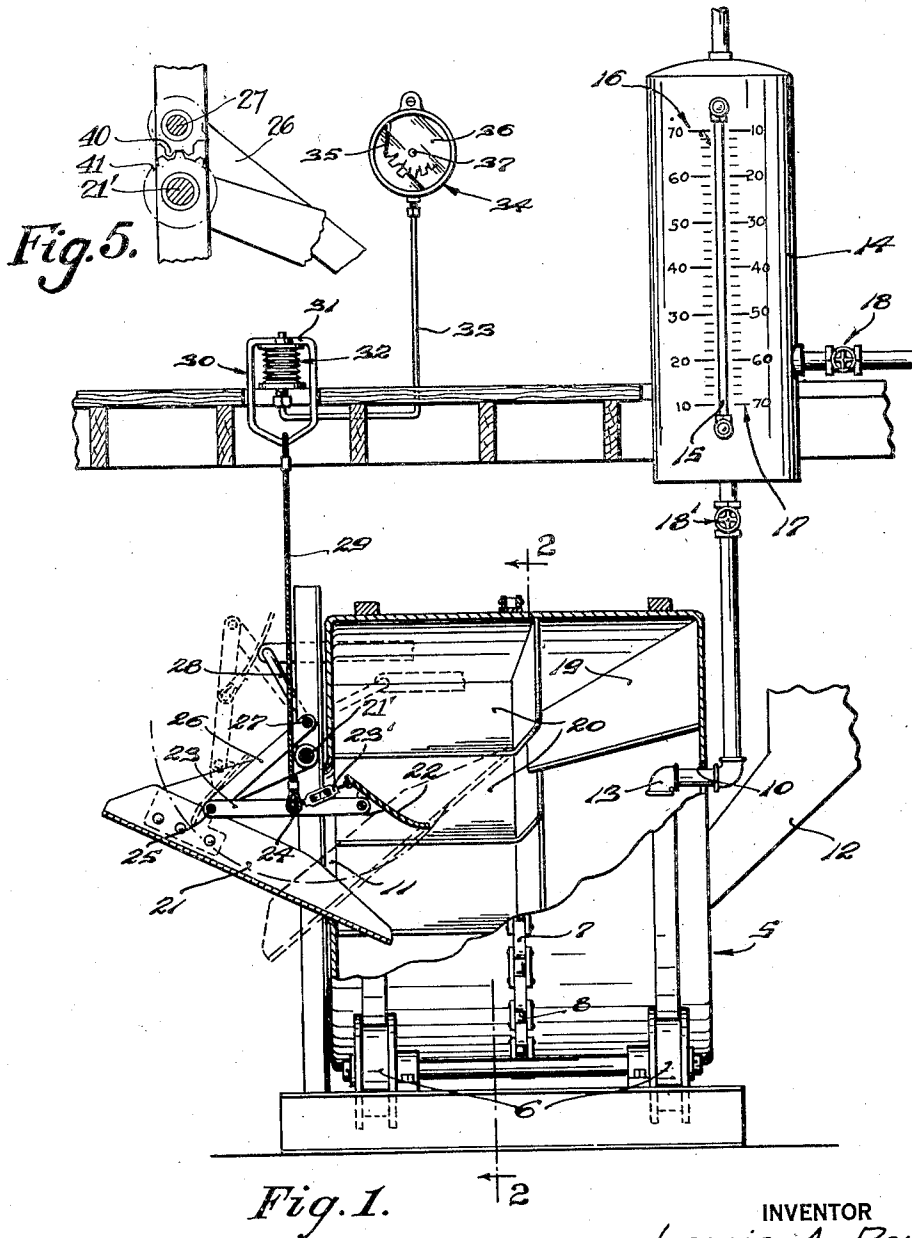


Sept. 10, 1935.

L. A. PERRY
CONSISTENCY AND TIME INDICATING AND RECORDING
EQUIPMENT FOR CONCRETE MIXERS
Filed May 24, 1930

2,013,837

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

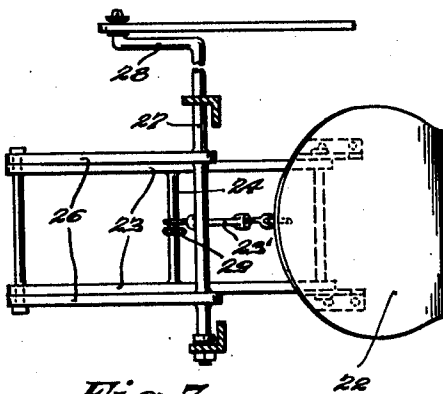


Fig. 3.

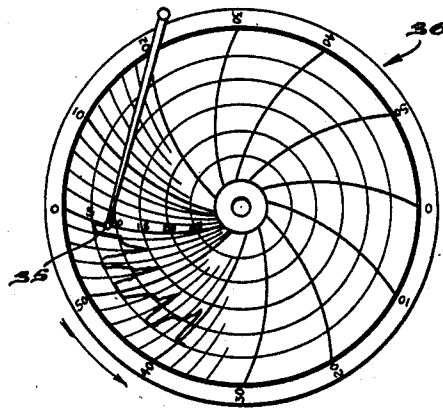


Fig. 4.

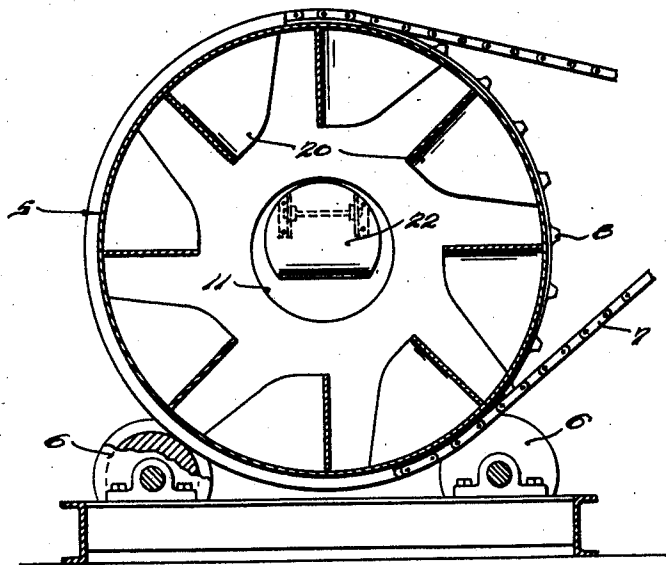


Fig. 2.

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CONSISTENCY AND TIME INDICATING AND
RECORDING EQUIPMENT FOR CONCRETE
MIXERSLewis A. Perry, Seattle, Wash., assignor to Pioneer
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Application May 24, 1930, Serial No. 455,271

15 Claims. (Cl. 83—73)

This invention relates to concrete mixers, with particular attention to apparatus therefor in most effectively predetermining both the consistency, and time of mixing, coincident with the mixing operation, of the ingredients constituting the concrete mix, the same being an improvement over apparatus illustrated and described in my United States patent application, Serial No. 346,353, filed March 2, 1929 that has matured into Patent 1,898,890, February 21, 1933.

Attention being had to the properties inherent to concrete proper, wherein the ratio of water therefor and period of time consumed in effecting a mixing, controls the strength of the cement-concrete, the present invention has for an object the provision of means most effective and advantageous to automatically indicate the time at which a mixing operation was commenced, period of time consumed to affect the same, and the consistency thereof.

A further object is the provision of means of this character, most effectively adapted for field use, providing ready removal, automatically and responsive to a batch discharge, of apparatus as utilized within the mixing drum.

A still further object is the provision of means for permanently charting the activity of said indicating and recording apparatus in a manner to advantageously retain the same for future inspection.

A still further object of the invention lies in the provision of novel control means accommodating a simplified, most advantageous and positive water supply in assuring correct mix consistency.

The foregoing and further objects and advantages should be apparent in the following detailed description and in the claims annexed thereto.

The invention consists in the provision of an inclined plate of novel construction adapted for removable insertion within a drum for reception thereon of progressive batch samples, an indicating gauge directly controlled by the fluidity of the mix with respect to said plate, means for retaining a record of the latter activity and involving a time element, and means for most effectively controlling the water supply to the mix for attaining the consistency requisite to a particular desired ratio of the constituent elements.

The invention further consists in the novel construction, adaptation and combination of parts hereinafter described and claimed.

In the drawings:

Figure 1 is a view taken partly in side eleva-

tion and partly in longitudinal vertical section of apparatus comprising the preferred inventive embodiment, broken lines indicating the relative disposition of parts for respective drum activities. Fig. 2 is a transverse vertical section taken substantially on line 2—2 of Fig. 1, the discharge chute being eliminated. Fig. 3 is a top plan view indicating the inclined receiver, the supporting frame of which is shown in horizontal transverse section. Fig. 4 is a view taken somewhat diagrammatically to indicate a graph chart of a form preferred in the present invention, a recording needle being indicated therewith; and Fig. 5 is a detail of intermeshing gearing employed to effect movement of the receiver to and from the drum responsive to the opposite movements imparted to the discharge chute.

Reference being had thereto, the numeral 5 represents a mixing drum of conventional cylindrical construction mounted upon rollers 6 and rotated by a motive medium such as an endless chain 7 engaging drum sprocket teeth 8 and a driving sprocket wheel (not shown).

Said drum is provided with centrally disposed intake and discharge openings 10, 11, within the former of which a spout 12 projects for gravitationally feeding selected quantities of cement, sand and gravel from a conventional hopper.

Said opening is further adapted to the reception therethrough of a supply pipe 13 from an elevated tank 14 equipped with a glass sight-tube 15 indicative of the water content therein.

Said tank is characterized by the provision, imprinted or otherwise suitably impressed adjacent said tube, of a pair of graduated markings 16, 17, denoting, in oppositional order the gallon content selectively taken as with respect to a quantitative entry and a discharge. More particularly, said tank is adapted such that an operator may admit, by opening valve 18 relative to graduations 16, the quantity desired to the tank, for subsequent release of the entire contents through valve 18¹, or, in event the supply should inadvertently rise in excess of the requirement, filling the tank and allowing a subsequent discharge through valve 18¹ to the quantitative reading 17.

I indicate, as conventional drum equipment, a plurality of concrete-mixing blades 19 and buckets 20, respectively disposed adjacent the intake and in proximity to the discharge openings. The functions thereof are well understood, said blades imparting activity to the materials longitudinally of the drum for reception within successive buckets, the latter of which afford a dumping activity

from a point vertically of the drum axis, the latter action serving, subsequent to completion of the mixing operation, to deposit into a trough-shaped chute 21 rigidly arranged with respect to a horizontal shaft 21' for pivotal motivation thereby into and out of discharging relation.

Reverting to further construction comprising the present invention, 22 represents a receiver normally disposed in the path of the mix descent, said receiver comprising a plate arranged angularly and having an arcuate end portion terminating in a substantially horizontal lip.

More particularly, said plate is pivotally mounted on the outer ends of spaced-apart arms 23, being adjustably secured thereto through a turn-buckle 23' engaging the same and a transverse rod 24. The inner end of said arms are pivotally mounted on the fulcrum shaft 25 of depending brace or suspension members 26 co-active with a transverse shaft 27, said shaft being adapted to a substantial 90° activity through manually or otherwise motivating an integral control lever 28 in a manner such that said associated braces and the plate-supporting arms are swingable from full-line operative positions to the dotted line positions shown in Fig. 1.

Said shafts 27 and 21' are arranged for simultaneous movement through means such as intermeshing spur gears 40, 41 (Fig. 5) secured on the respective shafts.

The aforesaid rod 24, Fig. 1, is engageable by a cable member 29, said cable depending from a looped fork member 30, a cross-bar 31 of which effects compression to the bellows receptacle 32 constituting a control through the medium of a pipe lead 33 to a recording gauge 34. Said gauge is or may be conformed to house a centrifugally movable spiral spring tube (not shown) communicatively connected with the compressible receptacle 32. As conventionally designed, a bell-crank or other suitable lever is introduced therebetween and a recording needle such as 35. As is believed evident, contraction and expansion of the spring tube responsive to the varying pressures upon the oil receptacle, moves the needle 35 out and in, respectively. A chart insertable over an arbor 37 and driven by the latter at a relatively reduced anti-clockwise speed of rotation from a source of constant motive energy such as a clock works, records the activity of the needle.

Peripheral markings of such chart are graduated, with respect to rotation, to preferably represent minute intervals.

In the operation of the receiver plate, successive buckets deposit or dump respective loads thereon, the fluidity of the same with respect to the inclined surface determining the amount necessarily supported and incidently the declination thereof, the latter controlling the depression of the cable to effect compression of the bellows.

The substantially horizontal arcuate end portion of the receiver plate 22 serves to more effectively retard the flow from the plate of a mix. An exceedingly dry mix, having comparatively a slow flow, effects a relatively large amount of the mix being retarded upon the receiver plate with a resultant depression of the same which through the linkage aforementioned, forces the gauge needle centripetally to register on the chart an indication of the consistency of the mix. An addition to the mix of water or such other suitable ingredient of the mix as may be necessary, changes its consistency with a corresponding

change in the flow of the mix over the receiver plate, such being registered on the chart by the change in position of the gauge needle.

When satisfactory recording is completed, the plate is removed to its inoperative position to effect a pivotal disposition of chute 21 for discharging relation to the revolving buckets. A permanent record is had with respect to the period necessary in mixing a specific batch, the exact time at which such was completed, and the ratio of the constituent ingredients. Such record is especially advantageous in affording a retention, by the operator, of a permanent chart in foretelling future liability for an unsatisfactory concrete installation, with equal assurance, by the contracting engineer, of a concrete ratio substantially in accord with the pre-determined specifications.

The invention is believed clear from the foregoing, and while I have herein shown and described an illustrative embodiment of the same, I do not wish to be taken as confining myself specifically thereto except as limited by the scope of the claims hereto annexed.

What I claim is:—

1. The combination with a rotary concrete mixing drum having means for elevating the mix therein and dumping the same in a vertical plane, said drum having a normally inoperative chute movable into the path of descent of said dumped mix for discharging the same, of testing apparatus for use in connection with said drum for determining the consistency of the concrete mix, said testing apparatus comprising a receiver adapted for normal disposition in the path of said stream of falling mix, a gauge for indicating the weight of the concrete on said receiver disposed exteriorly of the drum, means operatively inter-connecting said receiver and the indicating gauge, and means for removing said receiver from and simultaneously moving the discharge chute into the path of said stream of falling mix for discharging the latter through said chute.

2. In a concrete mixing machine having means for elevating the mix therein and dumping the same in a vertical plane, apparatus for use in connection with said machine for determining and recording consistencies of the concrete mix, said apparatus comprising a receiver adapted for disposition in the path of the falling stream of the mix, a device for indicating the relative deflection of the receiver under the force of said falling streams of concrete, means operatively connecting said device with the receiver, and means for recording the activity of said indicating device.

3. In a concrete mixing machine having means for elevating the mix therein and dumping the same in a vertical plane, apparatus for use in connection with said machine for determining and recording consistencies of the concrete mix, said apparatus comprising a receiver characterized by the provision of a sloping surface and adapted for disposition in the path of the falling stream of said mix, a device for indicating the relative deflection of the receiver under the force of said falling streams of concrete, means operatively connecting said device with the receiver, and means for recording the activity of said indicating device.

4. In a concrete mixing-machine having means for elevating the mix therein and dumping the same in a vertical plane, apparatus for use in connection with said machine for determining consistencies of the concrete mix, said apparatus

comprising a receiver adapted for disposition in the path of the falling stream of said mix, a compressible oil receptacle disposed exteriorly of said machine, operative connection between said receiver and said compressible receptacle for operating the latter under the influence of the concrete on said receiver, and means operating in conjunction with said receptacle for effecting a record of the relative compressions of said receptacle.

5. Plastic-concrete consistency-indicating and recording apparatus comprising a device provided with a sloping surface over which plastic concrete delivered thereon is adapted to flow, said device being depressible under the influence of the concrete thereon, means operatively connected with said device for indicating the relative deflections of the same, and means operating in conjunction with said indicating means to provide a record of the activity of the same.

6. Plastic-concrete consistency-indicating and recording apparatus comprising a device upon which plastic concrete is adapted to be delivered, said device being movable under the influence of the concrete relatively with the weight of the latter, and means operating in conjunction with said concrete-influenced movement of the device for recording such movements.

7. Plastic-concrete consistency-indicating and recording apparatus comprising a compressible fluid-retaining receptacle, means including a force-responsive device upon which plastic concrete is adapted to be delivered for operating said receptacle, and means for recording the compression of said receptacle.

8. Means for indicating and recording the consistency of a plastic-concrete mix comprising a device actuated by concrete delivered thereon, a chart revoluble at a constant speed of rotation, means mounted for movement radially with respect to said chart, and connection between said last named means and the device for operating said means in response to the movement of said device.

9. Means for indicating and recording the consistency of a plastic-concrete mix, said means

comprising a device actuated by concrete delivered thereto, a chart arranged for time-governed movement, an indicating device for said chart, and means operatively connecting said first-named device and the indicating devices for effecting responsive movement to the indicating device.

10. The combination with a concrete mixer, of means for determining the consistency of the concrete during the mixing operation of the same, and means co-active therewith for recording the time at which the mixing operation is commenced, the consistency while mixing, the time duration of the mix, and the time at which the discharge is made.

11. The combination with a concrete mixer, of means for determining the consistency of the concrete during the mixing operation of the same, and means co-active therewith for recording the time at which the mixing operation is commenced, the consistency while mixing, and the time at which the discharge is made.

12. The combination with a concrete mixer, of means for determining the consistency of the concrete during the mixing operation of the same, and means co-active therewith for recording the time at which the mixing operation is commenced, and the consistency while mixing.

13. The combination with a concrete mixer, and means for determining the consistency of the concrete during the mixing operation of the same, of means co-active therewith for recording said determined consistencies.

14. The combination with a concrete mixer, of a consistency indicator including a member movable under the influence of the mixture handled by the mixer, and means for making a permanent record of the movement of said member.

15. The combination with a concrete mixer, of a consistency indicator including a member movable by contact with the mix incident to mixing action, and recording means operable by the movement of said member for making a graphic record of the movements of said member.

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