H. F. SCHRODER.

STRAW STACKER.

APPLICATION FILED SEPT. 8, 1914.

1,144,386.

Patented June 29, 1915.

3 SHEETS—SHEET 1.

Fig. 1

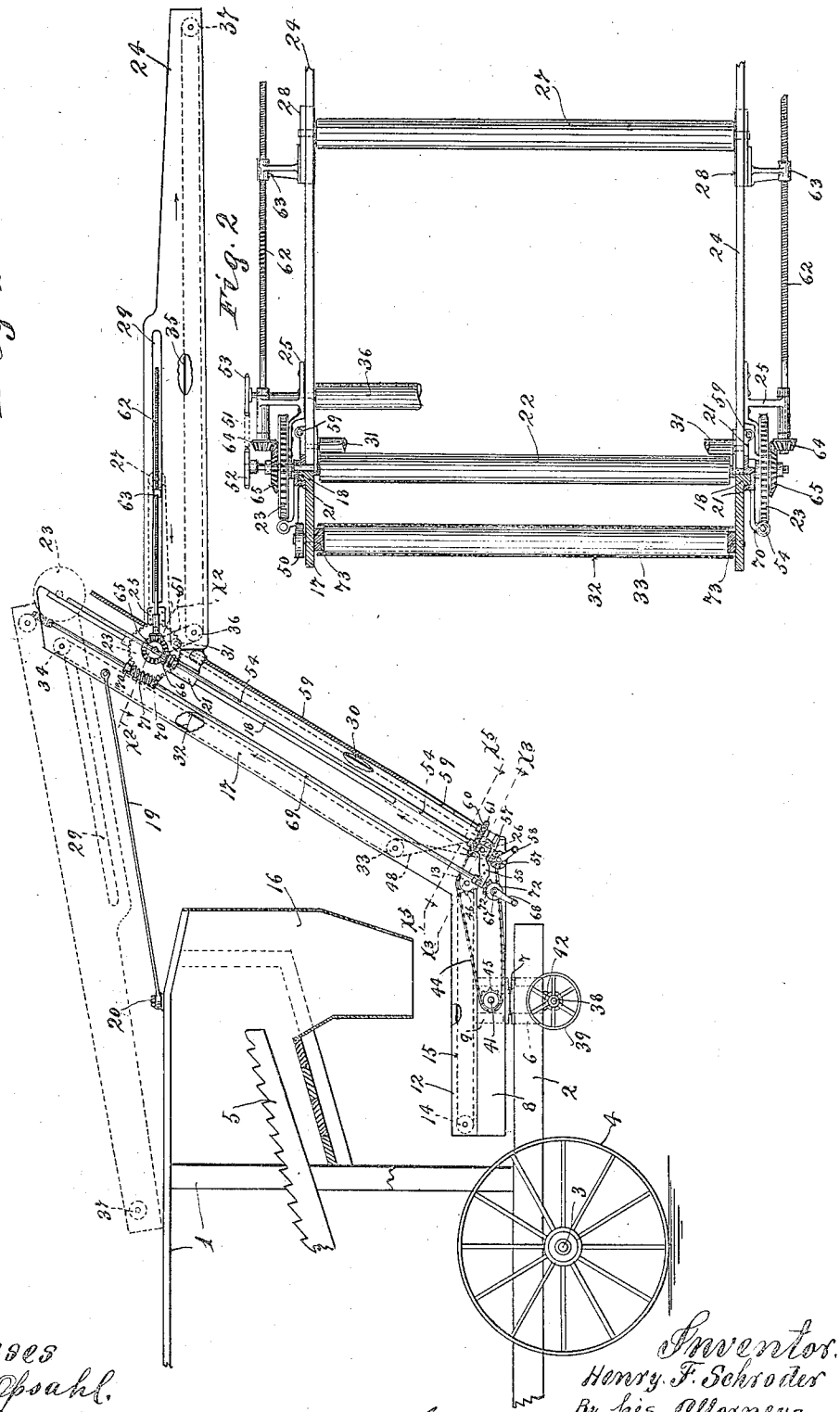


Fig. 2

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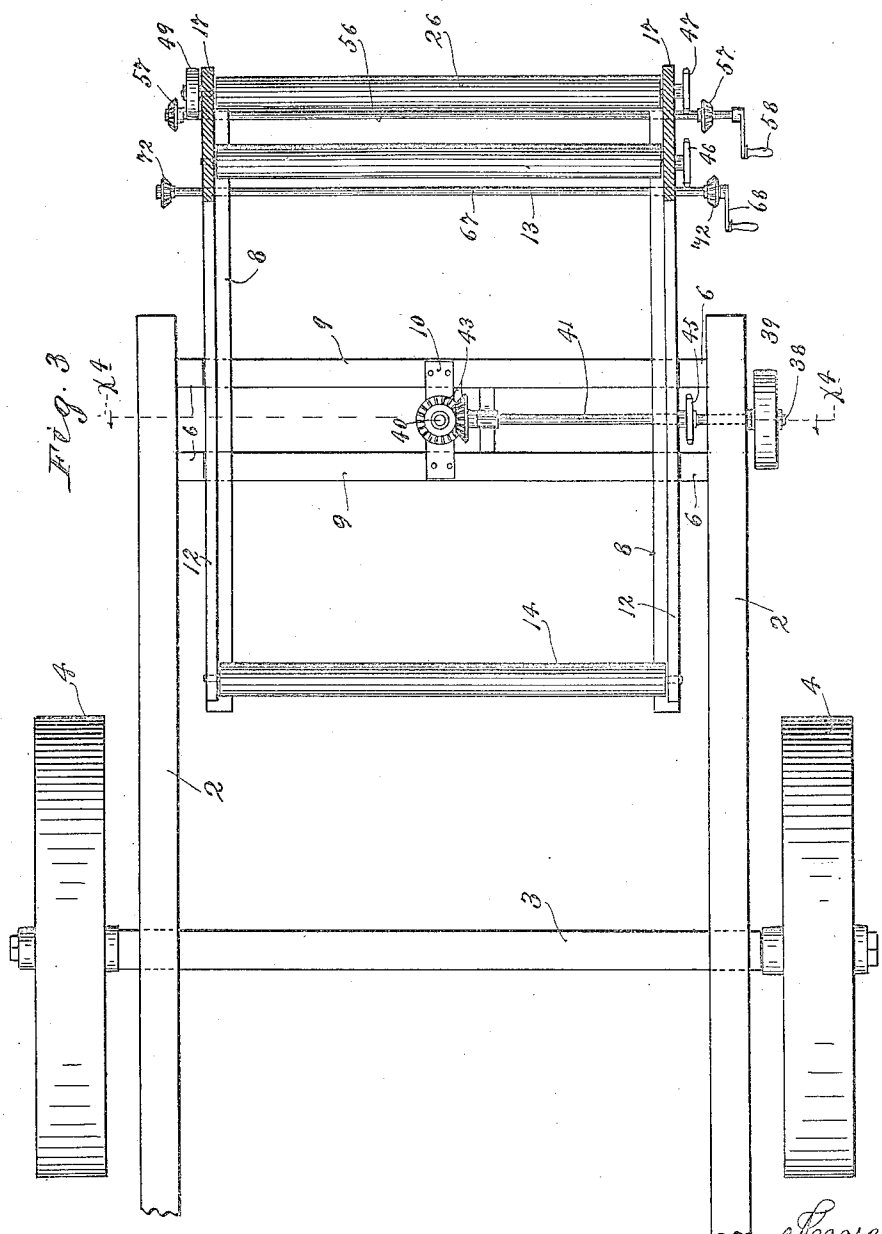
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3 SHEETS—SHEET 2.

Fig. 3



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3 SHEETS—SHEET 3.

Fig. 4

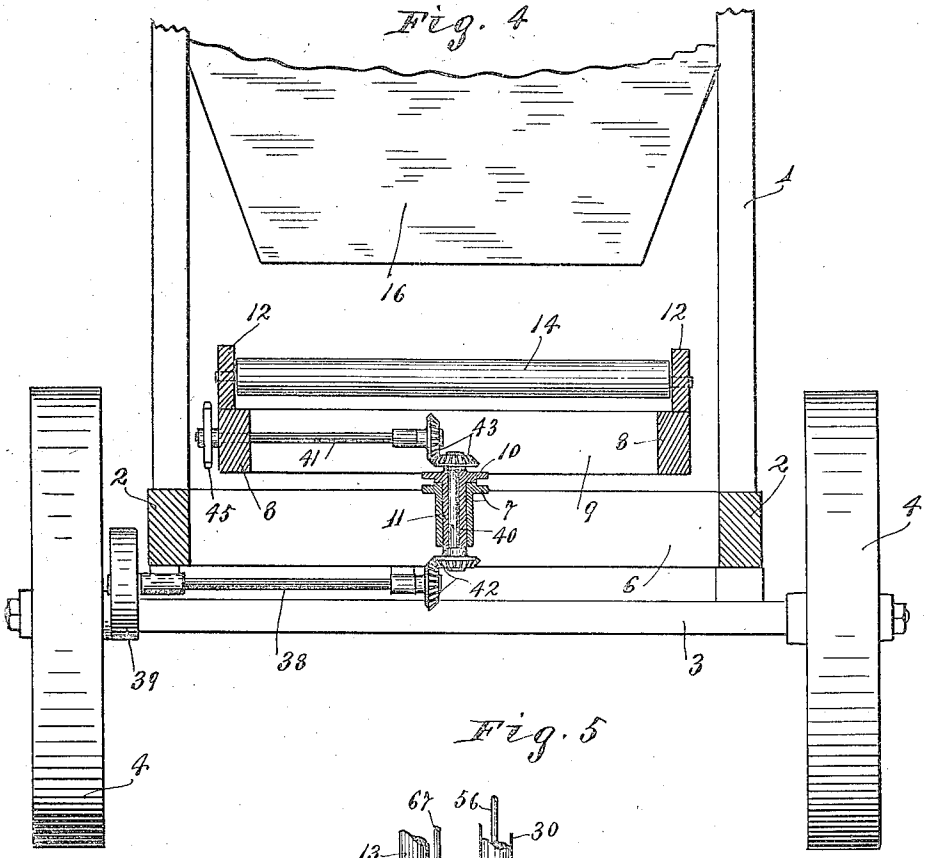
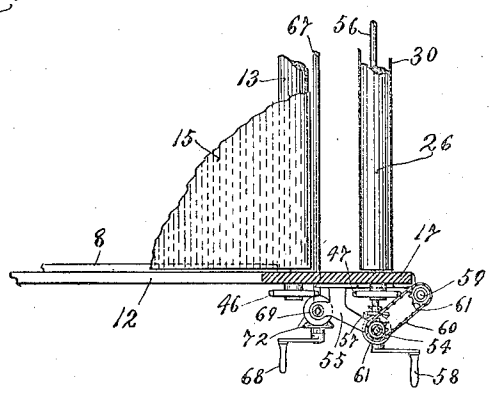


Fig. 5



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UNITED STATES PATENT OFFICE.

HENRY F. SCHRODER, OF WINDHAM, MONTANA.

STRAW-STACKER.

1,144,386. Specification of Letters Patent. Patented June 29, 1915.

Application filed September 8, 1914. Serial No. 860,553.

To all whom it may concern:

Be it known that I, HENRY F. SCHRODER, citizen of the United States, residing at Windham, in the county of Fergus and State of Montana, have invented certain new and useful Improvements in 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.

My invention has for its object to provide a straw stacker attachment for threshing machines; and, to this end, it consists of the novel devices and combinations of devices hereinafter described and defined in in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a side elevation of the improved straw stacker attachment, mounted on a threshing machine, some parts being broken away, some of the exposed parts being shown in section, and some parts being indicated in different positions by means of dotted lines; Fig. 2 is a view, partly in plan and partly in section, taken on the line x^2 x^2 of Fig. 1, some parts being removed and some parts being broken away; Fig. 3 is a view, partly in plan and partly in section, taken on the line x^3 x^3 of Fig. 1, some parts being removed and some parts being broken away; Fig. 4 is a view, partly in end elevation and partly in section, taken on the line x^4 x^4 of Fig. 3; and Fig. 5 is a detail view, partly in plan and partly in section, taken on the line x^5 x^5 of Fig. 1.

Of the parts of the threshing machine illustrated for the purpose of showing the improved stacker applied in working position, it is only necessary to note the machine case 1, supported on side sills 2, rear axle 3, rear wheels 4 and straw rack 5.

The parts above referred to may be of the standard or any desired construction.

The side sills 2 are rearwardly extended and rigidly connected by a pair of laterally spaced end sills 6, having bolted or otherwise rigidly secured to the intermediate portion thereof a casting 7, having a depending socket. A turntable 8, rectangular in form, is supported on the casting 7 for horizontal swinging movement. Rigidly secured to the intermediate portions of the side bars of the turntable 8 is a pair of laterally spaced bars 9, to the under side of which is bolted a casting 10, resting on the casting 7 and having a depending tubular trunnion 11, journaled in the socket of said casting 7.

Journaled in the front ends of side board extensions 12 on the turntable 8 is a horizontally extended driven roller 13, and journaled in the rear ends of said extensions is an idle roller 14. The rollers 13 and 14 are in parallel arrangement and a receiving or platform apron 15 runs thereover. An open bottom hopper 16 closes the delivery end of the machine case 1 and delivers the straw from the straw rack 5 onto the platform apron 15, substantially over the trunnion 11.

At the forward end of the turntable 8 is an upwardly and outwardly inclined elevator frame 17, rigidly secured thereto for horizontal swinging movement. On the outer face of each side board of the elevator frame 17, and at the lower longitudinal edge thereof, is rigidly secured a guide rail 18. The upper end of the elevator frame 17 is supported from the machine case 1 by a long rod 19, the inner end of which is swiveled on a stud 20, secured to the top of said case. This stud 20 is axially alined with the trunnion 11 to permit free swinging movement of the turntable 8.

Slidably mounted on each guide rail 18 is a traveler 21, having the trunnions of a horizontal roller 22 journaled therein. The trunnions of the roller 22 are both extended outward of the travelers 21 and have loosely journaled on each thereof a large worm wheel 23. A horizontally extended delivery frame 24 is supported from the worm wheels 23 by castings 25, rigidly secured to the inner ends of the side boards of said delivery frame and to said worm wheels. By means of the travelers 21, the delivery frame 24 may be raised and lowered bodily and by means of the worm wheels 23 the outer end of said frame may be swung in the arc of a circle, substantially 180 degrees. Means for moving the travelers 21 on the guide rails 18 and for oscillating the worm wheels 23 will presently be described.

Extending parallel to the roller 13 and located forward and slightly below the same is a driven roller 26, journaled in the side boards of the elevator frame 17. Mounted for parallel movement toward and from the

roller 22 is an idle roller 27, having its trunnions journaled in bearings 28 slidably mounted in slots 29, formed in the upper longitudinal portions of the side boards of the delivery frame 24, and which extend radially from the roller 22. An apron 30 travels over the rollers 26 and 27 and the upper run of said apron travels over the roller 22, and the lower run thereof travels over a relatively small idle roller 31, having its trunnions journaled in the travelers 21. The travel of the apron 30 between the rollers 26 and the two rollers 22 and 31 is in the same plane with the elevator frame 17, and the travel of said apron between the rollers 22 and 31 and the roller 27 is in the same plane with the delivery frame 24. Obviously, the sliding bearings 28 permit the upper end of the apron 30 to move toward and from the roller 22 to compensate for the varying length of the apron 36 between the rollers 22 and 26 during the raising and lowering movements of the delivery frame 24.

Vertically spaced above the apron 30 and extending parallel therewith is a coöperating apron 32 which runs over a lower driven roller 33 and an upper idle roller 34. The straw from the platform apron 15 is delivered between the aprons 30 and 32, which constitute an elevator, and is carried upward thereby and delivered onto a delivery apron 35. This apron 35 runs over an inner driven roller 36 and an outer idle roller 37. It is important to note that the rollers 36 and 37 are journaled in the side boards of the delivery frame 24 in a plane below the delivery end of the apron 30 and that said delivery end overlaps the receiver end of the apron 35.

The above described aprons are driven by the following connections, to-wit: A transversely extended, horizontal shaft 38 is journaled in depending bearings on the sills 2 and 6 and has keyed to its outer end a pulley 39 over which runs a belt, not shown. This belt may be driven from any of the driven parts of the threshing machine. In the trunnion 11 is journaled a vertical shaft 40 and a countershaft 41 is extended parallel to the shaft 38 and journaled in bearings on the turntable 8. The shaft 40 is driven from the shaft 38 by a pair of intermeshing gears 42 and the shaft 41 is driven from the shaft 40 by a pair of intermeshing bevel gears 43. Obviously, the connections thus far described permit free, horizontal, oscillatory movements of the turntable 8 with respect to the threshing machine. The rollers 13 and 26 are driven from the countershaft 41 by a sprocket chain 44, which runs over a sprocket wheel 45 on said countershaft, a sprocket wheel 46 on the roller 13, and a sprocket wheel 47 on the roller 26. By these connections, the apron 30 and the apron 15 are driven in the direction of the arrows marked on Fig. 1. The roller 33 is driven by a cross belt 48, which runs over a pulley 49 on the roller 26 and a pulley 50 on the roller 33. By this cross belt the apron 32 is driven in the direction of the arrow marked on Fig. 1. A sprocket chain 51 runs over a sprocket wheel 52 on the trunnion of the roller 22 and a sprocket wheel 53 on the trunnion of the roller 36, thus driving the delivery belt 35 in the direction of the arrow marked on Fig. 1.

The travelers 21, and hence the delivery apron 35, are raised and lowered by the following connections, to-wit: The lower ends of a pair of square shafts 54 are journaled in castings 55, secured one to the lower end of each of the side boards of the elevator frame 17 and also held therein against endwise movement. The upper ends of these shafts 54 are journaled in bearings on the travelers 21. The shafts 54 are simultaneously rotated by a horizontal, transverse shaft 56, journaled in the sides of the turntable 8 and connected to said shafts by pairs of intermeshing bevel gears 57. A hand crank 58 is provided for rotating the shaft 56. Extending parallel to each shaft 54 is a screw rod 59, journaled at its lower end in a bearing formed in the respective casting 55 and held thereby against endwise movement. The upper end portions of these rods 59 have screw-threaded engagement with the respective travelers 21. The screw rods 59 are rotated from the respective shafts 54 by sprocket chains 60, which run over alined sprocket wheels 61 on the shafts 54 and screw rods 59. The horizontal extension of the delivery end of the apron 30 is simultaneously shortened by the raising of the travelers 21 and simultaneously lengthened by the lowering of said travelers, to compensate for the varying length of said apron between the rollers 22 and 26, by a pair of screw rods 62. The inner ends of the screw rods 62 are loosely journaled in bearings on the respective castings 25, but held against endwise movement therein. The outer end portions of these screw rods 62 have screw-threaded engagement with lateral extensions 63 on the sliding bearings 28. The screw rods 62 are rotated to slide the bearings 28 in the slots 29 by bevel pinions 64, keyed to the inner ends of said rods and meshing with the bevel gears 65, loosely journaled on the trunnions of the roller 22 outward of the worm wheels 23. These loose level gears 65 are driven from the respective shafts 54 by bevel pinions 66, slidably mounted on the respective rods 54 but held for rotation therewith. The bearings on the travelers 21, in which the upper ends of the shafts 54 are journaled, hold the bevel pinion 66 in mesh with the bevel gears 65.

The outer end of the delivery apron 24

is raised and lowered by oscillating the worm wheels 23 through the following connections, to-wit: Journaled in the sides of the turntable 8 is a shaft 67 which extends parallel with the shaft 56 and is rotated by a hand crank 68. Extending parallel to each square shaft 54 is a square shaft 69, journaled at its lower end in a bearing on the respective casting 55. The upper ends of these shafts 69 are journaled in vertically spaced bearings 70, integrally formed with respective travelers 21. Slidably mounted between each pair of bearings 70 on the shaft 69 is a worm 71 which meshes with the respective worm wheels 23. The shafts 69 are driven from the shafts 67 by intermeshing bevel gears 72.

Guide strips 73 are extended between the rollers 33 and 34 and support the upper and lower runs of the apron 32 for straight line travel.

Operation: The operation of the improved straw stacker may be briefly stated as follows: As previously stated, the straw is delivered from the threshing machine into the hopper 16 and from thence deposited onto the platform apron 15. As shown, the hopper 16 terminates a comparatively short distance above the platform apron 15, thus preventing the straw from being scattered by the wind. From the platform apron 15 the straw is delivered to the elevator and carried upward between the aprons 30 and 32. From a point above the roller 22 the straw is carried outward from the machine on the horizontal extension of the apron 30. From thence it is delivered onto the underlying delivery apron 35, carried outward thereby and deposited on the stack. By operating the crank 58, the delivery apron 35 may be raised as the stack increases in height. As the delivery apron 35 is raised, the delivery end thereof travels outward, owing to the inclination of the guides 18. To offset this outward travel of the apron 35, the outer end thereof may be moved vertically by operating the crank 68 to oscillate the worm wheels 23 in a manner previously described. The importance of keeping the delivery end of the apron 35 in substantially the same vertical plane is to build a stack that is straight. By moving the turntable 8, the delivery end of the apron 35 may be swung in a semicircle to build a correspondingly formed stack. When the straw stacker is not in use, the delivery frame 24 may be raised vertically to its highest elevation and then swung into an inoperative position so that the free end thereof rests on the top of the machine case 1, as shown by dotted lines in Fig. 1.

What I claim is:

1. The combination with a delivery apron, of an elevator having a substantially horizontal delivery end portion, overlapping the receiving end portion of said delivery apron and mounted for vertical adjustment therewith, and means for driving said apron and elevator.

2. The combination with a delivery apron, of upper and lower opposing aprons constituting an elevator, said lower apron having a substantially horizontal delivery end portion, overlapping the receiving portion of said delivery apron and mounted for vertical adjustment therewith, and means for driving said aprons.

3. The combination with an elevator frame of a vertically adjustable delivery frame, mounted on said elevator frame, a delivery apron mounted on said delivery frame, an elevator apron having its delivery end overlapping the receiving end of said delivery apron, upper and lower rollers over which said elevator apron runs, said upper roller being journaled in bearings mounted for adjustment toward and from said elevator frame, said lower roller being journaled on said elevator frame, and means for driving said aprons.

4. The combination with an elevator frame of a vertically adjustable delivery frame, mounted on said elevator frame, a delivery apron mounted on said delivery frame, an elevator apron having its delivery end overlapping the receiving end of said delivery apron, upper and lower rollers over which said elevator apron runs, said upper roller being journaled in bearings mounted for adjustment toward and from said elevator frame, said lower roller being journaled on said elevator frame, an intermediate guide roller for said elevator apron, and means for driving said aprons.

5. The combination with an elevator frame of a vertically adjustable, substantially horizontal delivery frame mounted on said elevator frame, a platform apron, a delivery apron mounted on said delivery platform, an elevator apron arranged to receive from said platform apron and having its delivery end portion overlapping the receiving end portion of said delivery apron, upper and lower rollers over which said elevator apron runs, said upper roller being journaled in bearings mounted for adjustment toward and from said elevator frame, intermediate guide rollers for said elevator apron, and means for driving said aprons.

6. The combination with an elevator frame of a vertically adjustable, substantially horizontal delivery frame mounted on said elevator frame, a platform apron, a delivery apron mounted on said delivery platform, an elevator apron arranged to receive from said platform apron and having its delivery end portion overlapping the receiving end portion of said delivery apron, upper and lower rollers over which said elevator apron runs, said upper roller being

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journaled in bearings mounted for adjustment toward and from said elevator frame, intermediate guide rollers for said elevator apron, means for driving said aprons, and means for simultaneously adjusting said delivery frame and said upper roller.

7. The combination with an elevator frame of vertically adjustable travelers mounted on said elevator frame, a substantially horizontal delivery frame mounted on said travelers for vertical swinging movements, a platform apron, a delivery apron mounted on said delivery frame, an elevator apron arranged to receive from said platform apron and having its delivery end portion overlapping the receiving end portion of said delivery apron, upper and lower rollers over which said elevator apron runs, said upper roller being journaled in bearings mounted for adjustment toward and from said elevator frame, intermediate guide rollers for said elevator apron, means for driving said aprons, means for simultaneously adjusting said travelers and said upper roller, and means for vertically swinging said delivery frame.

8. The combination with an elevator frame of vertically adjustable travelers mounted on said elevator frame, a substantially horizontal delivery frame mounted on said travelers for vertical swinging movement, a platform apron, a delivery apron mounted on said delivery frame, upper and lower opposing elevator aprons arranged to receive from said platform apron, said lower elevator apron having its delivery end portion overlapping the receiving end portion of said delivery apron, upper and lower rollers over which said lower elevator apron runs, said upper roller being journaled in bearings mounted for adjustment toward and from said elevator frame, intermediate guide rollers for said lower elevator apron, means for driving said aprons, means for simultaneously adjusting said travelers and said upper roller, and means for vertically swinging said delivery frame.

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

HENRY F. SCHRODER.

Witnesses:
W. C. DIDRO,
S. H. PRESTON.