

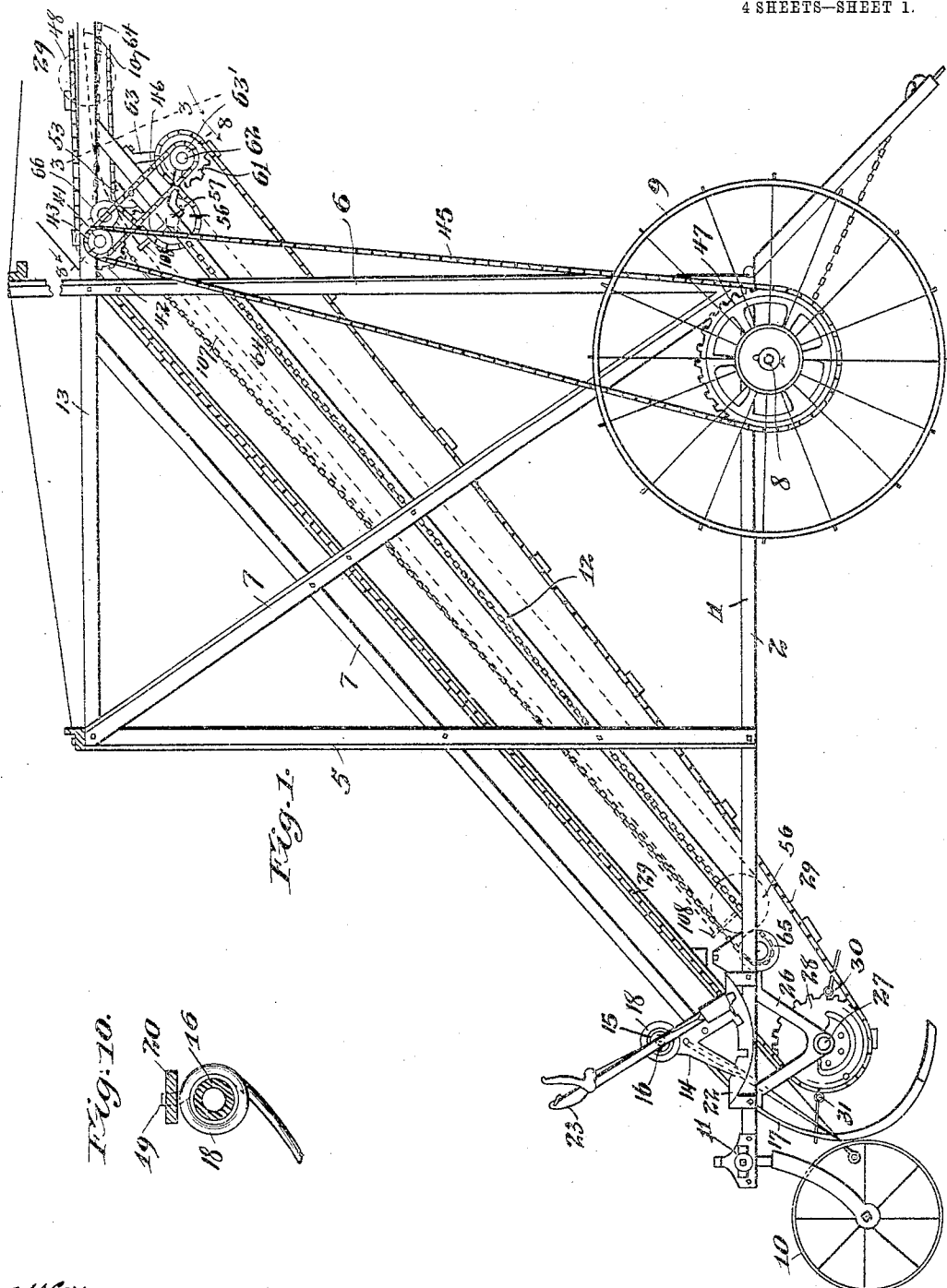
No. 778,561.

PATENTED DEC. 27, 1904.

S. M. WIXCEL.
CONVEYER.

APPLICATION FILED OCT. 19, 1903.

4 SHEETS—SHEET 1.



Witnesses,
J. D. Mann,
R. J. Rosenberg

Inventor,
Samuel M. Wixel
By Office, Fowler & Volkmann
Attys.

No. 778,561.

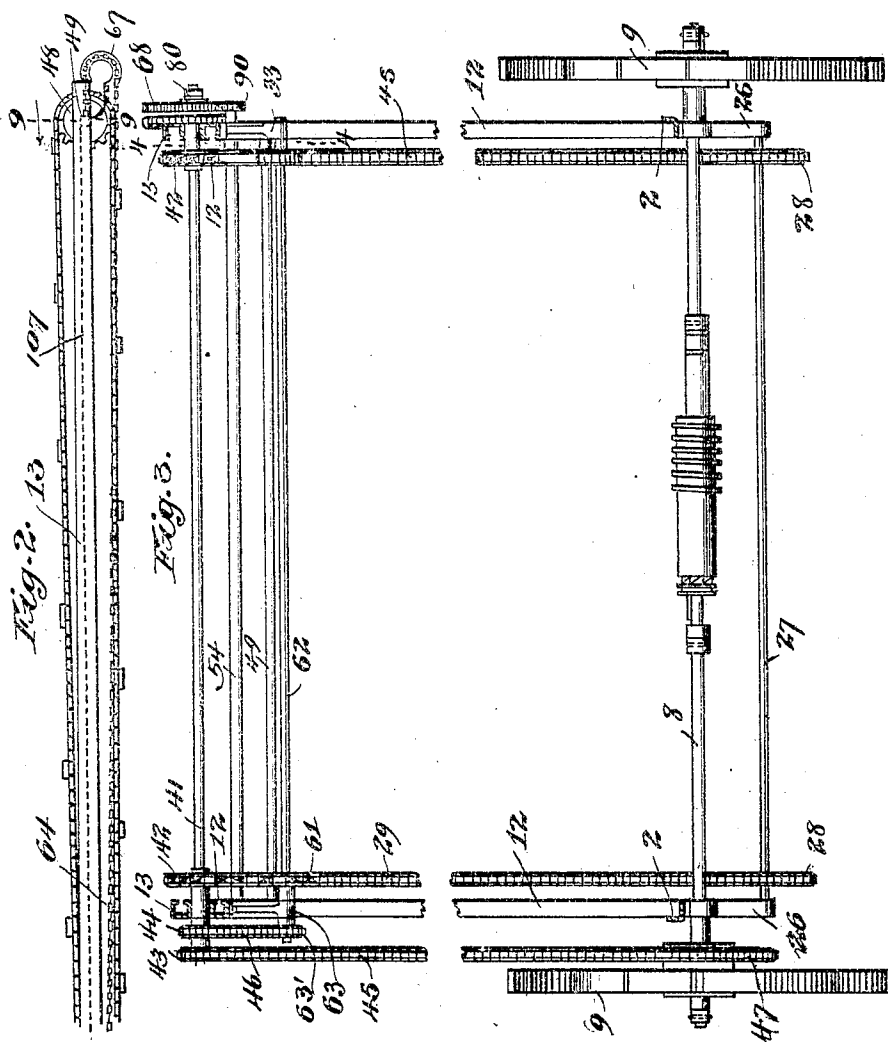
PATENTED DEC. 27, 1904.

S. M. WIXCEL.

CONVEYER.

APPLICATION FILED OCT. 19, 1903.

4 SHEETS—SHEET 2.



Witnesses,
J. J. Mann,
H. P. Litzberg

Inventor,
Samuel M. Kiesel

Pay Office, Fowler & Livingston
N.Y.

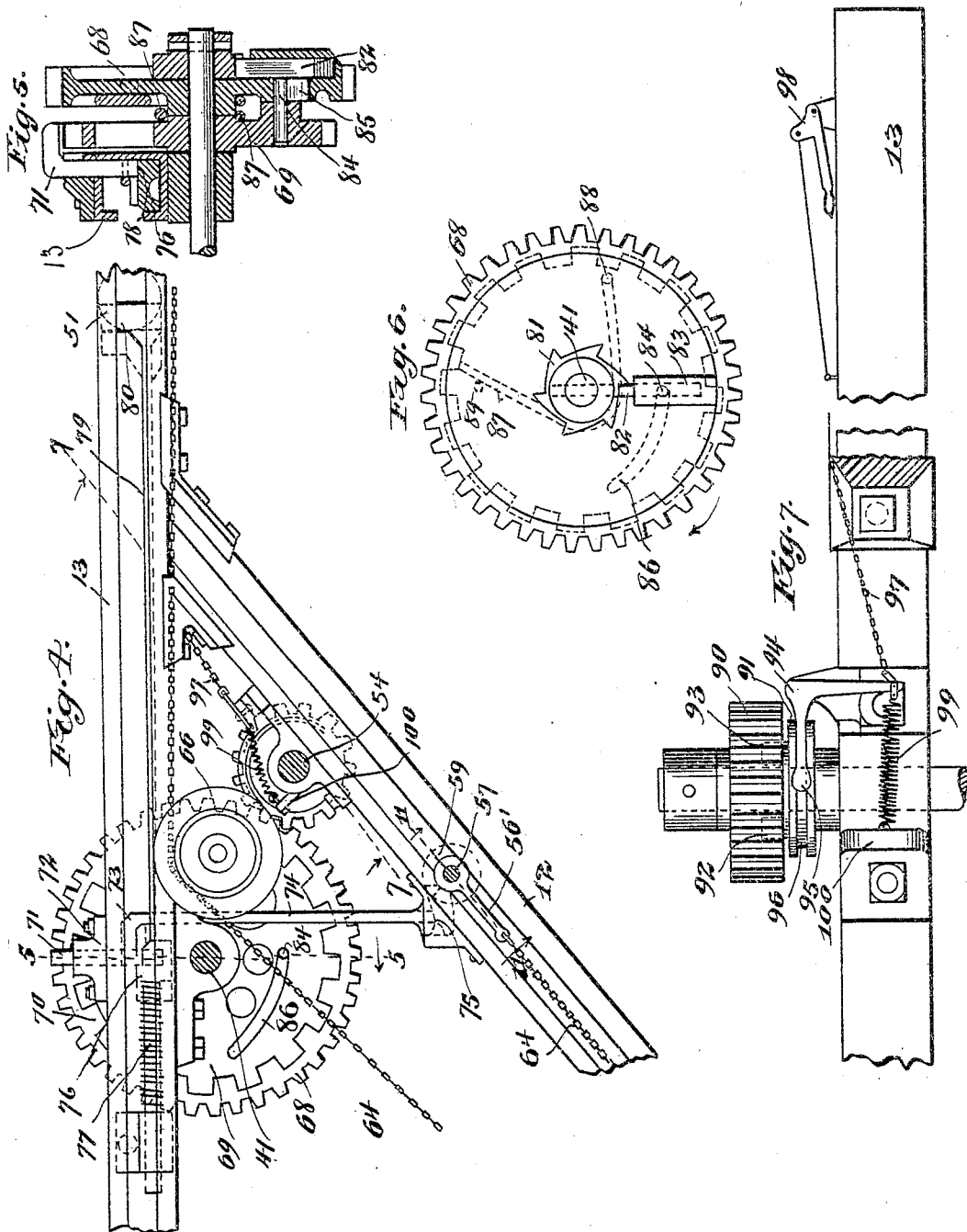
No. 778,561.

PATENTED DEC. 27, 1904.

S. M. WIXCEL.
CONVEYER.

APPLICATION FILED OCT. 19, 1903.

4 SHEETS—SHEET 3.



Witnesses,
J. B. Mann,
A. Litzenberg

Inventor,
Samuel M. Wixel
By O'Field, Fowler & Lenthum
Attys.

No. 778,561.

PATENTED DEC. 27, 1904.

S. M. WIXCEL.
CONVEYER.

APPLICATION FILED OCT. 19, 1903.

4 SHEETS—SHEET 4.

Fig. 8.

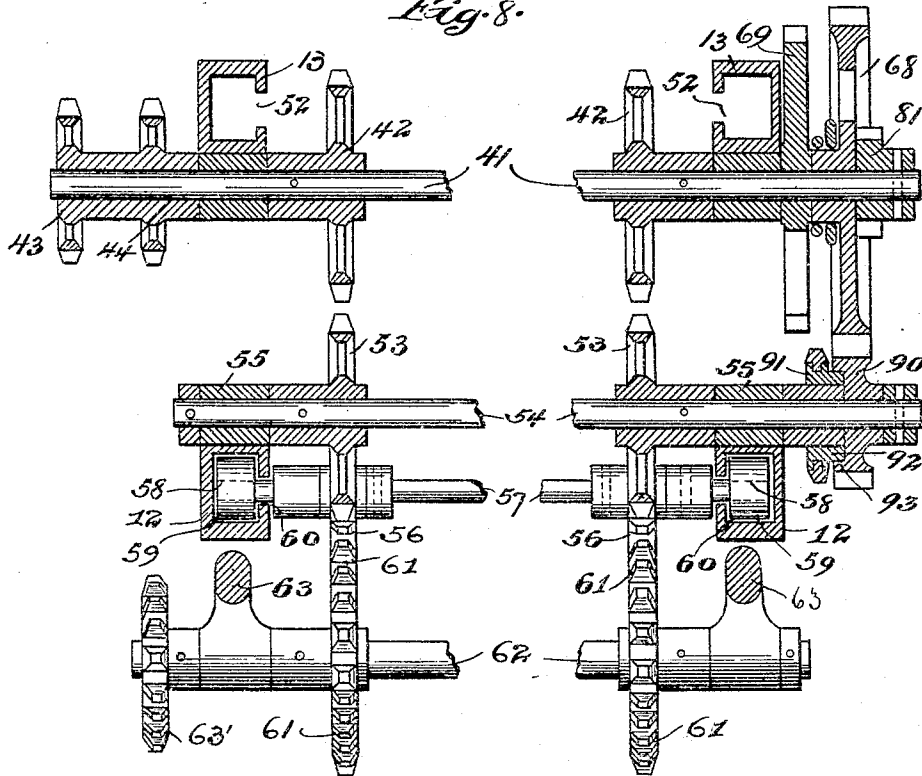


Fig. 11.

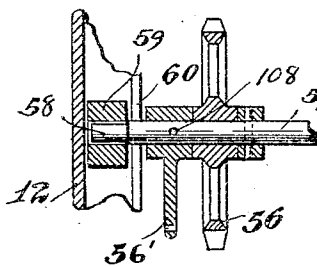
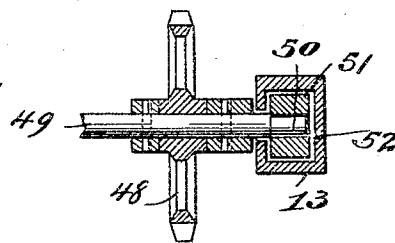


Fig. 9.



Witnesses,
J. D. Mann,
R. L. Rosenberg

Inventor,
Samuel M. Wixel
By Office, Fowler & Venturini
Attys.

UNITED STATES PATENT OFFICE.

SAMUEL M. WIXCEL, OF MARCUS, IOWA.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 778,561, dated December 27, 1904.

Application filed October 19, 1903. Serial No. 177,651.

To all whom it may concern:

Be it known that I, SAMUEL M. WIXCEL, a resident of Marcus, in the county of Cherokee and State of Iowa, have invented certain new and useful Improvements in Conveyers, of which the following is a specification.

This invention relates to improvements in conveyer mechanisms, and refers more particularly to a conveyer mechanism the delivering end of which is automatically extendible and retractable for the purpose of changing the point of delivery.

One useful application of the invention is that shown herein, wherein the conveyer is embodied in a hay-loader of the character described in my pending application for patent, filed April 13, 1903, Serial No. 152,432.

Among the salient objects of the invention are to provide a conveyer mechanism the delivery end of which is automatically reciprocated in the line of extension and retraction of the conveyer; to provide, in a mechanism of the character referred to, means for taking up or storing one portion of the conveyer while another portion is being retracted; to provide improved mechanism for automatically arresting and reversing the extending and retracting movements at predetermined points; to provide, in a conveyer of the character referred to, a construction wherein the rate of delivery is uniform; to provide, in conjunction with mechanism of the character referred to, means for readily arresting the extending or retracting movement of the conveyer without arresting its delivery movement, and in general to provide improvements in the construction and arrangement of mechanism of the character referred to.

To the above ends the invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

The invention will be more readily understood from the following description by reference to the accompanying drawings, forming a part of the description, and in which—

Figures 1 and 2 taken together constitute a view in side elevation of the entire hay-loader. Fig. 3 is a view, partly in section and partly in elevation, taken on line 3 3, Fig. 1, and

looking in the direction of the arrows, parts being broken out to reduce the height of the figure. Fig. 4 is a fragmentary detail, partly in side elevation and partly in vertical section, taken approximately on line 4 4 on Fig. 3. Fig. 5 is a sectional view taken on line 5 5, Fig. 4. Fig. 6 is an elevation or face view of the remote side of the largest gear seen in Fig. 4. Fig. 7 is a fragmentary detail taken approximately on line 7 7 of Fig. 4, but including the extreme outer end of the carrier-frame and looking downward. Fig. 8 is a sectional view taken approximately on line 8 8 of Fig. 1 with parts broken out. Fig. 9 is a sectional view taken on line 9 9 of Fig. 2. Fig. 10 is a fragmentary cross-sectional view of the rake-head. Fig. 11 is a sectional view taken on line 11 11, Fig. 4.

Describing the particular embodiment shown herein and referring to the drawings, 1 designates as a whole a main wheeled supporting-frame comprising side frame members 2, front and rear cross frame members, (not here shown,) upright frame members 5 and 6 at each side of the machine, and diagonal brace members 7. The several frame members are conveniently formed of angle-iron and are so constructed and united as to form a rigid strong supporting-frame for the carrier mechanism. Beneath the forward part of the main frame is secured the main supporting-axle 8, provided with the usual supporting-wheels 9 at each end, while the rear end of the main frame is conveniently supported by means of a pair of caster-wheels 10, adjustably connected with the main frame, so that the latter may be raised or lowered, as indicated clearly at 11.

12 designates main supporting frame members, one at each side of the machine, arranged to extend obliquely upwardly from the lower side frame members 2 to the extreme upper end of the inclined portion of the elevator and connected at their upper ends with corresponding horizontal side frame members 13, which latter extend forwardly and constitute the horizontal carrier-frame and also extend rearwardly to and are connected with the uprights 5 at the respective sides of the machine. Both the frame members 12 and 13 are channel-

shaped in cross-section, with their open sides facing inwardly, for a purpose which will hereinafter appear.

Referring next to the rake or gathering mechanism, 14 designates a pair of brackets mounted upon the side frame members 2 near the rear ends of the latter and provided at their upper ends with sockets 15, within which are mounted the ends of a tubular rake head or bar 16. The spring rake-teeth (see detail Fig. 10) are provided at their attached ends with the usual coils 18, which are arranged to encircle the tubular rake-head and terminate in upturned extensions 19, which extend through suitable apertures in the confining-bar 20. The confining-bar 20 is rigidly bolted to the upper side of the rake-head by means of bolts arranged to extend vertically through said members at points between the rake-teeth.

The rake-teeth are manipulated and held in the usual manner by means of the hand-lever 23 and the notched segment 22.

At a point vertically below the rake-head the side frame members 2 are provided with depending brackets 26, having journal-bearings at their lower ends, within which are seated the ends of a sprocket-shaft 27, carrying adjacent to each of its ends and inside of the respective brackets sprocket-wheels 28, which are rigidly mounted thereon. The carrier or conveyer belt 29 extends around and is carried at its lower end by the sprockets 28.

In order to assist in picking up the hay and delivering it to the upper side of the carrier as it is gathered by the rake-teeth, I provide co-operating pick-up fingers mounted upon two finger-shafts 30 and 31, which are mounted to extend between the two main sprockets 28 at diametrically opposite sides of the latter and are mounted upon and carried by said sprockets. Suitable mechanism is provided for manipulating said finger-shafts as they revolve with the sprockets 28 to more effectively deliver the hay upon the carrier, but which mechanism forms no part of the present invention and need not, therefore, be described in detail.

Describing now the arrangement of the carrier or conveyer belt and referring more particularly to Figs. 1 and 2, 41 designates a cross-shaft, which is journaled in suitable bearings mounted upon the under side of the horizontal frame members 13. Upon the shaft 41, at points between its ends and near the respective ends thereof, are rigidly mounted sprockets 42, which carry the sprocket-belts of the carrier 29. Upon the same shaft 41, at one end thereof, are rigidly mounted two other sprockets, 43 and 44, respectively, one of which carries the main drive-belt 45, while the other carries a transmission-belt 46, the main belt 45 being driven from a larger sprocket 47, mounted upon the main axle 8 of the wheel-frame. Inasmuch as the shaft 41 imparts mo-

tion to all of the several drive-sprockets which actuate the carrier, said shaft will be hereinafter designated the "main" shaft.

From the pair of sprockets 42 the carrier extends horizontally forward to and around a pair of sprockets 48, which are loosely mounted upon the shaft 49, the ends of which constitute trunnions 50, mounted in rollers 51, which are in turn confined to travel within the channels 52 of the frame members 13. From the sprockets 48 the carrier returns and passes over a pair of sprockets 53, rigidly mounted upon a shaft 54, which is journaled in suitable journal-boxes 55, mounted upon the upper sides of the respective frame members 12. From the sprockets 53 the carrier passes downwardly and around a pair of take-up sprockets 56, loosely journaled upon a cross-shaft 57, which is exactly similar to the shaft 49 and is similarly provided at its ends with trunnions 58, engaged with rollers 59, which are confined and travel within the channels 60 of the side frame members 12. From the sprockets 56 the carrier returns upwardly and passes around a pair of sprockets 61, rigidly mounted upon a shaft 62, which is in turn journaled in a pair of brackets 63, mounted upon the under sides of the respective frame members 12. In this connection it is to be noted that it is the shaft 62 which carries the sprocket 63', around which the transmission-belt 46, hereinbefore referred to, is trained. From the sprockets 61 the carrier extends downwardly to and around the main lower sprockets 28, hereinbefore referred to, thus completing the circuit.

From the foregoing it will be understood that the carrier is endless, and were the several supporting-sprockets mounted so as to be incapable of bodily movement the carrier would travel around the sprockets in the ordinary manner, the hay being delivered always at the extreme end of the horizontal extension. It will be further obvious that if the sprockets 53 be rotated at a greater speed than the speed of travel imparted to the upper lap of the carrier from the main shaft 41, through the sprockets 42 mounted thereon, and if the pair of sprockets at the forward end of the horizontal extension be free to move rearwardly (as they are) said outer end sprockets will be withdrawn and the surplus length of the carrier thus drawn in by the sprockets 53, which will permit the pair of sprockets 56 to descend or loop back between the two main upper and lower laps of the inclined portion of the carrier. It will be further obvious that if this movement be continued until the extendible portion of the carrier is fully retracted and thereupon the sprockets 53 are locked rigidly against rotation, while the sprockets 61 are continued in rotation, the latter acting upon the lower lap of the looped-back portion of the carrier will return said looped-back portion to its upper-

most position. If now the pair of sprockets 56 be connected by means of tension-chains 64 from the shaft 57, carrying said sprockets downwardly around guide-pulleys 65 at the lower end of the carrier, thence upwardly over guide-pulleys 66, and from there horizontally forward and around similar guides 67, located at the extreme forward end of the carrier-frame, and back to and connected with the shaft 49, which carries the movable pair of sprockets 48, then it will be clear that as fast as the pair of sprockets 56 are drawn upwardly by the sprockets 61 the extension portion of the carrier will be positively drawn outwardly. The mechanism by means of which the carrier is thus actuated will now be described.

Referring more particularly to detail Fig. 8, the main shaft 41 is provided adjacent to one end with a loosely-mounted spur-gear 68 and immediately adjacent thereto with a co-operating clutch-wheel 69, also loosely mounted upon the main shaft. (See also detail Figs. 4, 5, and 6.) The clutch-wheel 69 is provided with a peripheral series of notches 70, and adjacent thereto is mounted to reciprocate a vertically-movable dog 71, working through a suitable bearing 72, mounted upon the main side frame member 13. The dog 71 is provided at a point coincident with the interior channeled portion of the frame member 13 with a horizontal offset portion 73 and also with a vertical extension 74, which extends downwardly to and projects through an opening in the upper side of the inclined frame member 12, so as to protrude within the channel of the latter. The lower end of the extension 74 terminates in a cam projection or shoe 75, which is located within the channel of the member 12 and is adapted to be acted upon by the trunnion-roller 59, which carries the end of the shaft 57, as hereinbefore described.

76 designates a tripping-latch mounted to reciprocate within the channeled portion of the horizontal member 13 and normally held projected by means of a coiled spring 77, the engaging end of said latch being arranged to project beneath a shoulder 78, formed upon the dog 71, as shown clearly in detail Fig. 5, in such manner as to hold the dog in its up-lifted position. In order to retract the tripping-latch 76, the latter is provided with a rod-like extension 79, which extends forwardly some distance and terminates in a bumper 80, which is located in the path of the trunnion-roller 51, which carries the end of the shaft 49.

In order to lock the gear 68 rigid with the main shaft, upon which it is mounted, I provide upon the main shaft, adjacent to the side of said gear, a ratchet 81, (see Fig. 6,) with which ratchet is arranged to cooperate a radially-movable dogging-pawl 82, mounted to reciprocate within a suitable way or bearing 83 upon the side face of the gear. The dog-

ging-pawl is provided with a cam-stud 84, (see sectional Fig. 5,) which projects through a radial slot 85, formed in the gear 68, and engages at the opposite side of said gear an eccentrically disposed and curved cam-slot 86, formed in the clutch-wheel 69. The relative arrangement and construction of these parts are such that when the spur-gear is rotated relatively to the clutch-wheel in one direction the dogging-pawl will be withdrawn out of engagement with the ratchet 81 and when rotated in the opposite direction will be permitted to engage. Normally the gear and clutch-wheel are held in position to permit the dogging-pawl to engage the ratchet by means of a spiral spring 87, the intermediate portion of which is coiled around the hub of the former, while one end is rigidly connected to the clutch-wheel, as indicated at 88, and the opposite end arranged to engage a stop-lug 89, mounted upon the gear.

90 designates a pinion loosely mounted upon the shaft 54 and arranged to intermesh with the gear 68. Adjacent to the pinion 90 is mounted an endwise-shiftable clutch 91, which is provided with the usual clutch-teeth 92, arranged to engage corresponding recesses 93, formed in the proximate face of the pinion, said clutch being splined upon the shaft 54 and being actuated by means of a bell-crank lever 94, which terminates in a yoke 95, the ends of which engage the usual annular groove 96 upon the clutch. It is to be noted that this clutch 91 is so constructed as to lock the pinion 90 rigid against rotation upon the shaft in either direction. Inasmuch as the pinion 90 intermeshes with the gear 68, it follows that when the latter is locked against rotation, as hereinbefore described, the shaft 54, and with it the sprockets 53 mounted thereon, will be likewise locked against rotation so long as the clutch 91 remains in gear.

Normally—i. e., during the automatic extension and retraction of the carrier—the clutch 91 will remain in engagement with the pinion 90 at all times; but when the operator desires to interrupt the automatic extension or retraction of the carrier and deliver the hay at a fixed point during a definite period of time the bell-crank lever 94 is operated to throw the clutch out of engagement with the pinion. In order to actuate the bell-crank, a chain or cable 97 is connected with the arm of the bell-crank and extends thence forwardly to a hand-lever 98, pivoted upon the outside of one of the side frame members 13. The bell-crank lever is normally held in position to hold the clutch in gear by means of the coiled contractile spring 99, connected with the lever and with a fixed support on the frame member. (See detail Fig. 7.)

In order to prevent the hay from being blown from the horizontal portion of the carrier from beneath, I provide a canvas wind-guard 107, which extends between the upper

and lower laps of the extendible portion of the carrier and is retractable and extendible with the latter. To this end the shaft 57 is provided with a pair of radial arms 56', to which the tension-chains 64, hereinbefore described, are connected, thereby holding said shaft against rotation and in a definite position. Said shaft is also provided at each end with an upstanding radial stud 108, between the upper ends of which studs is extended a cross-rod, (not shown,) which carries one end of the canvas 107 hereinbefore referred to. The opposite end of the canvas web extends forwardly between the upper and lower laps of the horizontal portion of the carrier and is secured to the shaft 49 conveniently by being adjustably buckled to the latter, so that the web may be held taut. Inasmuch as the tension-chains hereinbefore referred to always keep the shafts 49 and 57 at a definite distance apart, measured lineally of the carrier, it follows that the canvas will remain taut and reciprocate with the extensible portion of the carrier.

Describing now the use and operation of the conveyer and assuming an initial position corresponding to that shown in the drawings, it will be seen by reference to Figs. 4, 5, and 6 that the carrier has just reached the position in which it is fully extended, the dog 71 having been just raised, so as to free the gear 68 and co-operative clutch-wheel 69. During the time the dog 71 was holding the clutch-wheel locked against rotation the tension of that part of the carrier engaged with the sprockets upon the shaft 54 which carries the pinion 90 was acting through said pinion to hold the gear 68 rotated to such position relatively to the clutch-wheel as to hold the dogging-pawl 82 free from the ratchet 81. As soon, however, as the dog 71 was released the spring 87 shifted the gear and clutch wheel relatively to each other, thereby throwing the dogging-pawl 82 into engagement with the ratchet 81, and thus instituting a driving connection between the main shaft 41 and the pinion-shaft 54. This driving connection having been thus made, the shaft 54, and with it the sprockets mounted thereon, will be rotated at a speed much greater than the peripheral travel of the sprockets 43, mounted directly upon the main shaft. In the present instance the relation of these speeds approximately is two to one. This will of course draw that portion of the underlap of the belt which at that time constitutes the horizontal portion of the carrier rearwardly twice as fast as the upper lap of the same portion of the carrier is run forwardly, which will of course positively draw rearwardly the outer set of sprockets carrying the extension end of the carrier. As these latter are drawn rearwardly the tension-chains or cables will, through the connections hereinbefore described, positively draw downwardly the pair of sprockets 56, mounted

upon the shaft 57, thereby looping back the intermediate portion of the carrier as fast as the loop is extended by the action of the sprockets 53. This operation will continue until the roller 51 engages the bumper 80, whereupon the latch 76 will be forced back, thus permitting the dog 71 to drop and engage the clutch-wheel and positively arrest the latter. As soon as the clutch-wheel is arrested the further rotation of the gear 68 will, through the action of the cam-pin 84 engaging the eccentric slot of the clutch-wheel, withdraw the dogging-pawl 82, so that the gear 68 will be thrown out of driving engagement with the shaft upon which it is mounted and come to rest. The arresting of the gear 68 will of course hold the pinion 90 stationary and through the medium of the clutch 91 in turn hold the shaft 54 and sprockets 53 thereon stationary. Thereupon the shaft 62, driven through the chain 46, becomes the drive-shaft of the carrier, and since the sprockets 53 are now held stationary the looped back portion of the carrier will be taken up at a rate of speed equal to one-half the peripheral speed of the sprockets 53. During this taking-up operation the tension-chains again operate to extend the extension portion of the carrier. Notwithstanding the fact that the underlap of the horizontal portion of the carrier is at this time stationary it will be obvious that the upper lap will, in fact, be running outwardly, because the shaft 49, carrying the outer pair of sprockets, is at this time drawn forwardly by the tension-chains. It will be seen, therefore, that the delivery of hay from the carrier is continuous during both the retracting and extending operation of the carrier and that these operations are alternate and automatic. If at any time the operator wishes to arrest the automatic to-and-fro movement of the carrier, he simply throws over the hand-lever 98, thereby throwing the clutch 91 out of driving engagement, whereupon the carrier will simply be operated from the main shaft 41 without any of its supporting-sprockets changing their relative positions so long as the clutch thus remains out of gear.

While I have herein shown and described a practical and what I deem to be an important embodiment of my invention, yet I do not wish to be understood as limiting myself in any sense to the specific construction shown herein. On the contrary, the mechanism may be modified without departing from the spirit of the invention. For example, it is not necessary that a portion of the carrier-belt be actually held stationary in order to secure the automatic extending and retracting operation of the carrier; but the same effect may be secured through the use of change-speed mechanism. Likewise while the endless carrier herein shown is obviously an extremely practical and desirable construction, yet within the broader

scope of my invention I do not deem such an endless carrier essential. Therefore I do not limit myself to the details of construction shown and described, except to the extent that they are made the subject of specific claims.

I claim as my invention—

1. A conveyer, comprising a supporting-frame, a flexible carrier moving upon said frame, one portion thereof adapted to be telescoped back into the other portion, driving connections for actuating said carrier, and mechanism for automatically extending and retracting the telescoped portion thereof during the movement of said carrier.

2. In a conveyer mechanism, the combination with a supporting-frame therefor, of an endless carrier, a movable support for the delivery end of said carrier, means for shifting said support to extend and retract the delivery end thereof, take-up mechanism for taking up the intermediate portion of the carrier during the retraction movement of the delivery end, driving connections for actuating said carrier, and mechanism for automatically moving and reversing the extendible and retractable portion of said carrier.

3. In a conveyer, the combination with a suitable carrier-frame, of an endless carrier mounted thereon, a bodily-shiftable carrier-support supporting the delivery end of the carrier, a bodily-movable take-up carrier-support, driving connections for imparting a substantially uniform rate of speed to one portion of the endless carrier, other driving connections for imparting a different rate of speed to another part of the carrier, and means for effecting an alternating operation of said driving mechanism.

4. In a conveyer, the combination with a suitable carrier-frame, of an endless carrier mounted thereon, a bodily-shiftable carrier-support supporting the delivery end of the carrier, a bodily-movable take-up carrier-support, driving connections for imparting a substantially uniform rate of speed to one portion of the endless carrier, other driving connections for imparting a different rate of speed to another part of the carrier, and controlling mechanism comprising an automatically-acting stop and an automatically-acting clutching and unclutching mechanism whereby one of said driving mechanisms is held stationary during one interval and driven at a higher rate of speed than the uniform speed-driving connections when in operation.

5. In a conveyer mechanism, the combination with a traveling extendible and retract-

able carrier, of a wind-guard sheet interposed between the upper and lower laps of the extendible portion of said carrier and extendible and retractable with the latter.

6. In a conveyer mechanism, the combination with a traveling extendible and retractable carrier, of a flexible wind-guard sheet mounted to extend adjacent to one of the laps of the extendible portion of said carrier, and extendible and retractable with the latter.

7. In a conveying apparatus, the combination with a carrier-frame, of an extendible and retractable carrier moving upon said frame, and mechanism for reciprocating the delivery end of said carrier, comprising a drive-shaft, a gear and a clutch-wheel rotatably mounted upon said shaft, a dog adapted to lock said clutch-wheel against rotation, a ratchet-wheel rigidly mounted upon the drive-shaft adjacent to the gear, a radially-movable dogging-pawl mounted upon the gear and adapted to engage the ratchet, an eccentrically-disposed cam upon the clutch-wheel, a cooperating cam projection upon the dogging-pawl, a spring yieldably connecting the clutch-wheel and gear and exerting its tension to rotate said parts in position to throw the dogging-pawl into engagement with the ratchet, and means for automatically throwing the clutch-wheel dog out of engagement with the wheel.

8. In a conveyer, the combination with a traveling extendible and retractable carrier, of means for automatically extending and retracting said carrier comprising a drive-shaft, a gear and a clutch-wheel rotatably mounted upon said shaft, a dog adapted to lock said clutch-wheel against rotation, a ratchet-wheel rigidly mounted upon the drive-shaft adjacent to the gear, a radially-movable dogging-pawl mounted upon the gear and adapted to engage the ratchet, an eccentrically-disposed cam upon the clutch-wheel, a cooperating cam projection upon the dogging-pawl, a spring yieldably connecting the clutch-wheel and gear and exerting its tension to rotate said parts in position to throw the dogging-pawl into engagement with the ratchet, means for automatically locking the clutch-wheel dog in its disengaged position, and means for automatically returning said dog to its locking position.

SAMUEL M. WIXCEL.

Witnesses:

J. M. SPAULDING,
C. O. PATCH.