

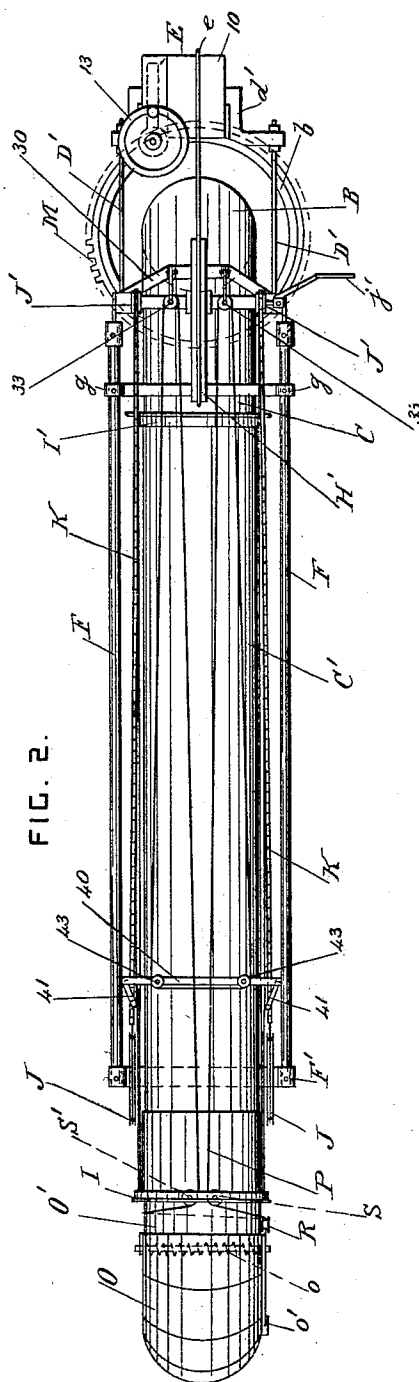
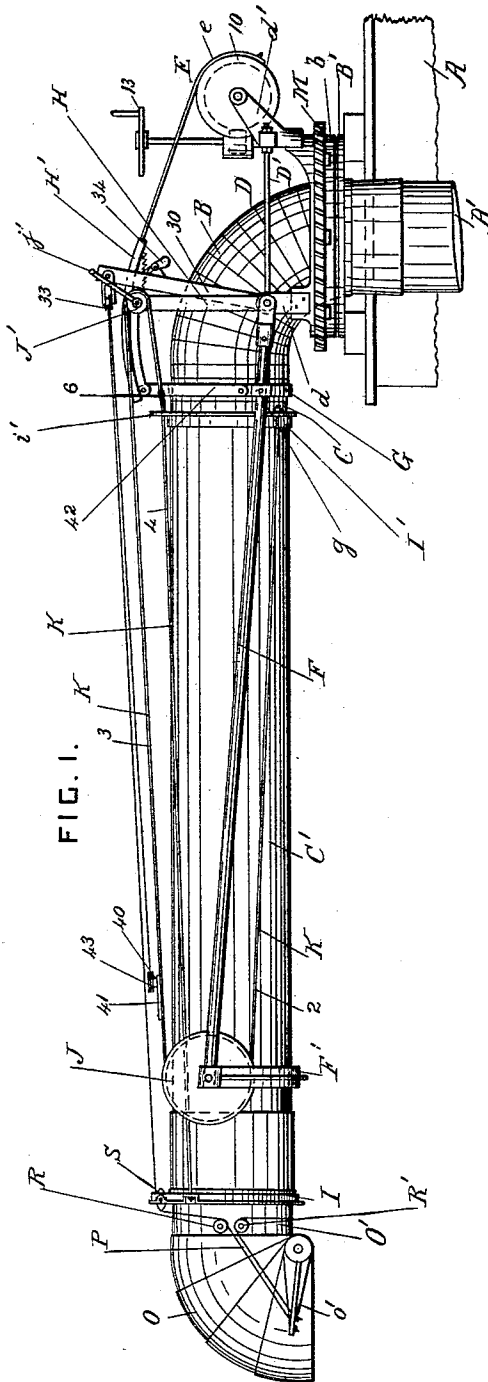
(No Model.)

3 Sheets—Sheet 1.

F. F. LANDIS.
PNEUMATIC STACKER.

No. 569,504.

Patented Oct. 13, 1896.



Witnesses

George H. Bliss, Jr.
George H. Bliss

Inventor

Frank F. Landis.

By Attorney *Karl W. Jenner.*

(No Model.)

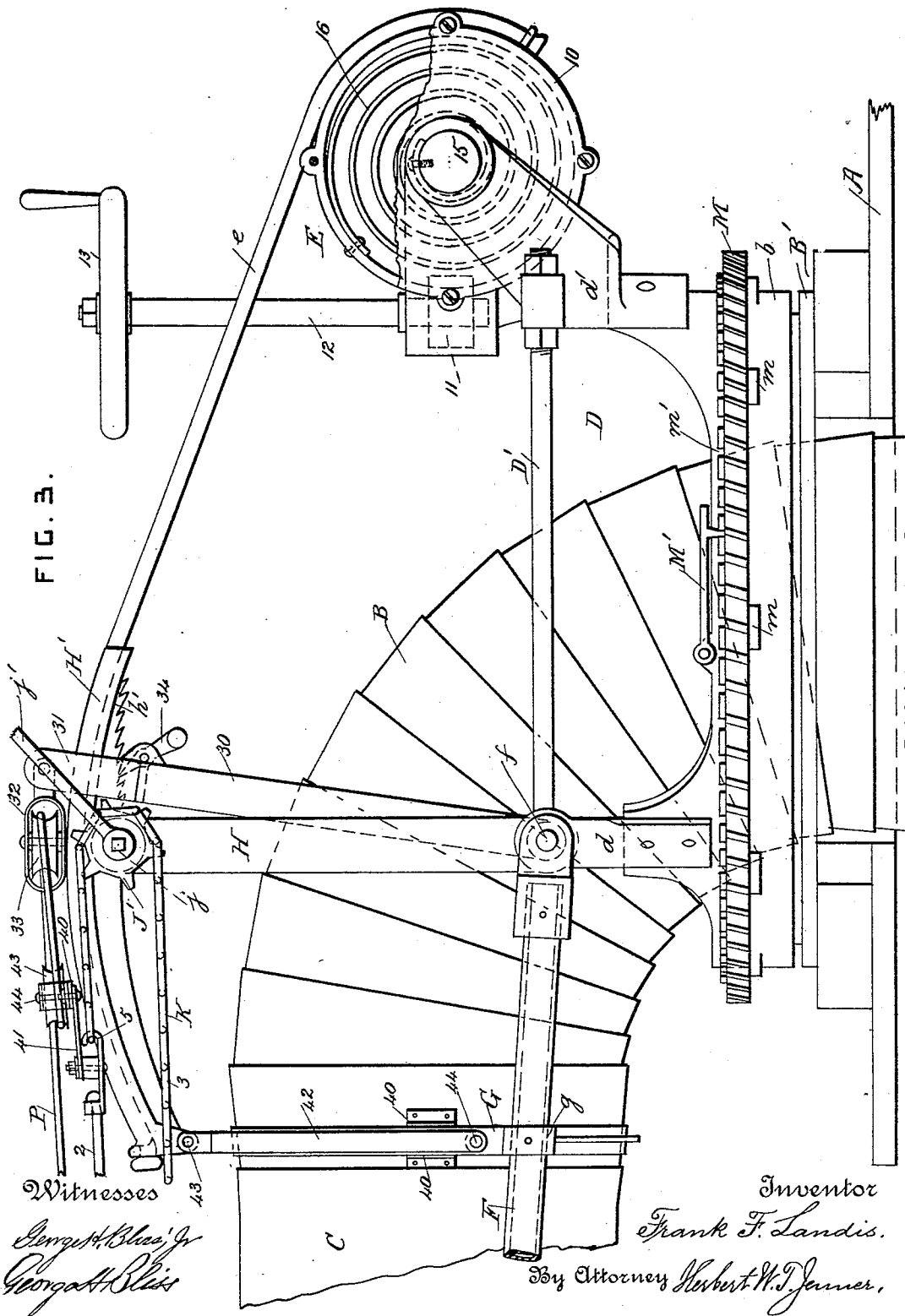
3 Sheets—Sheet 2.

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FIG. 3.



(No Model.)

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FIG. 5.

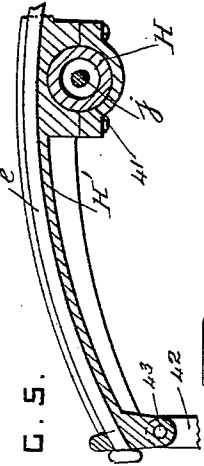


FIG. 6.

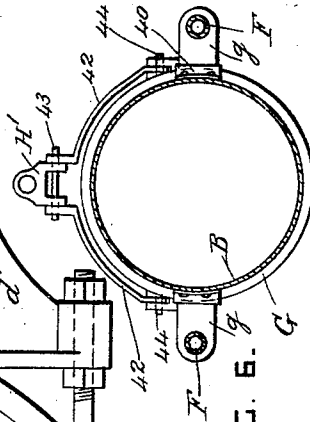
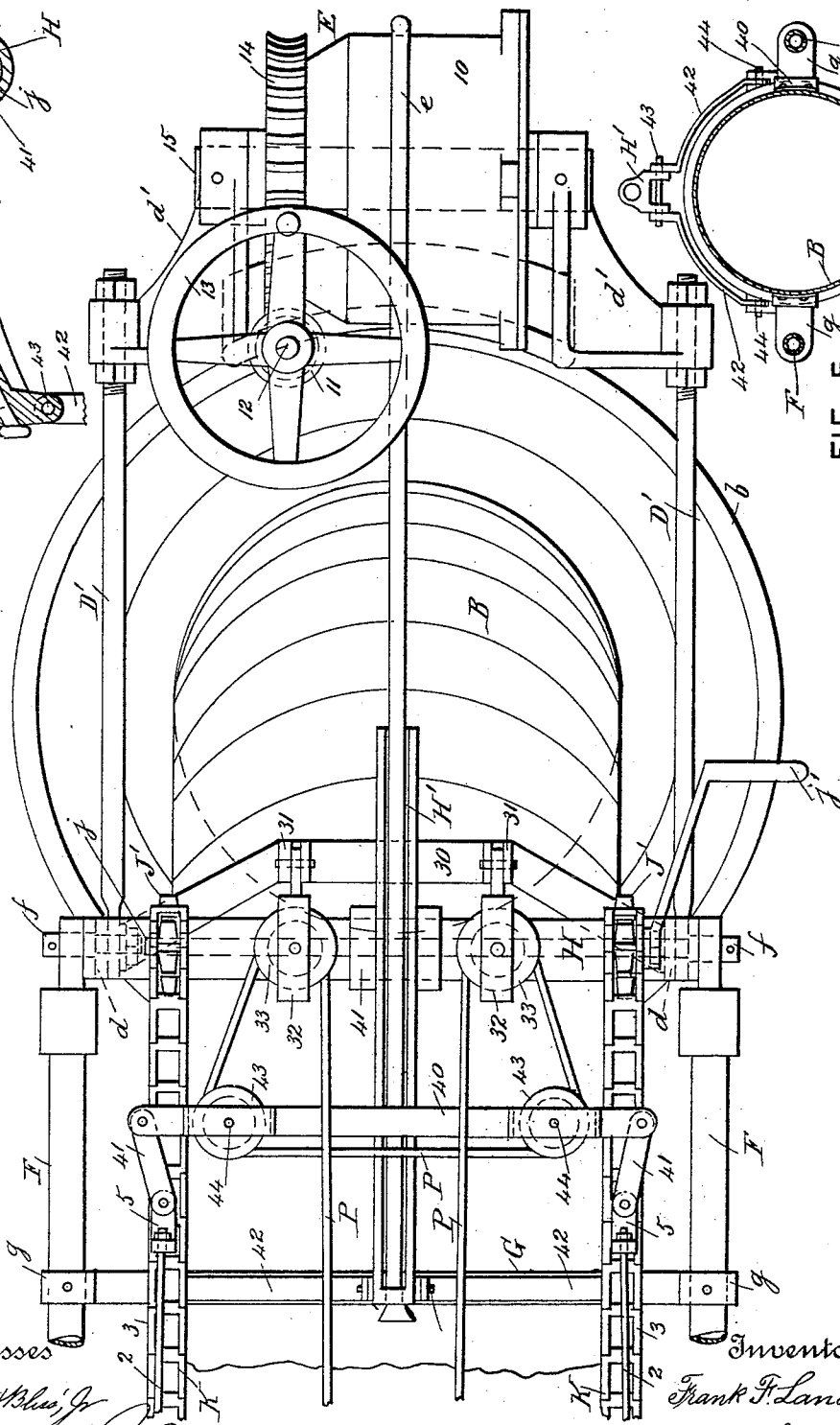


FIG. 4.



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UNITED STATES PATENT OFFICE.

FRANK F. LANDIS, OF WAYNESBOROUGH, PENNSYLVANIA.

PNEUMATIC STACKER.

SPECIFICATION forming part of Letters Patent No. 569,504, dated October 13, 1896.

Application filed February 15, 1896. Serial No. 579,438. (Nomencl.)

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-Stackers; 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-stackers having telescopic discharge-pipes; 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 telescopic discharge-pipe, showing it pushed in. Fig. 2 is a plan view of the same. Fig. 3 is a side view of the operating mechanism at the lower end of the pipe, drawn to a larger scale and showing the parts in the positions they assume when the slidable pipe is extended. Fig. 4 is a plan view of the mechanism shown in Fig. 3. Figs. 5 and 6 are details.

A is a portion of the casing of a threshing-machine or separator, and A' is the delivery-pipe of a centrifugal discharger of approved construction.

B is a flexible junction-pipe of approved construction, revoluble on the upper end of the delivery-pipe A'.

C is the discharge-pipe, secured to the upper end of the pipe B, and C' is the slidable section of the discharge-pipe, which slides telescopically over the lower pipe-section.

B' is a circular bracket or turn-table secured to the top of the casing A, and b is the cylindrical base of a frame D, which supports the discharge-pipe. The base b is revolubly supported by the bracket B' in any approved manner, as, for instance, by a ball-bearing. The base b has two short uprights or lugs d secured to it or formed integral with it. These uprights d are arranged one on each side of the base and near its front. Brackets d' are secured to or are formed integral with the rear part of the base b, and are adapted to support the winch E, which may be of any approved construction.

D' are tie-bars coupling together the up-

rights d and brackets d', and forming with the said parts and the base b the said frame D, which is revoluble upon the turn-table or bracket B'.

F are two arms having their lower ends pivoted to the uprights d by the pins f. These arms extend forwardly in an upwardly-inclined direction to the axis of the discharge-pipe and are parallel to its sides. These arms are preferably formed of pipes for lightness and strength.

F' is a yoke or bracket coupling together the upper ends of the arms F and extending in semicircular form under the discharge-pipe at the upper end of the non-slidable pipe-section.

G is a ring mounted on the upper part of the junction-pipe B, or which may be mounted on the lower end portion of the discharge-pipe C. Lugs 40 are secured to the pipe B and prevent the ring from sliding longitudinally of the pipe. This ring G is connected to the front end of guide H' by the links 42, as will be presently described, and thus forms a support for the lower part of the pipe C, and it is provided with two lugs g, which are secured to the arms F.

H is a forked bracket having its lower ends pivoted on the the pins f, and H' is a curved rope-guide carried by the bracket H and arranged substantially concentric with the pins f.

The guide H' is preferably provided with a bearing 41, which is journaled on the central portion of the bracket H. The front end of the guide H' supports the ring G by the two curved links 42. The upper ends of these links are pivoted to the guide by the pin 43, and their lower ends are pivoted to the ring G, close above the lugs g, by the pins 44.

The rope-guide H' is pivotally supported in order that it may adapt itself to all the various positions of the discharge-pipe and in a manner it could not do if it were rigidly connected with it.

The guide or bar H' is provided with ratchet-teeth h' on its under side, the use of which will be more fully explained hereinafter.

The upper end of the slidable pipe-section C' has a ring I secured to it, and a ring I' is secured to its lower end.

J are two guide-sheaves carried by the yoke

F' at the upper ends of the arms F, and arranged one on each side of the discharge-pipe.

J' are two sprocket-wheels or sheaves secured on a shaft *j*, which is journaled in the upper part of the forked bracket, and *j'* is a crank-handle for revolving the said shaft.

K are flexible connections arranged one on each side of the discharge-pipe. Each flexible connection is fastened at its lower end to the ring I', and thence passes over the guide-sheave J to the upper side of the sprocket-wheel J', around the said sprocket-wheel, and thence through a hole in a lug *i'* at the upper part of the ring I' to the ring I, and has its upper end secured to the said ring I. For lightness and convenience the lower part 2 of the flexible connection K, which passes over the sheave J, is preferably formed of a cord or wire rope. Its middle portion 3 is formed of a drive-chain, so that it may engage with the teeth of the sprocket-wheel, and its upper portion 4, which is held in a fixed relation to the pipe C and ring I' by the lug *i'*, is formed of a rod. A hook 5 connects the cord 2 to the chain 3, and a link 6 connects the chain 3 to the rod 4.

The sprocket-wheel is a little above the upper side of the discharge-pipe, and the point of the attachment of the upper end of the flexible connection with the ring I is a little below the upper side of the discharge-pipe, so that the flexible connection is at an angle to the axis of the discharge-pipe. When the slidable pipe-section is fully extended, the parts 3 and 4 of the flexible connection are in a substantially straight line, and the upward-lifting force on the ring I' due to the angularity of the parts 3 and 4 is but little. The lower end of the flexible connection is attached to the ring I' at a point below the bottom of the sheave J. When the slidable pipe-section is fully extended, the part 2 of the flexible connection below the sheave J is at a considerable angle with the axis of the pipe and exerts considerable lifting force upon the lower end of the pipe. When the slidable pipe-section is pushed in, as shown in Fig. 1, the parts 3 and 4 are at an angle to each other and considerable lifting force is exerted on the ring I'. The slidable pipe-section is wholly supported by the flexible connections, and the parts are so proportioned that the weight of the lower end of the slidable section when pushed in will be balanced by the upward-lifting force of the parts 3 and 4 on the ring I' due to their angularity and the tension to which they are subjected by the weight of the pipe. As the slidable pipe-section is extended the tension on the flexible connection increases, and the angularity between the parts 3 and 4 decreases, so that the pipe slides against a substantially uniform and slight resistance.

The angularity of the lower part 2 of the flexible connections is arranged so as to supplement the action of the parts 3 and 4 and balance the weight of the lower part of the

pipe at all points of its travel as accurately as possible.

The slidable pipe-section is moved in or out according to the direction in which the crank-handle *j'* is turned. Its weight is practically balanced upon the guide-sheaves. Its end thrust is transmitted to the base by the arms F, which are arranged in line with the direction of the thrust, and the friction of the parts holds the slidable pipe stationary until the crank-handle is turned.

The angularity of the whole discharge-pipe is changed by means of the winch E, which is provided with a rope *e*, attached to the front part of the guide H'. The rope *e* rests on the rope-guide and is secured to the barrel 10 of the winch. The winch is preferably provided with a worm 11, secured on a shaft 12 and provided with a wheel 13 or a handle for operating it. The worm gears into a worm-wheel 14, secured on the barrel, and revolves the barrel. The barrel 10 is journaled on the barrel-shaft 15. 16 is a strong spiral spring having one end secured to the shaft 15 and the other end secured to the barrel. The weight of the discharge-pipe is mainly supported by this spring, so that the teeth of the worm and worm-wheel are relieved of much of the weight of the stacker-pipe. The worm-wheel 14, being secured to the barrel, is also journaled on the shaft 15, which is stationary.

The discharge-pipe is oscillated upon the turn-table by means of a toothed wheel M, connected to the base *b*. Motion is imparted to the wheel M by any approved driving mechanism. (Not shown in the drawings.) The wheel M is not secured direct to the base, but is journaled upon it, and it rests upon the supporting-lugs *m*.

M' is a pawl which is pivoted to the base and engages with any one of a series of notches *m'* in the upper edge of the toothed wheel. The base may be disengaged from the toothed wheel by raising the pawl and may then be turned around by hand. The object of this disengagable connection with the toothed wheel is to simplify the driving mechanism. Supposing the driving mechanism had been oscillating the discharge-pipe through an angle of forty-five degrees on one side of the threshing-machine, the pawl can be raised and the discharge-pipe pulled around to the opposite side of the machine or to any other point of the circle. The pawl can then be dropped into another notch, and the driving mechanism will oscillate the discharge-pipe through the same angle, but in another part of the circle, without having to be adjusted or changed.

O is a revoluble and extensible deflector carried by the slidable section of the discharge-pipe. This deflector is formed of pivoted segments and a short pipe O', and is provided with a spring *o*, which operates to hold the segments in their extended position, as shown in Fig. 1. A flexible connection or

cord P is provided for bending and revolving the deflector. The ends of this cord are secured to one side of the outer segment by a bracket *o'*.

5 R R' are two sheaves supported at the side of the pipe O'.

S S' are two sheaves supported at the top of the slidable pipe C'. One portion of the cord P passes from the bracket *o'* over the sheaves R and S, and the other portion of the cord passes from the bracket *o'* over the sheaves R' and S'.

15 The deflector is bent backward by pulling back both portions of the cord P simultaneously, and is revolved by pulling one or the other portion of the cord, according to the direction in which the deflector is desired to revolve.

In order to permit the pipe-section C' to be slid in and out without affecting the adjustment of the deflector, take-up devices are used. A yoke 30 is pivoted to the pins *f* and extends over the flexible junction-pipe under the rope-guide H'. Lugs 31 project upwardly from the yoke 30 on each side of the rope-guide. Sheave-blocks 32 are pivoted to the lugs 31, and 33 are sheaves journaled in the said blocks. The yoke 30 is provided with a pivoted pawl 34, which engages with the ratchet-teeth *h'* on the bar or rope-guide H', so that the yoke 30 moves back and forth with the said rope-guide as controlled by the winch.

A bar 40 is connected to the two flexible connections K and extends transversely between them. This bar 40 is preferably connected to the hooks 5 by means of pivoted links 41, so that it is free to move to a slight extent in a direction crosswise of the discharge-pipe. Two sheaves 43 are journaled on pins 44, carried by the bar 40. The middle portion or loop of the flexible connection P passes over the sheaves 43, and its ends pass over the sheaves 33, and thence to the sheaves S S' and deflector, as hereinbefore described.

45 The deflector is bent backward by pulling back the yoke 30 by hand, and thereby pulling simultaneously on both ends of the cord P. The pawl 34 holds the yoke in position when pulled back, and the spring *o* draws forward the yoke and extends the segments of the deflector when the pawl is released from the ratchet-teeth.

What I claim is—

1. In a pneumatic straw-stacker, the combination, with a delivery-pipe, a discharge-pipe, and a flexible junction-pipe; of a revoluble frame supporting the discharge-pipe and provided with a cylindrical base arranged concentric with the delivery-pipe; a wheel journaled or mounted loosely to revolve on the said base and affording a means for oscillating the said frame, and means for coupling and uncoupling the said wheel and base, substantially as set forth.

2. In a pneumatic straw-stacker, the combination, with a delivery-pipe, a discharge-pipe, and a flexible junction-pipe; of a revol-

uble frame supporting the discharge-pipe and provided with a cylindrical base arranged concentric with the delivery-pipe; a wheel journaled or mounted loosely to revolve on the said base, and a pawl pivoted to the said base and engaging with notches in the said wheel, substantially as set forth.

3. In a pneumatic straw-stacker, the combination, with a delivery-pipe, a discharge-pipe, and a flexible junction-pipe; of a supporting-frame, arms pivoted to the said frame, a forked bracket also pivoted to the said frame, means for supporting the upper part of the discharge-pipe and the upper ends of the said arms from the said forked bracket, a supporting-rope attached to the said forked bracket, and a ring supporting the lower part of the discharge-pipe and carried by the said arms in front of the said forked bracket, substantially as set forth.

4. In a pneumatic straw-stacker, the combination, with a delivery-pipe, a discharge-pipe, and a flexible junction-pipe; of a supporting-frame, arms pivoted to the said frame, means for supporting the upper part of the said discharge-pipe and the upper ends of the said arms from the said frame, and a ring mounted on the upper end of the said junction-pipe close to the lower end of the discharge-pipe, and permitting the said discharge-pipe to be detached from the junction-pipe, substantially as set forth.

5. In a pneumatic straw-stacker, the combination, with a supporting-frame, a discharge-pipe, and a forked bracket pivoted to the said frame and operatively connected with the said pipe; of a barrel and means for revolving it carried by the said frame, a flexible connection between the said barrel and forked bracket, and a spring connected to the said barrel and operating to sustain the weight of the discharge-pipe, substantially as set forth.

6. In a pneumatic straw-stacker, the combination, with a supporting-frame, and a discharge-pipe pivotally connected with the said frame; of a winch carried by the said frame and provided with a lifting-rope connected with the said discharge-pipe, and a spring connected to the rope-barrel of the said winch and operating to sustain the weight of the discharge-pipe, substantially as set forth.

7. In a pneumatic straw-stacker, the combination, with a frame, and a discharge-pipe pivotally supported thereby; of a curved rope-guide connected with the said pipe and arranged over the front part of the said frame, a winch carried by the rear part of the said frame, and a rope secured to the front end of the said guide, resting on its curved portion, and connected to the said winch, substantially as set forth.

8. In a pneumatic straw-stacker, the combination, with a supporting-frame, of a telescopic discharge-pipe, sheaves J at the sides of the discharge-pipe, wheels J' at the lower end of the discharge-pipe, and supporting de-

4
vices carrying the said pipe, sheaves and
wheels, and pivoted to the said frame; of
flexible connections secured at one end to the
lower part of the slidable pipe-section, pass-
5 ing over the said sheaves and wheels and se-
cured at the other end to the upper part of
the said slidable pipe-section, the lower part
of the said slidable pipe-section being sup-
ported by the upper portions of the said flexi-
10 ble connections, substantially as set forth.

9. In a pneumatic straw-stacker, the com-
bination, with a supporting-frame, a telescopic
discharge-pipe, sheaves J at the sides of the
discharge-pipe, wheels J' above the discharge-
15 pipe at its lower end, and pivoted supporting
devices carrying the said pipe, sheaves and
wheels, from the said frame; of flexible con-
nections secured at one end to the lower part
of the slidable pipe-section, passing over the
20 said sheaves and wheels and secured at the
other end to the upper part of the said slid-
able pipe-section, the upper and lower end
portions of the said flexible connections being
inclined in opposite directions with respect
25 to the axis of the discharge-pipe, and the
lower part of the said slidable pipe-section
being supported by the upper end portions of
the said flexible connections, substantially as
set forth.

30 10. In a pneumatic straw-stacker, the com-
bination, with a frame, and a telescopic dis-
charge-pipe pivotally supported thereby; of
flexible connections K having their upper
ends attached to the upper side portions of
35 the slidable pipe-section at its outer end, hav-
ing their lower ends attached to the lower
side portions of the slidable pipe-section at
its inner end, and having their intermediate
portions operatively supported from the said
40 frame; and means for supporting the inner
end of the said slidable pipe-section from the
upper portions of the said flexible connec-
tions, substantially as set forth.

45 11. In a pneumatic straw-stacker, the com-
bination, with a supporting-frame, a telescopic
discharge-pipe, guide-sheaves J at the sides
of the discharge-pipe, sprocket-wheels J' at
the lower end of the discharge-pipe, and piv-
50 oted supporting devices carrying the said pipe,
sheaves and wheels from the said frame; of
flexible connections comprising cords secured
to the lower part of the slidable pipe-section
and passing over the said guide-sheaves,
55 drive-chains secured to the said cords and en-
gaging with the said sprocket-wheels, and
rods connected to the said chains and secured
to the upper part of the said slidable pipe-
section, the lower part of the said slidable
60 pipe-section being supported on the said rods,
substantially as set forth.

12. In a pneumatic straw-stacker, the com-
bination, with a supporting-frame, and a tele-
scopic discharge-pipe; of a ring connected
with the lower part of the said pipe, a forked
65 bracket pivoted to the said frame and con-
nected with the said ring, forwardly-project-
ing arms pivoted to the said frame and se-

cured to the said ring, sheaves J supported
by the front ends of the said arms at the sides
of the discharge-pipe, wheels J' supported by
the said forked bracket at the lower end of
the discharge-pipe, and flexible connections
having their ends secured to the slidable pipe-
section and passing over the said sheaves and
wheels, substantially as set forth. 70

13. In a pneumatic straw-stacker, the com-
bination, with a telescopic discharge-pipe,
and flexible connections attached to the slid-
able pipe-section and operating to extend it;
of an extensible deflector; guide-sheaves 33
80 and 43 supported respectively at the lower
end of the discharge-pipe and by the said flexi-
ble connections, and a cord passing around
the said guide-sheaves and operatively con-
nected with the deflector, the guide-sheaves
85 43 being constrained to move in the reverse
direction to the slidable pipe and operating
to keep the said cord taut, substantially as
set forth.

14. In a pneumatic straw-stacker, the com-
bination, with a telescopic discharge-pipe,
and flexible connections attached to the slid-
able pipe-section and operating to extend it;
of an extensible deflector; a yoke or lever
pivoted at the lower end of the discharge-
95 pipe, sheaves 33 supported from the said yoke,
sheaves 43 supported from the said flexible
connections, and a cord passing around the
said sheaves and operatively connected with
the deflector, substantially as set forth. 100

15. In a pneumatic straw-stacker, the com-
bination, with a supporting-frame, a tele-
scopic discharge-pipe pivotally supported by
the said frame, and a bar or guide H' con-
nected with the inner end portion of the said
105 pipe and moving with the said pipe about its
pivotal center; of an extensible deflector at
the upper end of the said pipe; flexible con-
nections for extending the slidable pipe-sec-
tion, a pivoted yoke or lever operating to re-
tract the deflector and provided with a catch
or pawl engaging with the said bar or guide,
guide-sheaves 33 and 43 carried respectively
by the said flexible connections and by the
110 said yoke, and a cord passing around the said
guide-sheaves and operatively connected with
the deflector, substantially as set forth.

16. In a pneumatic straw-stacker, the com-
bination, with a telescopic discharge-pipe,
and flexible connections attached to the slid-
able pipe-section and operating to extend it;
of an extensible deflector; guide-sheaves 33
115 supported at the lower end of the discharge-
pipe, a bar extending transversely of the dis-
charge-pipe, pivoted links connecting the said
bar to the said flexible connections, guide-
sheaves 43 carried by the said bar, and a cord
passing around the said guide-sheaves and
operatively connected with the deflector, sub-
stantially as set forth. 120

17. In a pneumatic straw-stacker, the com-
bination, with a supporting-frame, of a tele-
scopic discharge-pipe pivotally supported by
the said frame and provided with an extensi-
125

ble deflector at its upper end, flexible connections for extending the slidable pipe-section, a cord for operating the deflector, take-up mechanism connecting the said cord with the
5 said flexible connections and operating to keep it taut, and lifting mechanism carried by the said frame and connected with the discharge-pipe, whereby the angle of the said pipe may be changed without affecting the
10 adjustment of its slidable pipe-section or of its deflector, substantially as set forth.

18. In a pneumatic straw-stacker, the combination, with a supporting-frame, and a telescopic discharge-pipe pivotally supported by
15 the said frame; of an extensible deflector at the upper end of the said pipe; flexible connections for operating the slidable pipe-section, a support—such as a yoke—pivotally supported by the said frame, guide-sheaves
20 carried by the said flexible connections and support, a cord passing around the said guide-sheaves and operatively connected with the deflector, and catch mechanism connecting the said support with the said pipe, constraining
25 it to move back and forth when the pipe is raised and lowered and permitting it to be moved back and forth independent of the motion of the pipe, substantially as set forth.

19. In a pneumatic straw-stacker, the combination, with a supporting-frame, and a dis-

charge-pipe pivotally supported by the said frame; of a forked bracket pivoted to the said frame, connections supporting the upper portion of the said pipe from the said bracket,
35 a rope-guide journaled on the said forked bracket, links pivotally connecting the front end of the said rope-guide with the side portions of the lower part of the discharge-pipe, and a winch carried by the said frame and having its rope attached to the said rope-guide,
40 substantially as set forth.

20. In a pneumatic straw-stacker, the combination, with a supporting-frame, a telescopic discharge-pipe, and a sheave J' supported
45 from the said frame independent of the said pipe; of a connection passing over the said sheave and connected to the outer end portion of the slidable pipe-section, and means for suspending the inner end portion of the
50 slidable pipe-section from that portion of the said connection extending between the said sheave and the outer end portion of the slidable pipe-section, substantially as set forth.

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

FRANK F. LANDIS.

Witnesses:

T. B. SMITH,

T. S. CUNNINGHAM.