Sept. 30, 1924. 1,510,439

E. R. DRAVER

TRANSMISSION MECHANISM FOR FEEDERS CONNECTED IN A GANG

Filed July 1, 1918 2 Sheets-Sheet 1

Fig. 1

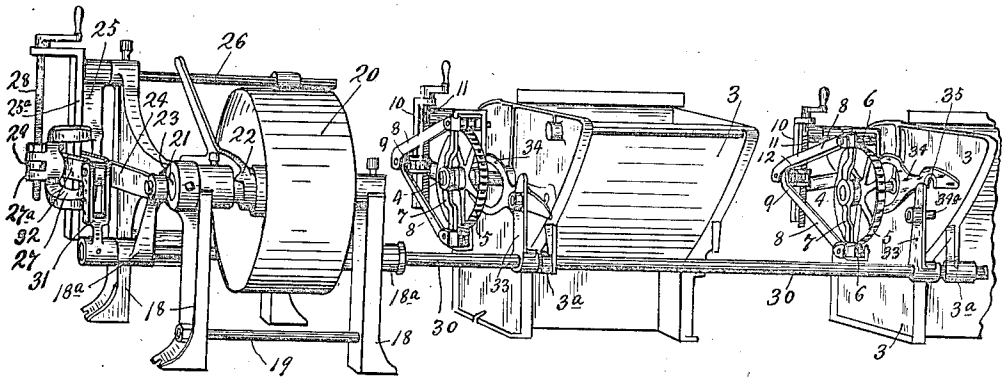


Fig 1a

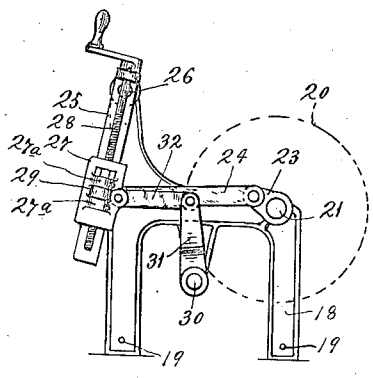
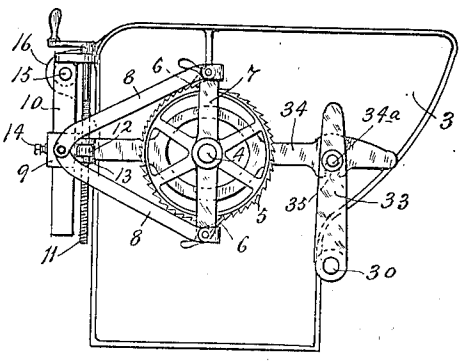


Fig. 1b



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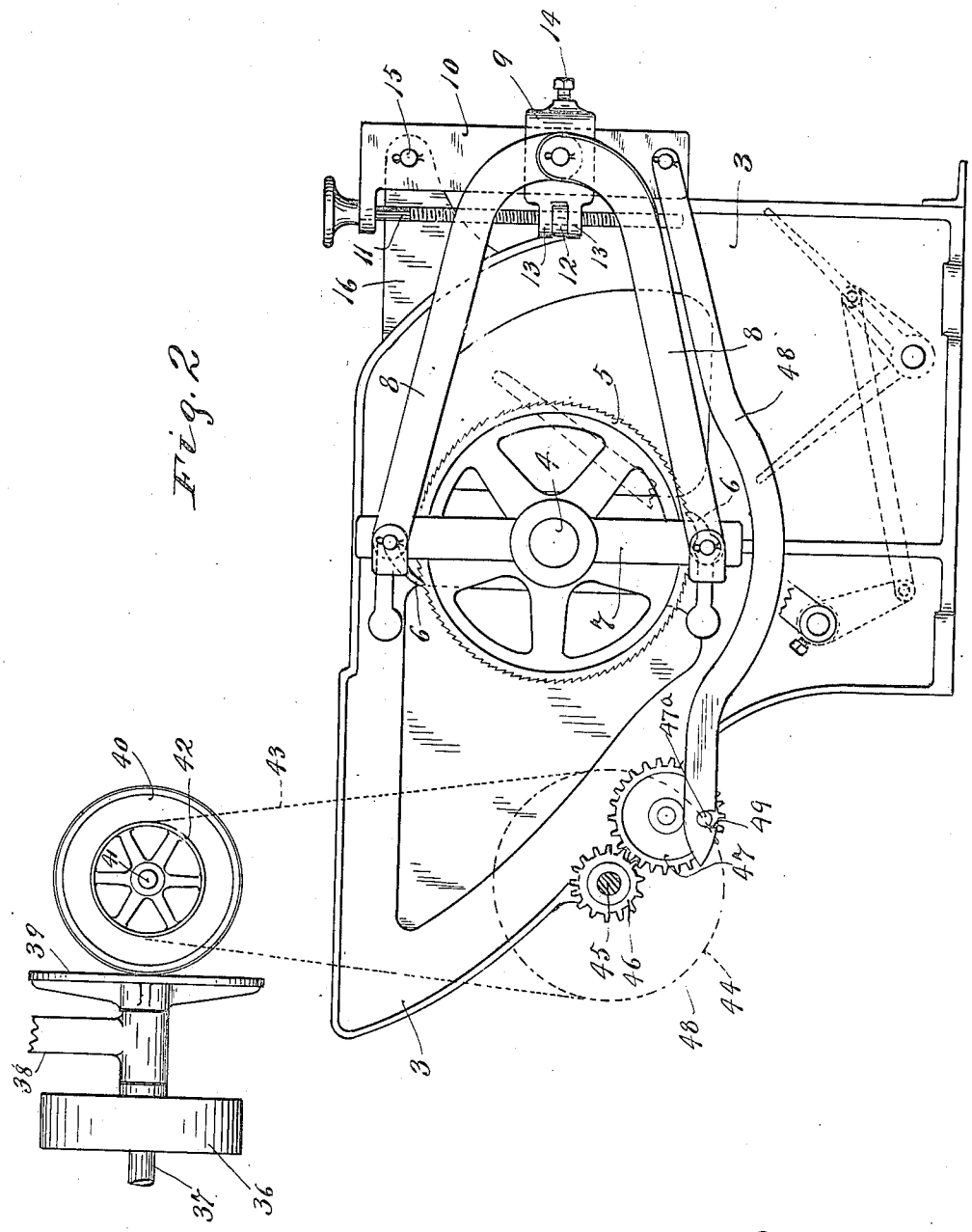
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TRANSMISSION MECHANISM FOR FEEDERS CONNECTED IN A GANG

Filed July 1, 1918 2 Sheets-Sheet 2

Fig. 2



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UNITED STATES PATENT OFFICE.

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TRANSMISSION MECHANISM FOR FEEDERS CONNECTED IN A GANG.

Application filed July 1, 1918. Serial No. 242,812.

To all whom it may concern:

Be it known that I, EMIL R. DRAVER, a citizen of the United States, residing at Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Transmission Mechanism for Feeders Connected in a Gang; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to transmission mechanism for feeders connected in batteries and is in the nature of an improvement or refinement of the construction disclosed and broadly claimed in my pending application S. N. 231,320, filed of date April 29, 1918.

Generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

The invention is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views. Referring to the drawings:

Fig. 1 is a perspective view showing a battery of feeders connected up and driven in accordance with my invention;

Fig. 2 is a view in side elevation illustrating a somewhat modified construction of the transmission mechanism;

Fig. 1ª is a left side elevation of the power element of the battery shown in Fig. 1; and

Fig. 1ᵇ is a left side elevation of one of the feeders shown in Fig. 1.

Describing first those features that are common to all of the views, the numeral 3 indicates the entire casing through which either grain or other stock is arranged to be fed under the action of gravity, and preferably, by the action of a rotary paddle wheel not herein shown, but such, for example, as that illustrated in my said prior application. Such paddle wheel would be secured to a shaft 4 rotatably mounted in the sides of each casing 3 and having at one projecting end a ratchet wheel 5 that is subject to reversely acting dogs 6 carried by arms 7 pivoted on the shaft 4. The free ends of arms 7 are connected by links 8 to a crank head 9 mounted to slide on an oscillatory arm 10. The head 9 is adjustable toward and from the pivot of the said lever 10 by means of an adjusting screw 11 swiveled to a projection of said arms 10 and engaging a nut 12 that is located between lugs 13 of the head 9. The head 9 is adapted to be rigidly secured to the arms 10 in any desired adjustment by additional securing means, such as a set screw 14.

The oscillatory arm 10 is pivoted to a stud 15 on a bracket 16 formed as a part of, or rigidly secured to one of the sides of the casing 3. The construction which will now be further and immediately described, is that illustrated in Figs. 1, 1ª and 1ᵇ.

The numeral 18 indicates laterally spaced side frames which, as shown, are tied together by rods 19 constituting the framework of a power device that is common to all of the several laterally spaced feeders. The numeral 20 indicates a driving pulley normally loose on a counter shaft 21 that is journaled in the side frames 18. This pulley is adapted to be connected to and disconnected from the shaft 21 by means of a suitable lever-actuated clutch 22 of any suitable construction, but preferably of substantially the arrangement disclosed in may said prior application.

At one end, towit, as shown, at its left hand end, shaft 21 is provided with a short crank 23 which, by means of a link 24, is connected to an oscillatory arm 25. This arm 25 is secured to one end of a shaft 26 journaled in suitable bearings on the side frames 18 of the power device. Said arm is provided with a flanged face 25ª upon which a bifurcated crank head 27 is mounted to slide. This head is adapted to be set in different adjustments varying the distance from shaft 26, by an adjusting screw 28 swiveled to a projection of the arm 25 and engageable with a nut 29 that works between spaced lugs 27ª of the head 27.

The numeral 30 indicates a long rock shaft that is journaled in suitable bearings 18ª on the side frames 18 and to suitable bearings 3ª on the side of the several casings 23. At one end, towit, as shown in Fig. 1, at its left hand end, this common rock shaft 30 is provided with an arm 31 which, as shown, is bifurcated and pivotally connected

to a link 32, the other end of which link is pivotally connected to the adjustable block 27 and is adjustable therewith.

The common rock shaft 30, adjacent to one side of its casing 3 is provided with an upwardly projected arm 33 that has a laterally projecting stud 34ª. For each arm 33 there is a connecting link or rod 34 provided at its free end with a notch 35 for detachable engagement with the co-operating stud 34ª. The other end of each such connecting link is pivotally connected to the co-operating oscillatory arm 10 previously described. At its intermediate portion, the said links 34 are made loop form so as to afford large clearance around the projecting portion of the co-operating shaft 4.

In the construction illustrated in Fig. 2, the primary power device and the common transmission shaft are of modified arrangement and comprise as follows:

The numeral 36 indicates a pulley secured to a shaft 37 journaled in a suitable overhead support 38 and provided at one end with a face friction wheel 39 that co-operates with a peripheral friction wheel 40 secured to a suitably supported counter shaft 41. Friction wheel 40 is movable on shaft 41, toward and from the axis of wheel 39 to produce a variable speed transmission of power. Shaft 41 is provided with a pulley 42. A belt 43 runs over pulley 40 and over another pulley 44, which latter is secured to a shaft 45. This shaft 45, in this arrangement, constitutes the common power transmission element, but is a continuously rotating shaft rather than a rock shaft. When the several feeders are connected in a battery, shaft 45 will extend along the several machines and will be journaled in suitable bearings on the casings thereof. Adjacent to one side of each feeder, a common shaft 45 is provided with a spur pinion or gear 46 that meshes with a gear 47 that is journaled to a stud on one side of the feeder casing and provided with a crank pin 47ª. The numeral 48 indicates a long link pivotally connected at one end to the free end of the co-operating arm 10 and provided at its other end with a notch 49 for detachable engagement with the crank pin 47ª. In this arrangement, the gear 47 and its crank pin 49 afford the crank for oscillating the arm 10.

Operation.

In the construction illustrated in Figs. 1, 1ª and 1ᵇ, it should be assumed that the pulley 20, and hence, the crank shaft 21 will be driven at a constant speed. Through the connections described, the common rock shaft 30 will, of course, be oscillated when the said pulley and crank shaft are driven, and it will be given one complete back and forth oscillation for each complete rotation of the crank 23; but the extent of oscillation of said shaft 30 and its arms 33 will depend upon the adjustment of the crank head 27 on the crank arms 25—25ª. Oscillations of the arms 33, operating through the co-operating connecting links 34, will oscillate the crank arms 10 of the respective feeders. Oscillations of the said crank arms 10, operating through the links 8 and co-operating pawl and ratchet devices, will rotate the shaft 4 and rotary members of the respective feeders. With the arms 33 given a predetermined angular oscillation, at a definite speed, the rotation of the rotary members of the respective feeders will depend on the adjustments of the crank heads 9 of the respective feeders. Hence, as is evident, there is provided, first, means for simultaneously varying the speed or rate of feed movement of all of the feeders, and second, means for further varying the rate of feed movement of the several feeders, the one independently of the other, and all of this without changing the speed of the primary driving shaft or element. Moreover, any one of the feeders may be quickly thrown out of action or back into action without interrupting the oscillatory movements of the common rock shaft, simply by disengaging one of the connecting links 34 from its co-operating stud 34ª of the respective arms 33. Of course, by means of a clutch 22, pulley 20 may be disconnected from crank shaft 21, thereby stopping all of the several feeders and the primary driving mechanism without interrupting the rotation of said pulley.

The above described adjustments and noted actions make it possible, first to set several machines for different proportionate rates of feed and then, without changing this proportionate rate of speed, to simultaneously increase or decrease the rates of feeding actions of the several feeders, as occasion may require. Different kinds of work and different conditions of stock make the above noted various adjustments highly desirable.

In the construction illustrated in Fig. 2, adjustments of friction wheel 40 toward and from the axis of friction wheel 39 serve to simultaneously vary the rate of feeding action of the several feeders without changing the proportionate relative rate of feed thereof; and by independent adjustments of the crank heads 9 on the arms 10, the relative rates of feeding actions of the several feeders may be independently varied.

What I claim is:

1. An apparatus for proportionately feeding different fine or granular materials comprising a battery of feeding devices, each constituting a separate machine unit having a feeding mechanism, a single rotatable driving mechanism, an oscillating means driven by said rotatable driving mechanism

extending to all of said feeding devices and independently variable means connecting said oscillating means with each of said feeding mechanisms for operating the latter, and means for varying the degree of oscillation of said oscillating means.

2. An apparatus for proportionately feeding different fine or granular materials comprising a battery of feeding devices, each constituting a separate machine unit having a rotatable feeding mechanism, a rotatable driving mechanism, an oscillating means driven by said rotatable driving mechanism extending to all of said feeding devices constituting the sole connection therebetween and independently variable means connecting said oscillating means with each of said rotatable feeding mechanisms for rotating the latter, and means for varying the degree of oscillation of said oscillating means while in operation, and while said feeding devices are in operation.

3. An apparatus for proportionately feeding different fine or granular materials comprising a battery of feeding devices, each constituting a separate machine unit having a rotatable feeding mechanism, a single rotatable driving mechanism, a rock shaft driven by said rotatable driving mechanism extending to all of said feeding devices, independently adjustable means connecting said rock shaft with each of said rotatable feeding mechanisms for rotating the latter, and means for varying the degree of oscillation of said rock shaft.

4. An apparatus for proportionately feeding different fine or granular materials comprising, a battery of feeding devices, each constituting a separate machine unit having a rotatable feeding mechanism and an oscillating arm for driving said feeding mechanism, a driving device also including an oscillating arm, means connecting said last mentioned oscillating arm to each of said first mentioned oscillating arms, blocks movable on all of said oscillating arms and independent means for independently adjusting each of said blocks to vary the degree of oscillation of each of said arms without stopping the oscillation of any of said arms.

5. The structure set forth in claim 1, means for disconnecting said oscillating means from said rotatable driving mechanism at will, and means for disconnecting each of said rotatable feeding mechanisms from said oscillating means, at will.

6. An apparatus for proportionately feeding different fine or granular materials comprising, a plurality of feeding devices, each constituting a separate machine unit having a rotatable feeding mechanism, and a pawl and ratchet mechanism for rotating said feeding mechanism, a driven rock shaft extending to all of said feeding devices, independently adjustable means connecting said rock shaft to each of said pawl and ratchet mechanisms for operating the latter, and means for varying the degree of oscillation of said rock shaft.

7. An apparatus for proportionately feeding material comprising a battery of feeding devices, each constituting a separate machine unit having a movable feeding element, of an oscillatory means extending between said devices, means connecting each of said elements to said means for moving said elements, a driving means for said oscillatory means, means for varying the degree of oscillation of said oscillating means without stopping the same, and means for independently varying the degree of motion of each of said movable elements without stopping the same.

8. The combination with a battery of independent receptacles, and a feeder for each of said receptacles, of means for driving the same comprising a rock shaft extended to all of said feeders, and adjustable means for variably driving said rock shaft.

9. The combination with a battery of independent receptacles, and a feeder for each of said receptacles, of a rock shaft having crank arms, one for each feeder, variable independently adjustable transmission devices between said crank arms and the respective feeders, and means for varying the transmitting action of said rock shaft.

10. The combination with a gang of machines of the kind described, and pawl and ratchet driving mechanisms for the several machines, of a common rock shaft for driving the several machines, means for varying the degree of oscillation of said rock shaft and for each machine an intermediate variable stroke oscillatory arm connected to and oscillated from said rock shaft, and connected to and operating the respective pawl and ratchet driving devices of said several machines.

11. A mechanism for proportionately feeding materials, comprising a battery of individual feeders, a common rock shaft having connections for driving the several feeders, means for varying the degree of oscillatory movement of said rock shaft, comprising a rotary constantly running driver, a rotary driving crank, a clutch for connecting said driving crank to said running driver, an oscillating intermediate arm, a link connecting said driving crank to said intermediate arm for oscillating the latter, an adjustable throw-crank head mounted on said intermediate arm, an arm on said common rock shaft, and a link connecting said crank head to the said arm on said rock shaft.

12. A mechanism for proportionately feeding materials, comprising a battery of individual feeders, a pawl and ratchet driving mechanism for each feeder, a common

power driven rock shaft for said several feeders, a variable action transmission device for operating each pawl and ratchet device from said common rock shaft, whereby the several feeders may be proportionately and variably driven, and means for varying the transmitting action of said common rock shaft while in operation, whereby the feeding action of the battery of feeders may be increased or decreased without changing the proportionate feeding actions of the several feeders and without stopping said feeders.

13. A feeding device having in combination a rocking bar, a block slidably mounted thereon comprising spaced members embracing the sides of said bar, a portion connecting said members and extending therebetween at one side of said bar and spaced therefrom, means for moving said block on said bar connected to said portion on the side away from said bar, a link connected to said portion between the same and said bar for transmitting motion therefrom and a feeding member operatively connected to said link and driven thereby.

14. A feeding device having a rocking arm, a block slidably mounted on said arm comprising spaced guiding members embracing said arm and in sliding contact therewith, a connecting portion for said members disposed on one side of said arm and spaced therefrom, means projecting from said portion at the side disposed away from said arm adapted to receive means for moving said block on said arm, a link disposed between said portion and said arm and pivotally connected to said arm and a feeding member operatively connected to said link and moved thereby.

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

EMIL R. DRAVER.

Witnesses:

C. G. LANCASTER,

ORRIN DRAVER.