May 21, 1929. G. JAEGER 1,714,475

SIGNAL FOR CONCRETE MIXERS

Filed Feb. 4, 1924 2 Sheets-Sheet 1

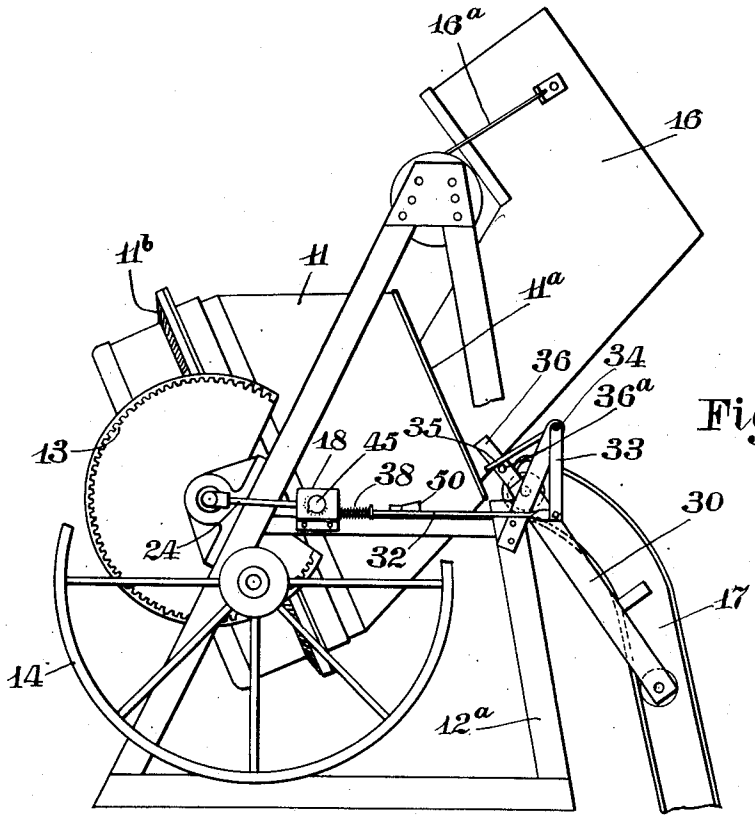


Fig. 1.

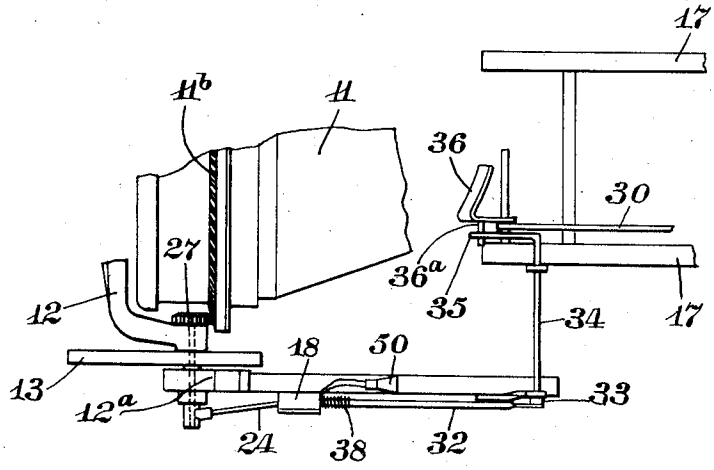


Fig. 2.

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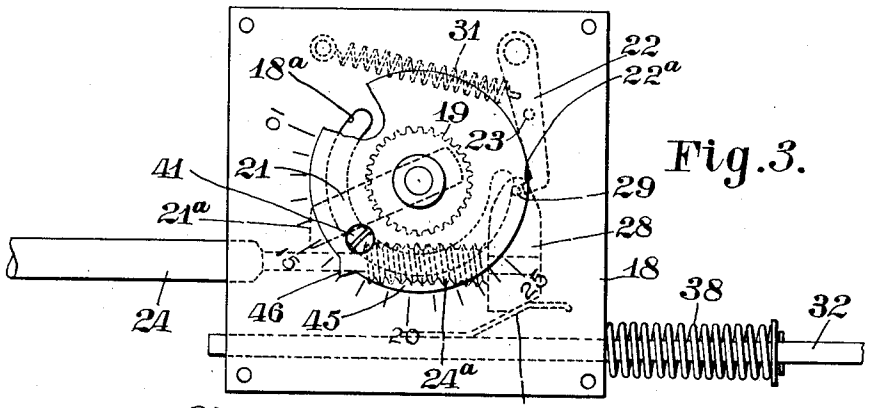


Fig.3.

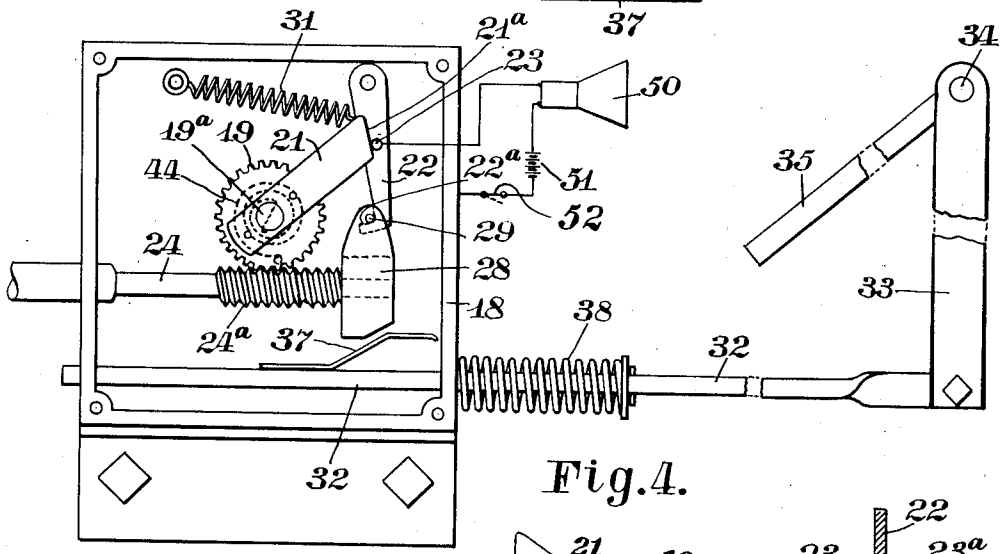


Fig.4.

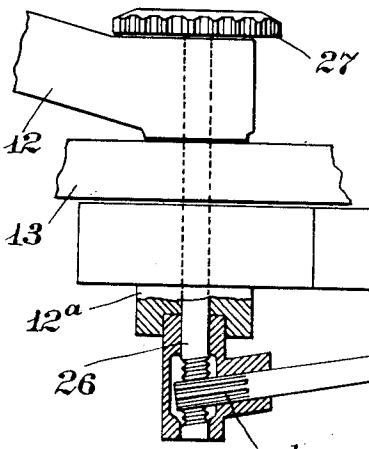


Fig. 5.

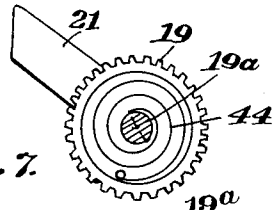


Fig. 7.

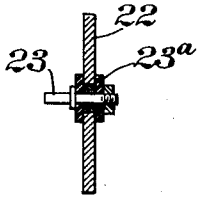


Fig. 6.

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Patented May 21, 1929. 1,714,475

UNITED STATES PATENT OFFICE.

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SIGNAL FOR CONCRETE MIXERS.

Application filed February 4, 1924. Serial No. 690,355.

This invention relates more particularly to mixing machines, and especially concrete mixing machines in which a rotary mixing drum and loader therefor are employed. In the ordinary use of such machines the attendant is relied upon to determine when the materials of the batch have been sufficiently mixed but his determination is based upon a guess, and therefore not to be relied upon. The object of the present invention is to provide mechanism whereby an annunciator, audible or visual, is actuated to indicate a sufficiency of the mixing operation, said mechanism being adapted to be adjusted, within limits, to vary the lapse of time when the annunciator shall be actuated and therefore the number of rotations of the drum to be allowed for the mixing of the batch.

The invention is embodied in the example herein shown and described, the features of novelty being finally claimed.

In the accompanying drawings—

Figure 1 is a view in general side elevation of a concrete mixer equipped with my invention.

Fig. 2 is a plan view of parts of the machine showing the operating mechanism in greater detail.

Fig. 3 is a detail on a larger scale showing the cover of the gear box, the mechanism therein being indicated by broken lines.

Fig. 4 is a similar view the said cover being removed and showing the mechanism therein in full lines. In this view the signal is diagrammatically shown.

Fig. 5 is a combined plan and section showing, on a larger scale than appears in Fig. 2, the driving means for operating the mechanism in the gear box.

Fig. 6 is a detail mainly in section of a means for insulating the pin on the trigger.

Fig. 7 is a detail illustrating in side view the rear side of the worm gear to which is connected the retracting spring.

In the views 11 designates the mixing drum of an ordinary form which has an opening at 11^a for charging it with the concrete materials and discharging them when mixed. This drum is mounted to turn on its axis upon a swinging yoke 12 that is journaled in a frame at 12^a to permit oscillation of the drum from charging to discharging position and reversely. To supply the drum with the sand, gravel and cement it is provided with a loader bucket 16 pivoted on the forward axle of a truck 30 that travels in a pair of parallel tracks like that shown at 17. The drum 11 has suitable means for turning it on its axis; and the loader bucket 16 has a suitable cable 16^a with power for operating it to raise it to position to discharge its contents into the drum and to lower it to the ground for its convenient refilling. In a general way the features thus described or equivalents of them are common to many mixers now sold and it is thought a brief description of them will suffice for the purpose of aiding in explaining the construction and mode of operation of the present cooperating elements which are described as follows.

18 designates a box which is mounted on a cross bar of the frame, said box having mounted therein a worm gear wheel 19 having secured thereon an arm 21 with an inclined end 21^a. Said worm wheel 19 turns loose on a bearing 19^a fixed to the inner side of the box 18 and secured between it and the gear is a coiled spring 44 tending to turn the wheel anti-clockwise. Hung in the box 18 is a latch 22 provided with a laterally projecting pin 23 electrically insulated from the latch by suitable material as at 23^a (see Fig. 6). Engaging the worm wheel 19 is a shaft 24 having at one end a worm 24^a engaging and operating the wheel 19, and at the other end elongated worm teeth 24^b engaged by a worm shaft 26 having a pinion 27 engaged by the annular rack 11^b of the mixing drum. When the drum is rotated, therefore, the worm gear wheel 19 is turned if and when the shaft 24 is engaged with it as hereinafter explained. The shaft 24 carries at its end beyond the worm 24^a a block 28 in which a reduced end of the shaft 24 turns, said block being bifurcate at its upper end (see Fig. 5) and having a cross pin 29 bridging the forks. The lower end of the latch 22 is provided with a hook 22^a having a blunt end and said latch is pulled by a spring 31 to project the hook under the cross pin 29 when the worm 24^a is engaged with the worm wheel 19.

Sliding horizontally in the lower portion of the box 18 is a rod 32 having pivoted to its longer projecting or right hand end an upstanding arm 33 from the upper end of which extends fixedly thereto a shaft 34 hav-

ing a crank arm 35 so that by oscillating said crank arm the rod 32 can be shifted longitudinally. On the end member of a yoke 36 fixed on the loader bucket is a laterally projecting pin 36ª that, when the loader is raised to drum-charging position, strikes the crank arm 35 and shifts the rod 32 to the left (see Fig. 1). Within the box the rod 32 is provided with a cam member 37 that strikes a truncated corner of the block 28 and raises that member and the shaft 24 if they be down (see broken lines Fig. 3). The cam member is of such a form that when the shaft 25 has been lowered to release the worm from the gear wheel the block 28 is of such form that it rests on the member with the cross pin 29 in position to abuttingly receive the blunt end of the hook of the latch 22. When pressure of the pin 36ª is removed from crank-arm 35 by the lowering of the loader bucket a spring 38 between the right hand end of the box 18 and a washer and stop on the rod 32 tends to restore the crank-arm 35 to position for reoperation by the raising of the loader bucket.

In order to predetermine the number of rotations to be made by the mixing drum before the giving of the signal the cover of the box is made with an arcuate slot 18ª concentric with the axis of the worm gear wheel 19 and in said slot is a stop pin 40 adapted to be clampingly secured to a rotary disk 45 having a pointer 46 at any point in the slot by means of a set screw 41, said slot pin when fixed adapted to arrest the anti-clockwise movement of the arm 21 under the influence of the worm gear spring at the selected starting position and thereby control the degree of the clockwise swing of said arm. The pointer 46 of disk 45 cooperates with a scale suitably marked with divisions and numbers 5, 10, 15, 20 and 25 indicating the number of rotations to be made when said pointer is set opposite thereto or opposite a division mark between them.

There is illustrated in the example shown an electrically operated horn 50, such as used on automobiles, the wiring of which is connected to the pin 23, any source of electricity at 51, and ground at the box 18. Normally the circuit of the horn is open but when the inclined end 21ª of the arm 21 strikes the pin 23 the circuit is closed and the horn sounded as usual in such devices. The clockwise swing of the arm 21 also releases the block 28 from the hook 22ª, said block together with the shaft 24 dropping to the position shown in Fig. 3 with the blunt end of the hook abutting against the pin 29. If desired a manually operated switch 52 can be inserted as indicated in the circuit to insure an open circuit (see Fig. 4) when the machine is not in use.

The operation which can be readily gathered from what has been said is briefly this: During the operation of the machine the rotation of the mixing drum is constant in one direction as usual. The oscillation of the drum and the raising and lowering of the loader are, in the variety of mixer shown, manually controlled for obvious reasons. Assuming that the drum has just been supplied with the concrete materials and the loader retracted, the worm 24ª engaged with the worm wheel 19 and the arm 21 retracted to lie against the stop 40 in the arcuate slot the rotation of the drum causes the arm 21 to turn clockwise slowly to position to strike with its end 21ª the pin 23 and release the block 28 which falls to position shown by broken lines Fig. 3 as before stated. In this position the circuit of the horn 50 is closed through the block 28 and shaft 24 and the horn sounded. The shaft 24 then turns idly. Because the worm gear 19 is relieved of operation by the worm 24ª the spring 44 restores the arm 22 to starting position. The parts remain in this last described position while the drum is oscillated to the left to discharge it and returned to charging position after which the loader is raised to recharge the mixing drum which raising actuates the rod 32 to reset the block 28 and the shaft 24 by means of the cam 37 thereon as before stated.

The forms of the parts can be varied without departing from the gist of the invention claimed and combinations of parts fewer than the whole number of them may be used.

What I claim is:

1. In an instrument of the class described, an electric signalling means, a laterally movable worm shaft, means for continuously rotating the worm shaft in one direction, a rotary worm gear, means for holding the worm shaft in engagement with the worm gear to operate the latter, said worm gear carrying a circuit closer for causing the actuation of said signalling means after a predetermined number of revolutions of the worm shaft, means for releasing the worm shaft from the worm gear during the actuation of the signal, means for retracting the worm gear to a starting position and means for automatically restoring said worm shaft to operating engagement with said worm gear.

2. Means for use in connection with a rotary mixing drum and a loader therefor consisting of a laterally movable worm shaft adapted to be rotated by the drum, a worm gear engaged by the worm shaft, a latch for sustaining said worm shaft in operating engagement with the worm gear, means for causing the release of the worm shaft laterally from engagement with the worm gear after a predetermined number of revolutions of the mixing drum, and means operated by the loader for effecting the reengagement of the worm shaft with the worm when the loader is raised to charging position.

3. Means for use in connection with a

rotary mixing drum and a loader therefor consisting of a laterally movable worm shaft adapted to be rotated by the drum, a worm gear engaged by the worm shaft, a latch for sustaining said worm shaft in operating engagement with the worm gear, means for causing the release of the worm shaft laterally from engagement with the worm gear after a predetermined number of revolutions of the mixing drum, means for retracting the worm to a starting position, and means operated by the loader for effecting the reengagement of the worm shaft with the worm when the loader is raised to charging position.

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