. Similarly a bar 6, if broken, may very easily be demounted by loosening the bolt connections in question. The absence of a continuous rectangular supporting frame for the bars 6 thus eliminates effectively the serious drawbacks in breakage of the frame in screens hitherto used. Moreover, the bars 6 in addition to filling their function as screen members between which in operation the finer parts of the material to be screened leave the screen downwards whereas the coarse parts leave the screen at the bottom end thereof, also fill a function as connection members between the box beams 7.

In screening finer material one can on the bars 6 attach a piece of wire gauze or perforated sheet metal which then serves as the screen member proper.

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To prevent the material to be screened from leaving the screen at the sides there are according to the invention mounted vertical sheet metal members at both longitudinal sides of the screen which preferably as shown are formed by two sheet metal members 15a and 15b at each longitudinal side, which sheet metal members by suitable connection irons 16 are carried by each box beam 7 and overlap to some extent. This eliminates every possibility of breaking stresses in the lateral sheet metal members and breakage thereof.

To prevent harmful breaking stresses in the upper box beam 7 in Fig. 3, if the chain 14 is subjected to rupture and then only the shaft 4—5 driven by motor 7 is rotated, due to the lateral pulses of vibration, suitable means are provided for securing a certain flexibility at this box beam. According to Fig. 1 this can be obtained by uniting each of the left-hand plummer blocks 3 in this figure to the supporting beams 2 by two brackets 18 and 19 one of which is secured to the bottom side of the respective plummer block 3 while the other bracket is secured to the top face of the respective supporting beam 2, a pivot pin 20 extending through said two brackets.

In interconnecting the eccentric driving shafts by a chain a special chain tensioning device is preferably used according to the invention as illustrated in Fig. 6. Said device consists of two smaller sprocket wheels 22 mounted for rotation at each end of the lever 23 which intermediate its ends is united to a lever 24 pivoted at 26 and operated by a spring 25 or some other loading device. The chain 14 is initially so adjusted that its upper and lower runs comprise an equal number of links and parts thereof whereby the two shafts 4—5 will be rotated exactly in phase. If, however, the chain 14 slackens during operation the driving runs (the lower one in Fig. 6) tends to become shorter than the upper runs whereby the chain 14 will operate by jerks. This is avoided by the chain tensioner 22—25 shown which automatically secures that the lower and upper runs of the chain also in case the chain 14 slackens automatically are maintained at equal length.

What I claim is:

1. In shaking screens, a fixed supporting structure, bearings supported on said structure spaced in apart relation, rotatable transverse shafts supported and mounted by said bearings only

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at their opposite ends, said shafts being provided with eccentric weight means, means interconnecting said shafts to control their rotation to cause the eccentric weight means to rotate synchronously and in phase, box beams encasing said shafts and eccentric weight means and being connected to said shafts by means of bearings located inwardly from the ends of the shafts so as to form self contained units, a plurality of individual screening bars, and means for detachably connecting said bars individually to each box beam.

2. In shaking screens, a fixed supporting structure, bearings supported on said structure spaced in apart relation, rotatable transverse shafts supported and mounted by said bearings only at their opposite ends, said shafts being provided with eccentric weight means, means interconnecting said shafts to control their rotation to cause the eccentric weight means to rotate synchronously and in phase, box beams encasing said shafts and eccentric weight means and being connected to said shafts by means of bearings located inwardly from the ends of the shafts so as to form self contained units, a plurality of individual screening bars, means for detachably connecting said bars individually to each box beam and a screening member attached so as to overlie said bars.

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