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PATENTED JULY 19, 1904.

F. C. STUCKEL.

MEANS FOR SHIFTING THE TUBES OF PNEUMATIC STRAW STACKERS  
OR OTHER PURPOSES.

APPLICATION FILED SEPT. 23, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

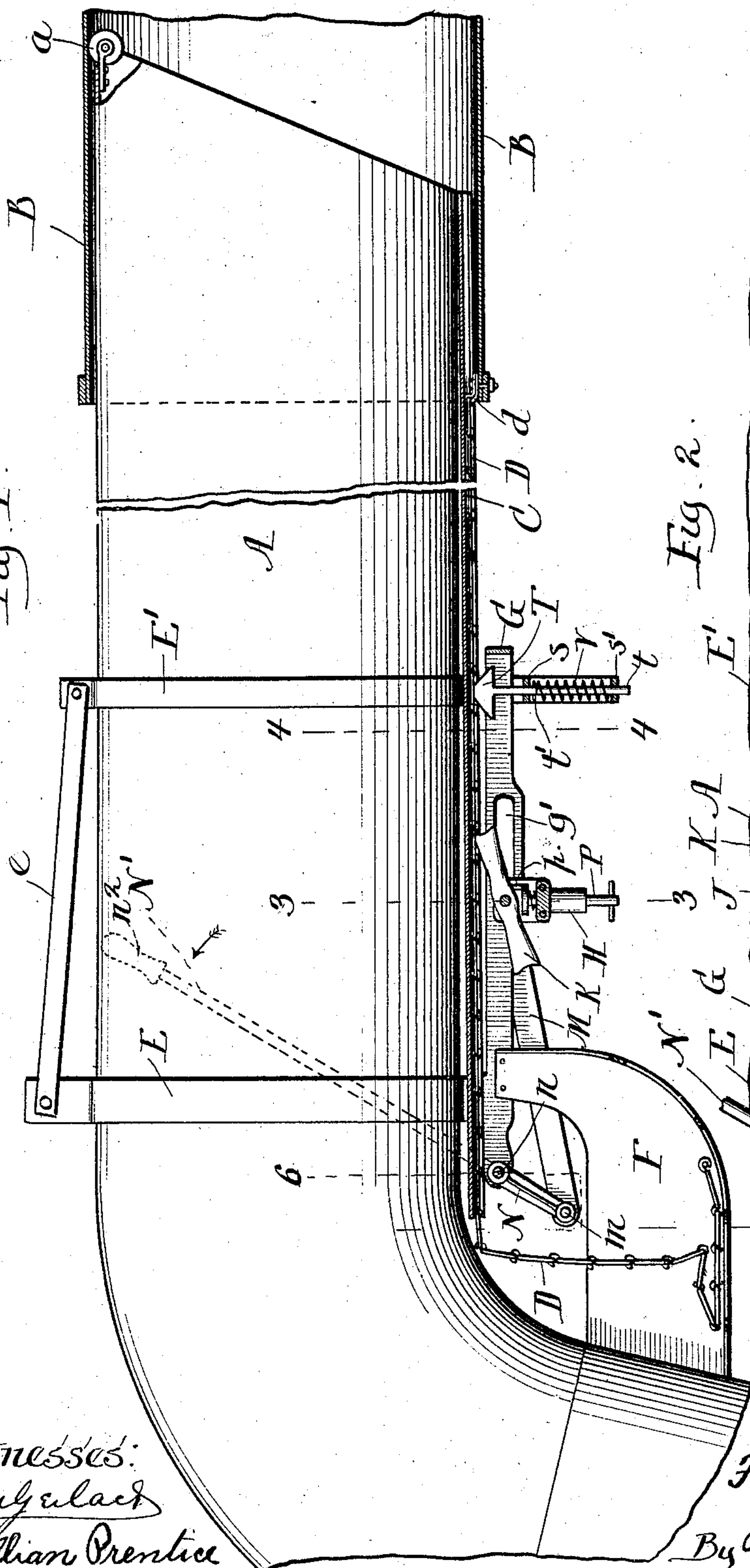
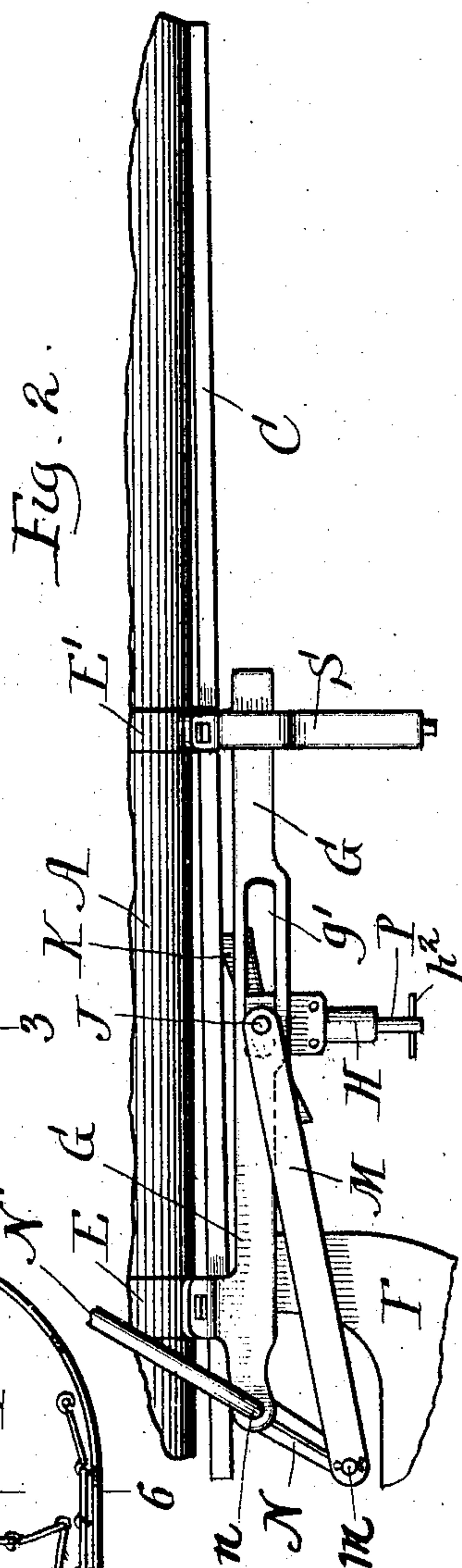


Fig. 2.



Witnesses:  
Frederick  
William Prentice

Inventor  
Frank C. Stuckel  
By Pierce & Fisher  
Attorneys.

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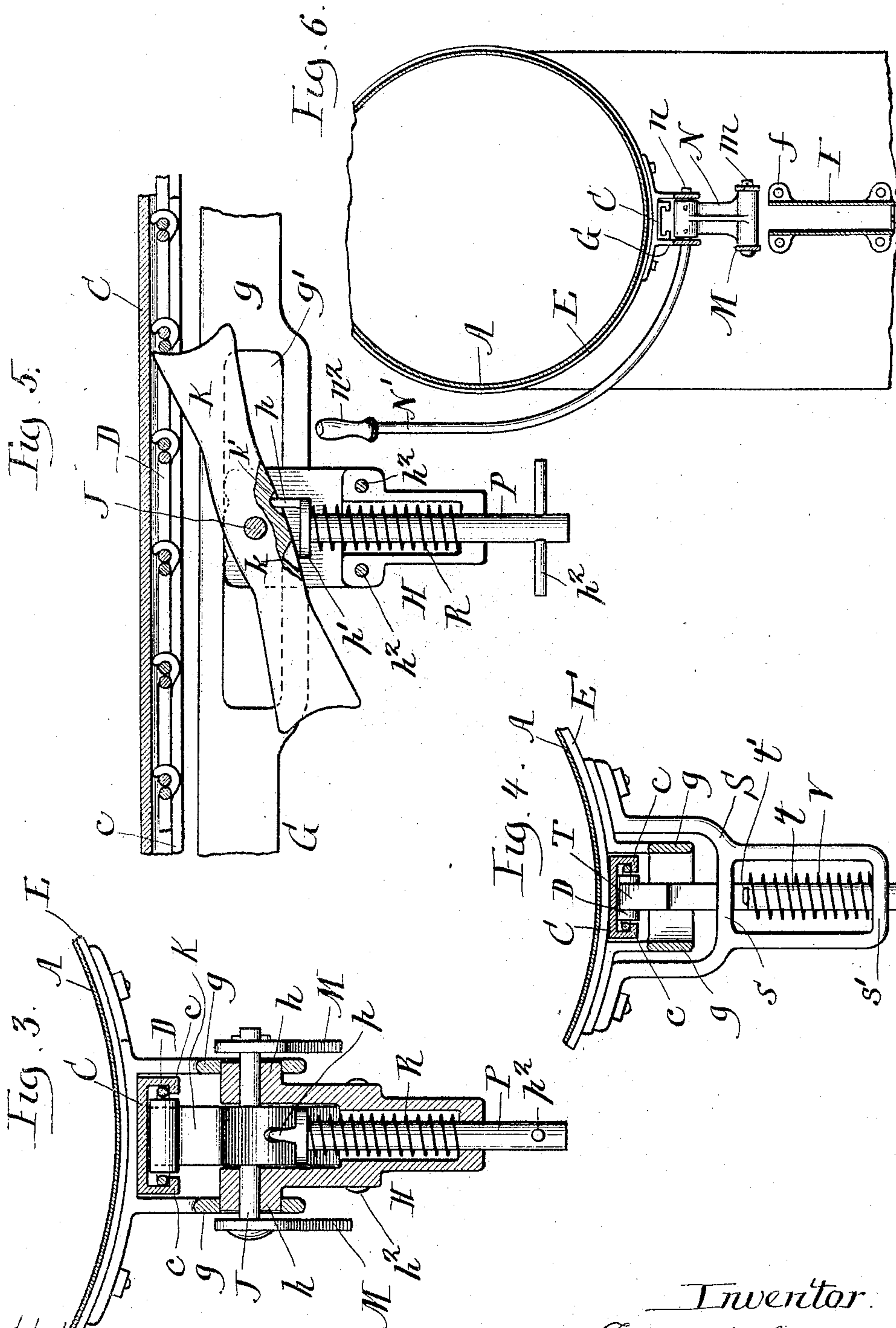
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Witnesses:  
Frederick  
Lillian Orentice

Inventor.  
Frank C. Stuckel  
By *Prin & Fisher*  
Attorneys.



# UNITED STATES PATENT OFFICE.

FRANK C. STUCKEL, OF RACINE, WISCONSIN, ASSIGNOR TO J. I. CASE  
THRESHING MACHINE COMPANY, OF RACINE, WISCONSIN, A COR-  
PORATION.

MEANS FOR SHIFTING THE TUBES OF PNEUMATIC STRAW-STACKERS OR OTHER PURPOSES.

SPECIFICATION forming part of Letters Patent No. 765,403, dated July 19, 1904.

Application filed September 23, 1903. Serial No. 174,267. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK C. STUCKEL, a citizen of the United States, and a resident of the city and county of Racine, State of Wisconsin, have invented certain new and useful Improvements in Means for Shifting the Tubes of Pneumatic Straw-Stackers or for other Purposes, of which the following is a full, clear, and exact description.

This invention has for its object primarily to provide improved means for shifting lengthwise the extensible portion of the wind tube or trunk of a pneumatic straw-stacker, although features of the invention are applicable to a variety of other purposes, as will hereinafter appear.

Figure 1 is a view, partly in side elevation and partly in vertical section, of a portion of a telescopic pneumatic stacker-tube embodying my invention. Fig. 2 is a view in side elevation, showing part of the stacker-tube and the shifting mechanism beneath it. Fig. 3 is a view in vertical cross-section on line 3 3 of Fig. 1. Fig. 4 is a view in vertical cross-section on line 4 4 of Fig. 1. Fig. 5 is a view in vertical longitudinal section through the guy beneath the bottom of the stacker-tube, certain subjacent parts being shown in side elevation. Fig. 6 is a view in vertical cross-section on line 6 6 of Fig. 1.

In pneumatic straw-stackers it is customary to form the tubes or trunks of telescopic or extensible sections, so that the straw may be deposited upon the stack at different distances from the machine. Various means have been heretofore provided for effecting the longitudinal shift of the outer telescopic or extensible section of the stacker-tube, the most common construction being to provide the inner section of the tube with a bracket reaching over the outer or extensible section and connected therewith by an operating-cable by which the back-and-forth movement of the outer section of the tube may be effected. My present invention contemplates providing the outer telescopic or extensible section of the tube with a flexible connection supported in such manner that notwithstanding its flexi-

bility such connection will be so held or guided as to sustain the thrust necessary to shift the telescopic or extensible section of the tube in outward direction as well as permitting it to be drawn inward.

The invention also comprises improved means for engaging the connection that leads from the telescopic or extensible section of the tube, as will more fully appear from the following description and from the claims at the end of this specification.

A designates the inner section of the trunk or tube of a pneumatic straw-stacker, and B denotes the outer section of the trunk or tube. The inner section A of the tube will be mounted in any suitable or convenient manner upon the threshing-machine, and the outer section B may be provided at its outer end (not shown) with any convenient form of hood and with suitable devices for manipulating the same. As shown, the outer end of the trunk-section A is furnished at its top with an antifriction-roller *a*, adapted to support the trunk-section B, that fits over and slides upon the outer portion of the section A. Beneath the trunk-section A extends a guide C, adapted to receive a chain or other suitable flexible connection D, the outer end of which is attached, as at *d*, to the inner end of the trunk-section B. The purpose of the guide C is to hold the chain or other flexible connection D against buckling or collapsing and to permit this connection to receive the thrust necessary to move the telescopic or extensible section B in outward direction. As shown, the guide C is a metal channel having downwardly and inwardly extending flanges *c*, that inclose and support the sides of the chain D. As shown, this guide C is sustained beneath the tube-section A by bands E and E', that extend around the trunk-section A and are connected together at the top thereof by a bar *e*. The guide C thus serves to hold the chain or connection D against buckling or folding, and hence permits an outward thrust to be exerted upon the chain when the trunk-section B is to be moved in outward direction. The inner end of the guide C is open, and from it



the chain D passes into a trough-like receiver F, which is shown as secured by ears  $f$  to the inner end portion of the tube-section A. This chain-receiver F, as shown in Fig. 6, is of a width corresponding to that of the chain D or is slightly greater than that of the chain, so that lateral movement of the chain-links is prevented, and hence the accidental separation of the links from one another cannot occur, it being understood that in the preferred embodiment of the invention, which is that shown in the drawings, the chain D is formed of detachable links.

So far as I am aware the present invention presents the first instance in which a flexible device such as a chain or the like has been provided with a guide or other means for holding it against buckling or collapsing, thereby permitting the chain or like flexible device to receive the thrust necessary to shift the movable part connected thereto.

While the invention is more particularly designed as a means for shifting the telescopic or extensible section of a pneumatic straw-stacker, it will be readily understood that so far as this broad feature is concerned the invention is susceptible of use in other machines embodying relatively fixed and movable members, the movable member being provided with a flexible connection furnished with a guide for holding it sufficiently rigid to permit a thrust to be transmitted through the flexible connection to said movable member.

While other suitable means may be employed for imparting movement to the chain or connection D, I prefer to use for such purpose the mechanism next to be described. Beneath the tube-section A and preferably bolted to the inner band E is a frame G, the side bars  $g$  of which are formed with slots  $g'$ , in which are mounted the lateral projections  $h$  of a yoke-shaped pawl-carrier H. Through the arms of the pawl-carrier H projects the shaft J, on which is pivotally supported the pawl K. To the outer ends of the shaft J are connected the links M, the rear ends of which are pivotally secured, as at  $m$ , to the lower end of a rock-arm N, that is fixed upon a shaft  $n$ , journaled in the rear ends of the side bars  $g$  of the frame G. The shaft  $n$  is provided with a shifting lever  $N'$ , that extends upwardly at the side of the tube-section A and is furnished with a handle  $n''$ , whereby it may be conveniently manipulated. Preferably the pawl K is a double-ended pawl, and in order to throw either end of the pawl K into engagement with the cross-bars of the links of the chain D, I prefer to provide the spring-actuated spindle P, that passes loosely through a hole in the bottom of the pawl-carrier H and is provided at its upper end with a stud  $p$ , adapted to engage with either of the notches  $h$  and  $h'$ , arranged at opposite sides of the center of the pawl K, as clearly shown in Fig. 5 of the drawings. A spring R encircles

the spindle P between its head  $p'$  and the bottom of the pawl-carrier H and serves to hold the stud  $p$  in engagement with the pawl K and to force either end of the pawl into yielding contact with the chain D. As shown, the spindle P is provided with a laterally-extending bar or projection  $p''$ , whereby it may be retracted and turned when the stud  $p$  is to be shifted from one notch  $h$  or  $h'$  to the other notch of the pawl K. The pawl-carrier H is preferably formed of vertical sections conveniently bolted together, as at  $h''$ .

From the construction as thus far described it will be seen that when the parts are in the position shown in the several figures of the drawings the outer end of the pawl K will be in engagement with the links of the chain D. If now the operator shifts the lever  $N'$ , he can force outwardly the chain D, and as this chain is held by the guide C against buckling or collapsing the outward thrust exerted by the pawl K upon the chain will be transmitted to the section B of the stacker-tube and will force said tube-section outward to the required extent. At each stroke of the lever  $N'$  in the direction of the arrow, Fig. 1, the pawl-carrier H will be shifted through the rock-arm N and links M in opposite direction and will correspondingly force outward the tube-section B; but as the lever N is returned to the position shown by dotted lines in Fig. 1 the end of the pawl K will ride over the cross-bars of the links of the chain D, being yieldingly held in the position shown by the pintle P and spring R. When it is desired to retract the tube-section B in order to shorten the tube, the operator will shift the stud  $p$  at the top of the pintle P into engagement with the notch  $h'$  of the pawl K, thereby throwing the inner end of the pawl into engagement with the chain D.

As shown, the outer end of the frame G sets between the arms of a frame S that are bolted to the encircling band  $E'$ . This frame S is provided with a friction block or brake T, the shank  $t$  of which passes through the cross-bars  $s$  and  $s'$  of the frame S and is encircled by the coil-spring V, that bears against the cross-bar  $s'$  of the frame S and against a pin  $t'$ , that passes through the shank  $t$  of the friction block or brake T. As the friction block or brake T bears yieldingly against the chain D, it will hold the chain, and consequently the tube-section B, against accidental movement.

It is manifest that within the scope of the following claims any other convenient means may be employed for actuating the chain or connection D and that instead of a chain any other suitable flexible connection may be used without departing from the spirit of the invention. The chain D in the construction shown forms a flexible rack that is exposed through the longitudinal slot in the under side of the guide C to the action of the pawl K;



but I do not wish the invention in its broad scope to be understood as restricted to a chain or to a pawl for actuating it, although these are employed in the preferred embodiment of the invention.

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

1. The combination with relatively fixed and movable members, of a chain or flexible rack connected to the movable member, a longitudinally-slotted guide or support for holding said chain or rack with sufficient rigidity to permit a thrust to be transmitted there-through to said movable member and means for engaging said chain or rack to effect its longitudinal movement.

2. In a pneumatic stacker having fixed and movable stacker-tube sections, the combination with a movable tube-section, of a flexible device connected thereto but arranged outside the stacker-tube, a guide or support for holding said flexible device with sufficient rigidity to permit a thrust to be transmitted there-through to said movable tube-section and means for exerting the thrust upon said flexible device.

3. In a pneumatic stacker, the combination with the relatively fixed and movable stacker-tube sections, of a chain connected to the movable tube-section, a guide or holder arranged upon the outside of the fixed stacker-tube section for retaining said chain against buckling or collapsing and means for exerting an outward thrust upon said chain to cause it to shift the movable stacker-tube section.

4. The combination with a movable stacker-tube section, of a chain connected thereto, a guide for holding said chain against buckling or collapsing when a thrust is exerted thereon, a pawl for engaging said chain and means for imparting reciprocating movement to said pawl.

5. The combination with a movable stacker-tube section, of a chain or flexible rack connected thereto, a longitudinally-slotted guide engaging the sides of said chain or rack to hold the same against buckling or collapsing, a pawl for engaging said chain or rack and means for imparting movement to said pawl.

6. The combination with a movable stacker-tube section, a chain or flexible rack connected thereto, a guide for holding said chain or rack against buckling or collapsing when a thrust is exerted thereon, a pawl for engaging said chain or rack, means for yieldingly holding said pawl in engagement with said chain or rack and means for imparting a lengthwise movement to said pawl to shift said chain or rack.

7. The combination with a movable stacker-tube section, of a chain or flexible rack connected thereto, a guide for holding said chain or rack against buckling or collapsing when

a thrust is exerted thereon, a double-ended pawl for engaging said chain or rack, means for throwing the opposite ends of said pawl into and out of engagement with said chain or rack and suitable means for imparting a reciprocating movement to said pawl.

8. The combination with a movable stacker-tube section, of a chain or flexible rack connected thereto, a guide for holding said chain or rack against buckling or collapsing when a thrust is exerted thereon, a double-ended pawl for engaging said chain or rack, a reversible spring-actuated device whereby either end of said pawl may be thrown into engagement with said chain or rack and means for imparting a reciprocating movement to said pawl.

9. The combination with a movable stacker-tube section, of a chain or flexible rack connected thereto, a guide extending lengthwise of said chain or rack and serving to hold the same against buckling or collapsing when a thrust is exerted thereon, means for engaging said chain or rack to move it longitudinally within said guide and a trough or receptacle of approximately the width of the chain and serving to receive the chain or flexible rack as it issues from the guide.

10. The combination with a movable stacker-tube section, of a chain or flexible rack connected thereto, a guide for holding said chain or rack against buckling or collapsing when a thrust is exerted thereon, a reciprocating pawl for engaging said chain or rack and a rock-shaft and lever connected to said reciprocating pawl.

11. The combination with a movable stacker-tube section, of a chain or flexible rack connecting thereto, a guide for holding said chain or rack against buckling or collapsing when a thrust is exerted thereon, a pawl for engaging said chain or rack, a reciprocating pawl-carrier and a frame for supporting it and lever mechanism connected to said pawl-carrier whereby it may be shifted back and forth.

12. In a pneumatic stacker, the combination with the fixed and movable stacker-tube sections, of a chain or flexible rack connected to the movable stacker-tube section, a guide arranged beneath the fixed tube-section and adapted to hold said chain or rack against buckling or collapsing when a thrust is exerted thereon, a pawl located beneath the fixed tube-section for engaging said chain or rack to move it in longitudinal direction and a spring-actuated brake arranged beneath said tube-section and beneath said chain or rack for holding the latter against accidental movement.

FRANK C. STUCKEL.

Witnesses:

FREDERICK LEE NORTON,  
EDWIN E. RUSSELL.