F. L. SATTLEY.

PNEUMATIC STACKER.

APPLICATION FILED MAY 15, 1908.

950,120.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.

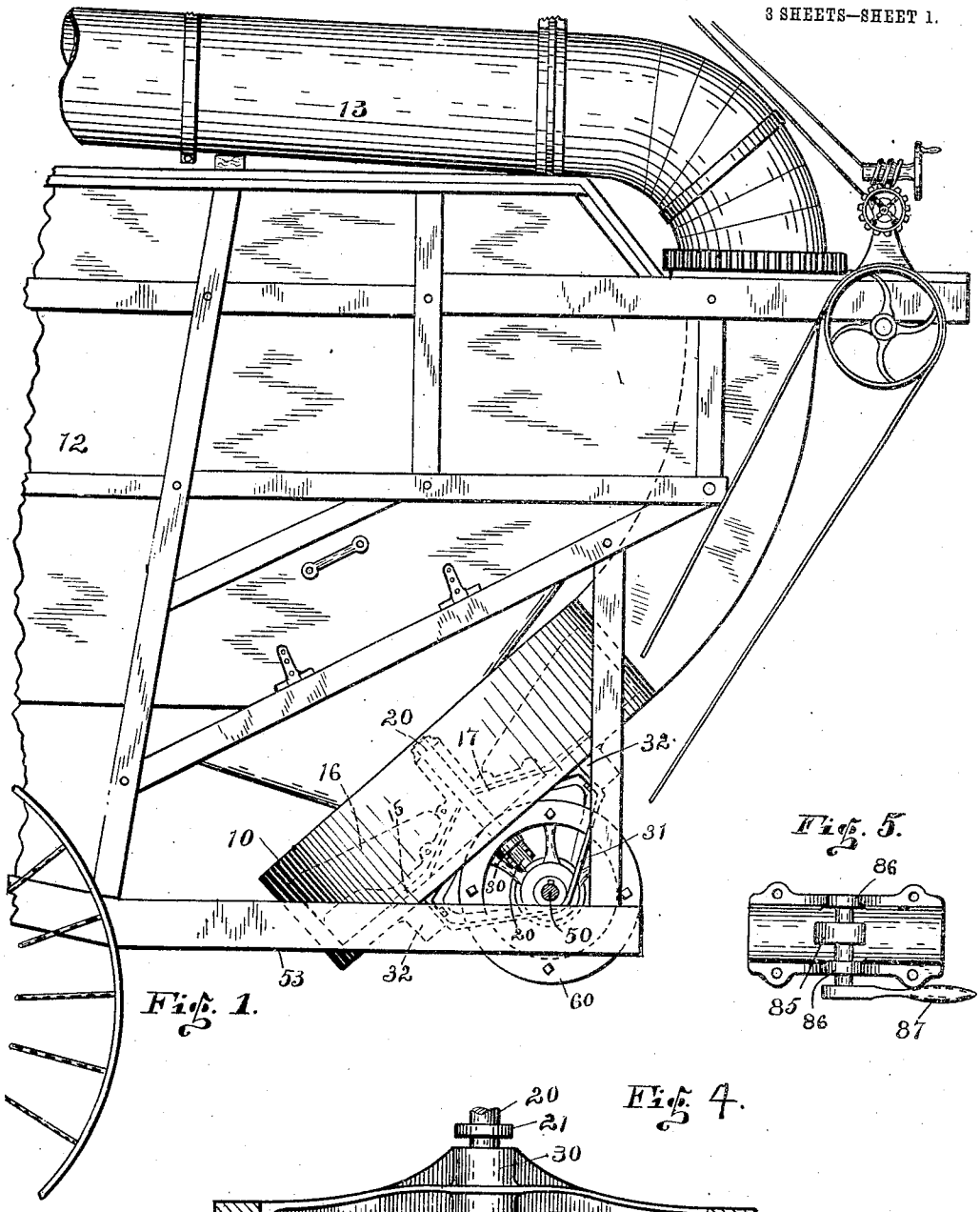

Fig. 1.

Fig. 5.

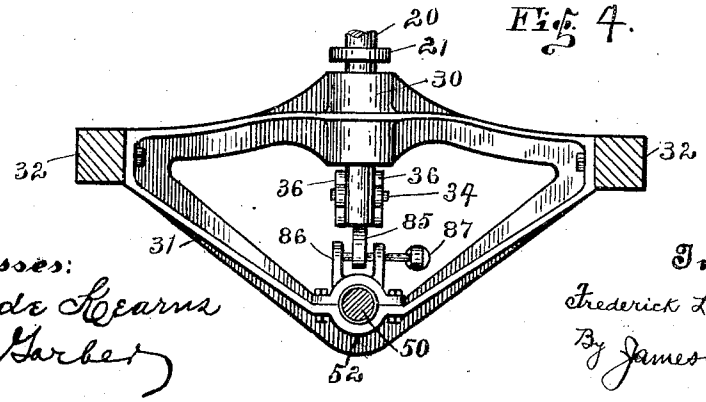

Fig. 4.

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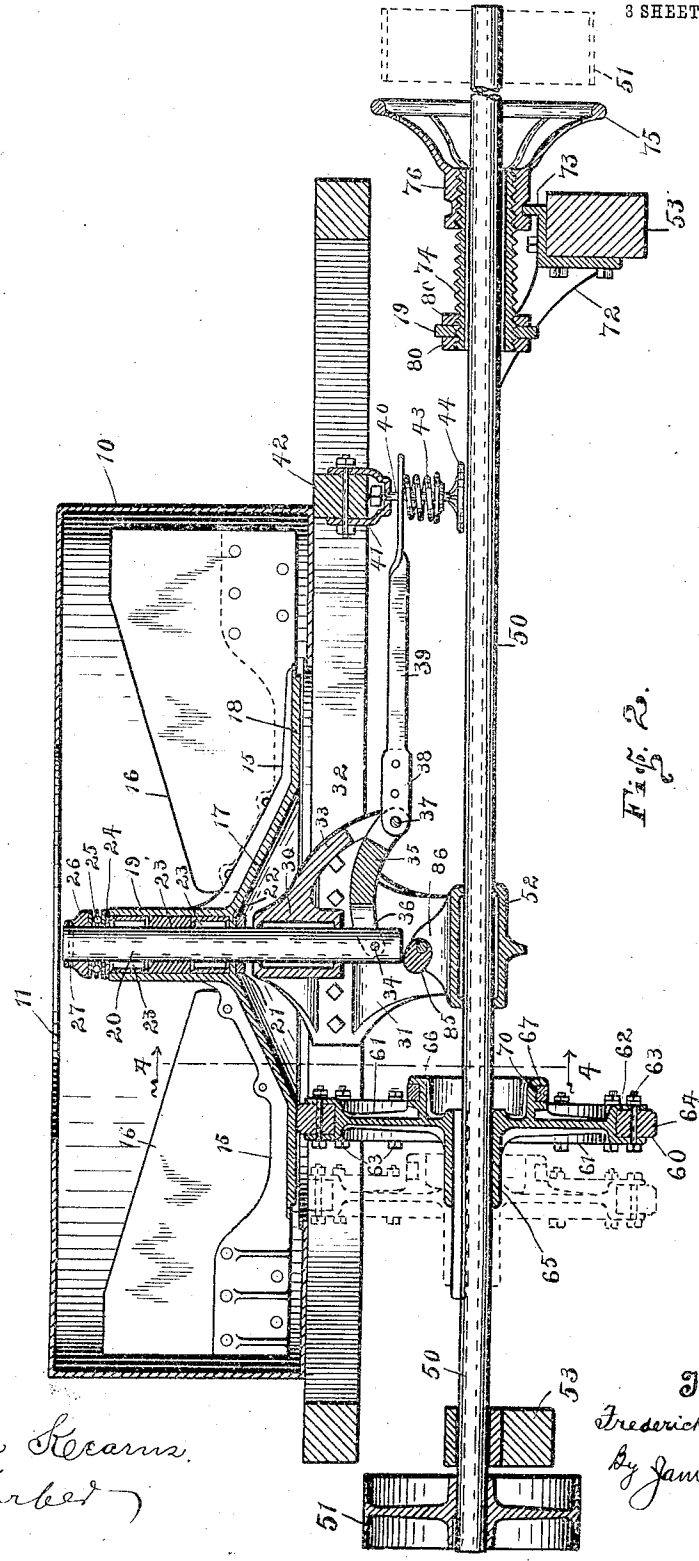

Fig. 2.

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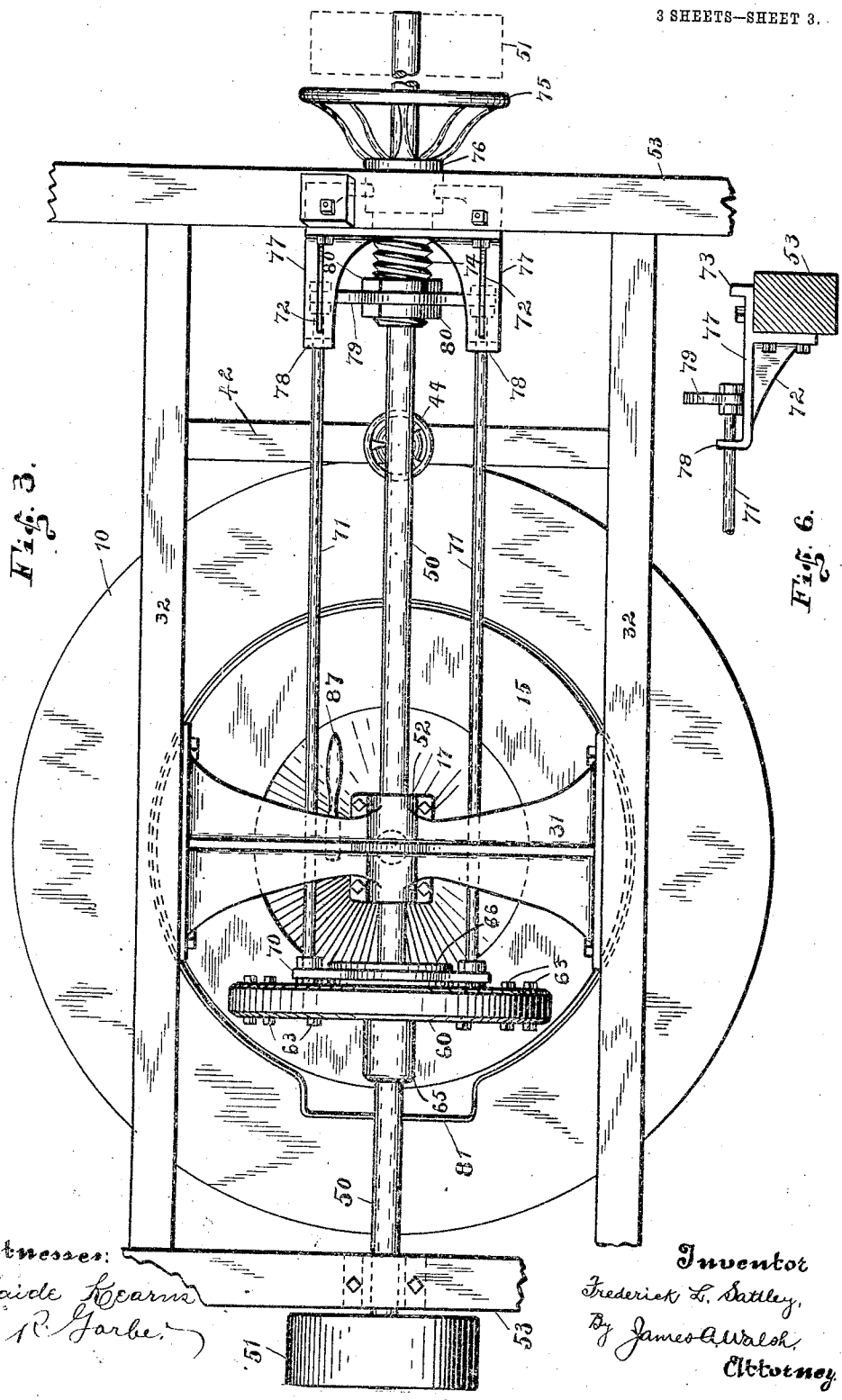

Fig. 3.

Fig. 6.

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UNITED STATES PATENT OFFICE.

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PNEUMATIC STACKER.

950,120. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed May 15, 1908. Serial No. 433,030.

To all whom it may concern:

Be it known that I, FREDERICK L. SATTLEY, 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.

My invention relates to improvements in pneumatic stackers, and more particularly to the fans therefor of that character designed to be rotated by frictional means and the speed thereof to be changed relatively to the speed of its initial driving means associated with an ordinary threshing or similar separating machine; and consists in certain details of construction and arrangements of parts whereby I am enabled to provide such a fan so arranged as to contact directly with its frictional driving means; that the contactual engagement or pressure between it and said driving means may be readily regulated while in operation; that it may be conveniently removed from contact with its driving means when not in operation or during transportation and the peripheral condition of such driving means thereby thus preserved and injury thereto avoided; that said driving means may be readily shifted in relation to said fan to increase or decrease the speed of the latter as desired; and to improve generally the construction and efficiency of such fan and adjusting and operating mechanisms associated therewith as will render such arrangement highly efficient under all the varying conditions incident to the operation of a threshing or similar machine, as will be hereinafter more fully explained.

In the accompanying drawings, which are made a part hereof, Figure 1 is a side elevation of a pneumatic stacker attached to a threshing machine; Fig. 2 a transverse vertical sectional view of a stacker fan, and the operating devices therefor, embodying my invention; Fig. 3 a bottom plan of the same; Fig. 4 a detail sectional view of the supporting bracket and adjusting devices, as seen from the dotted line 4—4 in Fig. 2; Fig. 5 a plan of the cam arrangement for elevating the fan-shaft; and Fig. 6 a detail of the speed changing device.

In said drawings the portions marked 10 represent the fan casing, which, in Fig. 1, I have shown in oblique position, but which may be placed in any appropriate position to receive material through its ingress opening, 11, from the separating machine, 12, and discharge the same through a stacker-pipe, 13, as usual. The lower portion of said fan-casing has a central opening therein, and within said casing and forming a closure for said opening is placed the fan-spider, 15, provided with wings, 16, which spider is preferably coniform in character, as 17, terminating in a horizontal rim or disk, 18, the upper portion, 19, of said spider being tubular in form.

The stud or fan-shaft, 20, is non-rotatable but movable longitudinally, and is provided with a collar, 21, bearing against the cone apex, 22, and anti-frictionally mounted in the tubular member 19 by means of roller bearings, 23, (two sets being shown divided by a spacing collar 23′) secured by a suitable cover or washer, 24, above which are suitably retained ball thrust-bearings, 25, held therebetween and the retaining cap, 26, which is secured to the upper end of said shaft by a locking-pin, 27, or otherwise, as may be desired. By employing stud-shaft 20 in connection with anti-friction bearings such as shown I provide a very simple and efficient axial bearing for the stacker fan, permitting it to be rotated at a maximum speed with but little friction at its bearing points, and this is advantageous for, as will be readily understood, where the fan and driving shaft are connected in such as geared or frictionally driven fans, considerable strain and friction are present during the operation of the fan consequent upon the employment of gearing or the limited bearing surface for such rotary shafts, which conditions in my construction are non-existent, and by which arrangement I obtain a perfectly stable and true bearing for the rotating fan, rendering it very light running and maintained constantly in unstrained and proper position.

Shaft 20 extends through boxing, 30, forming part of bracket, 31, which bracket is secured to frame members, 32, of the stacker structure, and preferably formed integrally with said boxing is a bifurcated arm, 33; and upon the lower end of shaft 20 is pivoted, at 34, a lever, 35, preferably bifurcated to bear upon opposite sides of said shaft, as at 36, (Fig. 4), said lever being

bossed, 37, and perforated to register with a similar perforation in the members of arm 33, so that these members may be pivotally connected (Fig. 2), said lever having an extension or shank, 38, to which is secured an arm, 39, engaging a bolt, 40, which is held by a clip, 41, secured to frame members 42, said lever-arm 39 being interposed between said clip and a spring, 43, the tension of which spring is controlled by hand-wheel, 44. As will be readily understood, the fan structure is arranged to contact to a certain extent by gravity with its driving wheel, 60, (hereinafter to be more fully described), and also by pressure produced by the action of lever 35, which imparts a constant downward pull to shaft 20 which, by reason of its connection with the fan spider, draws the fan structure downwardly, so that disk 18 while in operation is in constant engagement with said driving wheel, and as it is desirable under certain conditions to vary and regulate the pressure between these elements I am enabled to readily and effectively do so by manipulating hand-wheel, 44, which increases or decreases the tension of spring 43 which in turn acts upon lever 35, through its arm 39, to exert a greater or lesser pull upon shaft 20, with a consequent degree of pressure upon said driving-wheel by disk 18.

Beneath the stacker fan is driving shaft, 50, which preferably extends across the entire width of the separating machine, so that a pulley, 51, may be mounted at either end thereof, and said shaft thus be driven from either side of the machine, as may be convenient or desirable. Said shaft 50 passes through boxing, 52, forming part of bracket 31, and at each end is rotatably supported in appropriate bearings mounted on the sills 53.

Mounted upon shaft 50 is the driving wheel, 60, for the fan, of any suitable construction and dimensions for the purpose, that which I have shown consisting of a spider, 61, having a recessed periphery, 62, in which is clamped by bolts, 63, or otherwise secured, any material, 64, which may be adapted for frictional driving engagement with the fan structure, said wheel having a balancing hub, 65, splined to said shaft in a well known manner to insure rotation with and permit adjustment longitudinally of said shaft, a hub, 66, having a peripheral groove, 67, therein forming also a part of said wheel, for a purpose to be presently described. When said shaft 50 is rotated, as will be apparent, said driving wheel 60 is also rotated, and as the latter is in frictional contact with fan-disk 18, hereinbefore described, said fan will also be caused to rotate.

As a means for shifting wheel 60 I mount a yoke, 70, in the groove of hub 66, but which does not interfere with the rotation of said hub, and extending from each side of said yoke is a pair of shifting rods, 71, running parallel with shaft 50 and movably secured at their opposite ends to bracket 72 mounted on sill 53, said bracket having a shoulder, 73, (Fig. 2), and on said shaft 50 I provide a screw-threaded collar, 74, on the outer end of which is a hand-wheel, 75, having an internal screw threaded and peripherally grooved shank, 76, which is fitted on shoulder 73 of bracket 72, and by which it is permitted to rotate but is prevented from movement longitudinally of said collar. Said bracket 72 terminates in supporting members, 77, having perforated upturned ends, 78, through which the rods 71 pass and behind which they are secured to cross-member, 79, which is fixedly held on collar 74 by nuts, 80, by which arrangement, when hand-wheel 75 is rotated, collar 74 is caused to travel back and forth on shaft 50, and through rods 71 and yoke 70 shift driving wheel 60 along said shaft 50 diametrically across fan-disk 18 to increase or decrease the speed of the stacker-fan as said driving wheel is adjusted on said shaft inwardly or outwardly across said disk, as may be desired; and, as said disk 18 may lie somewhat above or flush with the bottom of fan casing 10, in order to prevent contact therewith by the clamping bolts or other projecting material of driving wheel 60, I provide an offset opening, as 81 (Fig. 3), in said casing, so that said wheel may be shifted to its extreme or peripheral engagement with the disk without danger of contacting with the fan casing.

It is very important that the material on the peripheral surface of driving wheel 60 be protected from abrasion or wear at one portion more than another and thus becoming flattened and unfit for use, in other words, that a true and even surface be constantly maintained, and for this purpose I provide in bracket 31 a cam 85 mounted in ears, 86, which cam is provided with an operating arm, 87, and lies normally out of operative contact with the end of shaft 20. When the stacker is not in use, and especially when being transported, to prevent pressure upon and consequent flattening of that portion of the driving wheel which would normally contact with the disk, I may by impinging said cam 85 against shaft 20 raise the same slightly, and with it (by reason of its collar 21 and cap 26) the entire fan structure from the driving wheel, by which arrangement the fan is maintained in elevated position away from contact with said driving wheel, and injury to the latter by constant pressure of the fan-disk upon any one portion of its friction surface thus avoided.

I claim as my invention:

1. The combination, in a pneumatic stacker, of a fan casing, a frictionally driven rotatable fan embodying a disk mem-

ber mounted within said casing, means for frictionally driving said fan, means for vertically adjusting said fan, and means for changing the speed of said fan.

2. In a pneumatic stacker, a fan casing, a non-rotatable fan-shaft, a fan spider embodying a disk member mounted on said shaft, means for retaining said spider on said shaft, and means for frictionally engaging and rotating said spider.

3. In a pneumatic stacker, a fan comprising a casing, a non-rotatable fan shaft, a tubulated fan spider embodying a disk member mounted on said shaft, means for retaining said spider on said shaft, and means for frictionally engaging and rotating said spider.

4. In a pneumatic stacker, a fan comprising a casing, a non-rotatable fan-shaft, a tubulated fan-spider mounted on said shaft, anti-friction bearings engaging said shaft and said spider, means for retaining said spider on said shaft, and frictional means engaging said spider through said casing to rotate the same.

5. In a pneumatic stacker, a fan embodying a disk member mounted upon and rotatable about a non-rotatable shaft, a driving shaft, means on said driving shaft for engaging said disk and rotating said fan, and means for rotating said driving shaft.

6. A pneumatic stacker comprising a fan-casing, a friction disk in said casing, fan-wings associated with said disk, a driving-shaft, a driving wheel mounted on said shaft for rotating said disk, means for regulating the contact between said disk and wheel, means for adjusting said disk into and out of contact with said wheel, and means for shifting said wheel along said driving shaft to change the speed of said disk.

7. The combination, with a separating machine, of a pneumatic stacker fan, embodying a disk member, a casing for said fan having an inlet opening in its upper side and in its under side a coincident opening having an offset extending from one side thereof, a driving shaft extending transversely of said machine and adapted to be driven from either side thereof, and a friction driving wheel on said shaft peripherally engaging said fan disk through the lower opening in said fan casing and rotating said fan.

8. The combination, with a separating machine, of a pneumatic stacker fan, embodying a disk member, a casing for said fan having an inlet opening in its upper side and in its lower side a coincident opening having an offset extending from one side thereof, a driving-shaft extending transversely of said machine and adapted to be driven from either side thereof, a friction driving-wheel on said shaft peripherally engaging said fan through the lower opening in said fan casing, and pressure regulating means for controlling the contactual engagement between said fan and wheel.

9. The combination, with a separating machine, of a pneumatic stacker fan embodying a disk member, a driving shaft extending transversely of said machine and adapted to be driven from either side thereof, a friction driving-wheel on said shaft peripherally engaging said fan through its casing, and means for adjusting said fan into and out of contact with said wheel.

10. In a pneumatic stacker, the combination of a fan casing, a fan therein comprising a winged spider embodying a disk, a non-rotatable shaft supporting said fan, and rotatable means for frictionally engaging said disk to rotate said fan.

11. In a pneumatic stacker, the combination of a fan casing, a fan therein comprising a combined winged coniform spider and disk, a non-rotatable shaft supporting said fan, a driving shaft, and means on said driving shaft for frictionally engaging said disk and rotating said fan.

12. In a pneumatic stacker, a supporting bracket, a non-rotatable and longitudinally adjustable shaft mounted in said bracket, a fan embodying a disk member rotatably mounted on said shaft, means communicating with said fan through its casing for rotating the same, and means for adjusting said shaft to move said fan into and out of contact with said driving means.

13. In a pneumatic stacker, a supporting bracket, an adjustable fan-shaft in said bracket, a frictionally driven fan mounted on said shaft, a driving shaft, a friction driving-wheel on said shaft peripherally engaging said fan, pressure regulating means for maintaining contact between said fan and wheel, and a cam in said bracket adapted to adjust said fan-shaft to move said fan into and out of contact with said driving-wheel.

14. In a pneumatic stacker, the combination of a driving-shaft, a supporting bracket, an adjustable non-rotatable fan-shaft in said bracket, a fan on said shaft, a driving wheel on said driving shaft, means for shifting said driving-wheel longitudinally of said driving shaft, means for maintaining contact between said wheel and said fan, and means for adjusting said fan shaft to move said fan into and out of contact with said driving-wheel.

15. In a pneumatic stacker, a fan, a casing therefor having an opening in its under side, a driving shaft, a friction driving-wheel adjustably mounted on said shaft and engaging said fan through said opening, shifting rods connected at one end to said wheel and at opposite sides thereof, means for connecting the opposite ends of said rods, and means for adjusting said

connecting means to longitudinally shift said rods and adjust said driving wheel on said shaft.

16. In a pneumatic stacker, a fan, a casing therefor having an opening in its under side, a driving shaft, a friction driving-wheel longitudinally adjustable thereon and rotatable therewith and engaging said fan through said opening, a yoke connected to said wheel, a supporting bracket, rods connected to said yoke and slidably supported in said bracket, and means associated with said bracket for simultaneously shifting said rods longitudinally and adjusting said driving-wheel on said shaft.

17. In a pneumatic stacker, a driving shaft, an adjustable friction driving-wheel mounted on said shaft, shifting rods connected at one end to said wheel and at opposite sides thereof, means for connecting the opposite ends of said rods, a screw-threaded member engaging said connecting means, and means for rotating said member to cause said connecting member to travel therealong and through said rods to adjust said driving wheel on its shaft.

18. In a pneumatic stacker, a coniform fan spider, a tubular member constituting its shaft-bearing extending from the apex thereof, and a disk member extending from the base thereof and adapted to be engaged by a friction driving wheel.

19. In a pneumatic stacker, a frictionally driven fan rotatably mounted on a non-rotatable fan-shaft, said fan-shaft, a driving shaft, a friction driving wheel on said driving shaft engaging said fan, a lever connected to said fan-shaft, and means for actuating said lever to vary its pull on said fan-shaft to increase or decrease the pressure between said fan and said driving wheel.

20. In a pneumatic stacker, a frictionally driven fan rotatable about a stud shaft, a driving shaft, driving means on said latter shaft engaging said fan, and a spring-actuated lever connected to said stud-shaft for regulating the pressure between said fan and said driving wheel.

21. In a pneumatic stacker, the combination of a supporting bracket, an adjustable shaft in said bracket, a rotatable fan on said shaft, a driving-shaft passing through said bracket, a driving-wheel on said driving shaft peripherally engaging and rotating said fan, and means mounted in said bracket for adjusting said fan-shaft to engage or disengage said fan and driving-wheel.

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

FREDERICK L. SATTLEY.

Witnesses:
JAMES A. WALSH,
HOMER R. BARKER.