

[54] **GRAIN SAMPLER**

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[51] Int. Cl. **G01n 1/20**

[58] Field of Search **73/421 R, 421 B, 423 R, 424, 73/422**

[56] **References Cited**

UNITED STATES PATENTS

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[57] **ABSTRACT**

The invention comprises a grain sampler having a rectangular elongated frame for slidable insertion into a grain passageway in a direction laterally across the travel of grain through the passageway. The outer end of the frame of the sampler projects out of the passageway when inserted. A channel member is provided on the frame having an opening for receiving a sample of grain as it travels through the passageway. A pair of endless chains carries the channel member along the frame and out of the passageway and empties the sample of grain out of the channel member.

1 Claim, 12 Drawing Figures

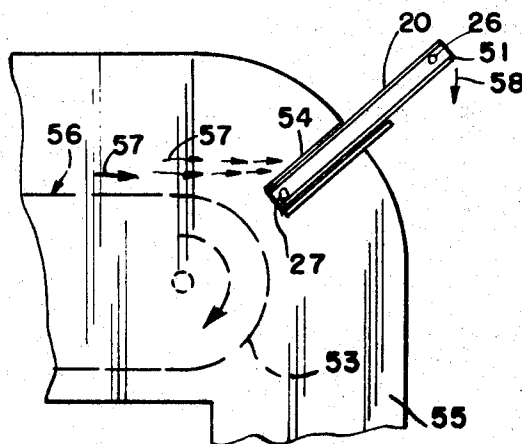


FIG. 6.

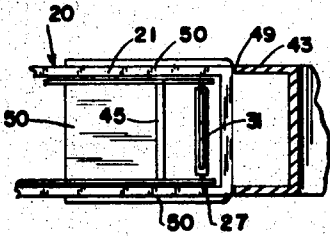
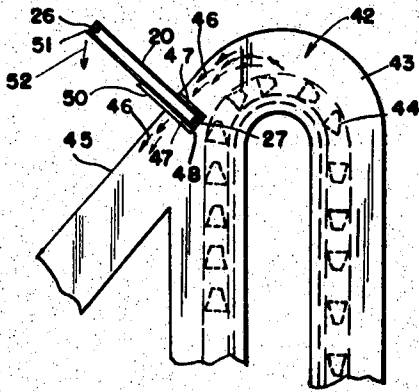


FIG. 7.

FIG. 8.

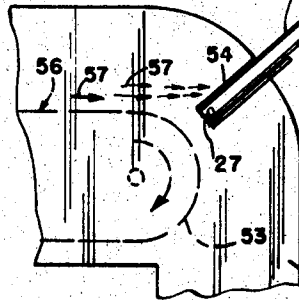


FIG. 9.

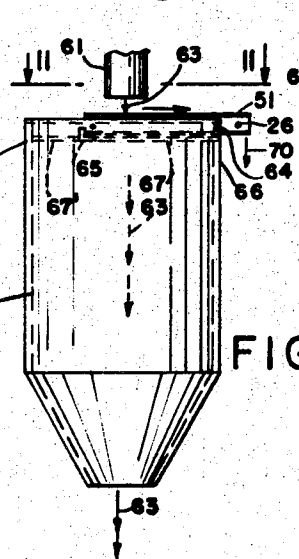
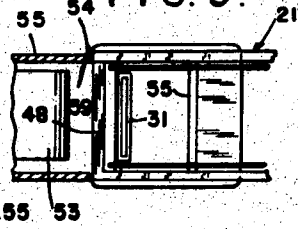


FIG. 11.

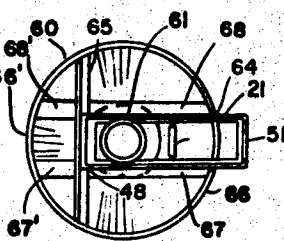


FIG. 12.

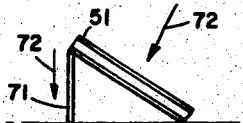


FIG. 12.

FIG. 1.

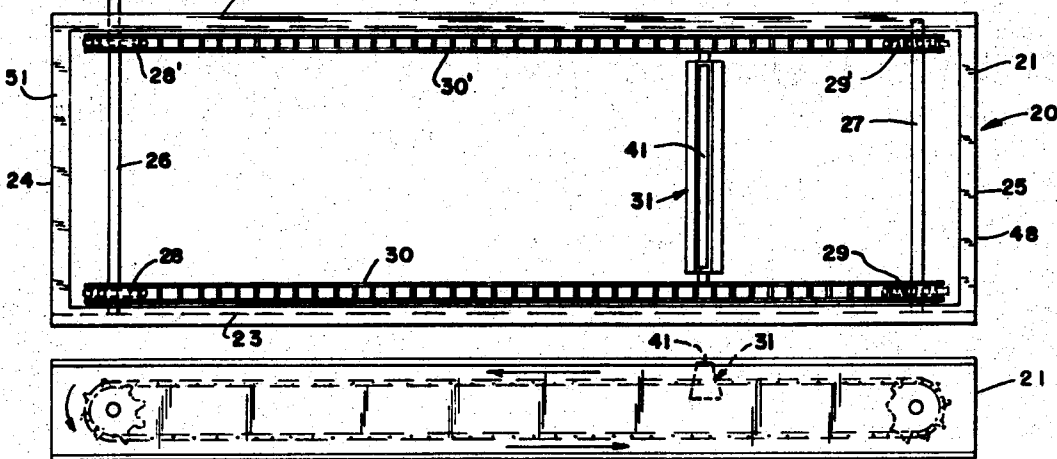


FIG. 2.

FIG. 3.

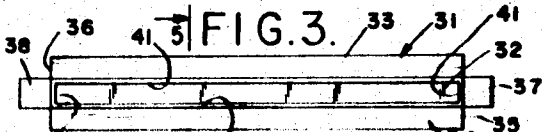


FIG. 4.



FIG. 5.



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GRAIN SAMPLER

This invention relates to samplers more particularly, the invention relates to grain samplers.

It is an object of the invention to provide a novel grain sampler which is portable in nature and which may be easily and rapidly inserted into a grain passageway for sampling of the grain.

It is a further object of the invention to provide a novel grain sampler which may be inserted into a variety of different types of grain passageways for sampling of grain.

It is a further object of the invention to provide a novel grain sampler for insertion into grain passageways and readily removable thereafter for sampling grain.

Further objects and advantages of the invention will become apparent as the description proceeds and when taken in conjunction with the accompanying drawing wherein:

FIG. 1 is a top plan view of the portable grain sampler invention.

FIG. 2 is a side elevational view of the portable grain sampler invention.

FIG. 3 is an enlarged top plan view of the channel member of the sampler invention for receiving the grain sampler.

FIG. 4 is an end view of the sampler taken along line 4—4 of FIG. 3.

FIG. 5 is a cross-sectional view of the channel member taken along line 5—5 of FIG. 3.

FIG. 6 is a side elevational view of the portable grain sampler invention shown operatively installed receiving chutes of elevator legs for receiving the grain as it is lifted over the top in the leg.

FIG. 7 is a cross-sectional view taken along line 7—7 of FIG. 6 and illustrating the slidable installation of the frame of the sampler invention in the receiving chute.

FIG. 8 is a side elevational view of the sampler invention shown operatively installed in a grain chute at the end of the grain belt conveyor.

FIG. 9 is a cross-sectional view taken along line 9—9 of FIG. 8.

FIG. 10 is a side elevational view of the sampler invention shown operatively installed in the top of a grain bin beneath a grain chute.

FIG. 11 is a cross-sectional view taken along line 11—11 of FIG. 10.

FIG. 12 is a side elevational view of the grain sampler invention shown supported at an angle by a stick or rod for receiving grain therethrough.

Briefly stated, the invention comprises a grain sampler device having a rectangular elongated frame, a pair of endless chains mounted upon gears at opposite ends of the frame for rotating the chains, an elongated channel member mounted between the endless chains, said device being adapted to be slidably inserted into a grain passageway with a portion of the frame in the path of the grain, said channel member having an opening in its top whereby a sampler of grain may be received by the channel member through the opening and carried by the channel member out of the grain passageway and deposited outside the grain passageway for use as a sampler of the grain passing through the passageway.

Referring more particularly to the drawing, in FIGS. 1 and 2, the grain sampler invention 20 is illustrated as having an elongated rectangular frame 21. The frame 21 has two metal side panel members 22 and 23 and metal front and rear panel members 24 and 25 with the panel members 22, 23, 24, and 25 being fixed or welded together at their corners to form the rectangular frame 21.

A pair of shafts 26 and 27 are rotatably mounted in the side panel members 24 and 25 at opposite ends of the panel members 24 and 25. A pair of toothed gears 28 and 29 are fixed to the shafts 26 and 27 respectively along panel member 23 and a similar pair of toothed gears 28' and 29' are fixed to shafts 26 and 27 along panel member 22.

A pair of conventional endless link chains 30 and 30' are provided with endless link chain 30 being mounted over gears 28 and 29 and endless link chain 30' being mounted over gears 28' and 29'.

A metal elongated channel member 31 has a flat elongated bottom panel 32 with a pair of elongated upwardly converging side panels 33 and 34 welded to the back panel. A pair of metal end panels 35 and 36 are welded across the opposing ends of the bottom panel and side panels to thereby form the channel member 31.

A pair of metal strips or tabs 37 and 38 are welded to the front and rear end walls 35 and 36 respectively, at their inner ends. The outer ends at the tabs or strips 37 are welded to the side linkage plates of endless chains 30 and 30' to suspend the channel member between the chains 30 and 30', as illustrated in FIG. 1.

The endless link chains 30 and 30' are of a conventional type made of a series of linkage plates 39 pivotally mounted together at their ends in end to end relation with pins connecting linkage of the one series of linkage plate to an adjacent series of linkage plates, the pins provide rungs for the gears to engage to drive the endless chain.

A suitable motor (not shown) may be mounted to the rectangular frame 21 in a conventional manner and drivably engaged with the shaft 26 to drive shaft 26 and thereby rotate the endless chains 30 and 30' to carry the channel member 31 along the path of the chains.

The channel member 31 receiving grain through its opening 41 at its top is formed by side panel members 33 and 34 and front and rear panels 35 and 36 as it travels along the upper portion 42 of the endless path of the chains 30 and 30'. The channel member has its side panel members 33 and 34 which diverge outwardly away from the opening 41 whereby additional grain may be received in the channel member without enlarging the size of the opening 41 in the channel member. Also, the channel member 31 may be made deeper than shown to handle more grain.

The portable grain sample invention 20 may be slidably installed in various different types of grain passageways where grain passes through for sampling a portion of the grain such as illustrated in FIGS. 6 and 7 wherein an elevator leg 42 is shown having a U-shaped chute or leg 43 with lifting cups 44 therein and a receiving chute 45 connecting to the U-shaped chute 43.

The lifting cups 44 lift the grain in the cups up over the top of the elevator leg 43 in a counterclockwise direction as illustrated in FIGS. 6 and 7 in a conven-

tional manner and as the cups pass over the top of the leg grain, as indicated by arrows 46 is thrown outward from the cups into the receiving chute, and in so doing passes through the rectangular frame 21 of the sample invention.

The sampling invention 20 will be slidably inserted into the rectangular slot 47 in the receiving chute 45 with its inner end 48 abutting the inner edge 49 of the notched or slotted portion 47 of the receiving chute. A plate 50 will be welded to the outside of the receiving chute and act to support the rectangular frame 21.

As the grain thrown out of the cups passes through the rectangular frame, the channel member 31 will be passing laterally through the path of the grain with the opening 41 in the channel member directed toward the oncoming grain. The endless chain 30 and 30' will carry the channel member in a counterclockwise direction, when viewed from FIG. 6 into the receiving chute 45 and as the channel member travels counterclockwise around the end gears 29 and 29' and onto the upper path of the chains, the opening 41 in the channel member will be receiving a sample of the grain passing through.

The channel member 31 will continue traveling with the endless chains out of the receiving chute 45 and as the channel member travels around gears 28 and 28' on the chains at the outer end 51 of the rectangular frame the sampler of grain in the channel member 31 will be emptied or dumped out of the channel member in the direction of the arrow 52.

The sampler invention 20 may be easily slid out of the slot 47 in the receiving chute when the sampling is completed.

Similarly, the grain sampling invention may be employed for sampling grain at the end of a grain conveyor belt 53 by being slidably inserted in a rectangular slot 54 in the receiving chute 55 receiving grain from the conveyor belt, as illustrated in FIGS. 8 and 9.

As the grain reaches the end 56 of the conveyor belt, it will be thrown outward along the path indicated by the arrows 57 and will pass through the rectangular frame 21 of the sampler invention. The channel member 31 will be carried by the endless chain 30 and 30' in a clockwise direction when viewed from FIG. 8 and the channel after passing around the end gears 29 and 29' onto the upper path will pass through the path of the grain and receive a sample of the grain in its opening 41. The endless chains 30 and 30' will carry the channel member out of the receiving chute 55 and as the channel member passes around gears 28 and 28' at the outer end 51 of the frame the sample of grain received in the channel member will be emptied from the channel member 31 as indicated by arrows 58.

The forward end 48 of the sample invention will abut the inner edge 49 of the slot 54, and a plate 60 will be welded to the outside of the receiving chute 55 to support the rectangular frame.

Also, the sampler invention 20 may be readily removed at the end of the sampling by simply sliding the frame 21 out of the slot 54.

Also, the portable grain sampler invention 20 may be employed in connection with a conventional grain bin 60 having a grain chute 61 positioned centrally above it, as shown in FIGS. 10 and 11, with the grain as indicated by the arrows 63 passing out of the grain chute 61 and centrally into the grain bin 60.

The portable grain sampler invention will be slidably inserted onto the top of the grain bin 60 with the rearward end 51 resting in the notch 64 and the inner end 48 resting upon an L-shaped angle iron 65 which extends laterally across the bin and is fixed to the bin, a pair of side beams 67 and 68 which extend longitudinally across the bin to spaced relation and are fixed to the wall portion 66 of the bin and pass under the frame 21 beneath the side panels 22 and 23 to support the frame and are formed integrally with the angle iron 65 at their forward end. A similar pair of beams 67' and 68' extend forward from the angle iron and are formed integrally therewith and are fixed at their forward ends to the wall portion 66' of the bin.

The endless chains 30 and 30' will be rotating clockwise when viewed from FIG. 10 carrying the channel member 31 and as the channel member 31 passes around gears 26 and 27 and onto the upper path of the chains the opening 41 in the channel member will be receiving a sample of the grain traveling out of the chute into the bin. The endless chains will carry the channel member 31 outside of the wall of the bin and as the channel member travels around gear 26' and 27' onto the lower path of the chains the channel member will empty the sample of grain in the channel member, outside the bin, in the direction of the arrows 70 into a suitable receptacle (not shown).

Also, the sampler invention may be employed as illustrated in FIG. 12, by simply raising the one end 51 of the sampler invention 20 with a stick member 71, when the invention is placed upon the ground, as grain is dumped through the frame, such as from a dump truck, with the path of grain indicated by arrow 72 the channel member, which will be traveling counterclockwise when viewed from FIG. 12, will be receiving a sample of the grain in its opening 41 as the channel member passes around gear 29 and 29' onto the upper path of the chains by passing through the path of the grain. The endless chains will carry the channel member out of the path of the grain to the outer end 51 of the frame and as the channel member travels around the gears 28 and 28' onto the lower path of the chains the sample of grain in the channel member will be emptied downward in the direction of the arrows 71.

Thus, it will be seen that a novel portable grain sampler has been provided which may be easily and rapidly inserted into a grain passageway with the outer end projecting out of the grain passageway, and an endless chain will carry a channel member along the frame through the path of the grain traveling along the grain passageway and carry it out of the grain passageway and deposit outside, and which device may be readily attached and detached for sampling in a variety of different grain passageways.

It will be obvious that various changes and departures may be made to the invention without departing from the spirit thereof, and accordingly, it is not intended that the invention be limited to that specifically described in the drawing but only as set forth in the appended claims wherein:

What is claimed is:

1. A grain sampler apparatus comprising a rectangular frame, a channel member, said frame having a pair of endless loop carrier means mounted to said frame along opposite lateral sides of said frame, an elongated channel member mounted laterally across and between

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said loop carrier means, said elongated channel member having a narrow elongated opening and a closed bottom, a grain conduit for passage of grain therethrough, said grain conduit having a lateral slot, said elongated frame being slidably mounted in said slot with its rearward end projecting from said slot in said conduit, power means to rotate said endless loop carrier means in a direction to carry said channel member to the forward end of the frame with its opening at the bottom and return said channel member to its

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rearward end with the channel opening at the top, whereby the endless loop carrier means may carry said channel member into the conduit and may carry the channel member out of the conduit while receiving a sample of grain in said channel opening from grain passing therethrough and unload the sample at the rearward end of the frame at a location outside the grain conduit.

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