Sept. 27, 1932. E. E. DEISTER 1,879,923

DRIVE MECHANISM

Filed Feb. 24, 1931 2 Sheets-Sheet 1

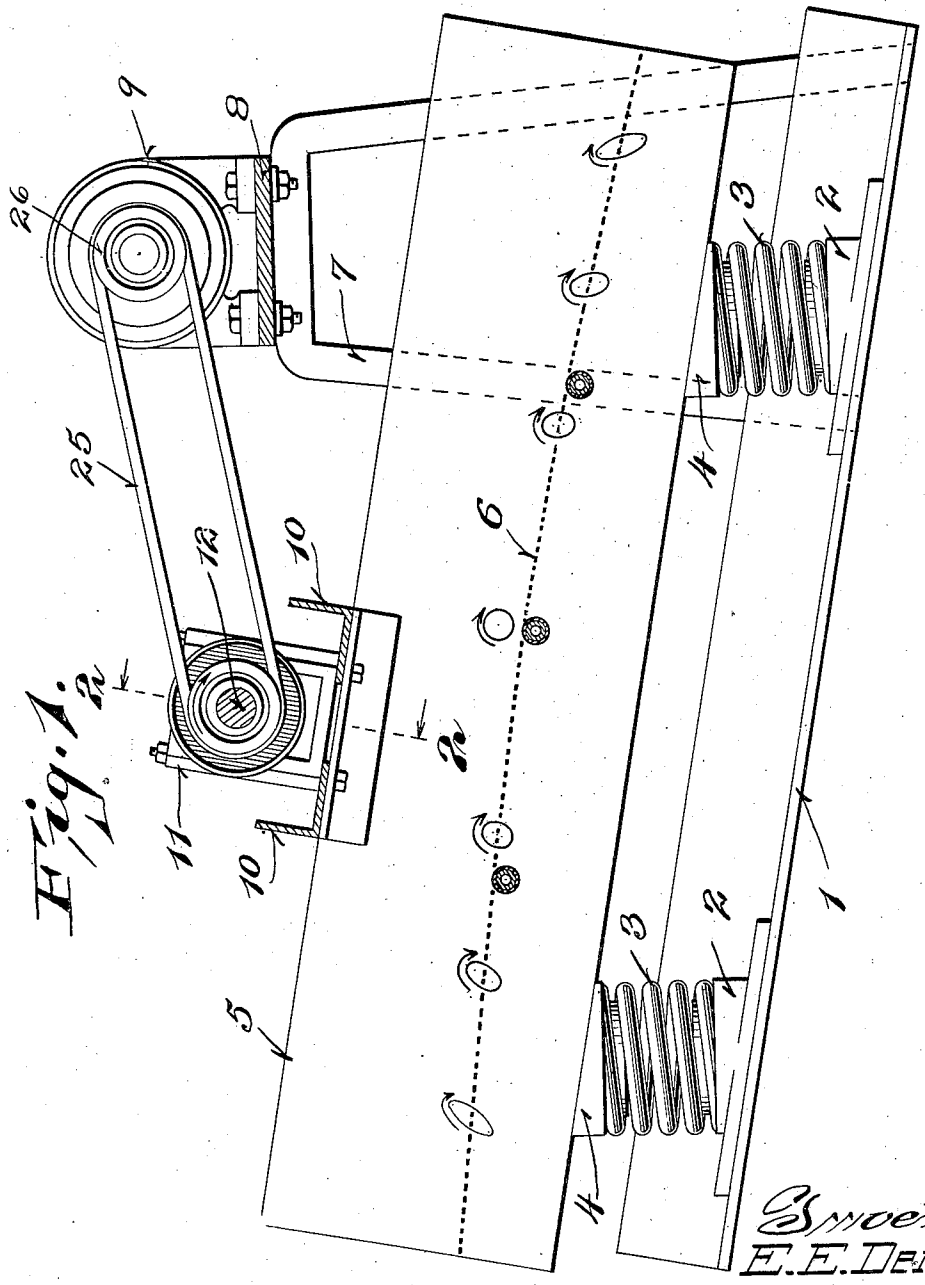


Fig. 1.

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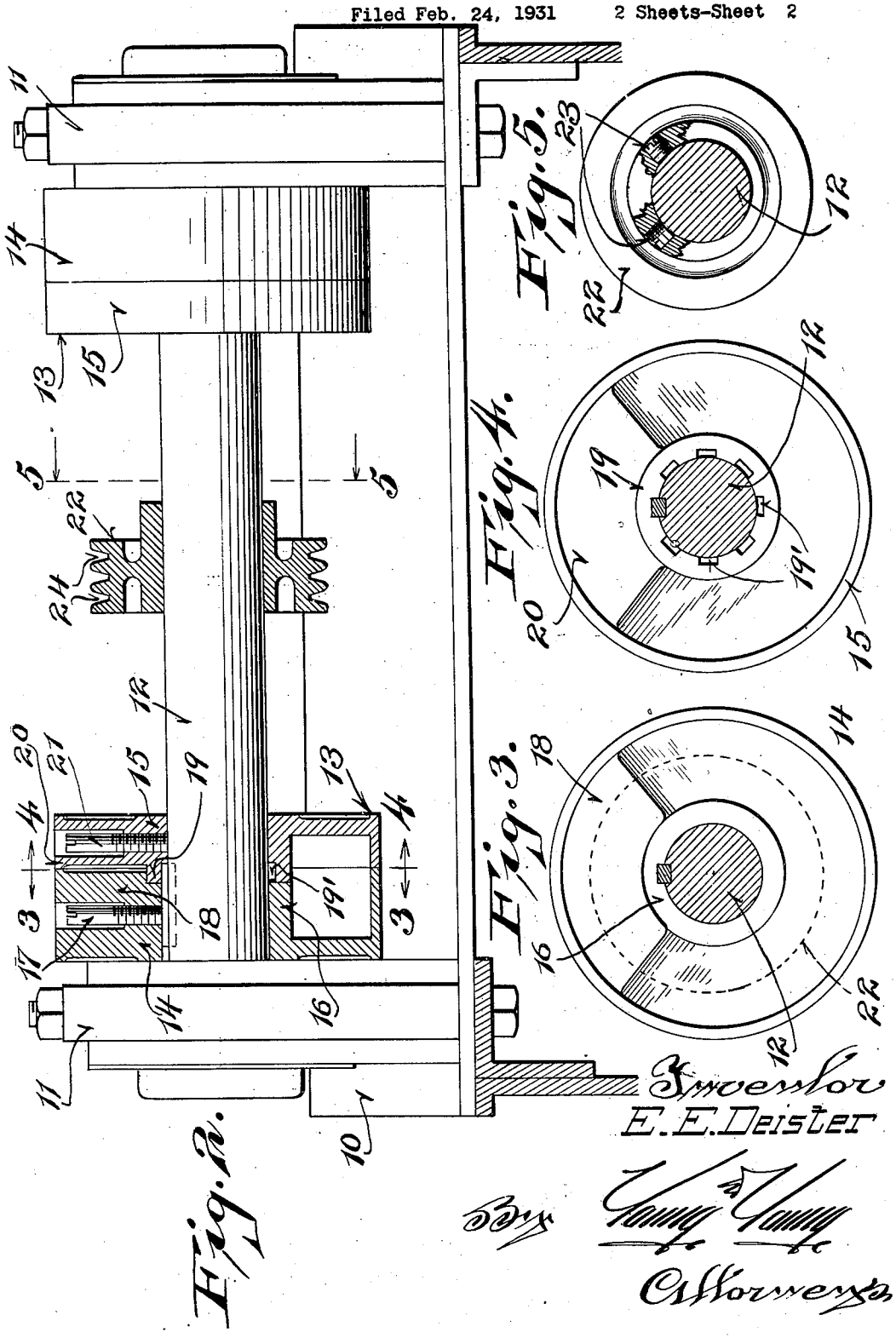


Fig. 2.

Fig. 5.

Fig. 4.

Fig. 3.

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UNITED STATES PATENT OFFICE

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DRIVE MECHANISM

Application filed February 24, 1931. Serial No. 517,730.

This invention relates generally to a drive mechanism, and more particularly to a belt or chain drive, wherein there is relative movement between the driving and driven members.

Obviously, where a belt or chain drive connection is employed between two members having relative movement, the belt or chain alternately loosens and tightens, resulting in considerable slipping, which causes excessive stretch or wear, this being particularly true on short center drives, as for instance in vibratory screens, wherein the driving member is stationary and the driven member is mounted upon the vibratory element.

While the invention may be applied to numerous types of machines, the same has been designed particularly for use in connection with vibratory screens. Therefore, for the purpose of explanation only, the invention is shown and described in connection with a machine of this type.

The invention has primarily for its object to provide means, in a chain or belt drive, to compensate for relative movement between the driving and driven elements, and thus maintain substantially uniform tension upon the driving connection, thereby eliminating flapping with resulting stretch or wear upon the connection.

Incidentally, a more specific object resides in eccentrically mounting one of the drive elements so that as relative movement occurs, the same is automatically compensated for and substantially uniform tension maintained on the driving connection.

More particularly in connection with drives for vibratory screens, a specific object of the invention resides in the peculiar setting of the eccentric drive member with relation to the means for imparting vibratory action to the screen.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

In the accompanying drawings is illustrated one complete example of the physical embodiment of the present invention constructed according to the best mode so far devised for the practical application of the principles thereof.

In the drawings, Figure 1 is an elevation of a vibratory screen with the invention applied thereto;

Figure 2 is an enlarged longitudinal section through the driven vibrating mechanism, taken on the line 2—2 of Figure 1;

Figures 3 to 5 are transverse sections, as indicated by the corresponding lines on Figure 2.

Referring now more particularly to the accompanying drawings, wherein the invention is illustrated in connection with a vibrating screen, the numeral 1 designates a base adapted to be supported upon any suitable foundation at approximately the angle illustrated. Mounted on the base are the spaced spring seats 2 for reception of the coil springs 3, which in turn support the spring seats 4 secured to the side frames 5 of the vibrating screen section, the screen 6 being indicated by dotted lines.

Suitably secured to the base 1 upon opposite sides of the side frames 5, are the uprights 7, connected by a transverse table 8, upon which the electric motor 9 is suitably bolted. Intermediate the ends of the side frames 5, the same are connected by the transverse angle irons 10, which carry suitable bearings 11 in which a shaft 12 is journalled.

The structure thus far described is conventional and therefore forms no specific part of the present invention, other than as set forth in the combination hereinafter claimed, and as set forth in the preceding objects the invention has numerous applications, and therefore the same is not to be limited to the specific combination shown.

Secured on the shaft 12, preferably adjacent the bearings 11, are a pair of overbalanced weighted wheels 13, each formed in two sections 14 and 15 for the purpose of regulat-

ing the vibratory action, as will be hereinafter explained.

As best shown in Figures 2 and 3, the section 14 comprises a rimmed wheel having its hub 16 keyed upon the shaft 12 and locked in assembled position by the locking screw 17. The wheel 14 is overbalanced by the weighted portion 18 confined to a limited circumference of the wheel.

As best shown in Figure 2, the key which splines the wheel 14 to the shaft 12 projects slightly beyond the hub 16 for engagement with the hub 19 of the section 15, it being noted in Figure 4 that the hub 19 is provided with a plurality of keyways 19′, which allow relative adjustment between the sections 14 and 15, for the purpose of regulating vibratory action of the screen.

The wheel 15 is also provided with an overbalanced weighted portion 20 and is locked against longitudinal movement on the shaft 12 by means of the set screw 21.

Naturally, when the weighted portions 18 and 20 are aligned, maximum vibration will be imparted to the screen as the wheels are rotated, the overbalanced weight of the wheels being greatest in this position. Should it be desired to reduce the amount of vibratory movement, the wheel 15 may be shifted to the desired position wherein the effect of the weighted portion 20 will offset that of the weighted portion 18 in the wheel 14.

In the operation of vibrating screens of the type heretofore described, it is necessary to rotate the overbalanced wheels at a high rate of speed, and due to the free resilient mounting of the screen, naturally vibratory movement will be imparted to the same.

In the present instance, the screen section will have both a longitudinal oscillating and rocking movement. Centrally of its ends, the screen frame will naturally follow a substantially circular path as the result of the action of the overbalanced wheels 14 and 15. However, inasmuch as the ends of the screen frame are opposed by the springs 3, a rocking movement is imparted to the screen, which results in the ends being vibrated through an elliptical path, as diagrammatically illustrated in Figure 1 by the arrows appearing thereon.

In order to impart rotative movement to the shaft 12, a pulley 22 is secured thereon intermediate the overbalanced wheels by means of the set screws 23 which provide for ready adjustment of the pulley on the shaft.

In the present form of the invention, the pulley is provided with a plurality of V-shaped grooves 24 for reception of the belts 25 connected with the motor pulley 26. However, it is to be understood that the invention is equally applicable to any type of chain or belt drive.

As best shown in Figures 2 and 5, the pulley 22 is eccentrically mounted upon the shaft 12, the eccentric portion being so disposed with relation to the vibratory action of the screen as to compensate for relative movement between the shaft 12 and the motor pulley 25, thus providing substantially uniform tension upon the belts 25, which eliminates slippage and also resultant stretch and wear upon the belts.

One would naturally assume that the high spot of the eccentric pulley 22 should be oppositely positioned with relation to the overbalanced portions of the wheels 14 and 15. However, it has been found in the operation of vibrating screens, such as illustrated, that there is a lag or delay in transmitting the inertia of the overbalanced portions of the wheels 14 and 15 to the vibrating screen section, this lag comprising substantially a half a revolution of the overbalanced wheels. Consequently, in order to compensate for the relative movement between the pulleys 22 and 26, the high spot of the eccentric pulley 22 is substantially aligned with the overbalanced portions of the wheels 14 and 15. Therefore, although the weighted portions of the overbalanced wheels may lead the movement of the screen by approximately half a revolution, the pulley 22 is so set with relation to the true movement of the screen as to compensate for the relative movement between the pulley 22 and the pulley 26.

It will also be appreciated that while either the driving or driven pulley may be offset to accomplish the result sought, it is considered more desirable to offset the movable driven pulley, inasmuch as a high spot of the pulley can then be definitely set with relation to its true relative movement. This is particularly true in a belt drive where a slippage occurs, which would result in disalignment of the eccentric driving pulley with relation to the driven element.

From the foregoing explanation taken in connection with the accompanying drawings, it will be quite apparent that exceedingly simple and efficient means has been provided for insuring substantially uniform tension upon either a chain or belt drive, in which relative movement occurs between the driving and driven pulleys or sprockets.

It will be further understood that in using the term "pulley" throughout the specification and claims, it is contemplated that the same shall include sprockets and other equivalent elements, utilizing either a chain or belt connection.

I claim:

1. In a driving mechanism for vibrating screens including a mechanism mounted on said screen for imparting vibratory movement thereto, said mechanism comprising a transverse over-balanced shaft; an eccentric pulley mounted on said shaft for rotating the same, a transverse stationary drive shaft, a concentric pulley mounted on said drive

shaft in the same plane with said eccentric pulley, and an endless belt connecting both of said pulleys.

2. In a driving mechanism for vibrating screens including a mechanism mounted on said screen for imparting vibratory movement thereto, said mechanism comprising a horizontal over-balanced shaft; an eccentric pulley mounted on said shaft for rotating the same, the high part of said eccentric pulley being substantially alined with the over-balanced side of said shaft, a horizontal stationary drive shaft, a concentric pulley mounted on said drive shaft in the same vertical plane with said eccentric pulley, and an endless connection between both of said pulleys.

In testimony that I claim the foregoing I have hereunto set my hand at Fort Wayne, in the county of Allen and State of Indiana.

EMIL E. DEISTER.