

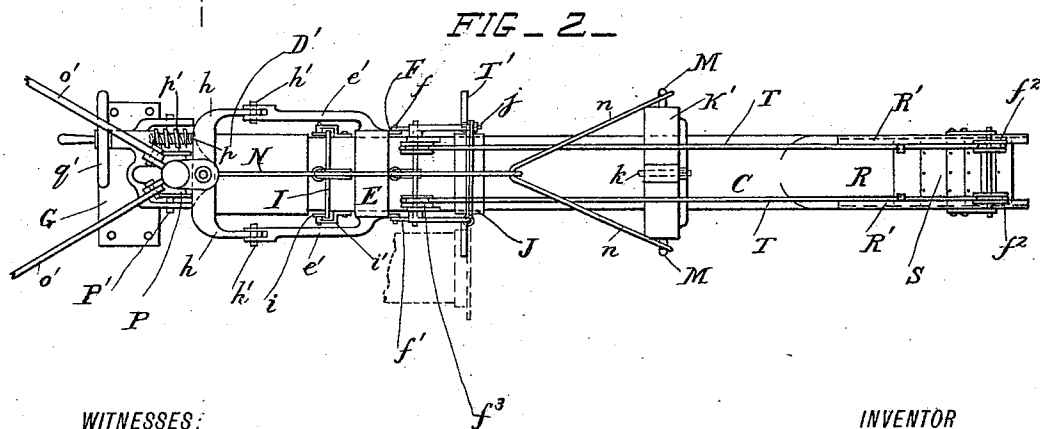
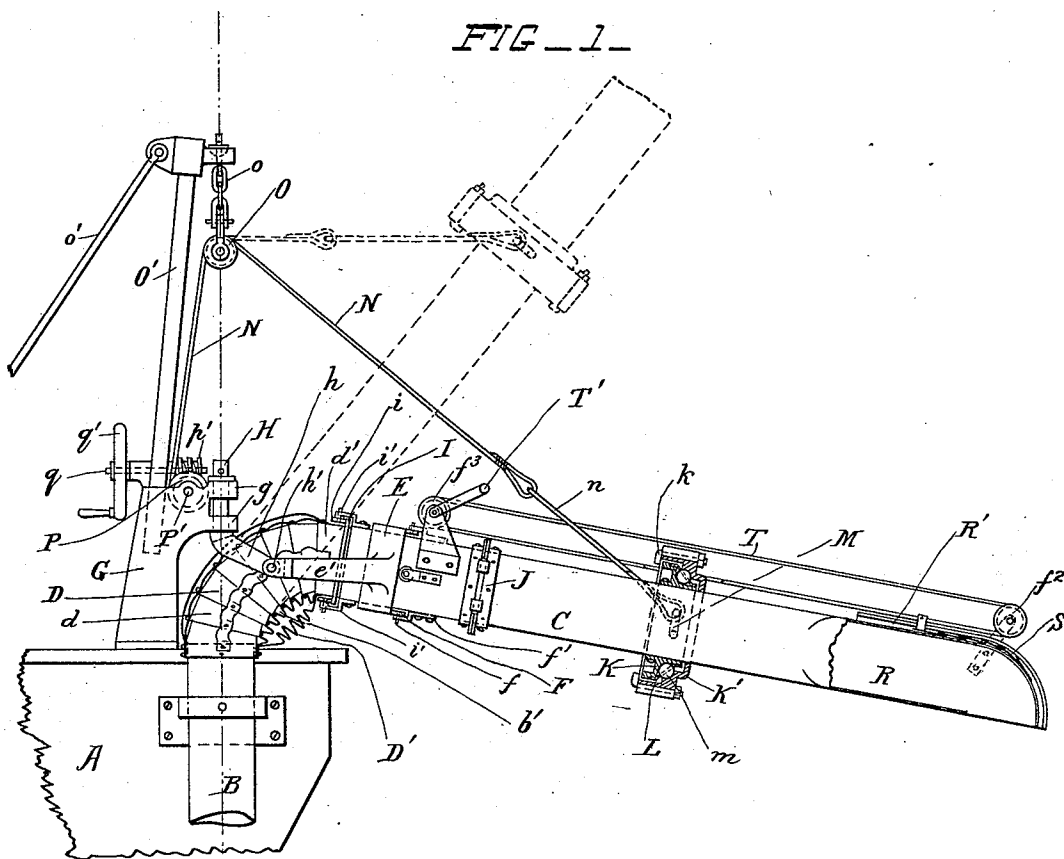
(No Model.)

2 Sheets—Sheet 1.

F. F. LANDIS.
PNEUMATIC STRAW ELEVATOR.

No. 514,266.

Patented Feb. 6, 1894.



WITNESSES:

Geo T Doran Jr
A. H. Simmonds

INVENTOR

Frank F. Landis.

BY

Herbert W. Jenner.

ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

F. F. LANDIS.
PNEUMATIC STRAW ELEVATOR.

No. 514,266.

Patented Feb. 6, 1894.

FIG. 3.

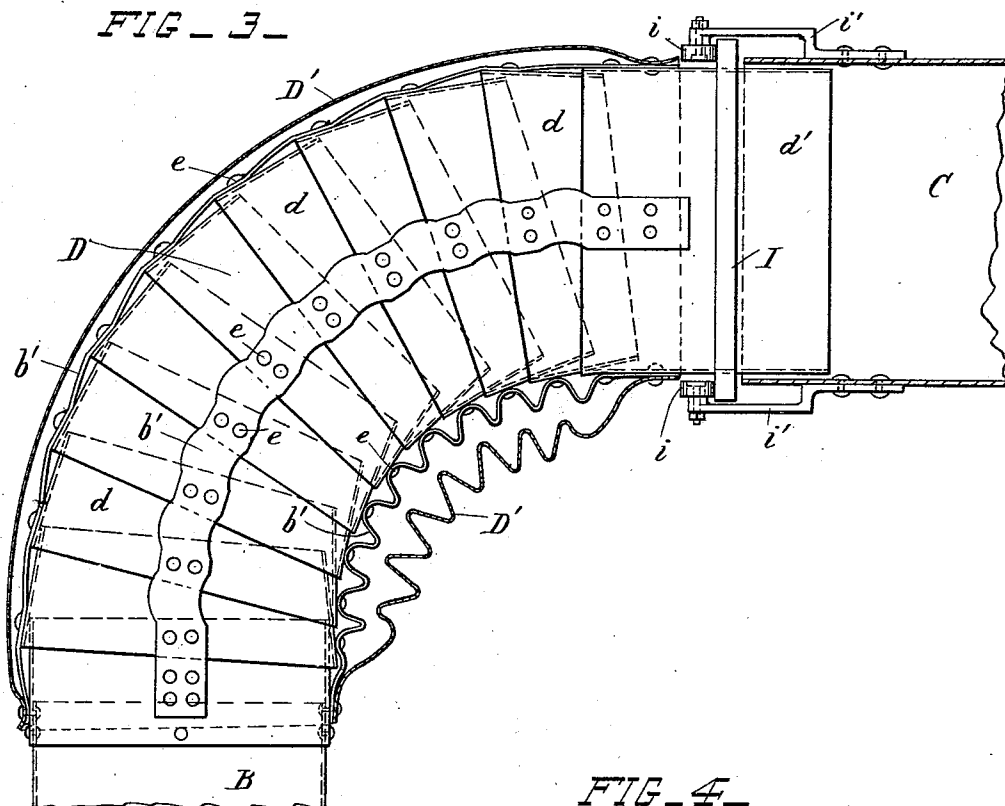
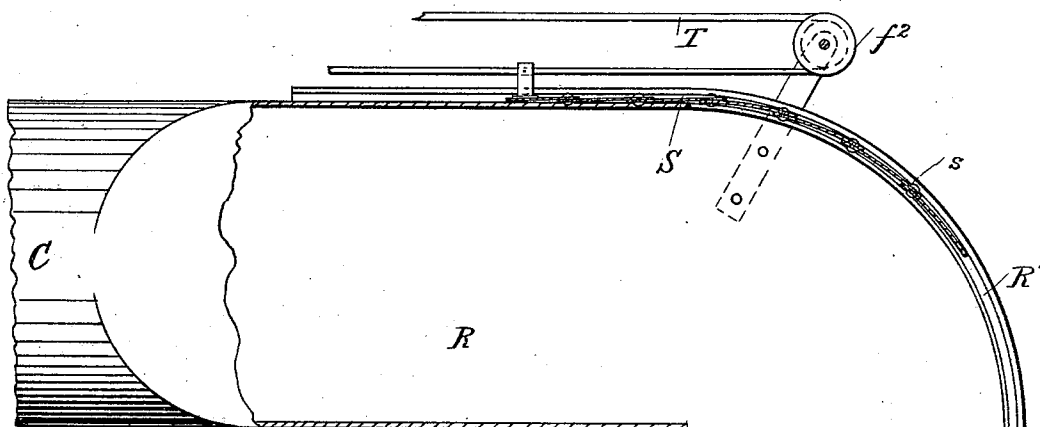


FIG. 4.



WITNESSES:

Geo. F. Doran Jr.
A. H. Simonds

INVENTOR

Frank F. Landis.

BY

Herbert W. Jenner.
ATTORNEY.

UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

PNEUMATIC STRAW-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 514,266, dated February 6, 1894.

Application filed August 7, 1893. Serial No. 482,556. (No model.)

To all whom it may concern:

Be it known that I, FRANK F. LANDIS, a citizen of the United States, residing at Waynesborough, in the county of Franklin and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Straw-Elevators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to pneumatic straw elevators and stackers used in connection with thrashing machines; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings: Figure 1 is a side view of the straw stacker partly in section; and Fig. 2 is a plan view of the same. Fig. 3 is a detail side view of the flexible junction pipe drawn to a larger scale and showing a portion of the revoluble discharge pipe in section. Fig. 4 is a longitudinal section through the end of the discharge pipe drawn to a larger scale.

A is a portion of the casing of a grain separator, and B is the delivery pipe through which the straw is driven by a blast of air in any approved manner. The pipe B is rigidly secured to the separator casing.

C is the revoluble discharge pipe which is made of a length sufficient to stack the straw to the required height.

D is a flexible junction pipe which connects the pipes B and C and permits the pipe C to be moved in every direction both vertically and circumferentially. Any kind of a flexible junction pipe which will give the requisite range of movement may be used, but preference is given to a sheet metal pipe formed of articulated segments and inclosed in a flexible and substantially air-tight casing or tube.

The pipe D consists of a series of overlapping conical segments *d*, and an end piece *d'*. The bottom segment is secured to the pipe B. The segments *d* are all alike and are operatively connected together and to the plain circular end piece *d'* by means of three or more straps *b'* of flexible material, such as leather. Four straps arranged equi-distant from each other are preferred. Each strap

is secured to all the segments by bolts or rivets *e* at points where the segments never overlap, and the straps are made of a length sufficient to permit the segments to bend over to the greatest requisite curvature. The segments fit into each other loosely, and in order to prevent straw from being driven between their joints by the pressure of the blast, the segments are inclosed in a tube *D'* of flexible material. The tube *D'* is secured to the end of the pipe B and to the end piece *d'* in any approved manner, and is preferably made of canvas or some other similar material which is practically air-tight.

E is a collar journaled on the pipe C and provided with rearwardly projecting arms *e'*.

F are rollers journaled on the pins *f* carried by the brackets *f'* which are secured to the pipe C. These rollers bear against one end of the collar E, but the thrust of the pipe C, when raised, may be taken in any other approved manner besides using the rollers F.

G is a standard secured to the top of the separator casing and provided with bearings *g* arranged vertically over the center of the pipe B.

H is a shaft journaled in the bearings *g*, and provided with a yoke *h* at its lower end. The ends of the yoke are pivoted to the ends of the arms *e'* by the pins *h'*. The shaft and yoke prevent the segments *d* from telescoping into each other. They also permit the pipe C to be revolved in a horizontal plane for the greater part of a circle, and they also permit it to be raised to the position indicated by the dotted lines in Fig. 1.

A collar I is secured on the end piece *d'* which is inserted into the pipe C, and *i* are rollers journaled on pins projecting from the brackets *i'* which are secured to the pipe C. The brackets *i'* extend over the collar I, and the rollers bear against the said collar and hold the segments *d* extended, at the same time permitting the end piece *d'* and the pipe C to revolve freely and independent of each other.

The pipe C is made in two portions connected together by the hinge J. When the elevator is in operation the two portions of the pipe C are secured in line with each other, but when the separator is being moved from place to place the bolt *j* of the hinge is re-

moved and the front portion of the pipe C is turned back, as indicated by the dotted lines in Fig. 2, for convenience.

K is a collar or ring which is secured to the pipe C at about the middle of its length.

K' is a collar, which is slipped over the collar K, and is provided with hooked bolts *k* to prevent its return.

L is a spacing ring arranged diagonally in the chamber formed by the two collars K and K', and *m* are balls which are dropped into holes in the ring L and form a ball bearing between the two said collars.

M are lugs on the collar K' for the attachment of the lifting cord.

N is the lifting cord preferably provided with two ends *n* which are connected to the lugs M.

O is a sheave which is suspended over the center of the pipe B and is free to turn in every direction.

O' is a support for the sheave O, and preferably consists of a tube secured at its lower end to the standard G. The support O' is provided with a cap at the top to which the sheave block or bracket is connected by the links *o*; and *o'* are stay rods for the tube O', which are secured at their lower ends to any convenient part of the separator casing.

P is a barrel secured on the shaft P' which is journaled in the standard G. A worm wheel *p* is secured on the shaft P', and is driven by the worm *p'*, which is secured on the shaft *q*, also journaled in the said standard and provided with the hand wheel *q'* for revolving it.

The end of the lifting cord N is wound on the barrel P, and the pipe C is raised and lowered by turning the hand wheel *q'*. Any other approved hoisting mechanism may be used for winding up the lifting cord if desired.

The discharge pipe C is preferably provided with a rectangular end portion R which is open at the end and bottom. The sides of the end portion R have curved guides R' secured to them, and these guides have straight upper portions arranged parallel with the discharge pipe.

S is a flexible jointed plate which slides in the guides R. The plate preferably consists of several plates of thin sheet iron loosely connected together by rivets *s*. The loosely fitting rivets permit the plate S to bend freely and the separate plates are also bent slightly when made of thin sheet metal.

When the plate S is in the straight parts of the guides, the straw is driven out of the end of the pipe in a straight line by the blast; but when the plate S is pushed forward into the curved parts of the guides, the straw is deflected and is discharged downward onto the stack.

Any approved operating device may be used for sliding the plate S back and forth in its guides.

T is an endless cord, or its equivalent such

as a chain, wire rope or band. The cord T is secured to the plate S. One end of the cord or chain passes around the guide sheave *f*² at the end of the pipe, and the other end passes around the driving sheave *f*³, which is mounted on a shaft journaled in brackets secured to the pipe C, and provided with a handle T', and arranged so that it may be operated by a man standing on the separator casing. The cord T and its driving devices may be duplicated if desired. The handle T' is also used to revolve the pipe C to the right or to the left. When the pipe C is swung around horizontally the end piece *d'* of the pipe D revolves inside the pipe C, and the pipe C is not revolved, the revolution of the pipe C being independent of the junction pipe and controlled by hand.

I do not confine myself to the specific construction of the various parts of the device when used in combination, as the construction of the flexible pipe D, for instance, may be changed without changing its action in combination with the revoluble pipe C.

I do not claim the specific form of deflector shown at the end of the discharge pipe, as I am aware that the same has been used by others.

What I claim is—

1. In a pneumatic straw elevator, the combination, with a stationary delivery pipe, a swinging discharge pipe, and a flexible junction pipe connecting the aforesaid pipes; of a jointed support operatively connected with the said discharge pipe, and a stationary standard pivotally connected with the said support, whereby the said junction pipe is prevented from telescoping, substantially as set forth.

2. In a pneumatic straw elevator, the combination, with a stationary delivery pipe, a swinging discharge pipe revoluble on its own axis, and a flexible junction pipe connecting the aforesaid pipes; of an adjustable deflector at the free end of the discharge pipe, and a supporting device—such as a cord—connected with the said discharge pipe, whereby the said discharge pipe is free to be moved both vertically and horizontally and may be caused to discharge the straw to the right or left and at different angles, substantially as set forth.

3. The combination, with the stationary delivery pipe, and a standard provided with a bearing arranged in line with the said pipe; of a flexible junction pipe secured at one end to the delivery pipe, a discharge pipe revolubly connected with the other end of the junction pipe, a collar journaled on the discharge pipe and provided with rearwardly extending arms, and a vertical shaft journaled in the said bearing and provided with a yoke having its ends pivoted to the ends of the said arms, substantially as and for the purpose set forth.

4. The combination, with the stationary delivery pipe, and a stationary support provided with a bearing and a sheave both arranged substantially over the center of the delivery

pipe; of a flexible junction pipe secured at one end to the delivery pipe, a discharge pipe revolubly connected with the other end of the junction pipe, a collar journaled on the discharge pipe and provided with rearwardly extending arms, a vertical shaft journaled in the said bearing and provided with a yoke having its ends pivoted to the ends of the said arms, a lifting cord passing over the said sheave and connected with the discharge pipe, and winding mechanism connected to the said cord, whereby the discharge pipe may be raised and lowered and swung around, substantially as set forth.

5 5. The combination, with the stationary delivery pipe, and the flexible junction pipe secured at one end to the delivery pipe and provided with a collar on its other end; of the discharge pipe journaled on the free end of the junction pipe; and the brackets secured to the discharge pipe, extending over the said collar, and provided with rollers bearing against the side of the collar, substantially as set forth.

25 6. The combination, with the stationary de-

livery pipe of a straw elevator; of a flexible junction pipe consisting of a series of overlapping conical segments *d*, a lower end piece rigidly secured to the said delivery pipe, and an upper end piece *d'*, a series of flexible straps 30 secured to the segments and to the end piece, and a tube of flexible material inclosing all of the said segments; and a discharge pipe revolubly connected with the said end piece *d'*, substantially as set forth. 35

7. The combination, with the delivery pipe of a straw elevator, of a universal junction pipe rigidly secured to the said pipe, and consisting of a series of overlapping conical segments, a series of flexible straps secured to 40 the said segments, and a tube of flexible material inclosing the said segments, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK F. LANDIS.

Witnesses:

HERBERT W. T. JENNER,
ALF. N. RUSSELL.