Sept. 30, 1941. A. C. CHRISTENSEN 2,257,672

SAND SAMPLER

Filed Oct. 23, 1939

FIG. 1.

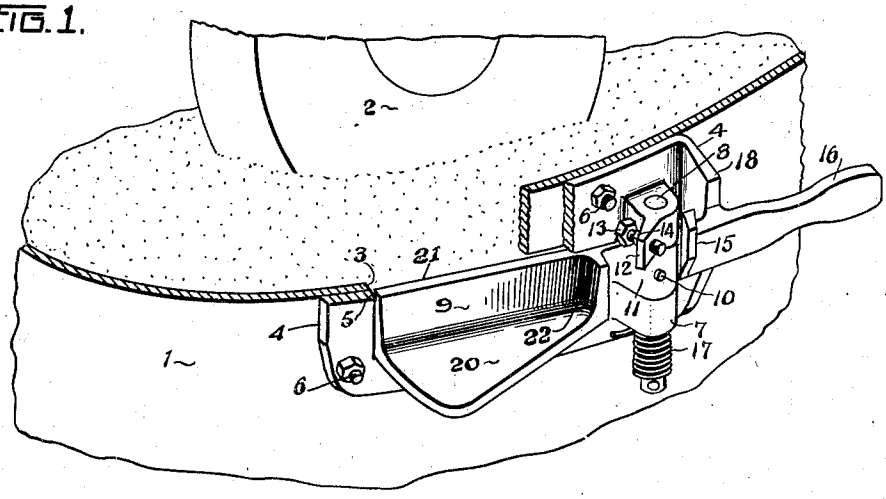


FIG. 2.

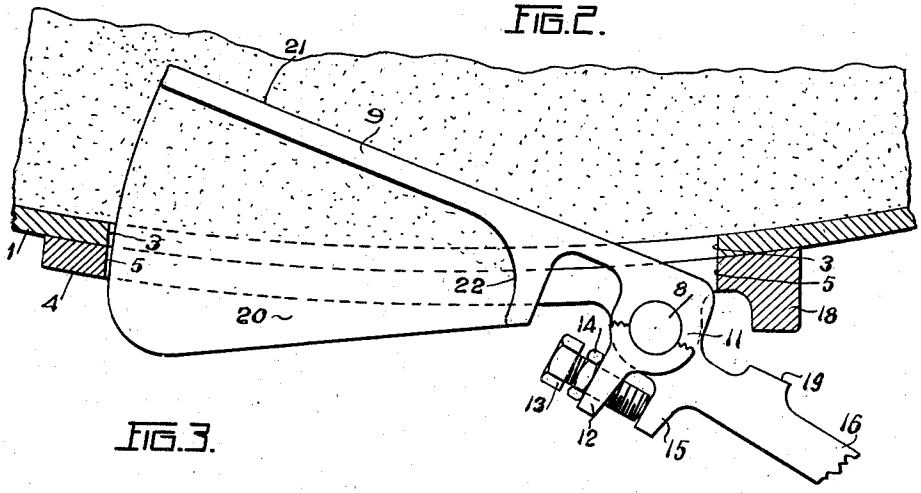
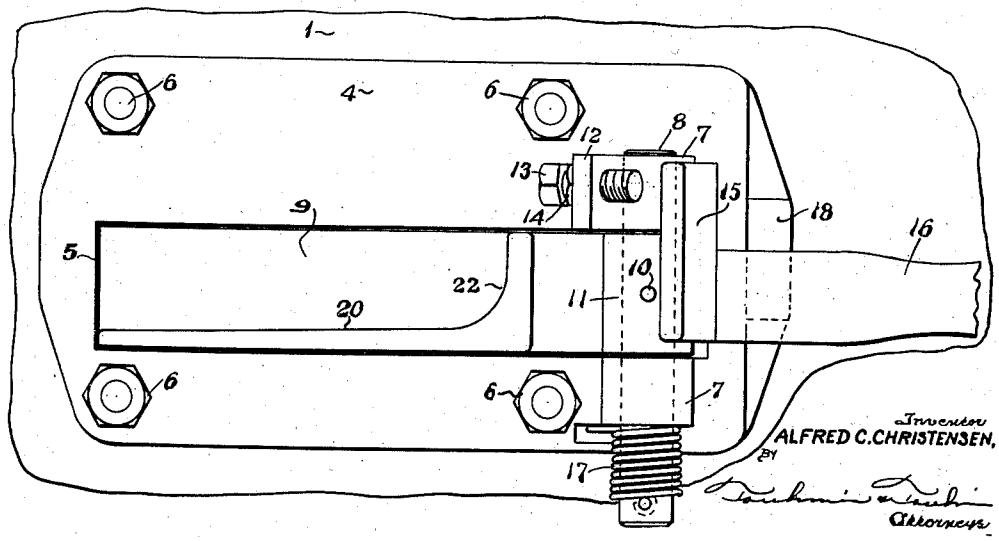


FIG. 3.



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SAND SAMPLER

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7 Claims. (Cl. 83—93)

This invention relates to a device for sampling sand or similar material being mixed in an intensive mixer or similar mixer such as in a muller of the type set forth in United States Letters Patent to Simpson Re. 20,747.

The principal object of the invention is to provide a device for testing or sampling material being mixed in a mixer and whereby a small quantity of sand or the like may be removed from the machine while it is operating without reaching into it, thereby making possible a cleaner, easier and safer method of sampling by eliminating the hazard to the operator of reaching into the operating machine.

Another object is to provide a sand tester of the foregoing type which is adapted to be placed on the side wall of the machine and to be operated at desired times so as to take a sample of the material being mixed by simple manual manipulation.

Another object is to provide a sand tester of the foregoing type which is adapted to be applied either to new or to existing machines.

Another object is to devise a sand sampler which, when inoperative, leaves no opening in the side wall of the machine and which is located in the side wall of the machine at a height such that the material being mixed in the mixer is directly moved onto the scoop of the sand sampler by the motion of the material in the mixer; the sampler makes possible the facile taking of a representative sample of the material being mixed and thereby gives to the operator very quickly and without danger an indication of the condition of the entire batch of material being mixed.

Still other objects of the present invention will more fully hereinafter appear.

In the accompanying drawing:

Figure 1 is a perspective sectional view of a muller equipped with a sand sampler embodying the principles of the present invention.

Figure 2 is a horizontal sectional view with the sampler scoop or shelf in elevation and being held in such position as to take a sample.

Figure 3 is a front elevation of a portion of the muller crib equipped with the sand sampler of Figures 1 and 2.

Referring to the drawings in detail reference numeral 1 designates the crib of an intensive mixer such as a sand muller, wherein a muller wheel 2 is revolved by suitable mechanism in an orbital path, thereby intensively mixing the sand and clay or other materials being mixed or mulled. A rectangular opening 3 is formed in the side wall of the crib 1 and over this opening the sand sampler of the present invention is mounted in such manner that the frame 4 of the sand sampler, which is suitably curved to correspond with the curvature of the crib wall, surrounds this opening 3. Opening 3 is disposed at any suitable height above the bottom of the crib such that the material being mixed will be sampled by the sampler. The frame 4 is formed with an opening 5 corresponding to the opening 3 in the crib wall and serving for the reception of the sampler blade or scoop. The sampler is attached to the crib as by means of bolts 6 passing through the frame 4 and the crib wall.

At one end of the frame 4 there are provided a pair of integral upstanding lugs 7, and journaled in these lugs is a vertical pin 8 to which the sampler scoop, designated generally as 9, is fixedly attached as by means of dowell pin 10 passing through the portion 11 of scoop 9 which encircles pin 8 and through pin 8.

Extending leftwardly from the uppermost journal 7 is an integral ear 12 through which is screw-threaded an adjusting screw 13 having a lock nut 14 and the end of which is adapted to act as a stop for scoop 9 by being engaged by an ear 15 integrally extending from scoop 9 rightwardly of the pivot point of the scoop. Thus, while the scoop is adapted to be rotated inwardly, its inclined motion is limited by the adjustable stop 13 engaging the fixed ear 15. This adjustable stop 13 is particularly advantageous where the muller or mixer has a plow or plow support revolving fairly closely to the crib wall, it being possible by adjusting stop 13 to limit the inward movement of the scoop so that when it is receiving sand for test it will clear the plow or plow support by the desired distance.

In order to operate the scoop 9 manually, a handle 16 is provided which is integral with the scoop 9 and extends rightwardly of the pivot point of pivot pin 8. Thus, by pulling handle 16 outwardly for an instant the scoop will move inwardly into the interior of the mixer and the material being mixed will be forced onto the scoop by reason of its motion in the crib, whereupon by releasing handle 16 tension spring 17 will cause the return of the scoop to its normal non-sampling position. In order to limit the outward motion of the scoop to that in which the scoop closes the opening 3 and is substantially flush with the frame 4, or with the side wall of the crib 1 if desired, an outwardly extending ear 18 integral with the frame 4 is provided. An inward ear 19 is provided on the handle 16 to co-

operate with ear 18 in limiting the outward travel of scoop 9 under the influence of spring 17.

The scoop 9 comprises a substantially horizontal bottom portion 20 which is inclined slightly upwardly towards the pivot pin 8, and which is adapted to support the sample taken during the passage of the material onto the scoop and during the return of scoop 9 to its normal non-sampling position. This bottom portion 9 is also adapted to extend from the innermost edge of the scoop to and beyond the crib wall while a sample is being taken, as is shown in Figure 2. This bottom portion 20 diverges away from the pivot pin 8 in order to obtain this effect. The scoop 9 also comprises an inward substantially vertical wall 21 which lies along the inward edge of bottom portion 20 and which is adapted to guide the material from the interior of the mixer onto the bottom portion 20 and to aid in retaining it there during the return of scoop 9 to its outward portion. Vertical portion 21 also is effective to substantially close the opening 3 in the crib when the sampling device is in the non-sampling position. Side wall 21 is curved at its rear portion adjacent the pivot pin 8, this curved portion 22 extending outwardly to the outward edge of the bottom portion 20 and serving to complete the scoop, portion 21 also being a continuation upwardly of the bottom portion 20 of the scoop.

From the foregoing it will be seen that the present invention provides an exceedingly advantageous method of sampling the contents of a mixer or the like without danger of injury to the operator, but nevertheless in a very convenient and effective manner. While the device will usually be held in sampling position only sufficiently long to obtain the sample upon the scoop 9, under certain circumstances if desired it may be held in sampling position for an extended period of time, a container or the like being held below the outward edge of the bottom portion 20 so as to continuously receive the material flowing outwardly. It will be understood that in the usual mixer or muller the sand or other material will generally be at a height above the location of the sampling device so that the action of gravity may cause or aid in the depositing of the sample upon the scoop 9. If desired an upper horizontal portion corresponding to portion 20 might be provided so as to insure that the sample was taken by the revolving movement of the material in the crib, or a sampling device might be located at the level of the material in the crib.

I wish it to be understood that I intend to include as within my invention such modifications thereof as may be necessary to adapt it to varying conditions and uses and as fall within the scope of the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In combination a mixer having a side wall having an opening therein, means in said mixer for mixing material and for propelling it along said side wall past said opening, and a sampling device associated with said opening and adapted to be projected inwardly into the interior of said mixer and to take a sample, said sampling device comprising a horizontally extending means for supporting a sample and vertically arranged baffle means inclined to the direction of travel of the material for guiding material onto said supporting means, for aiding in the retention of said sample on said supporting means and for closing said opening when said sampling device is in its non-sampling position.

2. In combination, a mixer having a side wall, said side wall having an opening therein in contact with the material being mixed and moved past said opening, a sampling device associated with said opening comprising a material scoop pivoted adjacent one edge of said opening, said scoop having a horizontally arranged floor plate and a substantially vertically arranged baffle plate secured thereto on one side of the pivot point, said scoop being positioned to normally lie on the exterior side of said wall with the baffle plate over said opening to close the same and arranged to be moved inwardly through said opening into the interior of said mixer with the baffle plate directed angularly against the direction of movement of the material to divert a sample of the material being mixed and to support the sample from the general body of material as it is diverted, and a manually operable handle for swinging said member about said pivot.

3. In combination, a mixer having a side wall, said side wall having an opening therein in contact with the material being mixed and moved past said opening, a sampling device associated with said opening comprising a material scoop pivoted adjacent one edge of said opening, said scoop having a horizontally arranged floor plate and a substantially vertically arranged baffle plate secured thereto on one side of the pivot point, said scoop being positioned to normally lie on the exterior side of said wall with the baffle plate over said opening to close the same and arranged to be moved inwardly through said opening into the interior of said mixer with the baffle plate directed angularly against the direction of movement of the material to divert a sample of the material being mixed and to support the sample from the general body of material as it is diverted, a manually operable handle for swinging said member about said pivot, and means for limiting the inward swing of said scoop to prevent the outer edge of the floor plate from being positioned within the mixer when the scoop is moved inwardly.

4. In combination, a mixer having a side wall, said side wall having an opening therein in contact with the material being mixed and moved past said opening, a sampling device associated with said opening comprising a material scoop pivoted adjacent one edge of said opening, said scoop having a horizontally arranged floor plate and a substantially vertically arranged baffle plate secured thereto on one side of the pivot point, said scoop being positioned to normally lie on the exterior side of said wall with the baffle plate over said opening to close the same and arranged to be moved inwardly through said opening into the interior of said mixer with the baffle plate directed angularly against the direction of movement of the material to divert a sample of the material being mixed and to support the sample from the general body of material as it is diverted, a manually operable handle for swinging said member about said pivot, means for limiting the inward swing of said scoop to prevent the outer edge of the floor plate from being positioned within the mixer when the scoop is moved inwardly, and means for limiting the outward swing of said scoop to a position where the baffle closes said opening.

5. In combination in a sampling device, a frame adapted to be mounted on a wall adjacent an

opening therein, an opening in said frame, a sampling scoop positioned adjacent the exterior side of said frame and pivotally secured adjacent said opening, said scoop comprising a floor portion arranged at substantially a right angle to said frame and diverging in a substantially horizontal plane from the point of pivotal mounting and a vertical side portion integral with the inner edge of said bottom portion and parallel with said frame when in the non-sampling position and closing said opening, said floor portion extending outwardly from the exterior side of said frame.

6. In combination in a sampling device, a frame adapted to be mounted on a wall adjacent an opening therein, an opening in said frame, a sampling scoop positioned adjacent the exterior side of said frame and pivotally secured adjacent said opening, said scoop comprising a floor portion arranged at substantially a right angle to said frame and diverging in a substantially horizontal plane from the point of pivotal mounting and a vertical side portion integral with the inner edge of said bottom portion and parallel with said frame when in the non-sampling position and closing said opening, said floor portion extending outwardly from the exterior side of said frame, and means to limit the inward movement of said scoop to a position wherein the outer edge of the floor is aligned with the inner edge of the frame when the scoop is in the sampling position for removing a maximum quantity of sample.

7. In combination in a sampling device, a frame adapted to be mounted on a wall adjacent an opening therein, an opening in said frame, a sampling scoop positioned adjacent the exterior side of said frame and pivotally secured adjacent said opening, said scoop comprising a floor portion arranged at substantially a right angle to said frame and diverging in a substantially horizontal plane from the point of pivotal mounting and a vertical side portion integral with the inner edge of said bottom portion and parallel with said frame when in the non-sampling position and closing said opening, said floor portion extending outwardly from the exterior side of said frame, and means to limit the inward movement of said scoop to a position wherein the outer edge of the floor is aligned with the inner edge of the frame when the scoop is in the sampling position for removing a maximum quantity of sample, and means to limit the outward movement of said scoop to insure positioning said baffle in co-planar relation with the inner face of said frame when in the non-sampling position.

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