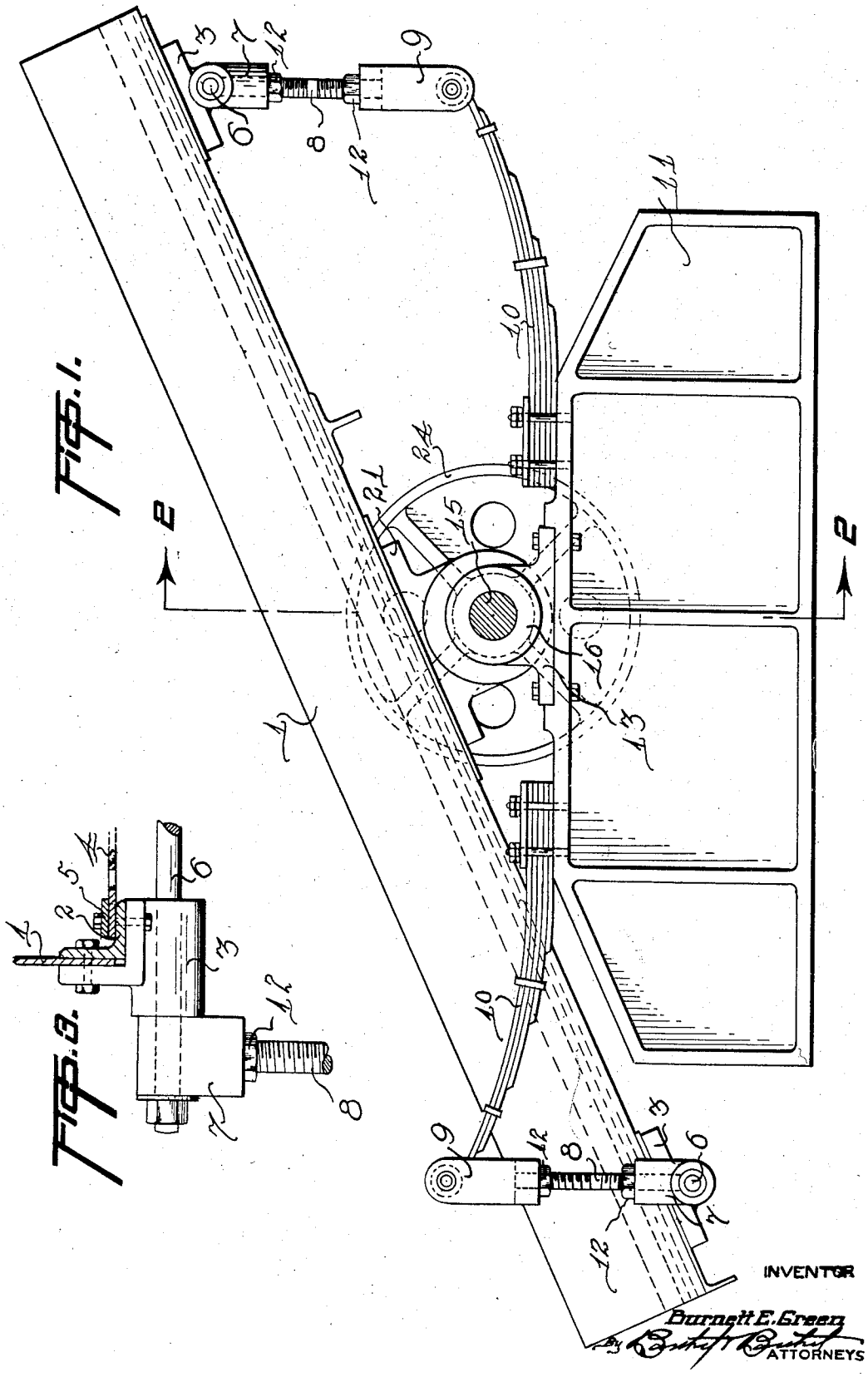
April 25, 1933. B. E. GREEN 1,905,393

VIBRATING SCREEN

Filed March 3, 1930 2 Sheets-Sheet 1



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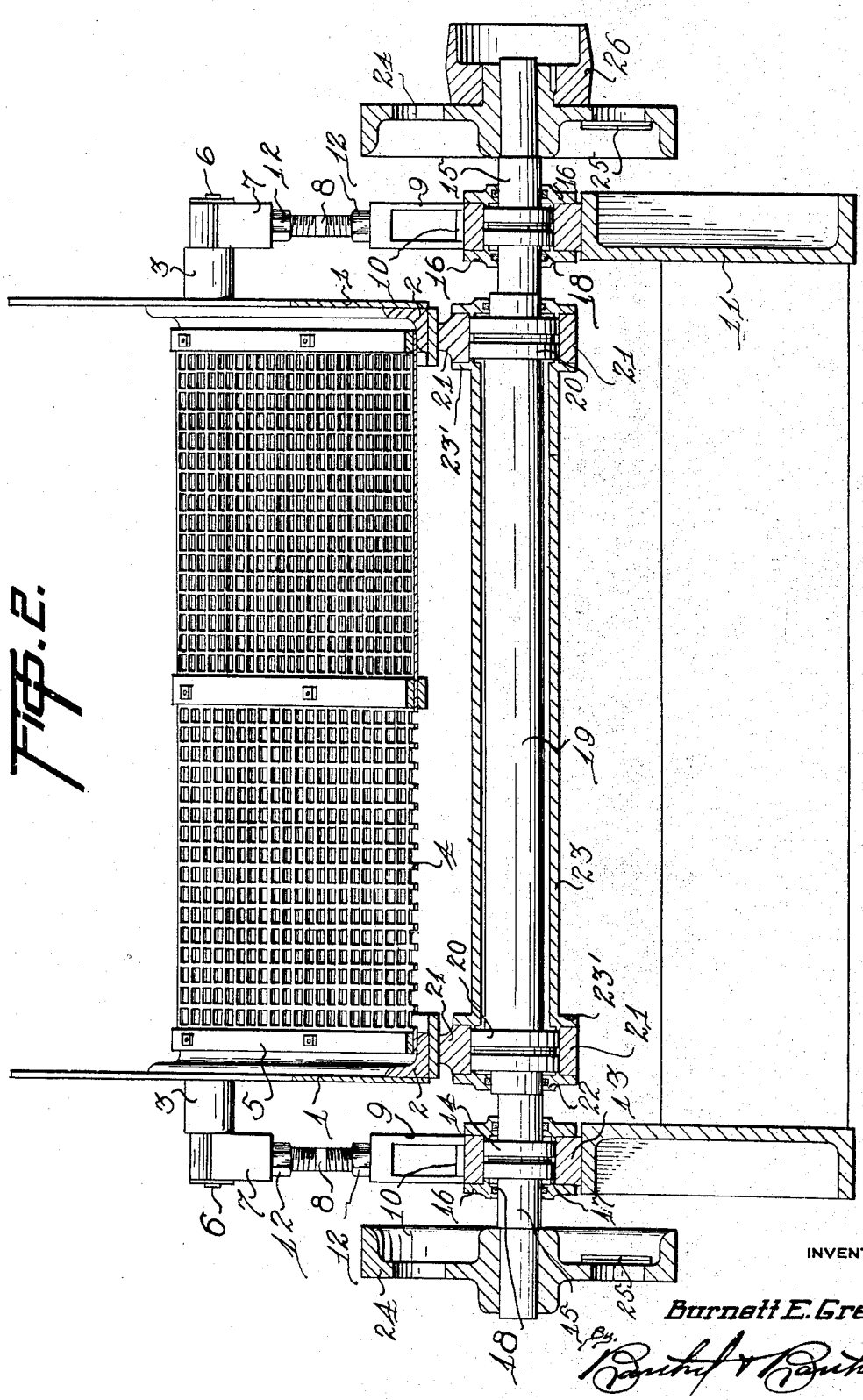


Fig. 2.

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1,905,393

UNITED STATES PATENT OFFICE

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VIBRATING SCREEN

Application filed March 3, 1930. Serial No. 432,667.

The present invention pertains to a novel vibrating screen particularly adapted for use in the stone, sand and gravel industry to efficiently handle wet or dry material to facilitate accurate sizing of the separated materials. The device is further adapted for use in any of the industries requiring means for separating various sizes of materials, such as the coal grading industries.

A primary object of the present invention is to devise a screening machine provided with a mechanism adapted to impart a vibratory motion to a screen supporting frame having resilient and adjustable supporting members, resulting in an efficient sifting or screening action being imparted to material passing over said screen. The vibrating motion is derived from an eccentric shaft that is connected to the central portion of the screen frame which is supported by connecting members adjacent its ends connected to the base by means of quarter elliptic leaf springs, the latter permitting jerking or rocking movement of the screen frame, the jerking or rocking movement resulting from the oscillatory movement of the eccentric and being a result attained only by the particular type of spring disclosed by the present invention. The eccentric mechanism facilitating the screening movement is designed to efficiently operate under all conditions, maintenance cost being reduced to a minimum by efficiently enclosing the moving parts and bearings in a manner excluding dust or grit coming from the material being screened which would clog the bearings and cause considerable wear and expense and prevent satisfactory operation of the device.

With the above and other ends in view the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which

Figure 1 is a side elevation of the present screening machine;

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

Fig. 3 is a fragmentary detail of one of the screen frame supporting brackets.

Like characters are employed throughout to designate the corresponding parts.

The screen comprises a pair of side plates 1 having secured thereto inwardly projecting angle irons 2 to which are secured brackets 3 adjacent the four corners thereof. The screen proper is indicated by the numeral 4 and is secured upon the angle irons 2 by means of the straps 5 that are bolted thereto. The brackets 3 support cross shafts 6 which extend transversely between the brackets mounted upon the opposite angle irons, the shafts 6 projecting outwardly to pivotally support bearing blocks 7. In one end of each block is screwed the end of one of the screws 8, the opposite ends of the screws being screwthreaded in the U brackets or shackles 9 to which are connected the quarter elliptic springs 10. The springs 10 are suitably bolted or secured upon the base member 11 to project outwardly and upwardly from both ends thereof.

It is necessary that the screen should be supported in an inclined position and this is accomplished by having the members 3, 7, 8 and 9 supported below the springs at one end of the structure while the corresponding members at the opposite end of the structure are supported above the springs. It will also be noted that opposite ends of the screws 8 are oppositely threaded to permit adjustment of the space between the spring and the corresponding bracket 7 by simply rotating the screw. Lock nuts 12 are provided upon each of the screws 8 to butt against the members 7 and 9 respectively to secure the screw in an adjusted position.

Secured in depressions in the upper portion of the base 11 is a bearing bracket 13 which is provided with a circular bore to receive the bearing races 14 that are pro-

vided to support the ends of shaft 15. To make these bearings dust proof there are provided caps 16 each having a projection 17 received in the bore of the bearing bracket, the caps being secured in any suitable manner and having packing glands 18 to engage the shaft 15.

The shaft 15 is formed with an eccentric portion 19 which is formed on the portion of the shaft supported between the bearings 14 and this eccentric portion is surrounded by the bearing races 20 mounted adjacent the ends thereof. The bearing races are received in a circular bore in the bearing brackets 21 which are secured to the screen frame and the outer face of the bearing bracket is covered by a cap 22 having suitable packing glands and being formed to prevent dust or grit from entering the circular bore in the bracket. The inner faces of the bearing brackets 21 are covered and made dust proof by the outwardly projecting flanges 23′ formed on the sleeve 23 which extends between the two brackets to completely enclose the shaft 19.

On the outer ends of the shafts 15 are mounted flywheels 24 having balancing weights 25 secured thereto to counter-act the weight of the eccentric shaft and insure smooth running thereof. To one of the flywheels is attached a pulley 26 to receive a belt driven from any suitable power source in order to operate the present screen.

Smooth running of the shaft 15 and portion 19 is insured by providing counter-balanced flywheels and by providing bearings which are so enclosed that they are not affected by the dust or grit coming from the material passing through the screen. The screen is supported by a special type of spring and by mounting the bearing brackets 21 to the screen frame intermediate its ends the eccentric shaft 19 imparts oscillatory movement to the screen and the springs convert the oscillatory movements into a highly efficient vibratory or screening movement.

What I claim is:

1. A device of the character described comprising a base, a screen-supporting frame, front and rear multi-leaf quarter elliptic springs disposed lengthwise in spaced apart parallel relation to said frame and base and having one end secured to said base and the other pivotally shackled to said screen-supporting frame, variable-length connecting means between said springs and said screen adapted to support said screen in an adjustably inclined position, and a transversely-disposed eccentric drive shaft supported by said base and connected to said screen frame whereby rotation of said shaft causes vibration of said screen.

2. A device of the character described comprising a base, a screen supporting frame, front and rear multi-leaf quarter elliptic springs disposed lengthwise in spaced-apart parallel relation to said frame and base and having one end secured to said base and the other pivotally shackled to said frame, adjustable-length connecting shackle members mounted on the outer ends of each of said springs and adapted to support the screen-supporting frame on their opposite ends and maintain the frame in an inclined position, and a transversely disposed eccentric drive shaft supported by said base and connected to said screen frame whereby rotation of said shaft causes vibration of said screen.

3. A device of the character described comprising a base, a transversely-disposed drive shaft having an eccentric portion and rotatably mounted on said base, a screen supporting frame, transversely-disposed shafts journaled adjacent the ends of said frame, adjustable-length connecting shackle members mounted on said shaft, front and rear multi-leaf quarter elliptic springs mounted on said base and disposed lengthwise in spaced-apart parallel relation thereto, shackles adapted to connect said adjustable-length connecting members to said springs whereby the screen frame is resiliently supported in an adjustably inclined position, and connecting means between said screen frame and the eccentric portion of said shaft.

4. A device of the character described comprising a base, a screen-carrying frame resiliently supported by front and rear multi-leaf quarter elliptic springs disposed lengthwise in spaced-apart relation to said frame and base and mounted on said base, adjustable-length connecting shackle members between said frame and said springs adapted to support said screen frame in an adjustably inclined position, and eccentric-shaft means for vibrating said screen frame.

5. A device of the character described comprising a base, a screen-carrying frame resiliently supported by front and rear multi-leaf quarter elliptic springs disposed lengthwise in spaced-apart parallel relation to said frame and base and having one end secured upon said base, adjustable-length shackling members pivotally connected to said frame and to said springs and adapted to support said frame in an adjustably inclined position, and eccentric shaft means mounted upon said base and connected to said frame to impart vibration to the latter.

6. A device of the character described comprising a base, a screen-carrying frame resiliently supported by front and rear multi-leaf quarter elliptic springs disposed lengthwise in spaced-apart parallel relation to said frame and base and having one end secured upon said base and the other end shackled to said frame, adjustable-length shackling members pivotally connected to said frame and to said springs and adapted to support said frame in an adjustably inclined posi-

tion, a transversely-disposed drive shaft mounted on self-aligning anti-friction bearings carried in dust-proof housings, an eccentric formed on said shaft, and connecting members between said eccentric and said frame whereby rotation of said eccentric causes vibration of said screen.

7. In vibrating screening apparatus of the class and character described, a base member for supporting a horizontal transversely-disposed counterbalanced drive shaft journaled in self-aligning anti-friction bearings enclosed in dust-proof pillow-block casings mounted on said base member, said drive shaft having an eccentric portion journaled in similarly encased self-aligning anti-friction bearings mounted in members attached to the underside of frame members supporting a screen, said screen and its supporting frame being vibrated by said eccentric portion of said drive shaft when latter is rotated, front and rear multi-leaf quarter-elliptic springs disposed lengthwise in spaced-apart parallel relation to said screen frame and attached at one end to said base and at the other end to adjustable-length shackling links pivotally connected to said screen-supporting frame members above said drive shaft, said links serving as double-purpose means for varying screen inclination and spring tension at will to modify the reaction of springs at one side of said drive shaft in relation to reaction of the springs at the opposite side of said drive shaft.

In testimony whereof I affix my signature.

BURNETT E. GREEN.