Nov. 5, 1968

E. C. SOCHA

3,409,187

DISTRIBUTING SPOUT

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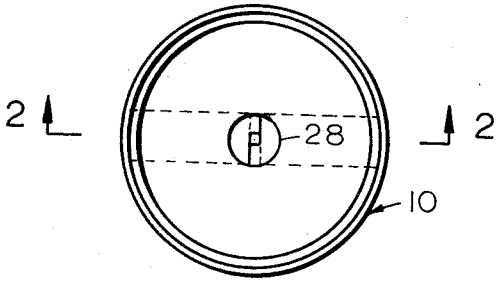


FIG. 1

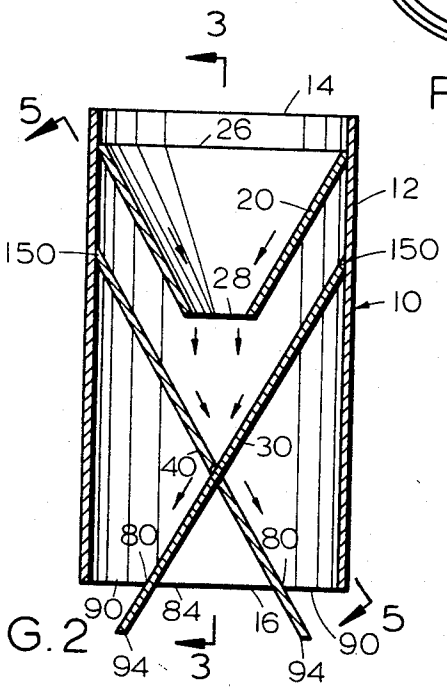


FIG. 2

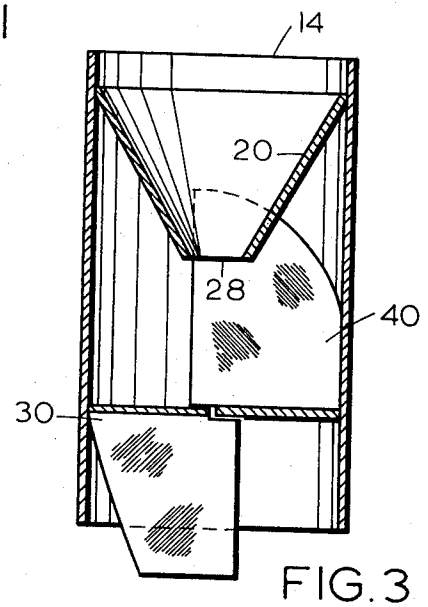


FIG. 3

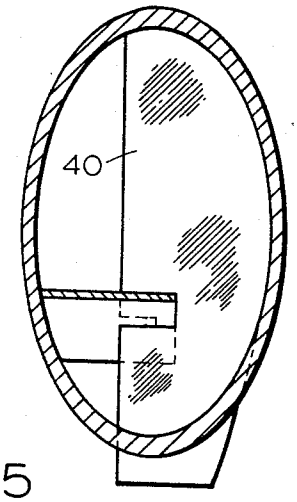


FIG. 5

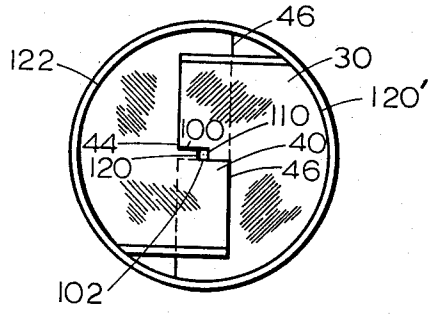


FIG. 4

INVENTOR.

EMIL C. SOCHA

BY Hiram A. Sturges, Agent

United States Patent Office

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DISTRIBUTING SPOUT

Emil C. Socha, 3145 N. 47th Ave.,
Omaha, Nebr. 68104

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This invention relates to a distributing spout for granular material comprising a tube containing baffles disposed on opposite sides of the interior thereof with outer edges adjacent the sides of the tube and inner edges adjacent each other, the baffles inclining and criss-crossing and directing flow of grain.

In the prior art when grain is delivered into grain cars through a side door, it is done with the spout that divides the flow from a single tube into two separate tubes or nozzles, and consequently the width of the spout becomes so great that it could not be used except through the large openings at the side of a grain car and it would be impossible to insert such a spout through the small openings at the tops of those types of grain cars called "hopper cars."

Consequently when grain is delivered into the small top opening of a hopper car, this must be done with an ordinary tubular spout without any flow division. This means that the grain will only fall directly downwardly as it is common to put the spout in place and leave it there without directing it manually and the opening is too small and the labor cost too great to have a laborer direct the nozzle in various directions.

The grain falling straight downwardly into a hopper car causes an excessive concentration of the more fine particles of the grain in the space directly below the spout, with the larger particles tending to flow farther outward.

The finer particles tend to form a more condensed mass in which air cannot gain access as easily, whereby there is extensive rotting directly below a conventional hopper car servicing spout. Few things are as expensive as this rotting.

A further factor tending to increase the rotting is that dirt particles are themselves small and tend also to group themselves in the same place with the grain finer particles directly beneath the conventional spout.

Since as long ago as the second World War, grain hopper cars have been in use on a railroad, and no solution has been found to prevent this rotting in the collection of fines beneath the spout. The material falls into rings when coming out of an ordinary spout. The top of each ring has fines of foreign material in it since the full sized grain rolls away down the slope. These rings of fine material spread out sufficiently in an area beneath one spout receiving opening of a hopper car particularly when the lower part of the car is being filled so that those of the cars which have laterally spaced multiple openings also have fines disposed beneath openings that had not even been used for insertion of material. As a result, when testing probes are deeply inserted through these latter access openings, they tend to be inserted right into the area where the foreign matter and fines are, since the access openings are commonly centrally disposed between the sides of the grain car.

When a testing probe proves that the grain in a car contains a high percentage of fines, then the car receives a lower grade rating and brings a much lower price.

This lower price means great loss of revenue. This lost revenue may be unfair since the total quality of the grain in the car may be quite high for the high percentage of large grain particles. But nevertheless, if it is the finer particles that are under the probing openings, then the car load will be down graded for a lower price.

Through the years no solution for this hopper car problem has been found and it is an object of this invention to provide a distributing spout as described which has the unique characteristic of being able to actually divide the flow without increasing the diameter of the delivery spout. Although a two-headed spout of the type used for delivery through the large side doors of a conventional grain car would not fit into the small openings at the top of hopper cars, yet my spout, having a uniformity of outside dimensions will pass through the delivery holes in the top of a hopper car and will very effectively spread the flow in each of two opposite directions.

A further object is to provide my spout with a funnel for effectively directing the flow toward the criss-cross baffles at the center of the housing so that flow coming with greater concentration down one side of a delivery tube toward the nozzle is directed first by the funnel toward the center of the nozzle so that the baffles can have an equal dividing effect, delivering to each side equally.

In the prior art I have found no delivery spouts of this construction nor for this purpose, although various baffle arrangements are to be found in bins for mixing purposes in various fields.

Other and further objects and advantages of the present invention will be apparent from the following detailed description, drawings and claims, the scope of the invention not being limited to the drawings themselves as the drawings are only for the purpose of illustrating a way in which the principles of this invention can be applied.

Other embodiments of the invention utilizing the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the present invention and the purview of the appended claims.

In the drawings:

FIGURE 1 is a top plan view of the pouring spout of this invention.

FIGURE 2 is a sectional view taken along the line **2**—**2** of FIGURE 1.

FIGURE 3 is a sectional view taken along the line **3**—**3** of FIGURE 2.

FIGURE 4 is a bottom plan view of the spout of this invention.

FIGURE 5 is a sectional view taken along the line **5**—**5** of FIGURE 2.

The distributing spout of this invention is generally indicated at **10** and has an outer tubular housing **12** which is preferably cylindrical. The housing **12** has an entry end **14** and an exit end **16**.

In the upper end of the housing **12** is a funnel **20** having a large inlet opening **26** and a constricted exit opening **28**, the exit opening facing toward the exit **16** and toward the center of the housing, as best seen in FIGURE 1, for directing grain directly toward a pair of elongated baffles **30** and **40**, which latter extend transversely of each other and transversely of the housing **12** and are disposed alongside each other, preferably with their inner edges **44** and **46** lapping each other as seen lengthwise of the housing, as best seen in FIGURE 4.

That portion **80** of each baffle which is opposite the lower end of the housing, or in another sense, adjacent the lower end of the housing, or on the same horizontal level with the lower end of the housing **84**, is spaced from the housing **12** across the majority of the horizontal dimension of the baffle at that portion **80** sufficiently so that the ou let openings **90** are provided between the housing **12** and each of the baffles **30** or **40** for the flow of material through the openings **90**.

The lower ends of each of the baffles direct material toward an opposite side of the housing for distribution of the material across a large area.

As best seen in FIGURE 2, lowermost ends of the baffles **30** and **40** are shown at **94** extending beyond the lower end **84** of the housing **12**.

The inner edge **44** or **46** of each baffle terminates a sufficient distance from the adjacent side of the housing to allow substantial flow from the inlet **14** to be deflected by the other baffle.

The lower ends of each baffle must extend downwardly in the housing at least substantially to the lower end of the tubular housing for substantially and effectively distributing grain out of the housing in two flow paths each of which is inclined with respect to the vertical and the horizontal and each of which extends downwardly out of the housing and partially horizontally away from the respective outer side of the housing in a path continuous with the angle of inclination of the respective baffle from which it was delivered, or in other words, in alignment with the upper side of that baffle.

Each baffle preferably has a notch **100** or **102** in its innermost edge and extending normally to such edge and those portions of each baffle which are disposed along the inner edge thereof on the opposite sides of the respective notch **100** and **102** are caused to lap each other, as seen in bottom plan view in FIGURE 4, with the innermost ends **110** and **120** of the notches **100** and **102** disposed closely adjacent each other.

The outer edges of the baffles **30** and **40** are preferably curved and are seen at **120'** and **122** in FIGURE 4 to be disposed tightly against the innerside of the housing so that substantially no material can pass therebetween.

The baffles **30** and **40** can be secured to the housing by an suitable means such as welding at **150**.

The funnel **20** has a large upper entry end facing the upper end of the tubular housing **12** and a constricted lower end centrally disposed in the tubular housing **12** and facing the baffles **30** and **40**. The lower end of the funnel **20** is disposed sufficiently close to the baffles **30** and **40** for effectively directing flow toward the baffles **30** and **40** at a horizontal center of the housing.

The lower end of the funnel **20** is further defined as disposed a substantial distance above the point of the criss-crossing of the baffles to allow grain to be substantially directed by portions of the baffles which are above the criss-cross point.

As thus described it will be seen that this invention has fulfilled the objectives above set forth in that flow concentrated toward the center of the housing **12** by the funnel **20** will strike the baffles and go in divergent directions for wide distribution.

From the foregoing description, it is thought to be obvious that a distributing spout constructed in accordance with my invention is particularly well adapted for use, by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention can be changed and modified without departing from the principles and spirit thereof, and for this reason, I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice, except as claimed.

I claim:

1. A distributing spout for granular material having in combination a tubular housing having an upper entry end and a lower outlet end, a pair of elongated baffles disposed alongside each other in said housing, said baffles being disposed on opposite sides of said housing whereby said baffles have inner edges adjacent each other and have outer edges adjacent said housing, said baffles extending inclinedly with respect to the vertical and horizontal and transversely of each other, said baffles crisscrossing at a point as seen in a vertical section taken through said spout, means attaching each of said baffles to said housing, said baffles each extending horizontally substantially less than completely across said housing to allow substantial flow from said inlet to be deflected by the other baffle, that portion of each baffle which is at the same horizontal level with the lower end of said housing being spaced from the lower end of said housing sufficiently so that outlet openings are provided between the lower end of the housing and each of said baffles for the flow of material therethrough, the lower ends of said baffles extending downwardly in said housing at least substantially to the lower end of said housing for substantially and effectively distributing granular material out of the housing in two flow paths each inclined with respect to the vertical and the horizontal and each of which extends downwardly out of said housing and partially horizontally away from the respective outer side of said housing in general alignment with the upper side of the baffle from which the flow was delivered.

2. The combination of claim **1** in which the upper portion of the inner side of each baffle overlaps the lower portion of the other baffle as seen looking vertically through said housing.

3. The combination of claim **1** in which the lower ends of said baffles extend beyond the lower end of said housing for extra side delivery effect.

4. The combination of claim **1** in which a funnel is provided in said housing and is attached thereto, said funnel is provided having a large upper entry end facing the upper end of said housing and a constricted lower end centrally disposed in said tubular housing and facing said baffles and disposed sufficiently close to said baffles for effectively directing flow toward said baffles at a horizontal center of said housing, and the lower end of said funnel being disposed a substantial distance above the said point of criss-crossing of said baffles.

5. The combination of claim **1** in which each of said baffles has a notch in its said inner edge receiving the inner edge of the opposite one of said baffles, said notches being disposed directly opposite each other.

6. The combination of claim **1** in which the outer edges of said baffles extend sufficiently closely to the adjacent inner surfaces of said housing for substantially preventing grain particles from passing therebetween.

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ROBERT B. REEVES, *Primary Examiner.*

F. R. HANDREN, *Assistant Examiner.*