H. K. LININGER.

GRAIN ELEVATOR.

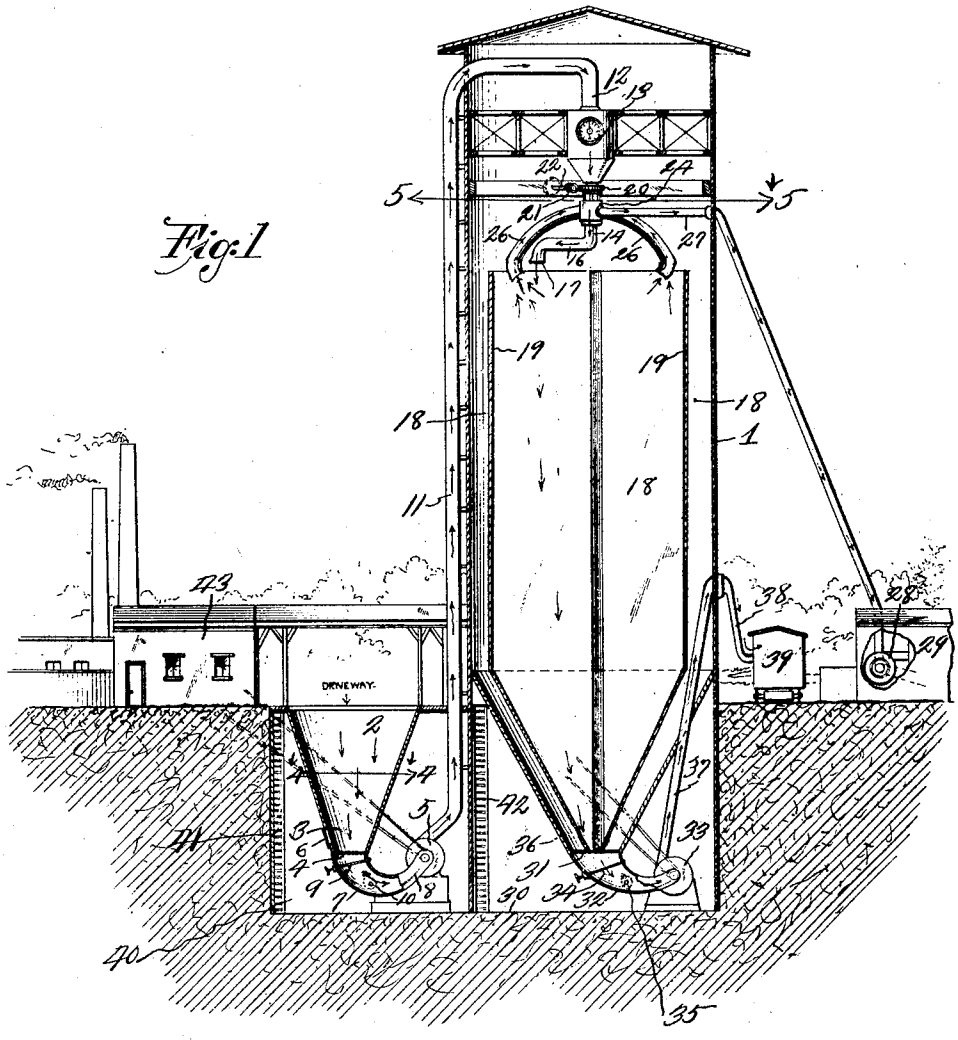
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1,381,570.

Patented June 14, 1921.

3 SHEETS—SHEET 1.

Fig. 1




Inventor

Herbert K. Lininger

By Philip A. Ferrell

His Attorney

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3 SHEETS—SHEET 2.

Fig. 2

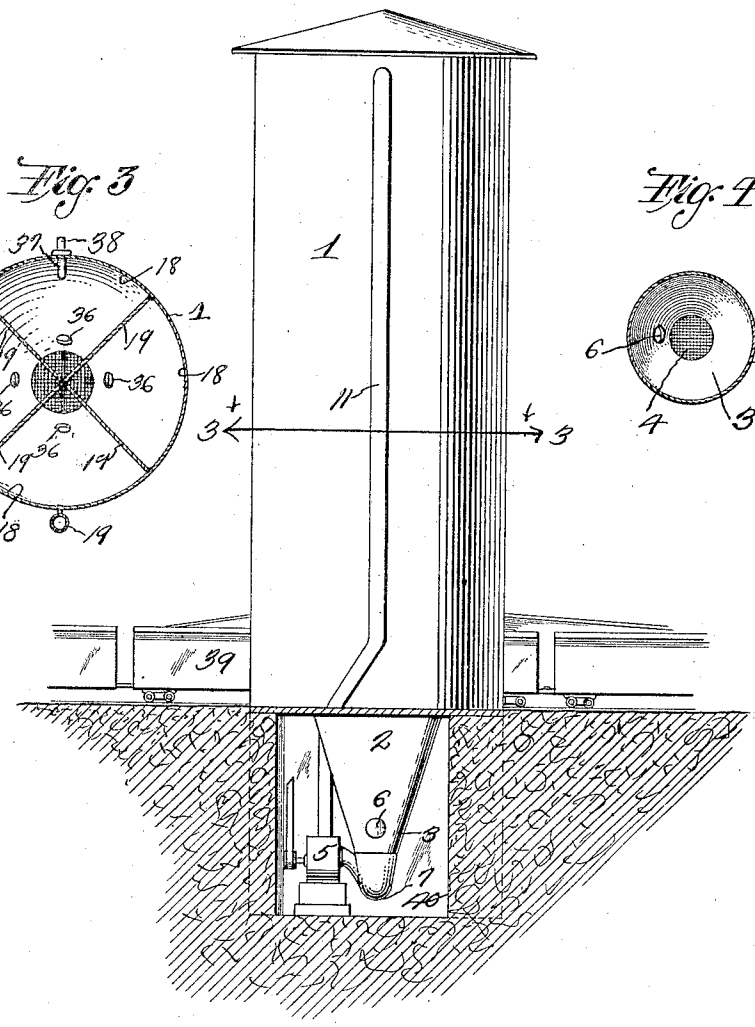



Fig. 3




Fig. 4




Inventor

Herbert K. Lininger

By Philip A. Hersell

his Attorney

H. K. LININGER.

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3 SHEETS—SHEET 3.

Fig. 5

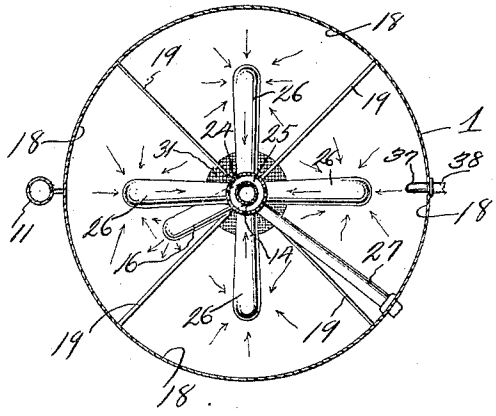



Fig. 6

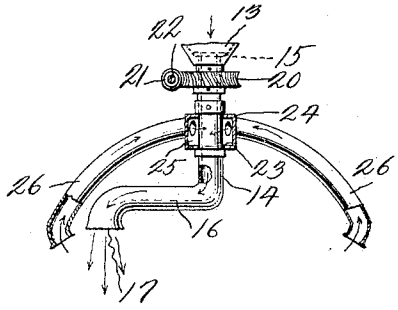
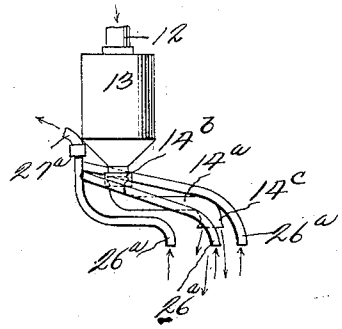



Fig. 7




Inventor

Herbert K. Lininger

By Philip A. Hasell

his Attorney

# UNITED STATES PATENT OFFICE.

HERBERT K. LININGER, OF KANSAS CITY, MISSOURI.

## GRAIN-ELEVATOR.

1,381,570. Specification of Letters Patent. Patented June 14, 1921.

Application filed January 27, 1920. Serial No. 354,501.

*To all whom it may concern:*

Be it known that HERBERT K. LININGER, a citizen of the United States of America, residing at Kansas City, in the county of Jackson and State of Missouri, has invented certain new and useful Improvements in Grain-Elevators, of which the following is a specification, reference being had therein to the accompanying drawing.

The invention relates to grain elevators and has for its object to provide an elevator, wherein the grain is dumped into a chute and the grain lifted upwardly from said chute by a centrifugal pump and deposited in a grain tank, said grain passing through a grain meter into the tank. Also to provide means whereby as the grain leaves the grain meter, dust and foreign material will be separated from the grain by a centrifugal pump.

A further object is to provide means whereby the grain within the grain tank may be removed therefrom by a centrifugal pump and loaded in cars.

A further object is to provide the grain tank with a series of compartments, into any one of which the grain may be deposited by a pivotal discharge pipe carried by the lower end of the grain meter. Also to provide a dust separating member comprising outwardly extending arms formed from piping, one of said arms being disposed above each compartment and to provide means whereby the pivoted discharge pipe may be placed in juxtaposition with any of the outwardly extending dust collecting arms so that the dust may be separated from the grain as it flows into any of the compartments.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:—

Figure 1 is a vertical sectional view through the dump chute and the grain tank.

Fig. 2 is a view in elevation and partly in section showing the dump chute and the grain tank.

Fig. 3 is a sectional view taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional view through the lower end of the dump chute taken on line 4—4 of Fig. 1.

Fig. 5 is a sectional view taken on line 5—5 of Fig. 1.

Fig. 6 is a detail view of the discharge pipe from the grain meter and the dust collecting nozzles.

Fig. 7 is a detail view of another form of discharge nozzle and dust collecting pipes, wherein the nozzle is stationary.

Referring to the drawings, the numeral 1 designates the grain tank into which grain is adapted to be lifted and stored, and 2 a conically shaped chute into which grain is dumped from vehicles or the like. Dump chute 2 has its apex end 3 downwardly disposed and provided with a screen 4, which screen prevents the passage of foreign matter such as nails or stones, which stones when passing through the centrifugal pump 5 would cause fires or dust explosions. The dump chute 2 at a point above the screen 4 is provided with a clean-out 6, whereby access to the top of the screen 4 may be attained. Connected to the apex 10 of the dump chute 2 and extending downwardly and upwardly is a pipe 7, the upper end of said pipe being connected to the centrifugal pump 5. By so forming the pipe 7 and providing it with a restricted end 8 it will be seen that as the grain is fed into the pipe 7 and controlled by a damper 9 that the grain will be prevented from flooding the centrifugal pump and preventing the rotation thereof. Pipe 7 is provided with an aperture 10 which may be uncovered when the damper 9 is closed so that air may pass to the intake end of the centrifugal pump 5 so that the pump will not become air bound when it is not actually lifting the grain. Connected to the discharge end of the centrifugal pump is a vertically disposed pipe 11 through which the grain is lifted by the pump 5. Pipe 11 at its upper end extends into the upper end of the grain tank 1 and is bent downwardly so as to form the vertical portion 12 substantially centrally disposed in the grain tank. The grain lifted through the pipe 11 passes through the grain meter 13 where it is automatically meas-

ured. This meter may be of any conventional form. The grain after passing through the meter 13 passes downwardly through a discharge pipe 14 which is pivotally mounted in the lower end of the grain meter as at 15. Discharge pipe 14 is provided with a right angle portion 16 which terminates in a downwardly extending flared discharge end 17. By so shaping the discharge pipe 14 and pivoting the same it will be seen that the portion 16 may be pivoted around the horizontal frame so that its flared end 17 may be disposed over any of the compartments 18 of the grain tank, said compartments being formed by vertically disposed and radially extending partitions 19. Secured to vertical portion of the discharge pipe 14 is a gear 20 and meshing with said gear is a worm gear 21, which gear 21 is adapted to be rotated by a shaft 22 which extends outside of the grain tank so that the flared end 17 may be disposed over any of the compartments 18, thereby allowing the filling of the compartments as desired. The pivoted discharge pipe 14 is also pivoted as at 23 in a casing 24, said casing being provided with an annular chamber 25 which extends around the vertical portion of the pivoted discharge pipe 14 so as to form an air passage. Extending outwardly and downwardly from the casing 24 are suction pipes 26, the lower ends of which pipes extend inwardly so that as the grain is discharged into one of the compartments, the dust and foreign particles will be sucked through one of the pipes 26, through the annular chamber 25 and thence through the suction pipe 27, which suction pipe extends through the wall of the grain tank and leads to a centrifugal pump 28 in a dust separating house 29 where the dust is collected. It will be seen that as the grain is lifted and deposited into any of the compartments 18 that said grain will be thoroughly separated and the dust collected in the dust house. It is also to be seen that when it is desired to fill any one of the compartments, it will only be necessary to rotate the gear 20 until the flared discharge end 17 is disposed over the desired compartments and adjacent to the suction pipe 26 which is also disposed over said compartment.

The lower end of the grain tank 1 is conically shaped and is disposed in a pit 30. Disposed in the conically shaped end of the grain tank is a screen 31, which screen may be finer than the screen 4 and is adapted to additionally screen the grain as it is sucked through the downwardly and upwardly extending pipe 32, into which pipe the grain passes from the compartments 18, pipe 32 being so shaped as to not allow the grain to fill up the centrifugal pump 33 and consequently stop the same. The flow of grain into the pipe 32 is controlled by a damper 34 so that the flow may be controlled as desired. An aperture 35 is provided in the wall of the pipe 32 so that the centrifugal pump may get sufficient air for operation while the damper 34 is closed. Access to the top of the screen 31 for cleaning out purposes may be had through clean-outs 36, which are located in the outer wall of the lower end of each compartment 18. The discharge pipe 37 from the centrifugal pump 33 extends upwardly and is provided with a preferably flexible section 38 whereby the cleaned grain may be deposited in a grain car 39.

The dump chute 2 is disposed in a pit 40 and access to said pit may be had by means of a ladder 41. Access to pit 30 may also be had by means of a ladder 42.

Pumps 5 and 33 may be belted in any suitable manner to machinery located in an engine house 43 and if so desired the pump 28 may also be driven by machinery located within the engine house 43. However it is to be understood that electric power may be generated within the engine house 43 and the various pumps operated by electric motors getting their power from the engine house.

From the above it will be seen that a grain elevator is provided, wherein the grain is lifted from dump chute, conveyed upwardly passing through a grain weighing meter, deposited in any one of the series of compartments of a grain tank through a pivoted nozzle which may be placed in registration with any of the compartments and adjacent a suction pipe whereby the dust and foreign material may be separated from the grain. It will also be seen that the grain as desired may be removed from the grain tank and deposited in grain cars by means of a centrifugal pump.

Referring to Fig. 7 in which a modified form of discharge pipe is shown, it will be seen that the discharge pipe $14^a$ is pivotally connected as at $14^b$ to the grain meter 13, said pivoting of the discharge pipe $14^a$ allowing its discharge end $14^c$ to be moved adjacent any one of the suction pipes $26^a$, which suction pipes merge into a single suction pipe $27^a$. Suction pipes $26^a$ are adapted to be disposed over compartments similar to the compartments 18.

The invention having been set forth what is claimed as new and useful is:—

A grain cleaning device comprising a discharge pipe substantially vertically disposed and pivotally mounted in a bearing, said discharge pipe being provided with a horizontally disposed portion terminating in a downwardly extending discharge end, a casing surrounding the vertical portion of the discharge pipe thereby forming an annular

chamber, outwardly and downwardly extending pipes carried by said casing and having their ends positioned so that the discharge end of the pivoted discharge pipe may be positioned adjacent their ends, means for creating a suction in the outwardly and downwardly extending pipes, the pivotal mounting of the discharge pipe permitting the end of the same to be positioned adjacent the end of either outwardly and downwardly extending pipe.

In testimony whereof I hereunto affix my signature.

HERBERT K. LININGER.