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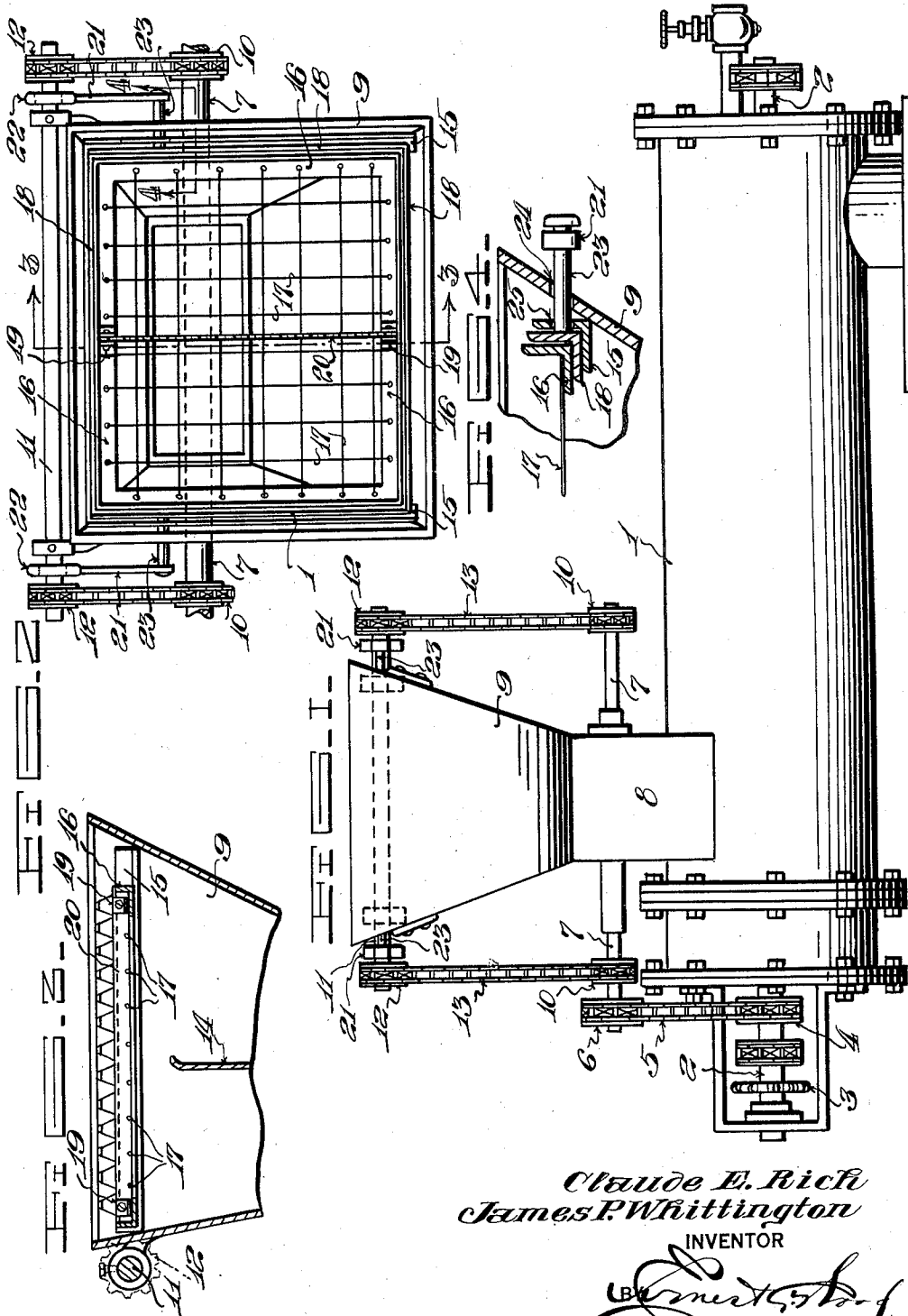
C. E. RICH ET AL

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SACK SEVERING OR PERFORATING MEANS FOR CEMENT MIXERS

Filed March 18, 1935

2 Sheets-Sheet 1



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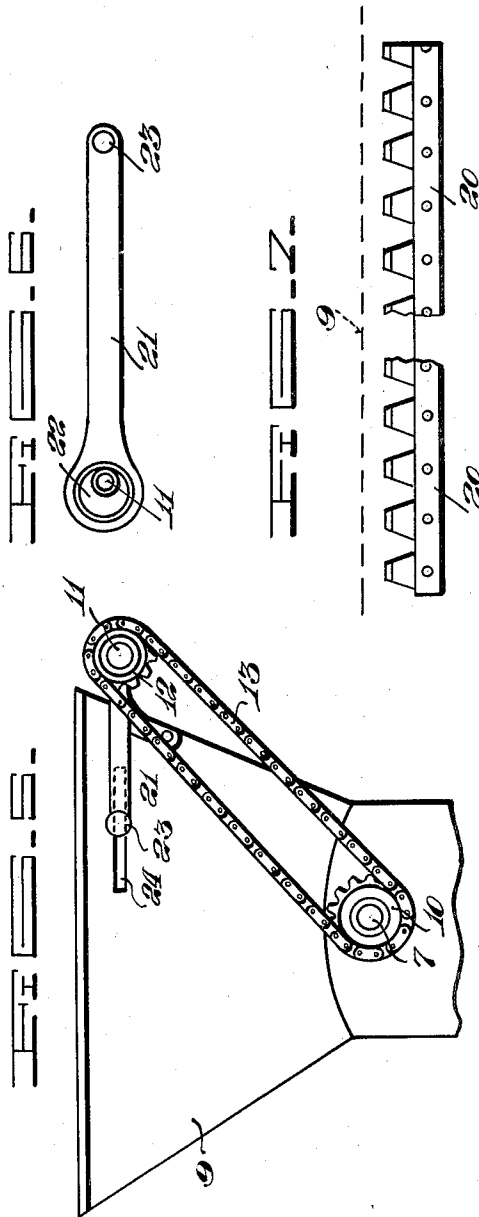
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SACK SEVERING OR PERFORATING MEANS
FOR CEMENT MIXERSClaude E. Rich and James P. Whittington, Long-
view, Tex.

Application March 18, 1935, Serial No. 11,628

4 Claims. (Cl. 214—1)

This invention relates to certain new and useful improvements in well cementing equipment, and it has particular reference to apparatus used in conjunction with cement mixing apparatus for perforating or severing sacks preparatory to the introduction of cement into the hopper of the mixing apparatus.

The principal object of the invention is to provide automatic means for perforating sacks in such manner that when slightly elevated from this means, the material of the sack will break or tear between the perforations by the weight of the contents and the latter will fall into the mixing apparatus. The invention provides that there will be practically no waste of cement and eliminates the arduous task of severing the sacks manually by a knife or by dragging the sack manually across a stationary knife or severing means. The methods named are conventional and it is obvious that the knives must be maintained in a sharpened condition at all times, whereas in the case of the present invention, sharpening of the sack severing medium is seldom if ever required.

Broadly, this invention is to provide means associated with the hopper of a cement mixing apparatus which will likewise dispense with the usual platform upon which the sack is initially deposited preparatory to ripping the sack whereupon it is moved over the hopper and the contents of the sack deposited therein. The present invention provides that the sack of cement be placed directly on the perforating or severing means which is situated in the hopper and by which it is immediately perforated, preparatory to emptying its contents. Fragments of the sack, if there be any, are prevented from entering the cement by a suitable frame and which frame is readily removed from the hopper.

With the foregoing objects as paramount, the invention has particular reference to its salient features of construction and operation, to become manifest as the description proceeds, taken in connection with the accompanying drawings, wherein:—

Figure 1 is an elevational view of one form of cement mixing apparatus, with portions broken away, and showing the invention attached.

Figure 2 is a plan view of the hopper of the mixing apparatus showing the invention thereon.

Figure 3 is a fragmentary view in vertical section, showing a hopper with the sack perforating means of the invention therein.

Figure 4 is a fragmentary detailed view partly in section showing the relationship of the re-

movable frame, sliding support therefor, with the hopper.

Figure 5 is an end elevation of the mixing hopper showing the driving means for the invention.

Figure 6 is a detailed view of the eccentric or shaker arm, and

Figure 7 is a detailed view of the sack perforating means per se, broken to show extension.

Continuing with a more detailed description of the drawings, 1 designates the barrel or mixing chamber of the conventional type of cement mixing apparatus, and while it is not shown, a form of agitating element is disposed within this barrel for thoroughly mixing the cement with water and for conveying the mixture to a point of discharge. This agitator is carried upon a shaft 2, which is operated by a sprocket wheel 3 by which the shaft is driven. A sprocket wheel 4 is likewise mounted upon the shaft 2, surrounding which is a chain 5, the latter encircling a sprocket wheel 6, mounted on a shaft 7.

The shaft 7 passes through the throat 8 of the hopper 9, and upon each end of the shaft is mounted a sprocket wheel 10. Adjacent to the mouth of the hopper 9 there is provided a shaft 11, the ends of which overreach the edges of the hopper and carry sprocket wheels 12. A chain 13 surrounds each of the sprocket wheels 10 and 12. It is apparent therefore that when the agitator shaft 2 is rotated, shafts 7 and 11 rotate in unison through the medium of the chains 5 and 13. The shaft 7 carries a rotary member 14, shown fragmentarily only in Figure 3. This member is of conventional design and operates in the capacity of a valve to normally close the throat of the hopper and to proportion or control the cement deposited in the hopper 9 as it passes into the mixing chamber 1.

Situated within the hopper 9 adjacent the mouth thereof is a pair of angle iron slides or tracks 15. These slides are fixed to the walls of the hopper and preferably extend at right angles to the longitudinal axis of the mixing chamber 1.

A frame 16, likewise preferably constructed of angle iron is slidably disposed on the tracks 15, and since it is necessary that the frame 16 reciprocate, its width is less than that of the hopper, but only slightly so since the extent of displacement need be but a small amount, as will become apparent presently.

The frame 16 has intercrossing wires 17 extending from one side to the other as shown in Figures 2 and 3. This frame rests upon what will be referred to as a shaker frame 18, a detail

of which is shown in cross section in Figure 4. An explanation will follow presently as to the manner in which the frames 16 and 18 are reciprocated.

To each side of the frame 16 is affixed a pair of angle iron straps 19, between each of which is secured the ends of a sack perforating means 20, shown in detail in Figure 7. It will be noted particularly in Figure 3 that the upwardly extending serrations of the blade 20 lie below the top of the hopper 9. This particular positioning of the perforating element is made with a view of safety to the operators of the machine.

Reciprocation of the perforating element 20 is rapid and is obtained through the medium of the eccentric arm 21 shown in detail in Figure 6 and on the end of which is an eccentric 22, the latter being affixed to the shaft 11. To the opposite end of the arm 22 is affixed a pin 23, disposed at right angles to the longitudinal axis of the arm 21 and which enters a slot 24, one of which is provided on the wall on each side of the hopper 9. A corresponding slot 25 must also be made in the stationary slides or tracks 15 within the hopper. This particular arrangement is shown in Figure 4. After passing through slots 24 and 25, the pin 23 is welded or otherwise suitably secured to the shaker frame 18.

From the foregoing it will be seen that rotation of the shaft 11 will impart to the arms 21 on either side of the hopper a pitman effect which will in turn impart to the shaker frame 18 a reciprocatory movement, the speed of which may be determined by the ratio of the sprockets 19 and 12 or other driving means which may be adopted in substitution thereof.

In operation, a sack of cement is placed upon the sack perforating element 20, usually by two operators standing on either side of the hopper. Obviously, the rapidly moving element 20 will instantly perforate the material of the sack and when the latter is lifted the weight of the contents will break the sacks between the perforations and will be deposited into the hopper. The sack is then disposed of. Should any fragments of the sack tend to fall within the hopper, they are intercepted by the screen comprised of the intercrossing wires 17. The frame 16 of the screen may be readily removed and any material intercepted thereby disposed of with but little delay in the operations. Even if fragments of the sack or other material of a similar nature should enter the hopper, this is of little consequence but it is desirable that the material be prevented from entering with the cement, hence the provision of the removable screen.

The simple form of securement of the sack perforating element 20 to the frame 16 is such that in the event it becomes dull and will not readily sever the sacks, a new or sharpened element may be installed in a minimum of time and with but little delay in the operations of cementing a well. These provisions are made for expedition since the job of cementing a well must

usually be carried out in haste and it is desirable to relieve workmen of the usually arduous task of handling the sacks of cement by eliminating certain operations previously required in conveying the cement to the hopper. One of these operations consisted of first elevating the sack to a platform and slitting the same manually with a knife or by sliding the sack across a stationary knife extending above the platform or across the hopper mouth. The present invention requires only that the sack be placed directly on the hopper where it is instantly severed and the contents deposited into the hopper.

Another advantage apparent in the present invention is that the screen is effective in breaking up balled masses of cement, caused by allowing the same to be exposed to dampness.

Manifestly, the construction shown and described is capable of considerable modification and such modification as is considered within the scope and meaning of the appended claims is also considered within the spirit and intent of the invention.

We claim:

1. In combination with the hopper of an apparatus for mixing cement, a cement sack perforating means comprising a frame capable of reciprocation and disposed to completely surround the mouth of said hopper, an elongated serrated member in fixed relation to said frame, and extending across the mouth of said hopper, a screen below said serrated member and means for imparting reciprocation to said frame.

2. In combination with the hopper of a cement mixing apparatus, a sack severing means including a rectangular frame whose sides lie within and are equidistantly spaced from the walls of said hopper and capable of horizontal reciprocation and carrying a sack severing blade, said blade having an upturned serrated edge and having its ends connected to opposite sides of said frame, a screen below said blade and means for reciprocating said frame.

3. In combination with the hopper of a cement mixer a sack severing means including a horizontally movable frame disposed in said hopper and whose sides are equidistantly spaced from the inner walls of said hopper, a blade affixed transversely across said frame, a screen horizontally disposed below said blade and means for actuating said frame.

4. In combination with the hopper of a cement mixing apparatus, a sack cutting means comprising a reciprocating frame lying within said hopper whose sides are equidistantly spaced from the inner walls of said hopper, said frame having a blade affixed thereto for movement therewith, said blade having an upturned serrated edge, means below said blade for receiving sack fragments and means for imparting reciprocating movement to said frame.

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