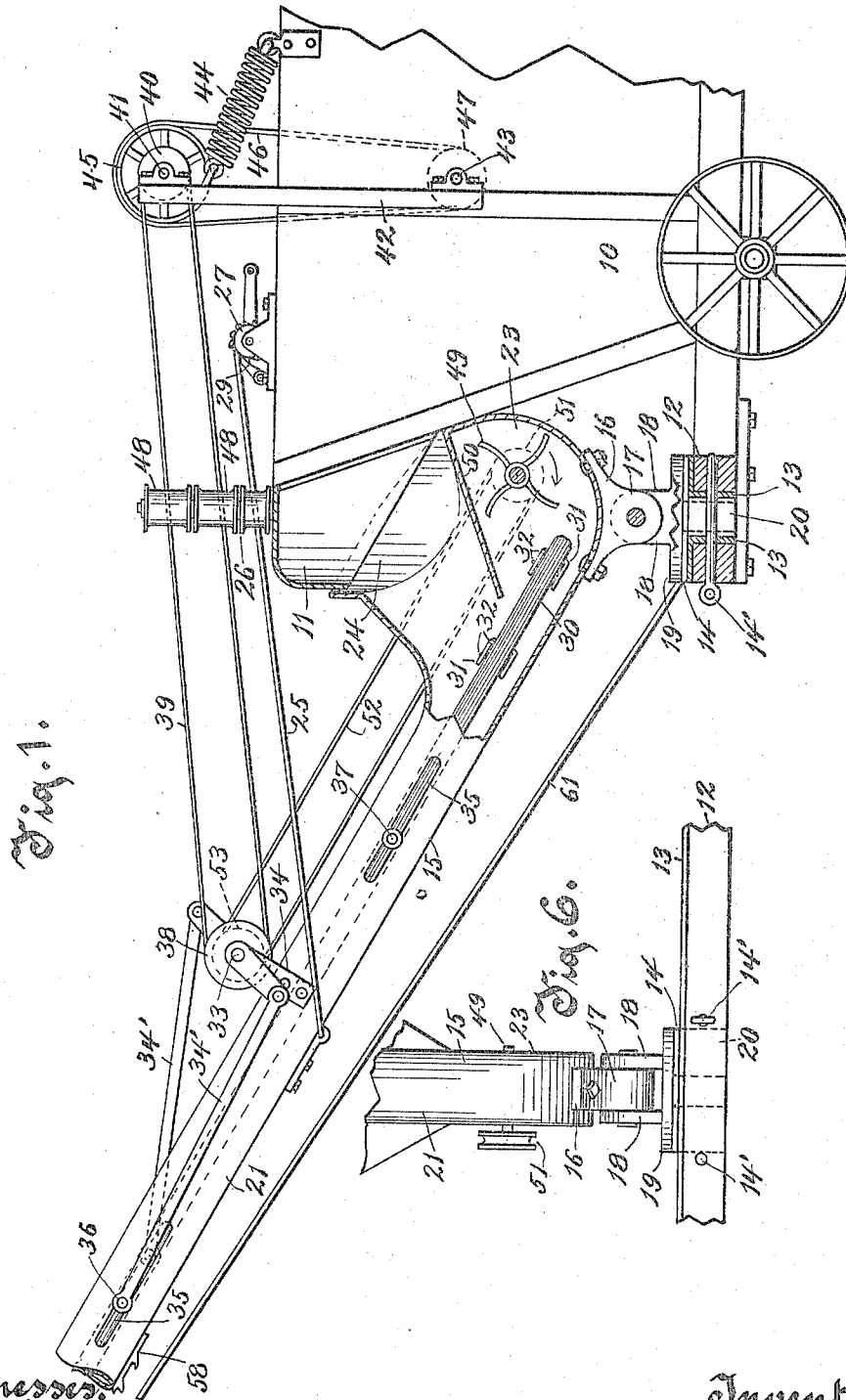


A. ROSENTHAL.  
STRAW STACKER AND ELEVATOR.  
APPLICATION FILED MAY 29, 1908.

957,907.

Patented May 17, 1910.

3 SHEETS—SHEET 1.



Witnesses:  
A. Keeney,  
Anna F. Schmidtbauer

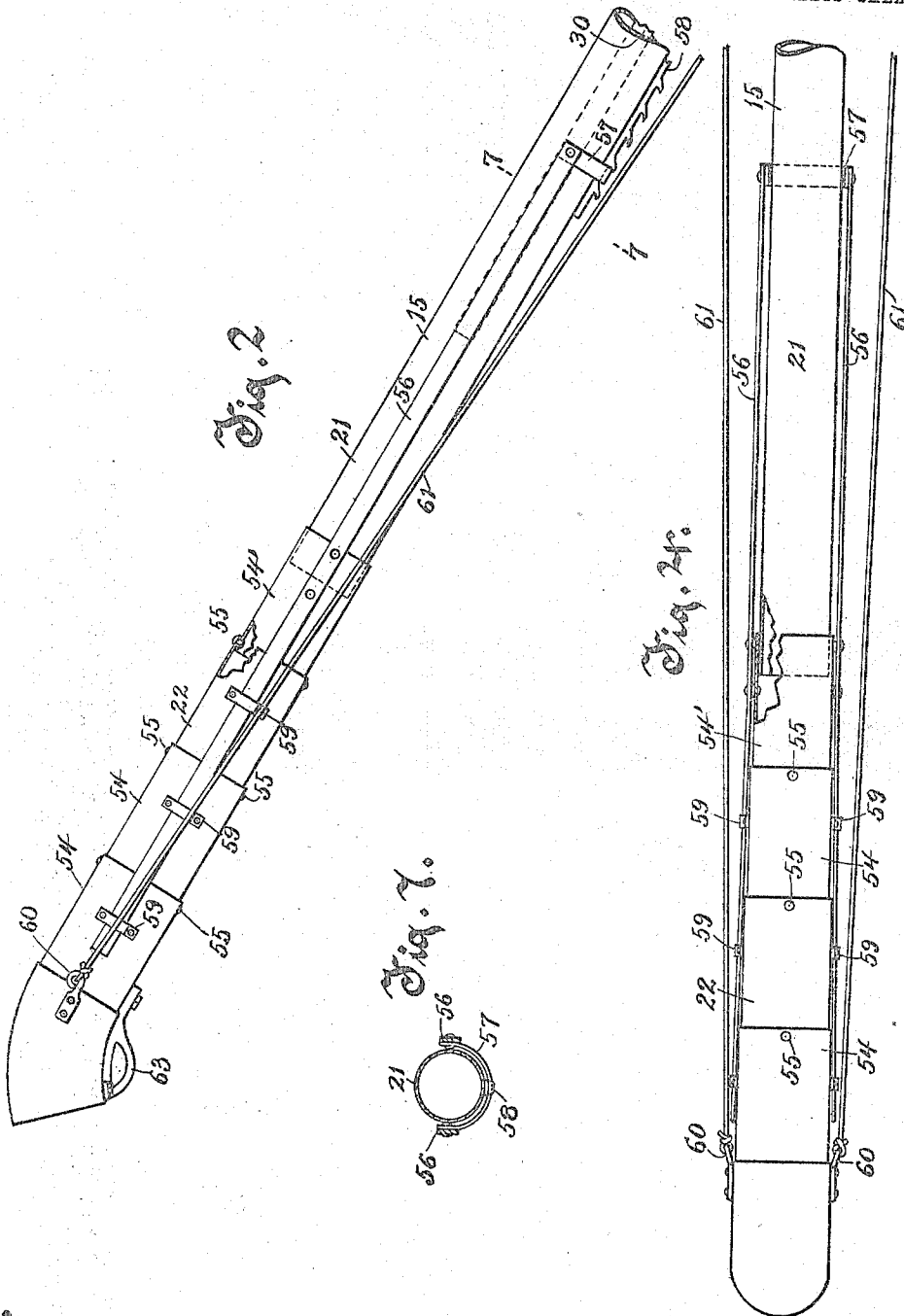
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3 SHEETS—SHEET 2.



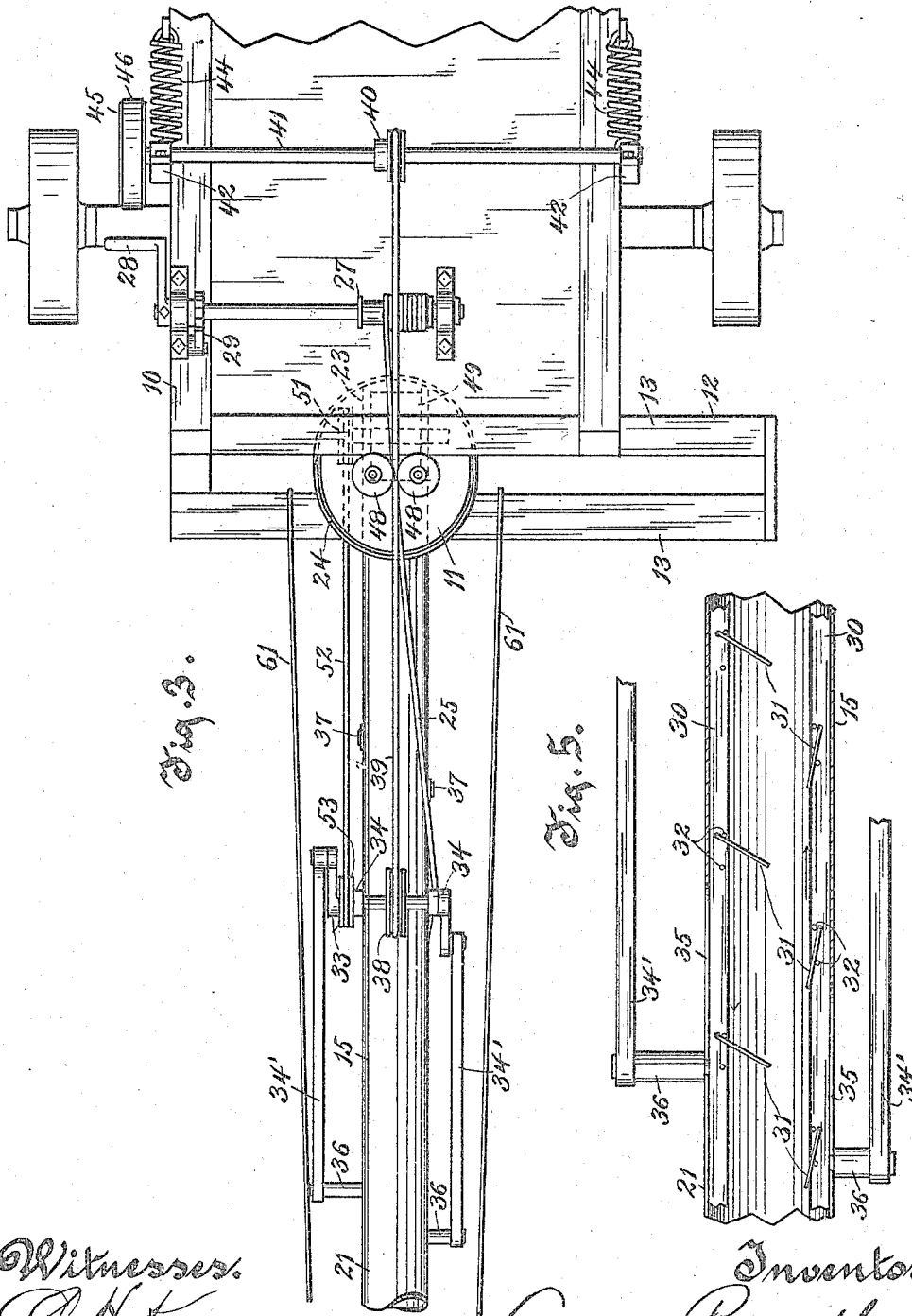
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 3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE

AUGUST ROSENTHAL, OF WEST ALLIS, WISCONSIN.

STRAW STACKER AND ELEVATOR.

957,907.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed May 29, 1908. Serial No. 435,610.

*To all whom it may concern:*

Be it known that I, AUGUST ROSENTHAL, residing in West Allis, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Straw Stackers and Elevators, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in straw stackers and elevators.

In the operation of discharging and elevating straw and fodder from threshing machines, corn huskers, ensilage cutters, and machines of like character, the material is discharged from the machine into a tube and is elevated and blown therefrom by pneumatic means, or the material is discharged into a trough and elevated by means of an endless chain provided with material engaging slats or fingers. Both of these constructions are open to serious objection. In the first place, the operators engaged in piling up the material blown from the tube, are subjected to great discomfort in being compelled to breathe the air which is permeated with the dust and fine particles of material blown from the discharge end of the tube. In the second place, machines of the character referred to are objectionable not only on account of the expense connected with their construction, but furthermore on account of their weight and the complicated nature of the endless conveyer, and the liability of the parts breaking.

One of the objects of this invention is to obviate these and other defects in straw stackers and elevators as they have heretofore been constructed, by providing means whereby the straw and fodder will be elevated and delivered from the spout without dust arising therefrom, the improved means for accomplishing this result being inexpensive to manufacture and maintain, and comprising but a minimum number of parts.

A further object is to accomplish the above result by reciprocating parts provided with engaging fingers associated with the tube of a stacker.

A further object is to provide a stacker tube which is flexible at its outer end, and which also increases in diameter at said end so that material may be more easily discharged therefrom.

A further object is to provide means for

moving the material into the path of movement of the reciprocating bars so it will be engaged thereby.

A further object is to provide means whereby the stacker may be swung or elevated to any angle desired without affecting the operation of the reciprocating bars or the means for moving the material into the path of movement of said bars.

A further object is to provide means for adjusting the length of the stacker and for curving the discharge end thereof laterally. And a still further object is to provide means whereby the stacker may be swung and lowered to a position alongside of the machine for convenience in traveling from place to place without disconnecting said stacker from the machine.

With the above, and other objects, in view, the invention consists of the devices and parts, or their equivalents, as hereinafter set forth.

In the accompanying drawings, in which the same reference characters designate the same parts in all of the views: Figure 1 is a side view of a portion of a threshing machine provided with the improved elevator and stacker, the outer end of which is shown in another figure, parts also broken away to show interior construction; Fig. 2 is a side view of the outer end of that portion of the stacker omitted in Fig. 1, parts broken away; Fig. 3 is a plan view of the parts shown in Fig. 1; Fig. 4 is a plan view of the parts shown in Fig. 2, parts broken away; Fig. 5 is a sectional detail view showing a fragment of the stacker tube and the reciprocating bars; Fig. 6 is a front view of a portion of the stacker and its support; and Fig. 7 is a cross sectional view of the stacker tube taken on line 7-7 of Fig. 2.

Referring to the drawings, the numeral 10 indicates the discharge end of a threshing machine, and 11 the circular discharge spout or outlet thereof. A stacker supporting frame 12 consisting of two parallel timbers spaced a short distance apart are fastened to and extend transversely of the main frame of the threshing machine. This frame 12 extends beyond one side of the main frame a short distance to provide a support for the stacker when it is swung alongside of the threshing machine in traveling from place to place, as will be hereinafter more fully described. The timbers of the frame are re-

enforced by means of angle irons 13 which also serve as guides and wearing plates for the sliding block 14 in which the stacker 15 is pivotally supported. The pivotal connection consists of a block 16 rigidly connected to the lower end of the stacker and provided with a depending eyed lug 17 positioned between and pivoted to two upstanding eyed ears 18 forming part of a block 19 revolvably mounted in the sliding block 14. The sliding block 14 rests on top of the angle irons of the supporting frame and has a rectangular portion 20 depending therefrom which is disposed between the inner sides of the supporting frame and guided thereby. The sliding block 14 is held in position between two pins 14' one of which is removable to permit the block to be slid to one end of the supporting frame in order to swing the stacker around against the side of the threshing machine.

The stacker, consisting of a straight section of tubing 21 and a flexible extensible tube section 22, merges into an enlarged lower end portion 23 provided with a circular opening 24 in the upper portion thereof. The circular opening 24 which is immediately beneath the discharge spout 11 and axially above the revolvable block 19 is provided with an upwardly turned flange which partly overlaps the circular downwardly extending portion of the discharge spout 11 so that in swinging the stacker to different positions of adjustment in a horizontal plane the two openings will always remain in register with each other. The outer end of the stacker is raised or lowered by means of the rope 25 which is connected to the tube of the stacker and passes between two idle spools 26 mounted on top of the discharge spout of the threshing machine and is wound around the drum of a small windlass 27. This windlass is provided with an operating handle 28 and the drum is prevented from unwinding by the pawl and ratchet wheel 29 associated with the shaft of said drum.

A pair of reciprocating bars 30 located within the straight section of tubing are positioned at opposite sides thereof and are provided with swinging fingers 31 pivotally connected thereto. These fingers are inserted through openings provided therefor in the bars and are bent at right angles in the form of the letter U with the two stems resting against the top and bottom sides respectively of the bars, and the base of the U forming the pivotal connection with said bars. Stop pins 32 connected to the bars are positioned in the path of movement of the fingers to limit their swing so that in the forward reciprocation of the bars the fingers are permitted to swing to a position substantially at right angles with the bars and will be in a position to engage and advance the

material upwardly in the tube, and during the rearward reciprocation of the bars the fingers are permitted to swing to a position substantially parallel with the bars and pass freely through the advancing material so as not to obstruct or retard the progress of said material. The bars are alternately reciprocated in opposite directions by means of a double crank 33 mounted in a support 34 connected to the tube of the stacker. Motion is communicated from the double crank to the bars by connecting bars 34' which are pivotally connected to the double crank lever and to the reciprocating bars. The tube of the stacker is provided with elongated slots 35 through which the pins 36 pass which connect the reciprocating bars to the connecting bars and also accommodate the guide pins 37 connected to said reciprocating bars. The reciprocating bars are of sufficient length to completely cover the elongated slots and prevent any material being discharged therefrom.

A grooved pulley 38 mounted on the shaft of the double crank is provided with a belt 39 which extends from said pulley to a small pulley 40 mounted on a shaft 41 which has its bearings in a swinging frame 42 pivoted on the drive shaft 43 of the threshing machine. This swinging frame serves as a belt tightener and is held in an upright position against the pull of the belt by coiled springs 44 connected thereto and to a part of the threshing machine.

A belt wheel 45 mounted on the shaft 41 is provided with a belt 46 which extends downwardly from said belt wheel to and surrounds a small pulley 47 mounted on the drive shaft 43. This drive shaft forms part of the mechanism of the threshing machine and is driven in any convenient manner. Four idle spools 48 are mounted in pairs on extensions of the shafts on which the spools 26 are mounted, and between which spools the belt 39 is guided. These spools are positioned approximately above the center of the pivotal connection of the stacker tube and the sliding block so that when the stacker is swung around on its pivot the belt will be held in proper alinement with its respective pulleys, the swinging frames permitting a sufficient give to compensate for the changed distance apart of the pulleys due to their angle with relation to each other.

In order to prevent particles of the material being elevated in the stacker from settling or gathering in the lower end of the tube of the stacker a beater 49 is mounted in said lower end of the tube and is adapted to beat or kick the material back into the path of movement of the reciprocating bars where it will be engaged by the fingers of said bars and moved toward the discharge end of the stacker with the other material. An apron

50 extends over the top of the beater and prevents the material discharged from the discharge spout of the threshing machine from dropping directly onto the beater and also serves to guide the material into the path of movement of the reciprocating bars. A grooved pulley 51 is mounted fast on the beater shaft and is provided with a belt 52 which extends to and surrounds a pulley 53 mounted fast on the shaft of the double crank and is the means for imparting rotation to the beater.

The outer portion 22 of the tube of the stacker is formed of a series of short tube sections 54 and 54' overlapping each other and pivotally connected together so that adjacent sections have a limited lateral swing with respect to each other. Each section increases in diameter with respect to the inner adjacent overlapped section and the sections are connected together by rivets 55 diametrically positioned vertically in pairs. This portion 22 of the stack telescopes over the outer end of the straight section of tubing 21 and is held in adjusted positions by means of two flexible bars 56 which are connected at their lower ends to a semicircular locking band 57 which is adapted to engage the teeth of a rack bar 58 fastened to the under side of the tube section 21. The medial portions of these flexible bars 56 are rigidly fastened to the lower section 54' of the extensible section 22 and each one of the other short sections 54 are provided with guide straps 59, positioned one on each side. The flexible bars are disposed in the eyes formed by the straps and the sides of the short sections and serve as a support for each section and also permit said section to slide thereon when the flexible tube is bent laterally.

The discharge end of the stacker is slightly curved downwardly in order to properly direct the discharge of the material and the sides of this curved end are provided with eyed plates 60 to which are connected ropes 61 which are adapted to adjust the angle of the lateral bend of the flexible section. An eyed plate 63 fastened to the two outer sections of the stacker is adapted to serve as a handle to shorten the stacker when the locking band 57 is sprung down and out of engagement with the teeth of the rack bar 58.

The operation of the stacker is as follows; straw or fodder is fed to the stacker through the circular opening thereof from the discharge spout of the machine to which it is connected. The material in entering the stacker will be deflected by the apron over the beater into the path of movement of the reciprocating bars where it will be engaged by the fingers of said bars and quickly worked up to the end of the tube and discharged therefrom. The bars are reciprocated back and forth by means of the double

crank and the connecting bars. The pivoted fingers of the bars are adapted to engage the material and move it forward at each upward reciprocation, and during the return stroke the fingers swing against the bars and pass down freely through the upwardly moving material and at the end of the stroke the fingers are again swung outwardly by engagement with the material and the same operation continues as before described. If any of the material should drop to the lower end of the tube and out of the path of movement of the reciprocating bars it will be kicked back by the beater.

The double crank is revolved by means of the pulleys and belts in any position of adjustment to which the stacker may be swung, due to the swinging frame, and the spools positioned above the axial center of the pivotal connection of the stacker with the supporting frame. The increasing diameters of the short sections of the flexible portion of the stacker will prevent the material from blocking up or packing in the end of the tube even though the outer ends of the reciprocating bars are at a considerable distance from the outer end of the stacker, or the flexible portion of the stacker be bent at an angle to the straight section.

The stacker may be extended or contracted by means of the telescoping portion and the outer portion may be bent laterally by means of the adjusting ropes.

The stacker may be raised or lowered by means of the windlass and connecting rope and also slid along the supporting frame to a position where it may be swung around alongside of the machine to which it is attached so that the machine may be conveniently moved from place to place.

It is to be understood that this invention is not limited to any specific form or arrangement of parts except insofar as such limitations are specified in the claims.

What I claim as my invention is:

1. A stacker and elevator, comprising a tube, a supporting frame, a sliding block mounted on said frame, a block revolvably mounted in said sliding block and to which the tube is pivoted, reciprocating bars positioned within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, connecting bars connected to said pins, cranked means for reciprocating the bars in alternately opposite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alignment with the pivot of the revoluble block, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, an

apron above said beater, and a connection between the beater and the shaft of the double crank for rotating said beater.

2. A stacker and elevator, comprising a tube provided with a circular opening constructed to overlap the discharge spout of the machine to which it is connected, a supporting frame for said tube, a pivotal connection between the tube and the frame positioned medially beneath the circular opening of the tube, reciprocating bars located within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, cranked means for reciprocating the bars in alternately opposite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alinement with the pivotal connection of the tube and frame, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, and a connection between the beater and the double crank for rotating said beater.

3. A stacker and elevator, comprising a tube provided with a circular opening constructed to overlap the discharge spout of the machine to which it is connected, a supporting frame for said tube, a pivotal connection between the tube and the frame positioned medially beneath the circular opening of the tube, reciprocating bars located within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, cranked means for reciprocating the bars in alternately opposite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alinement with the pivotal connection of the tube and frame, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, a pulley fixed on the shaft of the beater, a pulley connected to the cranked means, and a belt connecting both pulleys.

4. A stacker and elevator, comprising a tube provided with a circular opening constructed to overlap the discharge spout of the machine to which it is connected, a supporting frame for said tube, a pivotal connection between the tube and the frame positioned medially beneath the circular opening of the tube, reciprocating bars located within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, cranked means for reciprocating the bars in alternately op-

posite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alinement with the pivotal connection of the tube and frame, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, a connection between the beater and the double crank for rotating said beater, a windlass mounted on the machine, and a rope connected to the tube and the windlass and passing between two of the spools for adjusting the angle of the tube.

5. A stacker and elevator, comprising a tube, a reciprocating bar associated with said tube and provided with means for engaging and moving material within said tube, means for reciprocating the bar, means for positively moving material into the path of movement of the reciprocating bar, a flexible extensible tube formed of short tube sections pivoted together and of increasing diameters toward the discharge end thereof connected to said first mentioned tube, flexible bars connected to each short tube section, and means coacting with said flexible bars for holding the extensible tube in positions of adjustment.

6. A stacker and elevator, comprising a tube, a reciprocating bar associated with said tube and provided with means for engaging and moving material within said tube, means for reciprocating the bar, means for positively moving material into the path of movement of the reciprocating bar, a flexible extensible tube formed of short tube sections pivoted together and of increasing diameters toward the discharge end thereof connected to said first mentioned tube, flexible bars connected to each short tube section, a curved band connecting the lower ends of the flexible bars together, and a rack connected to the tube and constructed to hold the extensible tube in positions of adjustment.

7. A stacker and elevator, comprising a tube, a reciprocating bar associated with said tube and provided with means for engaging and moving material within said tube, means for reciprocating the bar, means for positively moving material into the path of movement of the reciprocating bar, a flexible extensible tube formed of short tube sections pivoted together and of increasing diameters toward the discharge end thereof connected to said first mentioned tube, flexible bars connected to each short tube section, ropes connected to the extensible tube for adjusting the angle of the tube, a curved band connecting the lower ends of the flexible bars together, and a rack connected and constructed to hold the extensible tube in positions of adjustment.

8. A stacker and elevator, comprising a tube, a reciprocating bar associated with said tube and provided with means for engaging and moving material within said tube, means for reciprocating the bar, means for positively moving material into the path of movement of the reciprocating bar, a flexible extension tube formed of short tube sections pivoted together and of increasing diameters toward the discharge end thereof connected to said first mentioned tube, straps connected to some of the short tube sections, flexible bars connected to the lowest short tube section and having a sliding engagement with the sections provided with the straps, a curved band connecting the lower ends of the flexible bars together, and a rack connected to the tube and constructed to hold the extensible tube in positions of adjustment.

9. A stacker and elevator, comprising a tube provided with a circular opening constructed to overlap the discharge spout of the machine to which it is connected, a supporting frame for said tube, a pivotal connection between the tube and the frame positioned medially beneath the circular opening of the tube, reciprocating bars located within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, cranked means for reciprocating the bars in alternately opposite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alignment with the pivotal connection of the tube and frame, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, a connection between the beater and the double crank for rotating said beater, a flexible extensible tube formed of short tube sections of increasing diameters toward the discharge end thereof connected to said first mentioned tube, and means for holding the tube in positions of adjustment.

10. A stacker and elevator, comprising a tube provided with a circular opening constructed to overlap the discharge spout of the machine to which it is connected, a supporting frame for said tube, a pivotal connection between the tube and the frame positioned medially beneath the circular opening of the tube, reciprocating bars located within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, cranked means

for reciprocating the bars in alternately opposite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alignment with the pivotal connection of the tube and frame, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, a connection between the beater and the double crank for rotating said beater, a flexible extensible tube formed of short tube sections pivoted together and of increasing diameters toward the discharge end thereof connected to said first mentioned tube, and means for holding the extensible tube in positions of adjustment.

11. A stacker and elevator, comprising a tube provided with a circular opening constructed to overlap the discharge spout of the machine to which it is connected, a supporting frame for said tube, a pivotal connection between the tube and the frame positioned medially beneath the circular opening of the tube, reciprocating bars located within said tube, material engaging fingers pivotally connected to said bars, pins connected to said bars and extending through slots provided in the tube, cranked means for reciprocating the bars in alternately opposite directions, a pulley connected to the cranked means, a swinging frame provided with a pulley, spools mounted above and in approximately axial alignment with the pivotal connection of the tube and frame, a belt connected to both pulleys and extending between the spools, a yielding means connected to the swinging frame, a beater positioned in the lower part of the tube, a connection between the beater and the double crank for rotating said beater, a flexible extensible tube formed of short tube sections pivoted together and of increasing diameters toward the discharge ends thereof connected to said first mentioned tube, straps connected to some of the short tube sections, flexible bars connected to the lowest short tube sections and having a sliding engagement with the sections provided with the straps, a curved band connecting the lower ends of the flexible bars together, and a rack connected to the tube and constructed to hold the extensible tube in positions of adjustment.

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

AUGUST ROSENTHAL.

Witnesses:

C. H. KEENEY,

ANNA F. SCHMIDTBAUER.