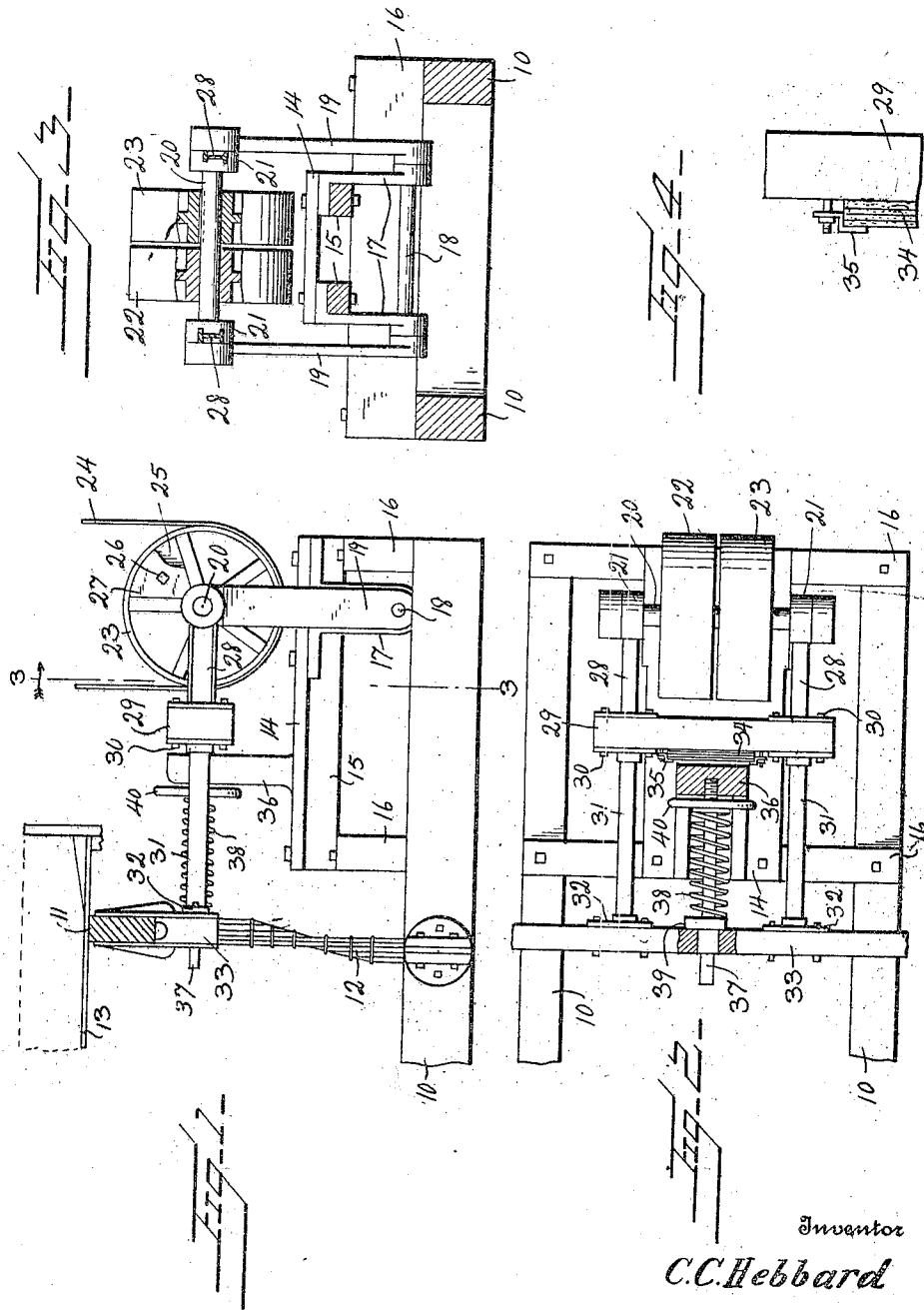


C. C. HEBBARD.
 HEAD MOTION FOR ORE CONCENTRATORS.
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1,286,617.

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HEAD-MOTION FOR ORE-CONCENTRATORS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES C. HEBBARD, a citizen of the United States, residing at Joplin, in the county of Jasper and State of Missouri, have invented certain new and useful Improvements in Head-Motions for Ore-Concentrators, of which the following is a specification, reference being had to the accompanying drawings.

10 This invention relates to concentrating tables, and particularly to a head motion which, while adapted for other purposes, is designed for imparting a reciprocating motion to a concentrating table.

15 One object of the invention is to provide improved means for this purpose of a very simple character and which includes an overbalanced fly wheel, means for transmitting the oscillating motion transmitted to this fly wheel because of its being over-
20 balanced to the deck itself, or other device to which the reciprocating motion is to be applied, and provide improved means for regulating or controlling the degree of movement of the table or other device according to the circumstances of operation.

25 A further object is to provide improved means for supporting the overbalanced fly wheel whereby the fly wheel may have free reciprocation parallel to the axis of the table, without there being any action tending to tear the shaft of the fly wheel from its bearings.

30 Still another object is to provide improved means for adjustably limiting the stroke of the bumper block which gives a reciprocating motion to the table, this means including the provision of variable layers of material mounted upon the bumper block and
35 engaging with the bumper.

40 A further object is to provide yielding means for resisting a movement of the bumper under the impact of the bumper block and provide for an adjustment of the tension of this yielding means.

45 Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

50 Figure 1 is a side elevation of a head motion constructed in accordance with my invention;

Fig. 2 is a top plan view, partly in section;

Fig. 3 is a section on the line 3—3 of Fig. 1; and

Fig. 4 is a fragmentary top plan view to show the manner of holding the bumper facing to the bumper block.

Referring to these drawings, 10 designates the side beams of a base or floor frame. These extend parallel to each other. Supported above these side beams is the object to be reciprocated which is illustrated as the deck of a concentrating table. This deck is supported in any suitable manner, the particular manner of forming the deck forming no part of my present invention. As illustrated, however, the deck is supported upon vertically extending, resilient supporting members 12. The deck 13 is mounted upon the deck supporting beams 11 and is of any usual construction.

Supported upon the beams 10 at the head end of the table is a base plate 14 illustrated as supported upon longitudinal beams 15 and transverse beams 16 which in turn rest upon the beams 10. Attached to the base plate 14 at each end thereof, and extending downward over the beams 15 are the hangers 17 having bearings at their lower ends through which passes a transversely extending pivot or shaft 18. Pivoted upon the shaft 18 are the upwardly extending arms 19 having bearings at the upper ends for a transverse shaft 20 and mounted on the shaft 20 inward of the arms 19 are rods 28 having heads 21 through which the shaft 20 passes. Mounted on the shaft 20 is a loose wheel 22 and an overbalanced pulley or fly wheel 23. A driving belt 24 is arranged to be shifted to either one of these pulleys.

As illustrated in Fig. 1, the unbalanced pulley or fly wheel 23 is formed with a web 25 through which a bolt 26 passes and by which a weight 27 may be clamped to the pulley to overbalance it. This weight may be varied in size or thickness so as to vary the power secured from this overbalanced pulley.

Extending from the heads 21 are rods 28 which are flanged at their ends and are bolted to a bumper block 29 by bolts 30 passing

through the flanges. Attached to the other faces of the bumper block 29 are rods 31 which at their opposite ends have flanged heads 32 bolted to the transverse beam 33 at the head end of the table.

The rods 31 are provided at their rear ends with flanges through which the bolts 30 pass. The middle of the bumper block 29 is provided with a facing 34 of leather or other material held in place by clips 35. This facing is made up of a plurality of layers of leather or other material and these layers may be increased or decreased as will be later stated.

Extending upward from the bed plate 14 is a bumper 36 which is disposed at the middle of the bed plate and extending through a passage in the upper end of a beam 33 is a rod 37 which is screw-threaded at its rear end and surrounding this rod is a coiled compression spring 38 which bears at its forward end against a socket 39 mounted upon the beam 33, this spring at its forward end bearing against a hand wheel 40, which has screw-threaded engagement with the rod 37 and constitutes a nut bearing against the compression spring and the rotation of this hand wheel or nut acts to increase or decrease the tension of the spring 38.

The operation of this portion of my invention is as follows: Assuming that the belt 24 is in engagement with the balanced pulley or fly wheel then it will be obvious that as the unbalanced wheel is rotated through the driving belt, an oscillatory movement will be given to the shaft 20 and the supporting arms 19 and through the rods or bars 28 to the bumper block and from the bumper block through the arms 31 to the deck. Thus a reciprocating motion will be given to the deck but in order to provide for a sudden jar being given to the deck, I provide the projecting bumper 36 which constitutes a stop against which the bumper block impacts.

When the bumper block 29 impacts against the bumper 36, the forward movement of the bumper, of the rods 31 and of the deck is suddenly checked and then as the weighted portion of the unbalanced fly wheel or pulley moves rearward, the bumper block 29, the rods 31 and the deck are drawn backward against the force or tension of the spring 38 which thus acts as a means for yieldingly limiting the rearward movement of the table. By rotating the hand wheel 40 which constitutes a nut, it is possible to increase or decrease the tension of this spring 38 and thus variably control the resistance of the rearward movement of the table and consequently control the extent of this rearward movement. The loose pulley 23 acts as an idler to restrain or stop the movement of the deck.

In the operation of this device, when the belt is shifted upon the idler pulley, it is obvious that no reciprocation of the table will be secured, but when the belt is shifted onto the overbalanced pulley or wheel 22, then the rotation of this wheel will cause the wheel to move forward and rearward in connection with the pivoted arms 19 and this forward and rearward movement will be transmitted to the cross beam 33 of the deck by means of the rods 28 and 31. When the leather pads on the bumper block 29 strike the face of the bumper 36, the forward movement of the table is stopped abruptly and the table is jarred, without however interrupting in any way the rotation of the overbalanced fly wheel. As the table moves rearward under the action of the overbalanced fly wheel, the spring 38 will be compressed and this compression of the spring will resist the rearward movement of the table to an extent depending upon the tension of the spring. This tension is, of course, regulated by adjusting the hand wheel 40.

It will be seen that I have provided a mechanism for reciprocating the table including a power driven member which is constantly rotatable and which is not stopped or impeded in its rotation in any manner as would be the case were a power driven cam used for reciprocating the table, and furthermore, I secure by the use of an unbalanced fly wheel, a stroke of a power not possible if a cam were used for urging the table forward.

While I have illustrated a mechanism embodying my invention which I have found to be thoroughly effective in practice, yet it will be understood that the details of this mechanism and arrangement of the several parts may be varied in many ways, without departing from the spirit of the invention, as defined in the appended claims.

Having described my invention, what I claim is:—

1. The combination with an element supported for longitudinal movement, of means for giving a longitudinal reciprocation to the element including a shaft mounted rearward of the head end of the element extending in a horizontal plane and supported for horizontal movement in the direction of movement of the element, an unbalanced power driven wheel mounted upon the shaft, and operative connections from the ends of the shaft to the element.

2. The combination with an element supported for longitudinal reciprocation, of means for longitudinally reciprocating the element including a shaft supported for horizontal movement in the direction of movement of the element, an unbalanced power driven wheel mounted upon the shaft,

operative connections extending from the shaft to the element, a bumper block carried by said connections and reciprocating therewith, and a bumper with which said block

balanced wheel mounted upon the last named shaft, and a bumper operatively connected to the last named shaft to reciprocate therewith as the unbalanced wheel is rotated.

7. A head motion of the character described including a supporting base having depending laterally spaced hangers, arms pivoted to the lower ends of the hangers and extending upward therefrom, a shaft carried upon the upper ends of the arms, a power driven unbalanced wheel mounted upon the shaft, a belt pulley also mounted upon the shaft, a bumper block operatively connected to the shaft and having rods extending therefrom adapted to be operatively engaged with the head end of an element to be reciprocated, and a bumper extending upward from said base with which the bumper block is adapted to engage.

8. A head motion of the character described including a shaft, a power driven unbalanced wheel mounted upon the shaft, a bumper block operatively connected to the unbalanced wheel to reciprocate, therewith and operatively connected to the element to be reciprocated, a fixed bumper disposed in the path of movement of said block, and means for supporting layers of cushioning material upon the face of the bumper block. said means permitting a variable number of layers to be used.

9. A head motion of the character described including a supporting base having laterally spaced hangers, arms pivoted to the ends of the hangers and extending upward therefrom, a shaft carried upon the upper ends of the arms, a power driven unbalanced wheel mounted upon the shaft and having a belt receiving face, an idler pulley mounted beside the unbalanced wheel, a belt shiftable into operative engagement with the wheel of the pulley, a bumper operatively connected with the shaft and having rods extending therefrom adapted to be operatively engaged with an element to be reciprocated, and a bumper extending upward from said base with which the bumper block is adapted to engage.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

CHARLES C. HEBBARD.

Witnesses:

N. B. CHATELIER,
W. C. WEBB.

3. The combination with an element mounted for longitudinal movement, of a shaft, an unbalanced power driven wheel mounted thereon, means for supporting the shaft for movement parallel to the movement of the element, rods operatively connecting the shaft to the element and transmitting motion thereto, a bumper block carried upon said rods, a fixed bumper with which the bumper block engages when the bumper moves forward, and a spring cushioning the rearward movement of the element.

4. The combination with an element mounted for longitudinal movement, of a shaft, an unbalanced power driven wheel mounted thereon, means for supporting the shaft for movement parallel to the movement of the element, rods operatively connecting the shaft to the element and transmitting motion thereto, a bumper block carried upon said rods, a fixed bumper with which the bumper block engages when the bumper moves forward, a spring cushioning the rearward movement of the element, and means for adjusting the tension of said spring.

5. The combination with a longitudinally movable element, of means for longitudinally oscillating the element comprising a shaft mounted at the head end of the element and movable in a direction parallel to the longitudinal axis of the element, an unbalanced power driven wheel mounted on the shaft, rods connecting the shaft to the element and transmitting power thereto, a bumper block carried upon said rods, a fixed bumper disposed in the path of the bumper block and limiting its forward movement, a screw-threaded rod mounted upon the bumper and having sliding operative engagement with the element, a hand wheel mounted on the screw-threaded rod, and a compression spring disposed between the hand wheel and the element, the spring cushioning the rearward movement of the element.

6. A head motion of the character described including a lower fixed shaft, arms pivoted to the shaft and extending up therefrom, a shaft passing through the upper ends of the arms, a power driven, un-