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F. R. PACKHAM & G. P. OATES.

GRAIN DRILL TUBE.

APPLICATION FILED NOV. 10, 1906.

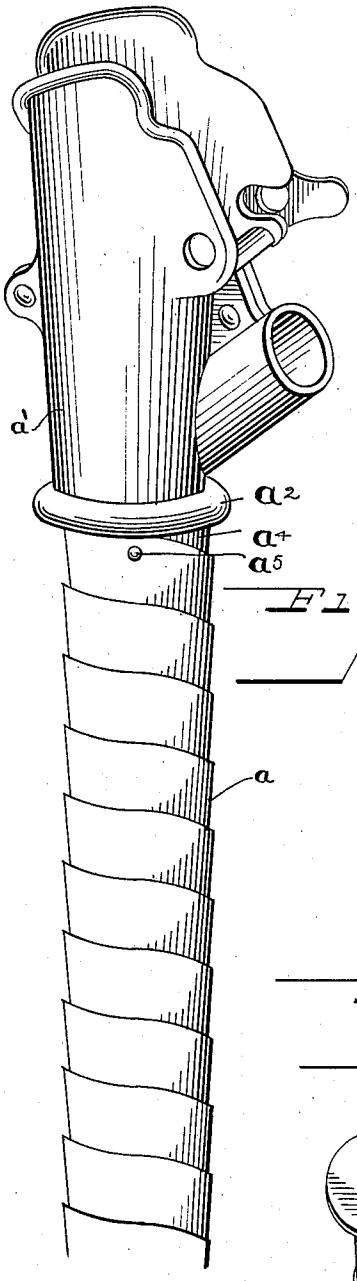


FIG 1

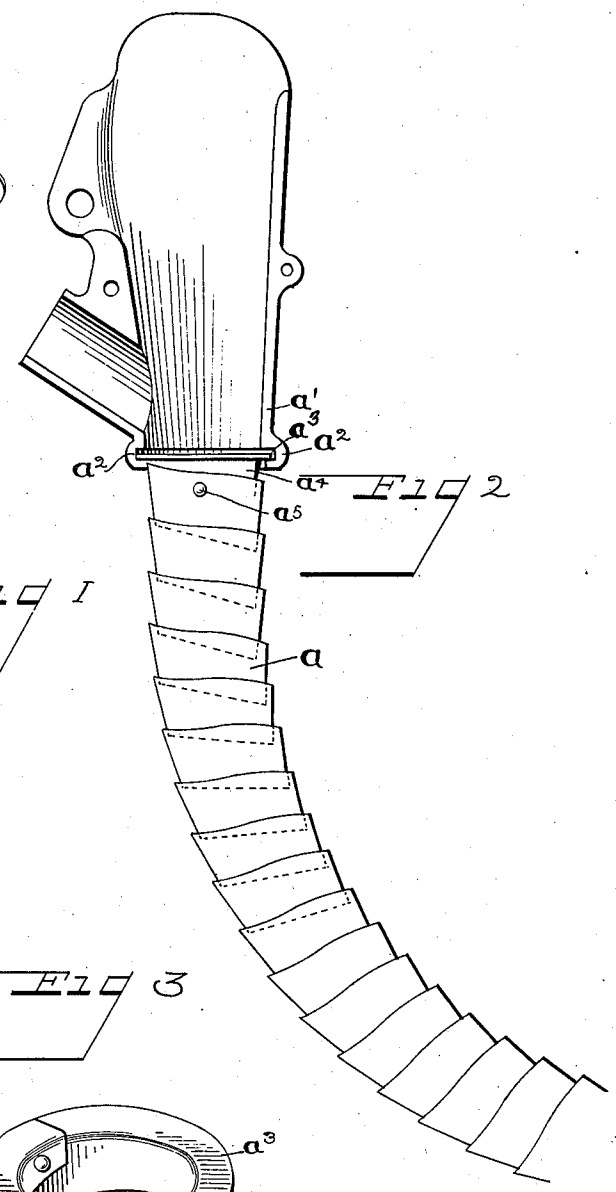


FIG 2

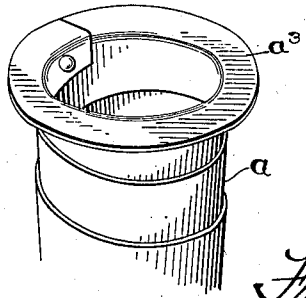


FIG 3

Witnesses

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# UNITED STATES PATENT OFFICE.

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## GRAIN-DRILL TUBE.

No. 841,888. Specification of Letters Patent. Patented Jan. 22, 1907.

Application filed November 10, 1906. Serial No. 342,795.

*To all whom it may concern:*

Be it known that we, FRANK R. PACKHAM and GEORGE P. OATES, citizens of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Drill Tubes, of which the following is a specification.

Our invention relates to conductor-tubes for grain-drills, and particularly relates to flexible spiral ribbon conductor-tubes so arranged to insure the proper feeding of the grain.

The object of the invention is to construct a spiral ribbon tube so connected to the support therefor that the tube will be maintained uniform in diameter in spite of the flexing of the tube by reason of strains incident to its use, and thereby preventing the gaping of the whirls comprising the tube, which would interfere with the proper feeding of the grain through the tube.

In the accompanying drawings, Figure 1 is a view in perspective of the tube connected to the support therefor. Fig. 2 is a sectional view. Fig. 3 is a detail view of the top of the tube.

Like parts are indicated by similar characters of reference throughout the several views.

The tube *a* is preferably made of an endless ribbon band and is spiral-shaped. The whirls of the tube are shown overlapping, and it is apparent from the views that the diameter of the tube is uniform throughout. In this construction of tube it is very important that the diameter of the tube be maintained uniform in order to prevent the whirls becoming separated by the strains incident to the use of the device and thereby causing openings such that the seed may spill out of the tube before reaching its discharge end. Figs. 1 and 2 disclose the casting $a'$, which is connected to any form of hopper that may be used, and the seed drops from the hopper through this casting. This casting or support is preferably formed with a bell-shaped tube-top at its lower end, as indicated at $a^2$. The upper whirl of the tube is formed with a flange, as indicated at $a^3$, Fig. 3, and the upper whirl $a^4$ is riveted to the next succeeding whirl at the point indicated by $a^5$, Figs. 1 and 2. In this way we have reinforced the upper part of the tube, and by means of the loose internal connection, as hereinafter described, we are able to maintain the uniform diameter of the tube even when flexed out of normal position, as indicated in Fig. 2.

The preferable form of loose connection shown is made by the flange $a^3$ fitting within a socket formed in the bell-shaped tube-top $a^2$. As clearly appears in Fig. 2, there is shown a space formed vertically and laterally between the flange $a^3$ and the body of the tube-top. This insures a limited amount of movement both vertically and laterally at the place of connection between the ribbon tube and the support.

The use of ribbon tubes has been unsatisfactory because they have been connected externally with the support therefor, and in order to make this connection it has been necessary to uncoil one or more of the whirls of the tube in order to extend the diameter sufficiently to permit this application to the outside wall of the support or tube-top. This not only weakens the tube by reason of the expansion of the whirls constituting it, but the extension of the diameter of the expanded coils is liable to cause them to gape open as the tube is flexed from one direction to another. By our improved device this serious defect is entirely obviated. During the flexing of this improved spiral ribbon tube there is such a movement at the loose connection that the tendency to strain the whirls is obviated, and the reinforcing of the two upper whirls by riveting them together insures that at the point of greatest strain the whirls will not be strained apart so as to permit objectionable gaping between the ends of the whirls, but, on the contrary, the whirls will always remain overlapped sufficiently to insure the grain being fed through the conductor-tube to the discharge end.

We do not desire to limit ourselves in this invention to the specific details of construction shown herein, but desire a construction that will be commensurate with the invention shown.

Having thus described our invention, we claim—

1. The combination of a flexible spiral ribbon tube, means for reinforcing the upper whirls of said tube, with the tube-top, and

means for internally connecting the tube to said top, substantially as described.

2. The combination of a flexible endless ribbon tube comprising a plurality of whirls, each whirl having a smooth engaging surface for the next succeeding whirl, and each whirl flexibly connected to the next succeeding whirl, a projecting part on the upper whirl, a tube-top, and means for securing the projecting part of the upper whirl within the tube-top.

3. The combination of a ribbon tube comprising a plurality of whirls, means for reinforcing the upper part of the tube, and means for maintaining uniform the diameter of the tube at its upper part, a tube-top, and a loose internal connection between the tube-top and the tube whereby the diameter of the tube is maintained throughout its length, for the purpose specified.

In testimony whereof we have hereunto set our hands this 8th day of November, 1906.

FRANK R. PACKHAM.
GEORGE P. OATES.

Witnesses:
THAYER K. MORROW,
CHAS. I. WELCH.