No. 725,624. PATENTED APR. 14, 1903.

C. N. LEONARD.

PNEUMATIC STACKER.

APPLICATION FILED FEB. 16, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

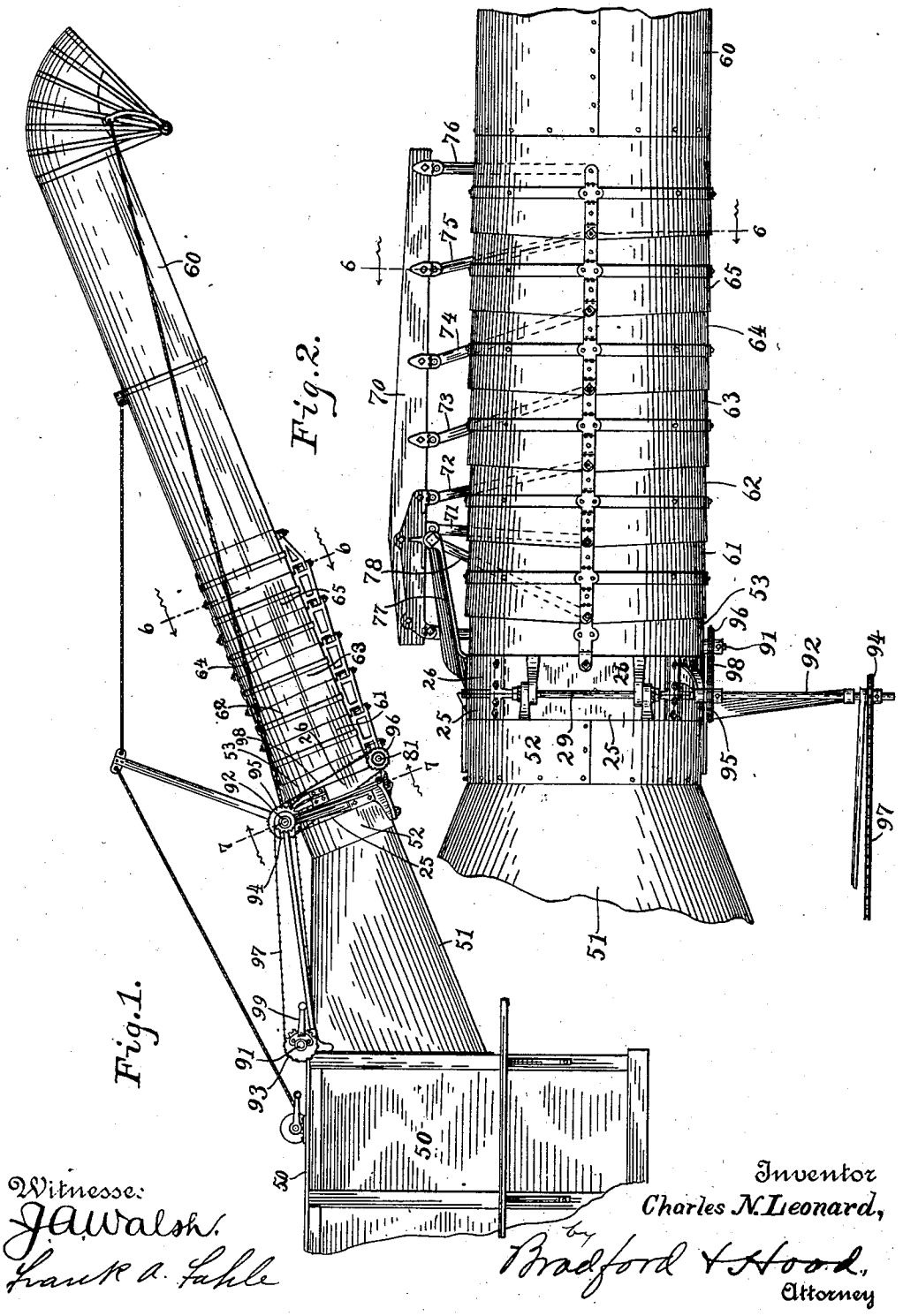


Fig. 1.

Fig. 2.

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NO MODEL. 4 SHEETS—SHEET 2.

Fig. 4.

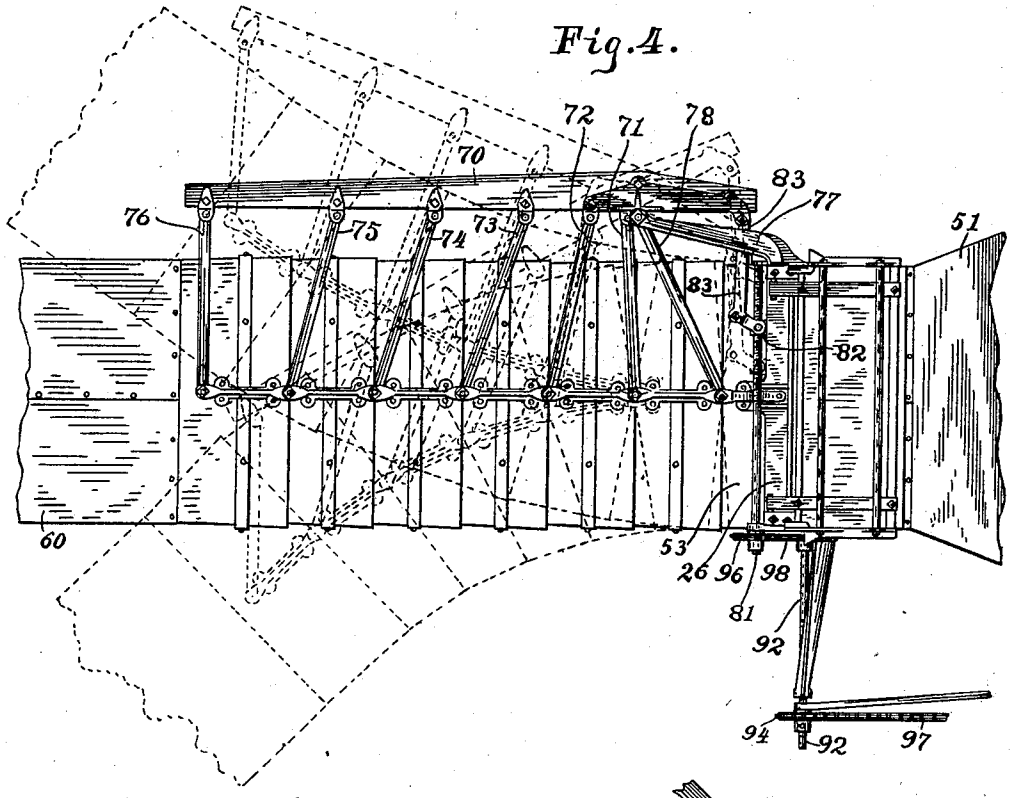
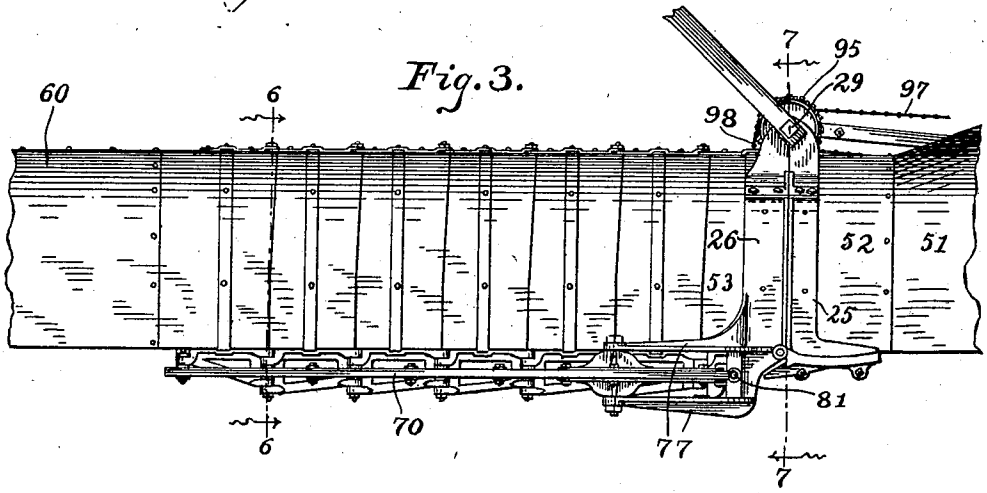


Fig. 3.



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NO MODEL. 4 SHEETS—SHEET 3.

Fig. 6.

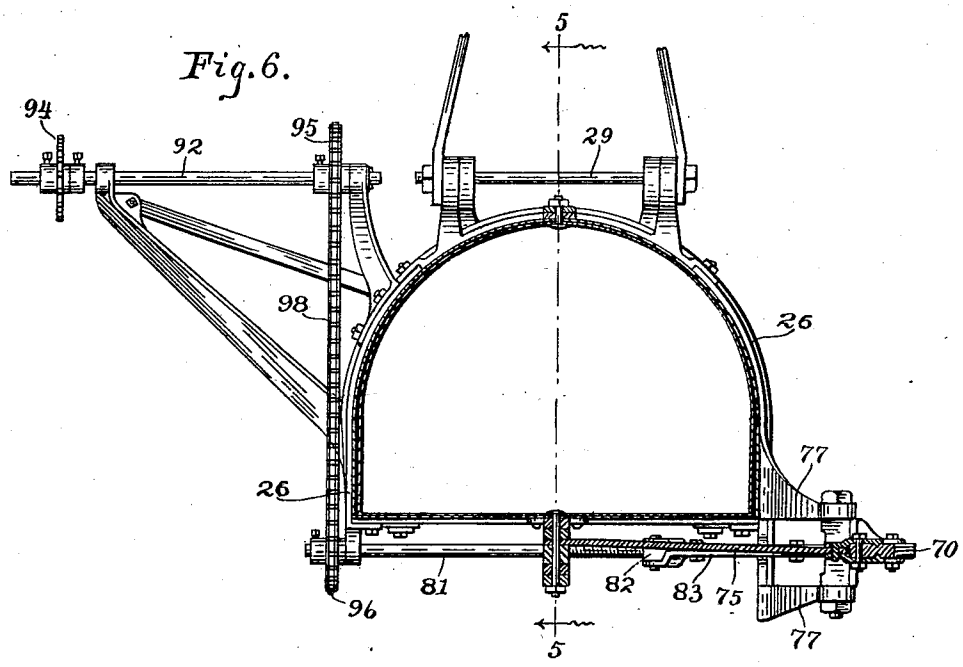
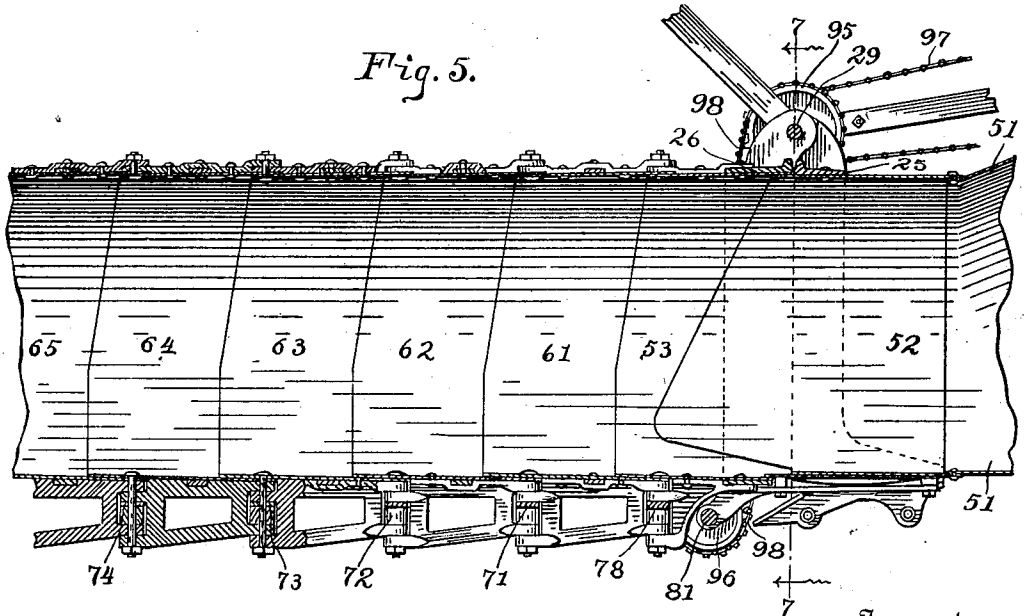


Fig. 5.



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NO MODEL. 4 SHEETS—SHEET 4.

Fig. 7.

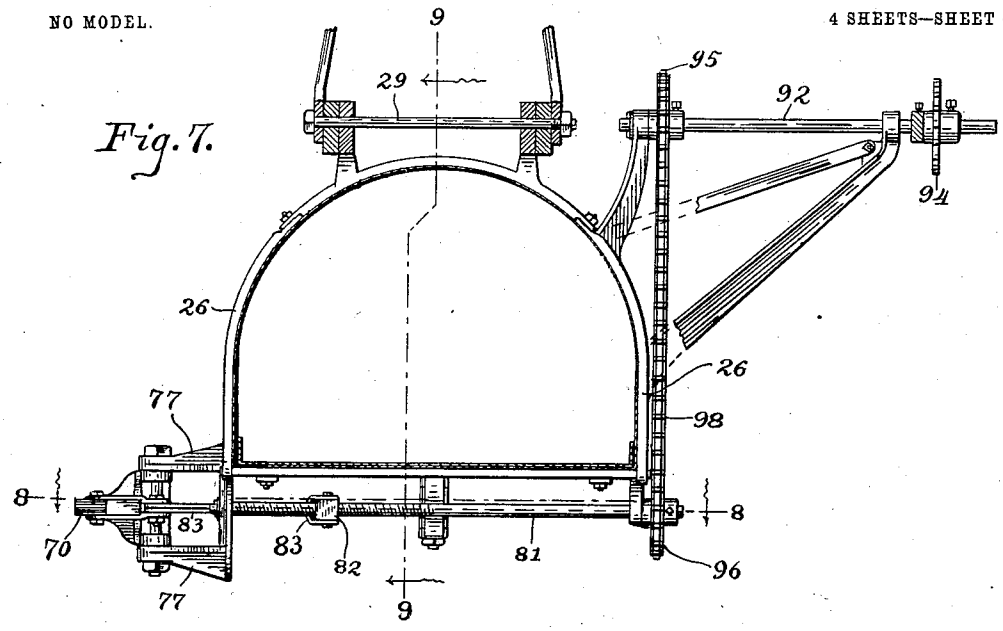


Fig. 8.

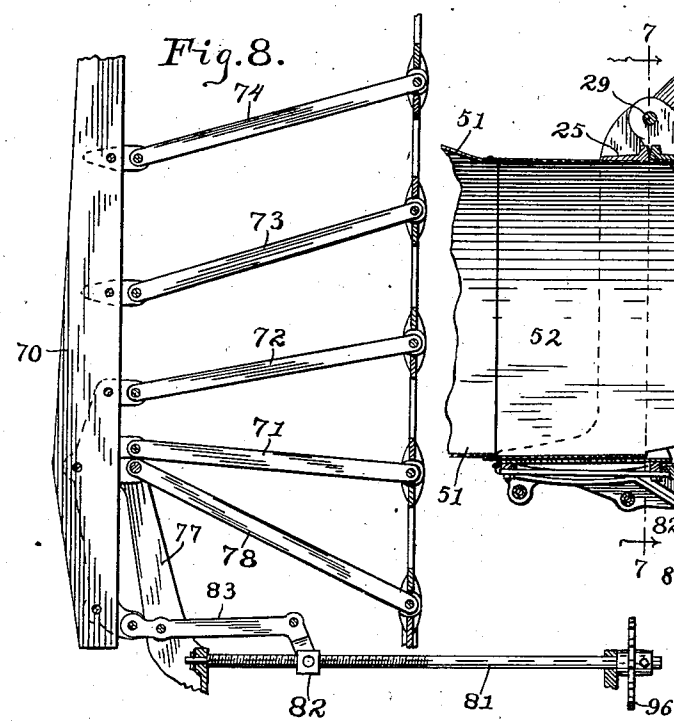
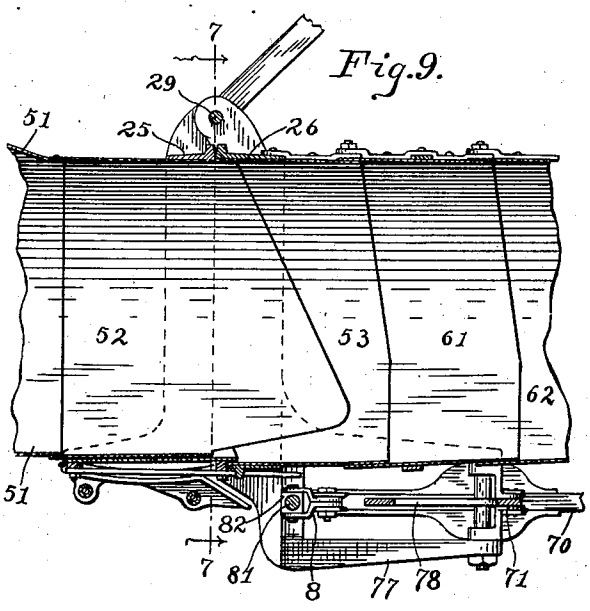


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES N. LEONARD, OF INDIANAPOLIS, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE INDIANA MANUFACTURING COMPANY, OF INDIANAPOLIS, INDIANA, A CORPORATION OF WEST VIRGINIA.

PNEUMATIC STACKER.

SPECIFICATION forming part of Letters Patent No. 725,624, dated April 14, 1903.

Application filed February 16, 1903. Serial No. 143,657. (No model.)

To all whom it may concern:

Be it known that I, CHARLES N. LEONARD, 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 Pneumatic Stackers, of which the following is a specification.

This invention relates to that class of pneumatic stackers in which a turn-table is dispensed with; and it consists in a means for enabling the duct to be moved from side to side sufficiently for the purpose of distributing the material ejected by the stacker over the desired area, such means consisting in the making of a portion of the duct of minor sections and providing mechanism by which said minor sections are substantially uniformly moved as the duct is swung from side to side, so that the result is a substantially regular curve or deflection of said duct at whatever position it is forced within the limits of its movement.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation of a stacker of the variety in question provided with the flexible-portion accessories embodying my present invention as the same appears when mounted upon the body of the machine with which the stacker is intended to operate, such as a threshing-machine or separator; Fig. 2, a top or plan view of so much of the stacker-duct and immediately adjacent parts as embody said invention on an enlarged scale; Fig. 3, a side elevation of the opposite side from that shown in Fig. 1 of the parts shown in Fig. 2; Fig. 4, an under side plan view of the parts and in the arrangement shown in Fig. 3, that portion of the duct shown being illustrated in its straight position by means of full lines and in its extreme deflected positions by means of dotted lines; Fig. 5, a central vertical sectional view as seen when looking in the direction indicated by the arrows from the dotted line 5 5 in Fig. 6 through a portion of the parts embodying my said invention on a still further enlarged scale; Fig. 6, a transverse vertical sectional view as seen when looking in the directions indicated by the arrows from the dotted lines 6 6 in Figs. 3, 2, and 1; Fig. 7, a transverse vertical sectional view as seen when looking in the directions indicated by the arrows from the dotted line 7 7 in Figs. 1, 3, and 5; Fig. 8, a plan view of the principal operating mechanism as seen when looking downwardly from the dotted line 8 8 in Fig. 7; and Fig. 9, a detail central vertical sectional view as seen when looking in the direction indicated by the arrows from the dotted line 9 9 in Fig. 7.

The stacker, as above indicated, is an attachment to another machine and is shown as mounted upon an ordinary threshing-machine or separator, a fragment of which, 50, is shown in Fig. 1 of the drawings. The stacker begins with a straw-chamber 51, which is rigidly attached to the rear end of the separator 50 and is of a suitable shape to receive the straw or other material as it is discharged therefrom. The stacker trunk or duct proper preferably begins with a section 52, which is rigidly connected to the chamber 51 and forms the termination thereof. The next section 53 of the stacker-duct is also non-movable laterally and is the part to which the articulated duct-sections embodied in my present invention are hinged. The sections 52 and 53 have bands 25 and 26 at their adjacent edges which carry suitable ears through which a hinge-rod 29 extends, by which the stacker-duct as a whole is hinged or connected to the chamber, and by means of which, also, said stacker-duct is enabled to be folded back onto the separator when desired. This hinge construction, however, is embodied in an invention which constitutes the subject-matter of a separate companion application executed concurrently herewith and will not, therefore, be further described herein, except incidentally in describing the said invention.

The duct of the stacker is formed of such length as is suitable for the requirements of the work to be done. Its outer portion 60, which generally constitutes the greater portion of its length, is commonly a straight inflexible pipe of suitable shape in cross-section, carrying upon its outer end a suitable deflecting and guiding hood, as shown in Fig. 1. The lower portion of this duct is, as above

indicated, composed of a suitable number of minor sections hinged together, and I have shown in the present application five such sections 61, 62, 63, 64, and 65. Each of these sections is connected to the adjacent section by means of two hinge parts centrally disposed at the top and bottom sides of the duct, respectively, the pivot-points of the corresponding hinge parts being of course substantially in line with each other. Alongside one of these sets of hinged parts (preferably the lower or under side set) I have placed an operating-bar 70 and have connected said bar to the corresponding hinge structures of the said minor duct-sections by the links 71, 72, 73, 74, and 75, and have also connected said bar to the outer or main duct-sections 60 by a corresponding link 76. The bar 70 is supported upon a suitable rigid arm or arms 77, which I have shown as extending out from the hinge-band 26, and which is also provided for purposes of additional rigidity and strength with a brace-bar 78, running back to the section 53, where it is connected, for convenience, to the first or rigid hinge part which said member carries. However, this brace-bar just described has no operative function and could be dispensed with by making the arm 77 of sufficient rigidity and strength. A lighter and more symmetrical construction, however, results from the use of such brace without sacrifice of such strength and rigidity.

In order to conveniently and efficiently operate the bar 70 and with it the stacker-duct, as above indicated, and especially illustrated in Fig. 4 of the drawings, I provide a screw-shaft 81, which is revolubly mounted in suitable bearings in ears or extensions provided for the purpose on the hinge-band 26, the construction being such as to prevent longitudinal motion of said shaft. A traveling nut 82 is mounted on the screw-threaded portion of said screw-shaft, and said nut is connected, by means of a link 83, with the rear end of the bar 70. The consequence is when the said screw-shaft is revolved that the bar is moved laterally, (swinging on the pivot-joint by means of which it is connected to the supporting-arms 77,) with the result that the movements, especially illustrated by the dotted lines in Fig. 4 of the drawings, are given to the various duct-sections, so that the duct as a whole is moved from side to side, and the minor duct-sections operated upon are caused to assume a substantially regular curve. In making my calculations to secure this regularity of curve I have found it desirable to make all the several links of differing lengths and arrange them at differing angles, as clearly shown in the drawings, particularly Figs. 4 and 8. The inner ends, where they are connected to the hinged sections, are equal distances apart; but the outer ends, where they are connected to the bar 70, are differing distances apart, as shown. In the full-sized stacker which I have made the distance from center to center of the pivots of the hinge structures on the duct-sections is eight inches. The distances between the centers of the various pivots along the bar 70 are as follows: Between that by which said bar is connected to its supporting-arm 77 and the pivot connecting the link 71 to the bar 70, one and one-fourth inches; between the pivots of links 71 and 72, three and one-fourth inches; between those of links 72 and 73, six inches; between those of links 73 and 74, eight and one-fourth inches; between those of links 74 and 75, nine and one-half inches, and between those of links 75 and 76 twelve inches. These distances are, however, only given for purposes of information, so that my invention can be conveniently carried out, and I do not desire to be understood as being limited in this matter, as such distances must necessarily depend upon the sizes, proportions, and arrangement of the various parts.

It is desirable that all mechanism of this sort should be driven from a point on the separator which is easily within reach of the operator. I have therefore (see Fig. 1) mounted a small crank-shaft 91 on the separator-frame and have provided a second shaft 92 in line with the hinge-pivot 29 and have placed a sprocket-wheel 93 on the shaft 91, two other sprocket-wheels 94 and 95 on the shaft 92 and a fourth sprocket-wheel 96 on the screw-shaft 81, and have connected the sprocket-wheels 95 and 96 with a sprocket-chain 98. By this means by turning the crank 99, also mounted on the shaft 91, I am enabled to drive the screw-shaft 81 from a point on the separator, and this irrespective of the elevation at which the stacker-duct may be positioned, the point of change of direction (viz., the axis of shaft 92) being in line with the axis of the hinge on which the stacker-duct as a whole is moved in raising or lowering it.

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

1. The combination of a multiplicity of minor duct-sections hinged together, a bar arranged alongside the hinges connecting said sections, a suitable support for said bar, links connecting said bar and said minor duct-sections, and means for actuating said bar, whereby the duct portion composed of the said sections is moved laterally in one direction or the other and caused to assume a curved position.

2. The combination, with a multiplicity of minor duct-sections, of a bar pivotally mounted on a support alongside said duct-sections, said support, and links connecting said bar to said sections, said links being connected (at the hinged points where they are united) to the duct-sections and extending therefrom, in differing directions, to the points where they are united to the bar.

3. The combination of a multiplicity of minor duct-sections, hinge structures uniting said duct-sections centrally on two opposite

sides, a bar extending alongside one of said hinge structures, a rigid support for said bar extending out from the initial minor duct-section, and means for swinging said bar on its support and thus causing the duct to assume a curved position.

4. The combination, in a hinged or foldable duct, of a stationary part, a movable part hinged to said stationary part and composed in part of minor duct-sections flexibly connected, means for moving said minor duct-sections in respect to each other and thus causing the duct to assume a curved or deflected position, an actuating shaft for effectuating the last-named purpose, a shaft in line with the hinge-pivot on which the foldable part of the duct is mounted and bearing wheels or pulleys, a wheel or pulley on the means for actuating the flexibly-connected duct-sections, another wheel or pulley on a shaft at the rear of the structure, and flexible connectors one running from the pulley on the last-named shaft to one of the pulleys on the first-named shaft, and the other running from the other pulley on the first-named shaft to the pulley on the means for actuating the flexibly-connected minor duct-sections.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 10th day of February, A. D. 1903.

CHARLES N. LEONARD. [L. S.]

Witnesses:

CHESTER BRADFORD,

JAMES A. WALSH.