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J. NICHOLLS.
ORE SCREEN.
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2 SHEETS—SHEET 1.

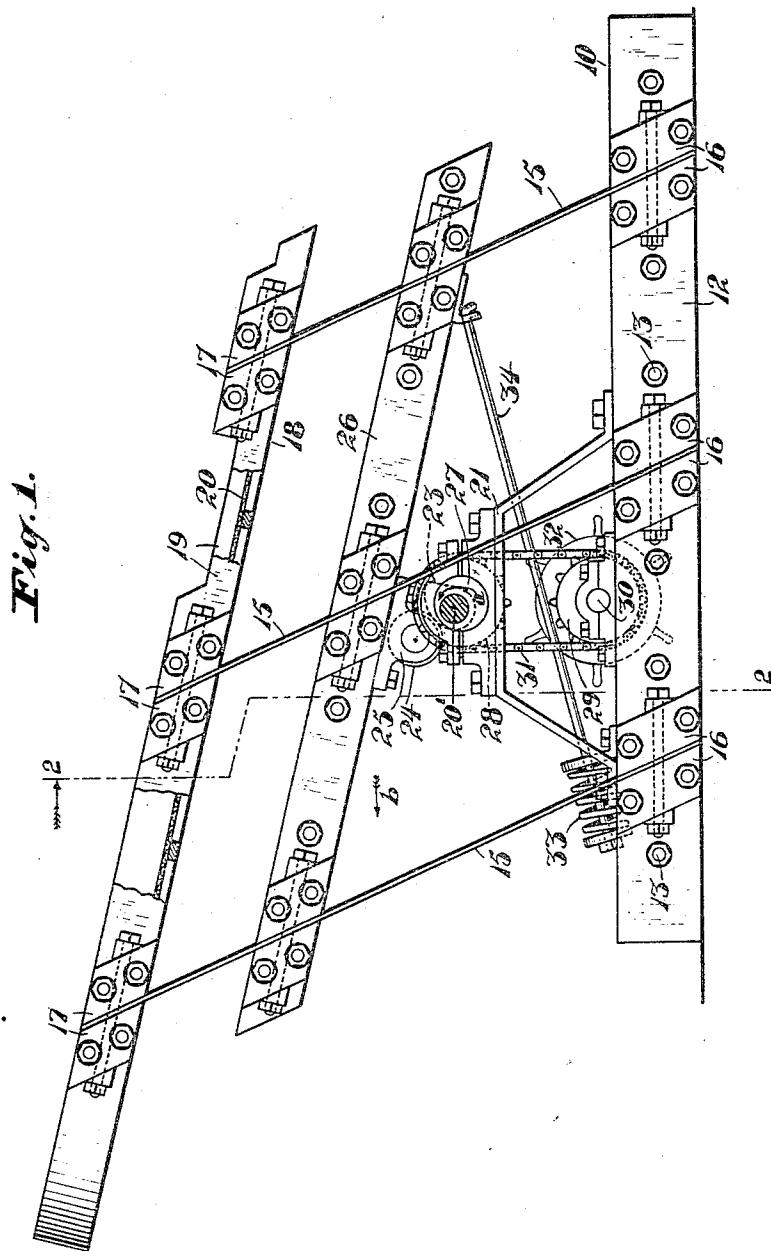


Fig. 1.

WITNESS

H. C. Thiedner

INVENTOR.

John Nicholls

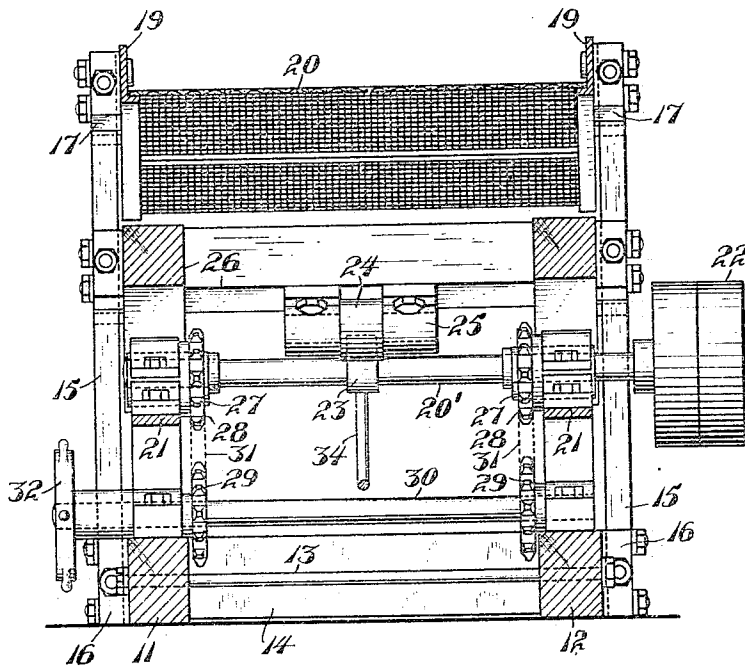
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Fig. 2.



WITNESS

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JOHN NICHOLLS, OF GLOBE, ARIZONA.

ORE-SCREEN.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN NICHOLLS, a citizen of the United States, residing at Globe, in the county of Gila and State of Arizona, have invented new and useful Improvements in Ore-Screens, of which the following is a specification.

This invention relates to ore separating machinery, and particularly pertains to a mechanically operated ore screen.

It is the principal object of this invention to provide a mechanism by which quartz and placer ore may be conveniently handled and which will mechanically act to agitate the ore in a manner to separate it from the gangue. With this idea in view a vibrating screen has been provided which is simple in its construction and is suitably supported by flexible members, allowing it to be mechanically vibrated, said structure being decidedly inexpensive as to manufacturing costs and operation and being easily assembled or dismantled when desired.

Another object of this invention is to provide a machine of the above class which is fitted with adjustable means for varying the vibrating stroke of the mechanism and thus controlling the action of the screen, this being necessary when different grades of ore are to be treated.

Other objects will appear hereinafter.

The invention is illustrated by way of example in the accompanying drawings, in which—

Figure 1 is a view in side elevation, illustrating the assembled machine with parts broken away to more clearly disclose its construction.

Fig. 2 is a view in vertical section, as seen on the line 2—2 of Fig. 1, and discloses in detail the vibrating mechanism as well as the means for adjusting the stroke thereof.

Referring more particularly to the drawings, 10 indicates a sub-frame, preferably formed of parallel timbers 11 and 12 which are securely held together by cross bolts 13 and cross timbers 14. Secured in spaced relation to each other and along the outer sides of the timbers 11 are resilient supporting bars 15 which are held between clamping blocks 16 and are disposed at an inclination to the vertical. In practice it has been found that an angle of 72° is suitable for the placing of these bars.

Fixed to the upper ends of the bars, by blocks 17, is an ore screen 18 which is formed

with parallel side rails 19, between which a screen 20 of suitable reticulated material is positioned. This screen is inclined at an angle to the horizontal and as supported by the bars 15 may have a limited horizontal vibrating movement. In small machines this movement may be effected manually. However, in the drawings a mechanism is provided for mechanically vibrating the screen.

The mechanical vibration of the screen is produced by a rotating shaft 20' mounted within the bearing brackets 21 secured to the timbers 11 and 12 of the sub-frame. This shaft is preferably driven by a pulley 22 receiving power from a suitable power source. Fixed upon the shaft at a point intermediate its bearings is a cam 23, the formation of which is particularly shown in Fig. 1. Here it will be seen that the cam is formed with a gradual swirl followed by a flat face. The arcuate portion of the cam normally rests against a roller 24 which is mounted upon a roller shaft held within bearings 25 which are secured to the under-side of a motion frame 26. This frame is formed of parallel timbers which positively engage each of the supporting bars 15 and, when moved horizontally, will cause these bars to be deflected from their fixed support upon the sub-frame, thus imparting a vibrating motion to the screen. This motion will be repeated as the cam 23 rotates, as will be evident.

In order that the extent of vibration of the screen may be controlled and may be varied to suit the requirements of different grades of ores which are treated, the ends of the cam shaft 20' which extend through the bearings 21 are directly held within eccentric bearing bushings 27. These bearings are cylindrical and may rotate within the bearings 21. The bores through the bushings, however, are eccentric to accommodate the shaft 20', and thus when the bushings are rotated in relation to the bearings, the shaft and cam will be moved toward or away from the normal position of the roller 24. Simultaneous adjustment of these bushings is necessary and for that purpose a sprocket 28 is fixed to the inner end of each bushing and thereafter connected with a complementary sprocket 29 upon an adjusting shaft 30 by means of a sprocket chain 31. The adjusting shaft 30 is rotatably secured upon bearings fixed to the sub-frame and here shown as in vertical alinement with the bearings 21. A

hand wheel 32 is secured to one end of the shaft and by its manipulation both of the bearing bushings may be simultaneously rotated and the eccentricity of the cam shaft 20' determined.

In order that the screen may operate with a sharp jerk and may be successively operated with a steady movement a recoil spring 33 is secured to the sub-frame and connected with a spring rod 34 fastened at the forward end of the motion frame. The action of this spring is contrary to the action of the cam and will draw the motion frame rearwardly at the instant the cam releases it.

In operation, the machine is set up, as shown in the drawings, and thereafter a quantity of ore may be placed upon the screen. The bolts of the bearings 21 may be slightly loosened to allow free rotation of the bearing bushings, after which the bearing bushings may be adjusted by the hand wheel 32 and the shaft 30. This adjustment will, as previously described, effect the position of the cam shaft 20' and control the movement of the screen as influenced by the cam. After a proper adjustment has been made the bolts may then be tightened to lock the bushings in place. As the cam shaft rotates in the direction indicated by the arrow *a* (see Fig. 1) the motion frame and the screen will be forced in the direction of the arrow *b* (see Fig. 1). Thus as the supporting members 15 yield the frame will be horizontally moved.

As soon as the cam passes the roller upon the motion frame the inherent resiliency of the supporting members 15 will act to restore the frame to its normal position. Extreme movement of the frame under this action will affect the spring 33 and again move the frame in the direction of arrow *b*. It will thus be seen that by a continued rotation of the cam the screen will be subjected to an alternate jerking movement or vibration which will act to separate the metal from the gangue. This action will be particularly effective in the present mechanism due to the inclination of the screened floor which will cause the material to be forcibly encountered by the screen to facilitate in separating the material. It will thus be seen that the mechanism here disclosed while inexpensive as to manufacturing cost and simple in operation yet provides an effective means for readily screening material.

While I have shown the preferred form of my invention as now known to me, it will be understood that various changes in the combination, construction and arrange-

ment of parts may be made by those skilled in the art without departing from the spirit of the invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. An ore screening machine comprising a base, a series of resilient bars secured to said base and disposed parallelly to each other and at an angle to the vertical, an ore screen secured to the upper ends of said bars and at an angle to the horizontal, a motion frame fixed to the bars and interposed between the base and the screen, mechanical means for engaging the motion frame to vibrate the screen, and means whereby the vibrating stroke of the screen may be varied, said means including a cam and bearing bushings which are adjustable with relation to the motion frame.

2. In an ore screening machine, vibrating means comprising a rotating shaft, an eccentric cam secured thereon, a floating motion frame adapted to be affected by the cam, and means whereby the effective stroke of the cam may be adjusted, said means including eccentric bushings within which the shaft is journaled, said bushings being turnable with respect to the normal position of the floating frame.

3. In an ore screening machine, a vibrating mechanism comprising a motion frame, an eccentric cam adapted to intermittently engage said motion frame, a rotatable shaft upon which said cam is fixed, an adjusting mechanism whereby the shaft may be variably disposed in relation to the motion frame and the effective stroke of the cam thus regulated, and means to simultaneously adjust the adjusting mechanism.

4. An ore screening machine including a vibrating mechanism comprising a rotating shaft, a cam carried thereby, a contact means against which the cam acts, bushings in which the cam shaft is borne, sprockets upon each of the bushings, complementary sprockets and chains connecting said sprockets with the first named sprockets, a shaft to which said second sprockets are fixed, and means to turn and adjust them and the bushings.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOHN NICHOLLS.

Witnesses:

GEORGE R. HILL,
TOM BREWER.