No. 782,642. PATENTED FEB. 14, 1905.

C. BRADFORD.

GRAIN ELEVATOR AND WEIGHER.

APPLICATION FILED APR. 30, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

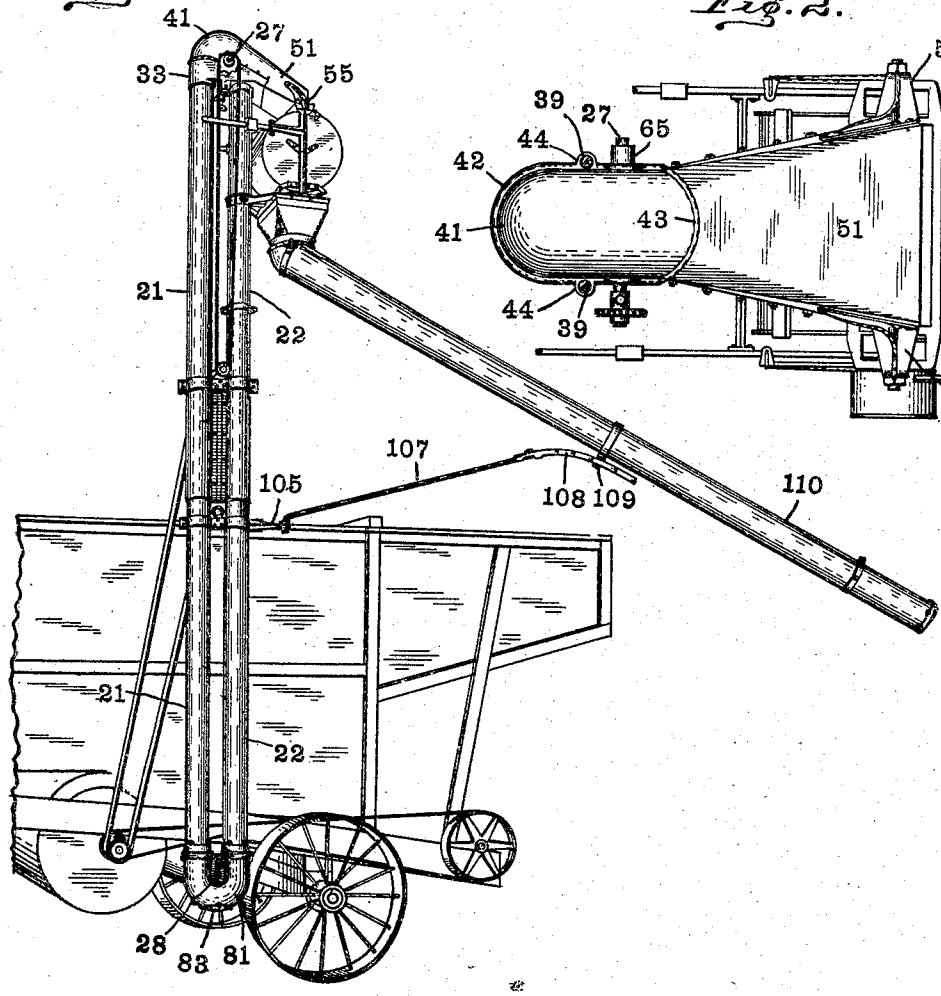


Fig. 2.

Fig. 3.

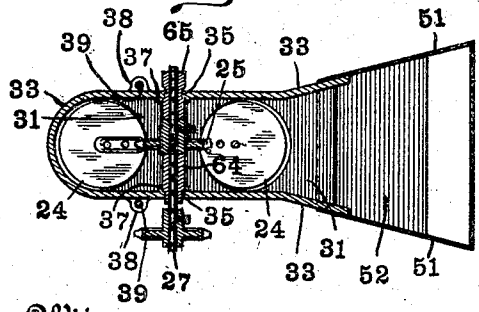
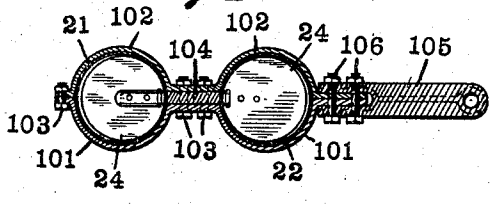


Fig. 4.



Witnesses

Frank A. Fahle

J. A. Walsh.

Inventor

Chester Bradford,

per Bradford & Hood,

Attorneys

No. 782,642. PATENTED FEB. 14, 1905.

C. BRADFORD.

GRAIN ELEVATOR AND WEIGHER.

APPLICATION FILED APR. 30, 1904.

3 SHEETS—SHEET 2.

Fig. 5.

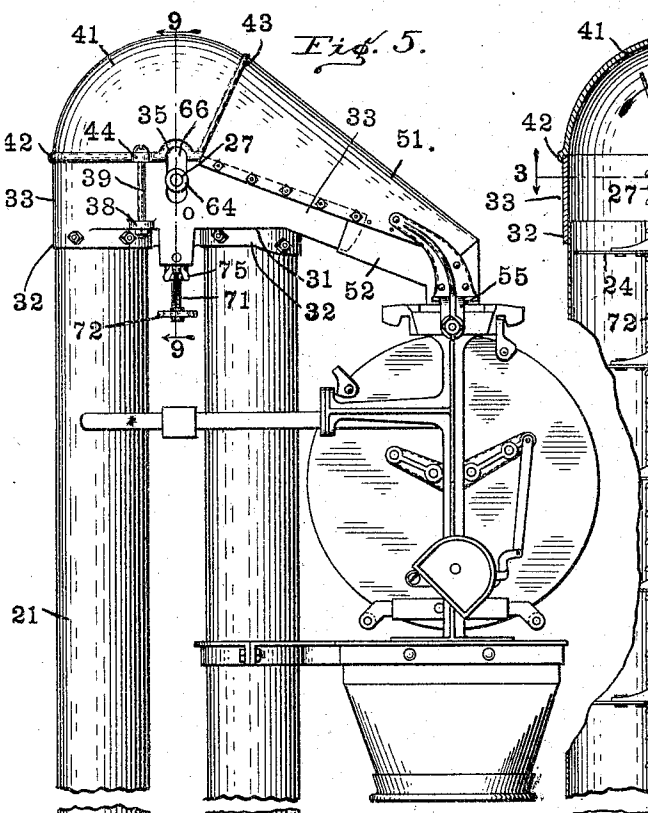


Fig. 7.

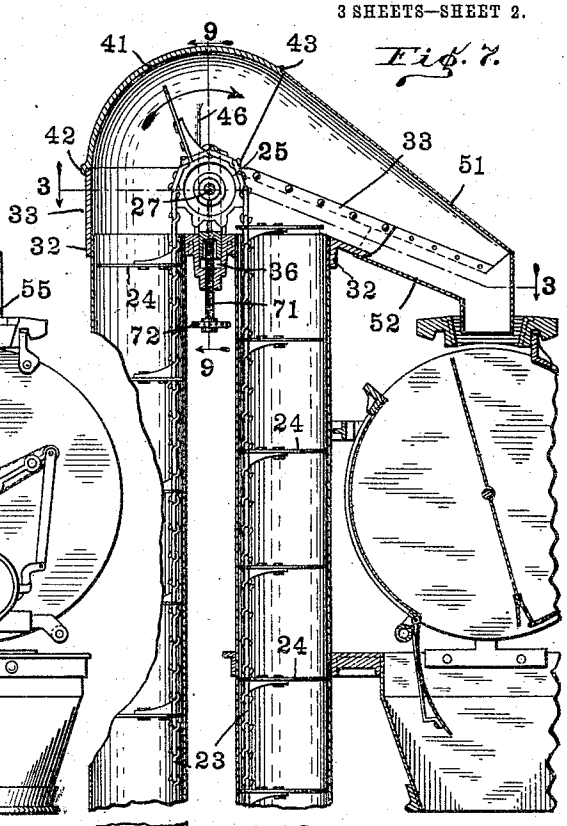
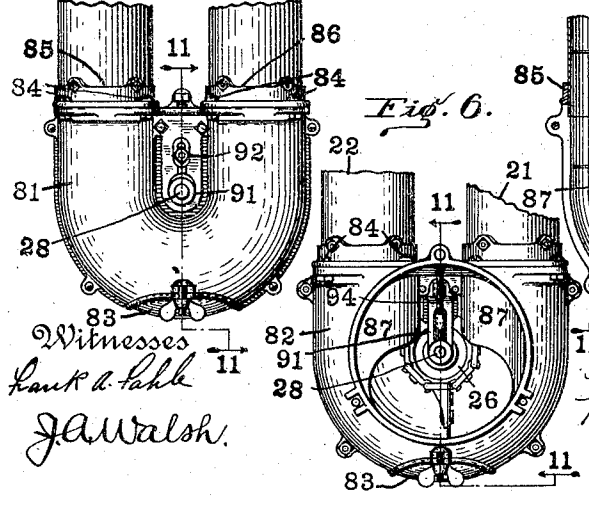


Fig. 6.



Witnesses
Frank A. Fahle
J. A. Walsh.

Inventor
Chester Bradford,
per Bradford & Hood,
Attorneys

No. 782,642. PATENTED FEB. 14, 1905.

C. BRADFORD.

GRAIN ELEVATOR AND WEIGHER.

APPLICATION FILED APR. 30, 1904.

3 SHEETS—SHEET 3.

Fig. 8.

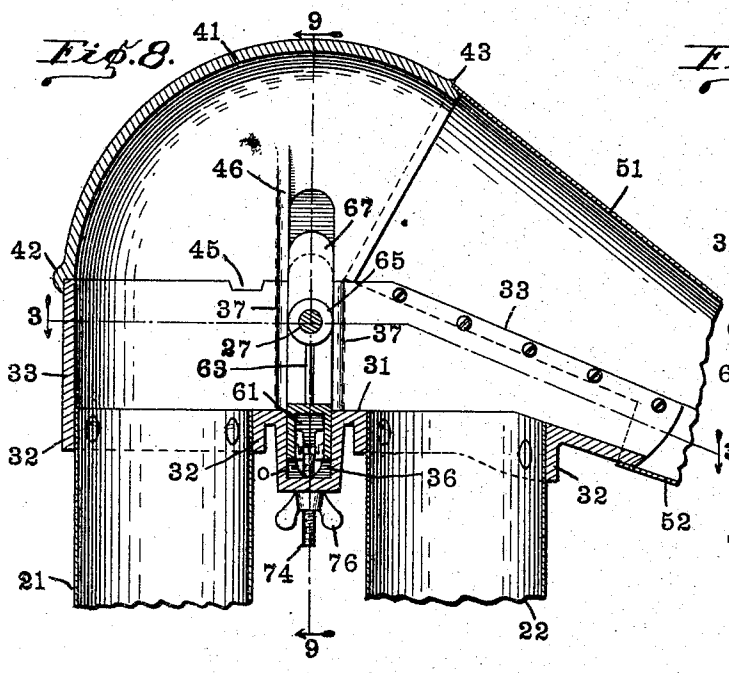


Fig. 9.

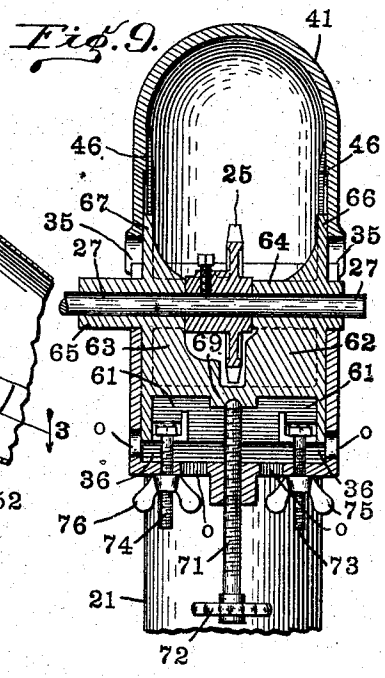


Fig. 10.

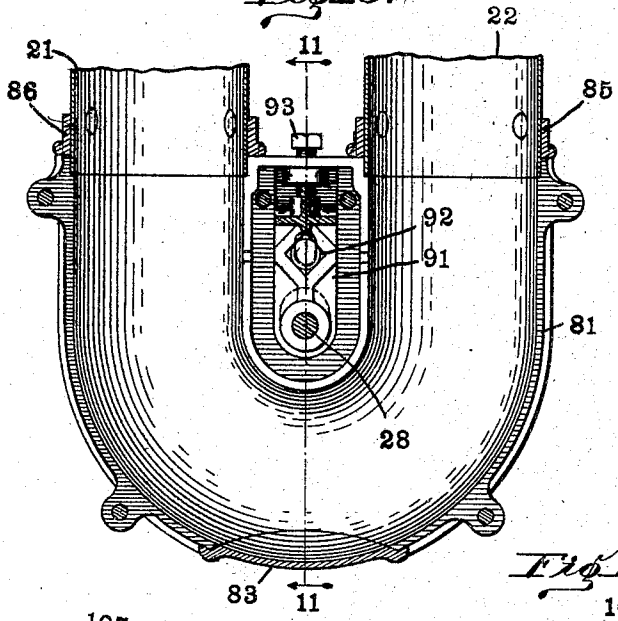


Fig. 11.

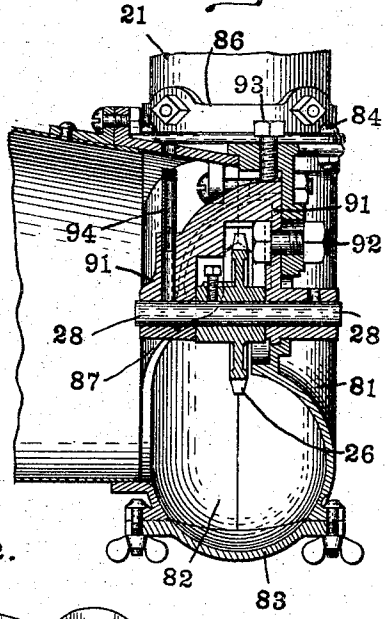
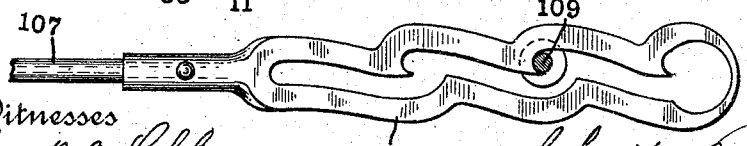


Fig. 12.



Witnesses
Frank A. Cable
J. A. Walsh.

Inventor
Chester Bradford,
per Bradford & Hood,
Attorneys

No. 782,642. Patented February 14, 1905.

UNITED STATES PATENT OFFICE.

CHESTER BRADFORD, OF INDIANAPOLIS, INDIANA.

GRAIN ELEVATOR AND WEIGHER.

SPECIFICATION forming part of Letters Patent No. 782,642, dated February 14, 1905.

Application filed April 30, 1904. Serial No. 205,699.

To all whom it may concern:

Be it known that I, CHESTER BRADFORD, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Grain Elevators and Weighers, of which the following is a specification.

The object of my present invention is to produce an improved form of that variety of elevators and weighers which are used as attachments to threshing-machines.

The nature of this invention will appear hereinafter.

Referring to the accompanying drawings, which are made a part hereof, and on which similar reference characters indicate similar parts, Figure 1 is a perspective view of a machine embodying my invention as it appears in use when attached to a threshing-machine or separator; Fig. 2, a top or plan view of the elevator and weigher separately on an enlarged scale; Fig. 3, a horizontal sectional view through the head or upper portion at the point indicated by the dotted line 3 3 in Figs. 8 and 7; Fig. 4, a horizontal sectional view at the point indicated by the dotted line 4 4 in Fig. 5; Fig. 5, a side elevation of the elevator and weigher, portions of the conveyer-pipe being broken away in order to permit of the enlarged illustration; Fig. 6, an illustration of the opposite side of the lower portion or boot to that seen in Fig. 5; Fig. 7, a central vertical sectional view of the same parts illustrated in Fig. 5; Fig. 8, an interior view of a portion of the head of the elevator as seen from a point to one side of the center, so as to omit the chain-wheel and bearings, being otherwise similar to a portion of Fig. 7, but on a still further enlarged scale; Fig. 9, a transverse vertical section through the upper portion of the elevator as seen when looking in the direction indicated by the arrows from the dotted line 9 9 in Figs. 5, 7, and 8; Fig. 10, a central sectional view of the lower portion of the boot of the elevator as seen when looking in the opposite direction from that in which the illustration of Fig. 7 is seen, but on an enlarged scale; Fig. 11, a transverse vertical sectional view of the bottom portion or boot of the elevator at the point indicated by the dotted line 11 11 in Figs. 5, 6, 7, and 10, and Fig. 12 a plan view of the upper member of the supporting rod or brace to the down-spout.

In this machine the conveyer-pipes 21 and 22, the elevating chain and buckets 23 and 24, the sprocket-wheels 25 and 26, over which said chain runs, and their shafts 27 and 28 are not dissimilar to the corresponding parts of well-known existing machines. The weigher illustrated is substantially that forming the subject-matter of Letters Patent of the United States No. 650,593, issued to the Pneumatic Elevator and Weigher Company upon the application of James B. Schuman. Said parts will therefore not be further particularly described herein except incidentally in describing the invention.

In this machine the conveyer-pipes 21 and 22 are secured at the upper end to the main member of the elevator-head. This member I prefer to make in the form of a casting, and it consists of a bottom plate 31, containing openings into which the ends of the pipe enter, which openings are surrounded by flanges 32, and at the outer edge thereof (at the back and upon two sides) a wall 33 rises, which forms a part of the wall of the inclosure containing the upper sprocket-wheel and through which the chain and buckets pass. The bottom 31 inclines downwardly at the front side, as shown, and also flares outwardly. Slots 35 are cut in the wall 33 at opposite sides of the head to receive the ends of the structure containing the bearings for the shaft 27. Immediately below these slots and extending below the general level of the bottom of the head is a chamber 36, in which the body of said structure is placed and wherein it may be adjusted in adjusting the tension of the chain, as will be hereinafter more fully described. The walls of the chamber are provided with openings, as *o o*, which both tend to lightness and afford exits for any dirt or other matter which may get into said chamber while the bearing structure is being adjusted or otherwise. Ribs 37, extending up inside the walls 33, form continuations of the ways in which said structure rests and is guided. Ears 38 are provided to

receive the bolts 39, which connect the cap 41 to said main part.

The cap 41 conforms at its lower edge to the portion of the main casting 31, upon which it rests. It has a flange 42, which overlaps the edge of said main casting, thus forming a closed joint. At its front edge it has a rib 43, against which the edge of the adjacent sheet-metal portion (hereinafter described) abuts. It has ears 44, by means of which and the ears 38 and the bolts 39 it is securely connected to the main casting 31. Said cap is at the same time rendered easily removable, it being only necessary to take out the two bolts 39 to effect such removal. As shown in Fig. 8, the edges of these two parts 31 and 41 have interlocking recesses and projections, as at 45, whereby the part 41 is prevented from sliding rearwardly on the part 31 after it is secured in place. This construction and arrangement enables me to provide a large removable cap, so that an ample opening through which access to the elevator-head may be had is secured. The remainder of this elevator-head is composed of two pieces of sheet metal 51 and 52, which are shaped to abut against and be connected to the parts 31 and 41, which have just been described, and they continue (when the parts are assembled) to a point directly above the receiving-mouth of the weigher, at which point these parts are turned downwardly, so as to form a mouth which will discharge directly into said weigher-mouth. At the mouth end these sheet-metal portions have the ears 55 attached thereto, by means of which the weigher is suspended to the head, much as in the case of the Schuman patent, No. 641,045, on pneumatic elevators.

As before stated the main casting of this elevator-head contains a central chamber to receive the bearing structure in which the shaft of the upper sprocket-wheel is mounted. This bearing structure is preferably a casting and has a main transverse chambered portion 61, two upwardly-extending portions 62 and 63, which embody the bearings proper 64 and 65 for the sprocket-wheel shaft 27 and are provided with flanges or plate portions 66 and 67, which shut the orifices which would otherwise exist in the sides of the head where the bearings 64 and 65 extend through and which orifices are necessarily elongated to enable the bearing structure to be adjusted. The bearings 64 and 65 extend out to different distances, as is best shown in Fig. 9, and the structure as a whole is reversible. I am therefore enabled to mount a driving-pulley at either side of the machine and close to or farther from the side of the head and in every case have it close to the end of the shaft-bearing, thereby giving it good support whatever its position. The elongated openings in the sides of the head (it may here be remarked) may extend somewhat up into the lower edge of the part 41, with some advantage of construction, as shown in the drawings. The inner surfaces of the parts 41 should be recessed somewhat to receive the upper ends of the plate portions 66 and 67, and especially on the rear sides these recesses should be bounded by ribs 46 to effectually prevent any grain from getting behind said plates, as it is thrown over by the buckets of the elevator.

The chains require to be adjusted to a proper degree of tightness in order to produce the best results, and this adjustment or tightening of the chains becomes necessary at intervals after the machine is put in use, as the chain wears. I have devised what I conceive to be a superior means for effecting such adjustment, because of its simplicity, durability, and certainty. At a central point in the under side of the main head member I provide a screw-threaded perforation in which I mount an adjusting-screw 71, the point of which bears against a spotting 69, provided to receive it within the chamber in the portion 61 of the bearing structure above described. This screw 71 I prefer to provide with a small hand-wheel 72. At each end of said bearing structure, as best shown in Fig. 7, I provide smaller chambers, which receive the heads of bolts 73 and 74, which bolts then pass down through perforations in the lower wall of the chamber within the main casting and have nuts 75 and 76 upon their lower ends. As will be readily seen, the bearing structure may be adjusted with the utmost accuracy by the manipulation of said screw and the nuts on said bolts, as said bearing structure may be raised to any extent desired within the limit of adjustment provided by means of the screw, while it may be held down firmly against said screw, and all lost motion thus prevented by manipulation of the nuts. Also by this means the bearing-structure may be adjusted in respect to its level, as well as to its vertical position. The small chambers which contain the heads of the bolts are of such size as to prevent the bolts from turning, and therefore where a hand-wheel on the screw and wing-nuts on the bolts are used, as is shown in the drawings, the operator is enabled to easily, quickly, and accurately make any required adjustment without the use of any tools whatever.

The bottom or boot of the elevator is composed of the three castings 81, 82, and 83, bolted together, as shown. This bottom or boot is secured to the lower ends of the pipes 21 and 22 by means of bolts 84, which connect the same to rings 85 and 86 on the bottom ends of said pipes. The ends of the pipes are permitted to extend through the rings slightly and enter the boot proper, so that any opening which might otherwise be left because of irregularity in the adjacent surfaces of the castings is effectively closed. This means of connecting the bottom or boot to the lower ends of the pipes is of great advantage. The threshing-machines or separators with which

these elevators and weighers are to be used are of various kinds and some of them require that the elevator be attached upon one side and some upon the other. I make my elevator bottoms or boots exactly alike as to each passage for the elevator chain and buckets, and by attaching them to the pipes in the way stated I am enabled to take any given machine and by simply turning the bottom or boot change it from a right-hand to a left-hand machine, or vice versa, at will, and thus render it capable of being attached to either side of a separator, as may be required. This is done simply by removing the small bolts 84 connecting the bottom or boot with the ring-castings 85 and 86, turning the bottom or boot in relation to the pipes, and reinserting the bolts. As above stated, I make this bottom or boot alike as to each passage-way. This, as will appear in Fig. 6, is done by extending down small flanges 87 equally upon both sides and positioning the grain-opening through which the grain is introduced into the elevator centrally in relation to said bottom or boot.

It is desirable that the sprocket-wheel at the lower end of the elevator should also be capable of some adjustment. I therefore provide for this sprocket-wheel 26 a bearing structure 91. This is secured to the casting 81 of the boot by a bolt 92, the opening for said bolt being slotted. In the top of the boot directly above the highest part of said bearing structure I insert an adjusting-screw 93. By loosening the bolt 92 somewhat the bearing may be adjusted by means of this screw 93, and after this is done the bearing structure may be again secured rigidly and strongly in place by tightening up the nut on the bolt of 93. An oiling-tube 94 extends up from the inner bearing of the structure 92 to near the top of the boot, so that said bearing is readily lubricated through a hole in the top wall of said boot through which access is readily had to said oiling-tube.

The pipes 21 and 22 at an intermediate point are clamped by means of clamping-bands formed, preferably, of hoop metal, the parts 101 and 102 of which each contain two semicircular depressions, which fit against the sides of the pipe, and said parts are clamped onto the parts by suitable bolts 103. The depressions formed in these clamping-bands are somewhat less than one-half the diameter of the pipe, which leaves a space between the two bands at the center, in which the shank of a bearing 104 may be inserted and by means of which said bearing may be strongly supported. Upon the ends of the clamps 101 I secure an arm 105 by means of bolts 106, in the outer end of which arm the brace-rod 107, which supports the down-spout 110 of the machine, rests. The upper end of this down-spout-supporting rod terminates in a slotted member 108, in which the central slot has a series of notches which are adapted to engage with a stud 109, carried by a suitable ring upon said down-spout 110. This stud 109 has a head, and the outer end of the member 108 has a corresponding opening adapted to slide over said head. By this means the separation of these parts is prevented, except at this single point. By means of this arrangement I am enabled to easily and quickly adjust the angle of the down-spout 110, simply lifting or lowering it (as the case may be) until the stud rests in the desired manner in the notches.

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

1. The combination, in a grain-elevator, of the conveyer-pipes, the boot, the head, a chamber centrally positioned in said head to receive the structure embodying the bearing for the sprocket-wheel shaft, said structure mounted to slide vertically in said chamber, a screw mounted in the head for adjusting said structure upwardly, and bolts connected with said structure and passing down through the lower wall of the chamber whereby said structure is held downwardly against the thrust of the screw.

2. The combination, in an elevator, of the conveyer-pipes, the boot, the head, the sprocket-wheels, the sprocket-wheel shafts, bearings for said shafts, the upper shaft-bearings being embodied in a U-shaped structure the main member whereof is chambered, a screw for operating said U-shaped structure in one direction, and bolts engaging with walls of said chamber for operating said structure in the other direction.

3. The combination, in an elevator, of the conveyer-pipes, the chain, the head, a sprocket-wheel for the chain within said head, a shaft for said wheel, and a U-shaped structure carrying said shaft, the sides of said head being slotted to receive the projecting ends of the shaft-bearings, and the said shaft-bearings being provided with flanges which cover the openings in said slot, said head being also provided with ways in which the shaft-bearing structure may be moved vertically, and means for adjusting said shaft-bearing structure.

4. The combination, in an elevator, of the conveyer-pipes, the elevating-chain, a head on said pipes forming a chamber through which the elevating-chain passes, said head embodying a main lower portion and a cap portion fitted thereon and held thereto by interlocking notches and projections, and suitable bolts tying the two parts together whereby said cap is both held firmly in place and rendered easily removable, substantially as shown and described.

5. The combination, in an elevator, of the conveyer-pipes, the elevating-chain, and a head at the upper end of said pipes through which the elevating-chain passes, said head being composed of a main lower member a cap por-

tion and sheet-metal portions extending out in an inclined direction and developed into a fan-shaped discharging-mouth, said several parts being constructed and arranged substantially as shown and described.

6. The combination, in an elevator, of the conveyer-pipes, a head at the upper end of said pipes through which the elevating-chain passes, a sprocket-wheel for said elevating-chain, a shaft for said wheel, a U-shaped structure containing bearings for said shaft, the lower transverse portion of said structure being chambered and containing recesses for holding the heads of the adjusting-bolts, and said bolts.

7. The combination, in an elevator, of the conveyer-pipes, a head at the upper end of said pipes comprising a main portion and a cap portion, slots formed in the sides of said portions for receiving the ends of the shaft-bearings, and ribs formed alongside said slots for preventing the passage of grain behind the adjacent portions of the shaft-bearings.

8. The combination, in an elevator, of the conveyer-pipes, a head on the upper ends of said pipes, the boot on the lower ends of said pipes, the elevator-chain, sprocket-wheels therefor, shafts for said sprocket-wheels, bearings for said shafts, the upper bearing structure being adjustable, and the lower bearing structure being secured to one side of said boot by means of a bolt passing through a slot whereby the same may be adjusted.

9. The combination, in an elevator, of the conveyer-pipes, rings at the lower ends of said pipes having ears, and a boot also at the lower ends of said pipes and adapted to be secured thereto by bolts passing vertically through the ears on the boot and on said rings, respectively, whereby said boot may be secured to said tubes with the grain-receiving opening upon either side of the elevator as a whole, as desired, the two sides of the elevator-boot being formed correspondingly, substantially as shown and described.

10. The combination, in an elevator, of the conveyer-pipes, the head, the boot, the elevating-chains, a discharge-spout leading downwardly from the head, a supporting-rod for said down-spout mounted at one end upon a bearing secured to the conveyer-pipes and connected at the other end to a stud on a ring carried by the down-spout, the upper member of said supporting-rod being slotted and having series of notches in the sides of its slot, substantially as shown and described.

11. The combination, with the vertical conveyer of a grain-elevator, and the downwardly-inclined discharging-spout thereof, of a supporting-rod for said spout, a bearing for the lower end of said supporting-rod connected to said conveyer, a stud carried by said downwardly-inclined discharging-spout, and an upper member to said supporting-rod curved and slotted and provided with a series of notches in its slot for engaging with said stud.

12. The combination, in an elevator, of the conveyer-pipes, the boot, the head, the conveyer-chain, the sprockets, the shafts thereto, the structures containing the bearings for said shafts, and a chamber in the head for receiving the lower portion of the upper adjustable shaft-bearing structure having outlet-orifices through which any foreign matter which may get into said chamber may escape.

13. The combination, in an elevator, of the conveyer-pipes, the conveyer-chain, a head on the upper ends of said pipes, the sprocket for said chain, the shaft for said sprocket, an extension on said head for receiving the body of the structure embodying the bearings for said shaft, said structure, and means for adjusting the same, the walls of that portion of the head carrying and supporting said structure having orifices through which any foreign matter which may enter while said structure is being adjusted may escape.

14. The combination, in a grain-elevator, of the conveyer-pipes, the head, the sprocket-wheels, the sprocket-wheel shafts, and bearings for said shafts, the upper bearing structure having two bearings one of which extends out farther than the other and said structure being also reversible, and said head being provided with ways to receive said bearing structure and with slots out through which said bearings extend, whereby a support for a driving-pulley in several different positions by means of the same structure is secured.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 23d day of April, A. D. 1904.

CHESTER BRADFORD. [L. S.]

Witnesses:

JAMES A. WALSH,

RUTH WORTHINGTON.