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G. SCHUBERT.

CONVEYER GEARING FOR HARVESTERS.

No. 486,900. Patented Nov. 29, 1892.

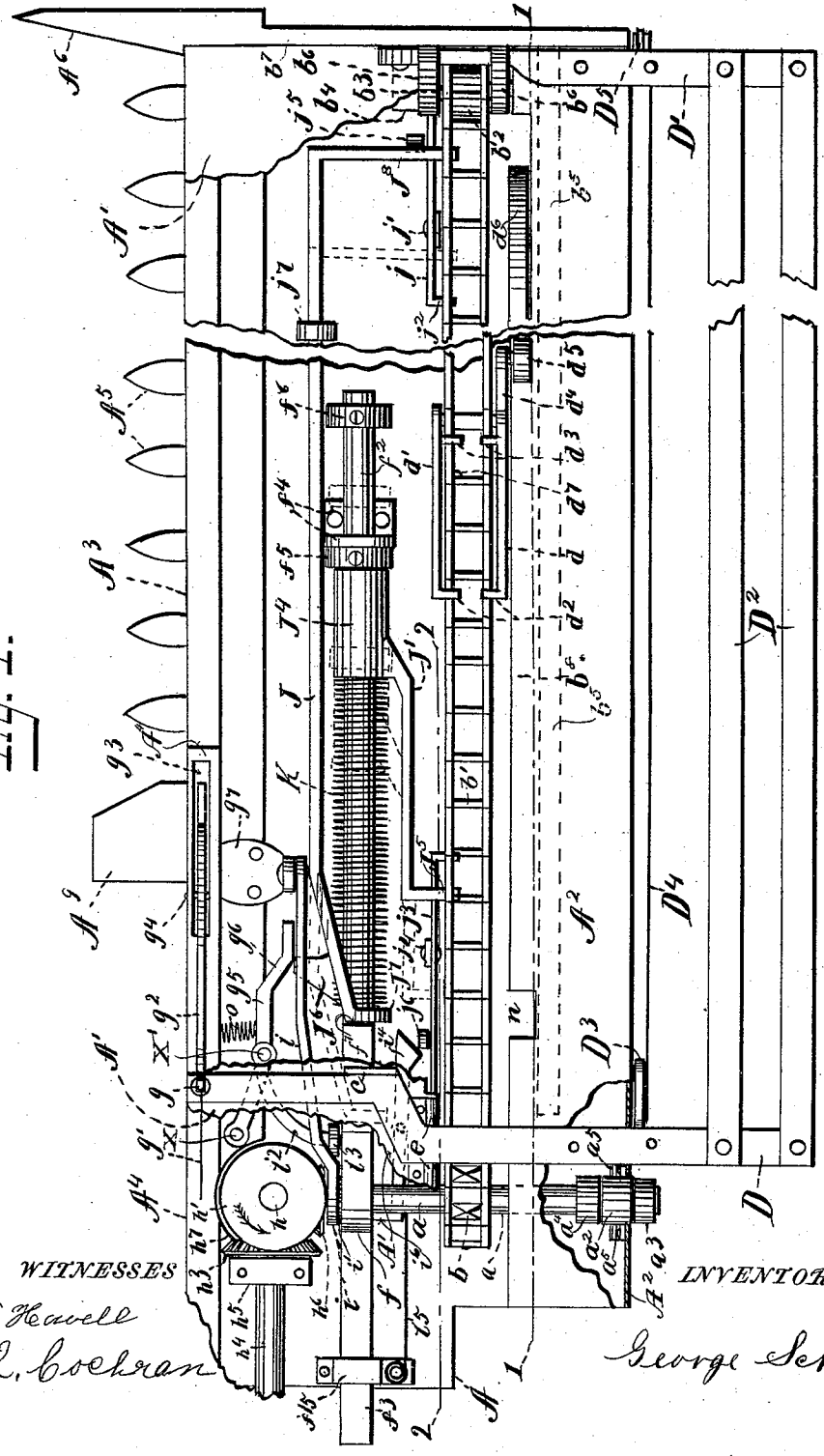

Fig. 1.

WITNESSES

W. T. Hamell

J. R. Cochran

INVENTOR

George Schubert

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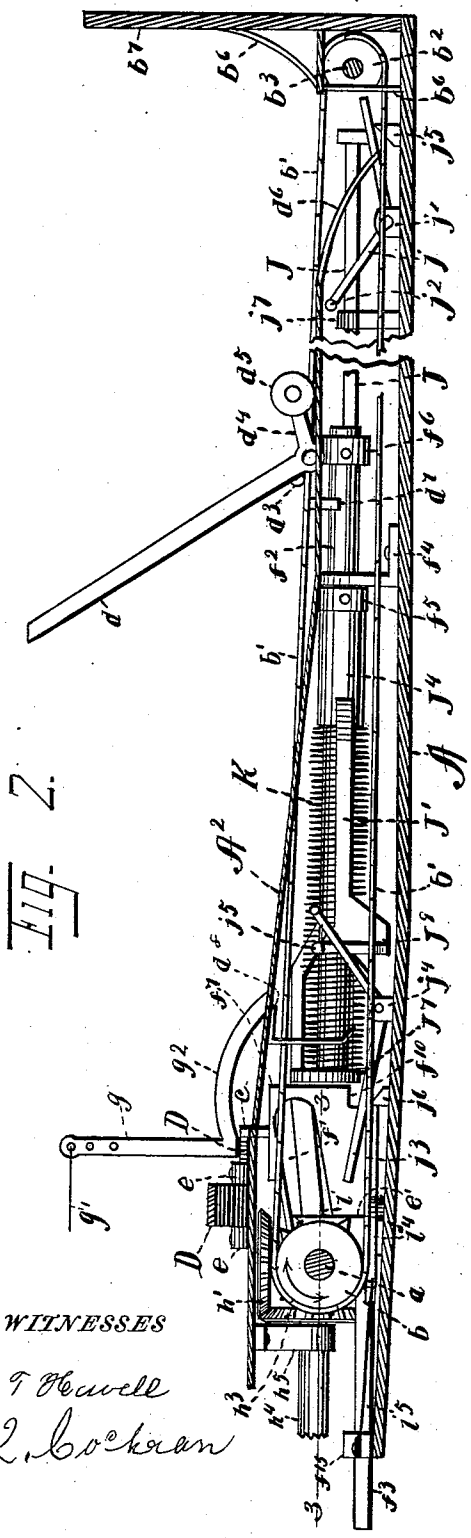

Fig. 2.

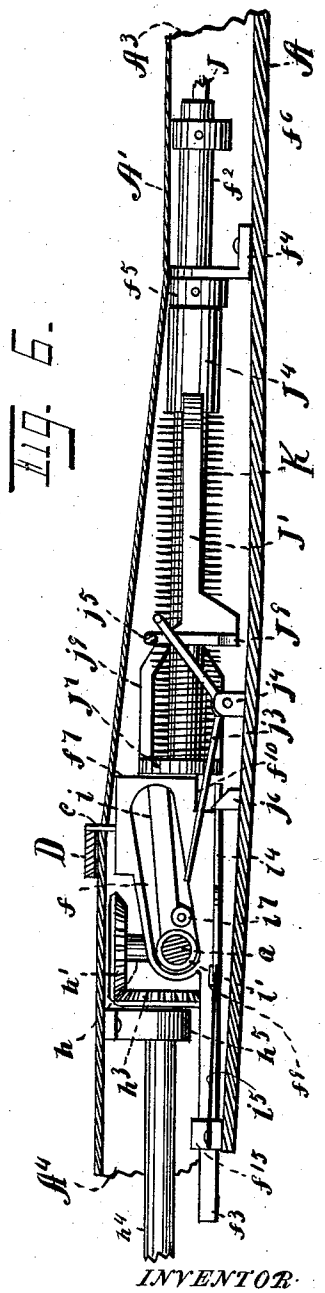

Fig. 5.

WITNESSES

W. T. Howell

J. R. Cochran

INVENTOR

George Schubert

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G. SCHUBERT.

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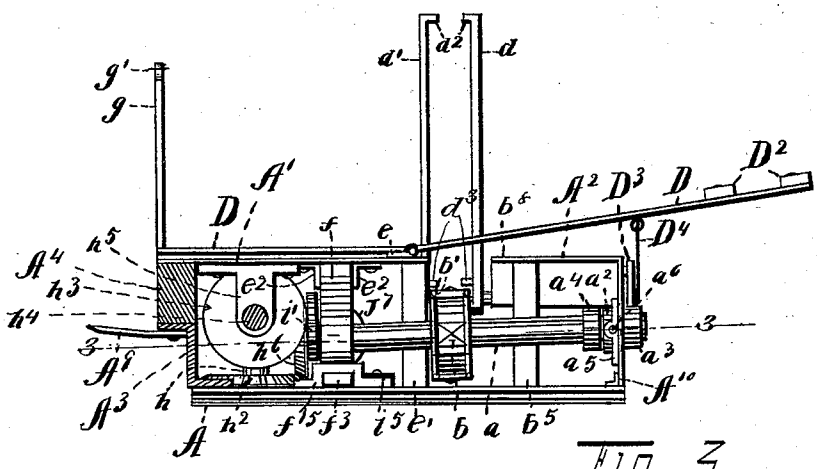

Fig. 3.

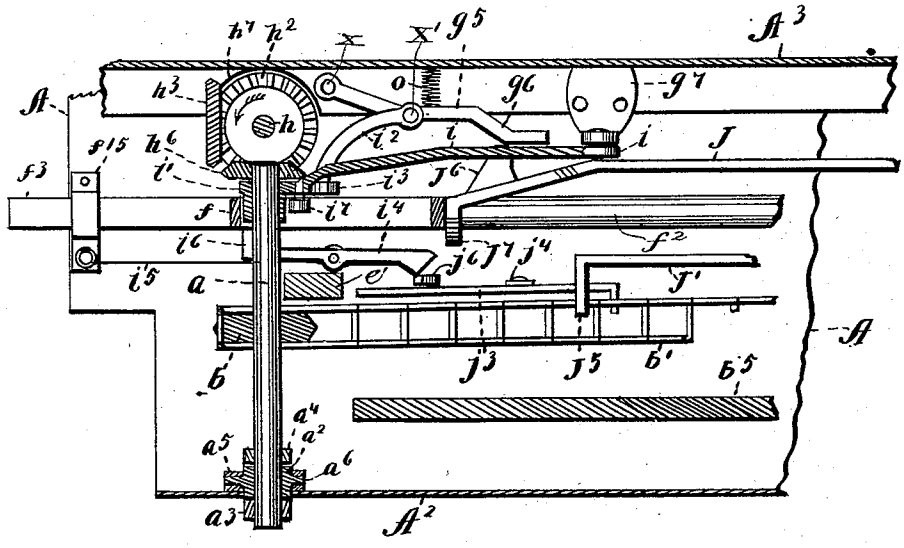

Fig. 4.

WITNESSES

W. T. Howell

J. R. Coehran

INVENTOR

George Schubert

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G. SCHUBERT.

CONVEYER GEARING FOR HARVESTERS.

No. 486,900. Patented Nov. 29, 1892.

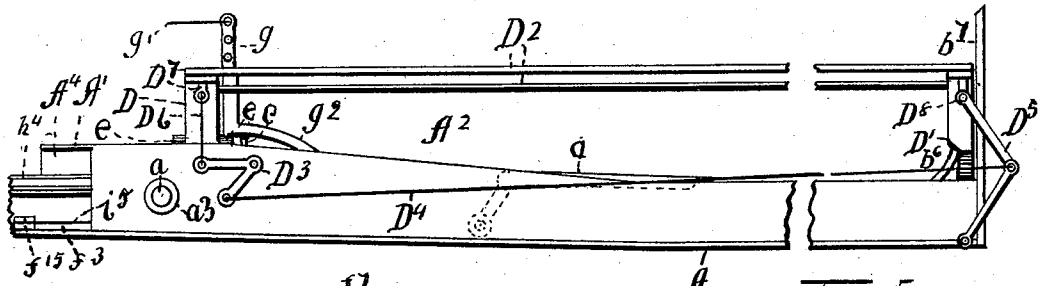

Fig. 5.

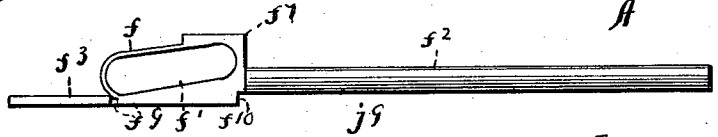

Fig. 7.

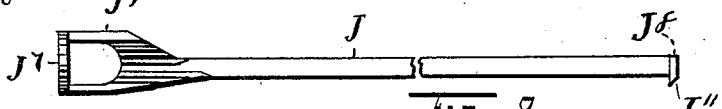

Fig. 8.

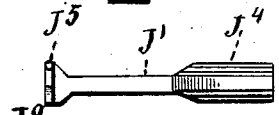

Fig. 10.

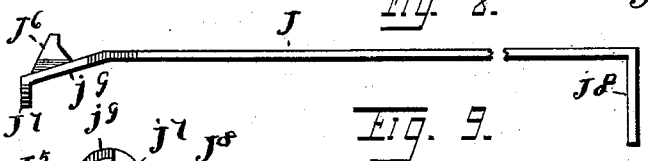

Fig. 9.

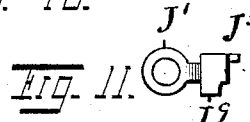

Fig. 11.

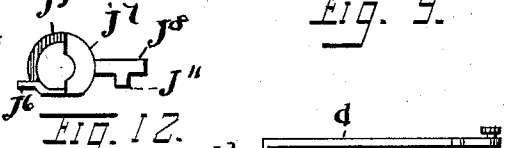

Fig. 12.

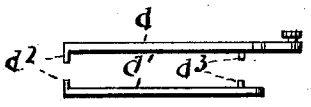

Fig. 15.

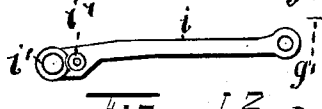

Fig. 13.

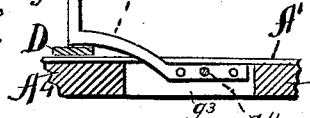

Fig. 14.

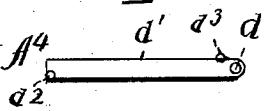

Fig. 16.

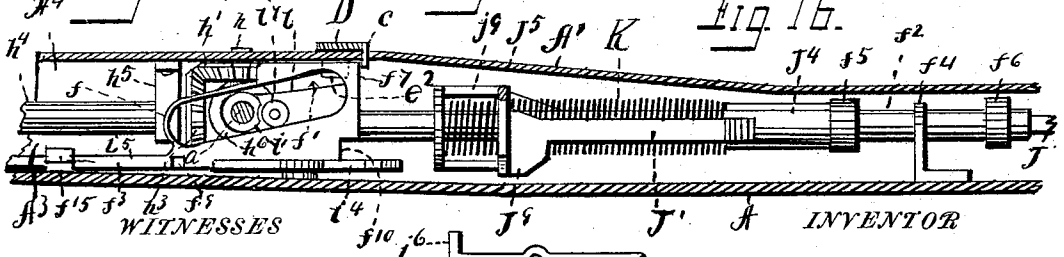

Fig. 17.

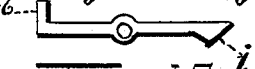

Fig. 18.

WITNESSES

J. F. Nomble

W. A. Barley

INVENTOR

George Schubert.

UNITED STATES PATENT OFFICE.

GEORGE SCHUBERT, OF WALNUT, TEXAS.

CONVEYER-GEARING FOR HARVESTERS.

SPECIFICATION forming part of Letters Patent No. 486,900, dated November 29, 1892.

Application filed February 4, 1892. Serial No. 420,309. (No model.)

To all whom it may concern:

Be it known that I, GEORGE SCHUBERT, a citizen of the United States, residing at Walnut, in the county of Bosque and State of Texas, have invented a new and useful Gearing for Harvester-Conveyers, of which the following is a specification.

This invention relates to improvements in a reciprocating conveyer for harvesters and binders in which arms fold beneath the upper plate of the platform for their grainward movement and unfold for their stubbleward movement, and a gear-shifting mechanism so constructed as to be placed beneath the upper plate of the platform and operated by a lug secured to the conveyer-chain, and a starting or tripping device by which the conveyer is started.

My improvements refer, first, to the construction of the conveyer-arms and a track to fold such arms grainward to the chain for their grainward movement and to elevate such arms for their stubbleward movement; second, to construct a shifting-bar with an inclined slot adapted to receive a bearing to engage or disengage gearing to operate the conveyer; third, to the construction of a shifting device operated by the driver, by which he can readily determine the quantity of grain on the platform by the weight of said grain, so that the driver after a little practice will be able to trip the conveyer nearer the right time to obtain sheaves of about the same size, and, fourth, to secure compactness and efficiency in such mechanism and promote simplicity and cheapness in the construction of such mechanism.

Figure 1 is a plan view of a harvester-platform provided with my improvements. The upper plates of the platform are broken away in different parts to show parts below in full lines. Fig. 2 is a sectional view on line 1 1 of Fig. 1, showing parts beyond in full lines. Fig. 3 is a subbleward end view of Fig. 1. Fig. 4 is a horizontal section on line 3 3, Fig. 3, with parts below shown in full lines. Fig. 5 is a view of the platform and tripping mechanism from the rear. Fig. 6 is a sectional view on line 2 2, Fig. 1, showing the shifting-bar and brackets beyond the section-line. Fig. 7 is a detail view of the shifting-bar. Figs. 8, 9, 10, 11, and 12 are detail views of the brackets carried by the shifting-bar. Fig. 13 is a detail view of the movable bearing and its antifriction-roller. Fig. 14 is a view of the trip-lever. Figs. 15 and 16 are detail views of the conveyer-arms. Fig. 17 is the same as Fig. 6, with the gearing disengaged and the trip-lever and other parts omitted; and Fig. 18 is a detail plan view of one of the locking-dogs.

In the drawings, A designates the lower plate of the platform, secured, with its front edge, to the lower flange of the finger-bar A^3.

A′ is the upper front plate of the platform, and A^2 is the upper rear plate of the platform. The front plate A′ is secured, with its front edge, to the front and upper flange of the finger-bar A^3 and the strip A^4 and rests, with its rear edge, at the stubble end on the block e' and at its grain end on the block b^4.

b^5 designates a strip extending from near the shaft a to the grain end of the platform. Said strip is placed far enough to the rear of the conveyer-chain to provide room for the conveyer-arm and its antifriction-roller d^5, with the front edge of the plate A^2 projecting inwardly over said strip b^5, forming a track b^8 for the antifriction-roller d^5, and leaving a slot in the upper floor of the platform for the conveyer to operate in, as hereinafter described. The rear edge of the plate A^2 is turned down to meet with the plate A and secured to said plate A by corner-irons A^{10}.

b^7 is the usual grain-board, secured to the plates A, A′, and A^2.

A^6 designates the divider-board, secured to the finger-bar A^3 in any suitable manner. The finger-bar A^3 is of the ordinary double-angle bar provided with guards A^5 on its upper and front flange and an inner shoe A^9 near the inner end of the grain-receiving platform.

A^4 is a strip secured to the upper flange of the finger-bar and extending from near the shoe A^9 to the stubble end of the plate A′ and is to elevate the stubbleward end of said plate to provide room for the gearing hereinafter described. The stubbleward end of the finger-bar A^3 is preferably extended to the harvester-frame, (not shown in the drawings,) and the plates A, A′, and A^2 are extended stub-

bleward beyond the shoe A^9 a proper distance to provide room for the folding of the conveyer-arms, as hereinafter described.

a designates a shaft beneath the plates A′ and A^2 near the stubbleward end in the platform, as shown in Figs. 1 and 2, and journaled with its near end, in a pivoted or trunnioned bearing a^2, having its trunnions pivoted in brackets a^5 a^5, secured to the vertical flange A^2 of the plate. Said flange is perforated to receive said shaft a and the bearing a^2.

a^3 and a^4 are collars on the shaft a, adjacent each side of the pivoted bearing a^2, to prevent longitudinal movement of the shaft a. Said shaft a is journaled, with its front end, in a bearing i', supported by the shifting-bar, as hereinafter stated, and provided with a bevel-pinion h^6 on its front end in position to engage or disengage with the bevel-pinions h' and h^2 to operate a sprocket-wheel b, located on the shaft a near the center of the slot in the platform and provided with a chain b', which extends over an idler b^2, which is secured near the center of the width of the slot at its grainward end on a shaft b^3, journaled in the strip b^5 and in the block b^4 at the grain end of the platform.

d and d' are conveyer-arms secured to a shaft carried by the chain b'. The arm d is provided with an extension d^4, having an antifriction-roller d^5, as seen in Figs. 1 and 2, in position to operate on the inward-projecting edge of the plate A^2.

d^2 are projections projecting inward toward the chain b' and formed on the free end of the arms d and d' and are to prevent said arms from folding beneath the upper strand of the chain b' and interfering with the gear-shifting mechanism hereinafter described.

d^3 are similar projections near the pivoted end of the arms d and d' in position to engage with the chain b'. Said projections d^3 are for the purpose of preventing the arms d and d' from dropping too far stubbleward.

b^6 are guides secured to the plate A and to the grain-board b^7, as seen in Figs. 1 and 2, and placed adjacent each side of the idler b^2, thus forming a guide for the chain b', and curved properly, as seen, to guide the conveyer-arms d and d', as hereinafter stated.

d^6 is a part of the inward-projecting edge of the plate A^2, cut down and curved downward, as shown, forming a spring and a guide for the roller d^5 at the grain end of the platform.

n is a notch formed in the inwardly-projecting edge of the plate A^2 and located near the end of the grainward movement of the conveyer.

d^8 is a spring secured on the under side of the plate A^2 on the grainward edge of the notch n and curved downward and slightly grainward and partly closing the passage-way of the antifriction-roller d^5 to detain said roller d^5 and fold the conveyer-arms grainward to the chain b'.

f' is a slot in the shifting-bar, having the projection or shoulder f^7 and the guard f.

f^3 is an extension of the shifting-bar, projecting stubbleward through a guide in the bracket f^{15}, secured to the plate A.

f^2 designates a shank of the shifting-bar, extending grainward and is guided in the bracket f^4, secured to the plate A. Said shank f^2 is preferably rounded, as shown.

f^{10} is a shoulder, and f^9 is a notch, formed on the lower and rear side of the shifting-bar.

e^2 e^2 are corner or angle iron plates secured to the under side of the plate A′, adjacent each side of the shifting-bar, to prevent the upper edge of said shifting-bar from canting sidewise.

J designates a bracket on the shifting-bar, resting with it stubbleward end against the shoulder f^7 when in its normal position and provided with a shank or rod extending to the grain end of the platform with its end J^8 turned rearward in the passage-way of the lug d^7, as seen in Fig. 1, and provided with the projection J″, which rests on the plate A.

j^7 is a lug secured to the plate A near the grain end of the platform, forming a guide for the grain end of the bracket J. The stubble end of the bracket J is turned rearward and is perforated to receive the shank f^2 of the shifting-bar. The front and stubbleward end of the bracket J is cut partly down at an angle, as shown at j^9, to clear the bar i. Said portion j is cut partly down and then flattened and formed into a projection J^6 to operate the dog i^2, as hereinafter stated. The remaining part of the bracket J projects forward and is rounded to provide room for the spring K.

J′ designates a bracket encircling, with its cylindrical grain end J^4, the shank f^2, with its said end resting against the collar f^5 when in its normal position and extending with its free end stubbleward and turned rearward into the passage-way of the lug d^7, as shown in Fig. 1, with the projection J^9 resting on the plate A and in position to operate the dog i^4 and to engage with the stud j^6, secured to the plate A near the end of the stubbleward movement of the end or projection J^9 with its grainward side slanting.

j^5 is a similar stud secured to the plate A at the end of the grainward movement of the projection J″ and in the path of said projection J″, with its stubbleward side slanting, projection J″ slanting grainward, and the projection J^9 slanting stubbleward to readily pass over said studs and engage with the said studs, as hereinafter described.

j designates a lever pivoted near its center to the lug j' near the grain end of the platform and having its ends curved slightly upward and with its stubbleward end j^2 turned rearward into the passage-way of the lug d^7 and extending with its grainward end beyond the lug or stud j^5.

j^3 is a similar lever near the stubbleward end of the platform with its grainward end

turned rearward into the passage-way of the lug d^7 and extending with its other end past the stud j^6 and pivoted to the lug j^4.

d^7 designates a stud secured to the conveyer-chain near the conveyer-arms, as shown in Fig. 2. Said stud is on the front edge of said chain and projects inward or downward.

K designates a spring coiled on the shank f^2 of the shifting-bar between the brackets J and J'.

f^5 and f^6 are collars secured on the shank f^2 of the shifting-bar on each side of the bracket f^4 a proper distance apart. By the adjustment of the collars on the shank f^2 the movement of the shifting-bar can be regulated, thus regulating the depth of mesh of the bevel-pinion h^6 with the bevel-pinions h' and h^2.

i' is a bearing formed on the stubbleward end of the bar i, which partly projects into the slot f'.

i^7 is an antifriction-roller pivoted to the bar i on the grain side of the bearing i' in position to operate on the lower plane of the slot f', as seen in Fig. 5. The grain end of the bar i is curved slightly upward and forward to clear the dog i^2 and the bracket J and is extended a suitable distance and pivoted with its grainward end to the bracket g^7, which is secured to the plate A or to the lower flange of the finger-bar.

g^5 designates a lever pivoted at X, near the bevel-pinion h^2, and extending with its free end grainward, with a short crook rearward at g^6, with its free end in position to be engaged by the projection J^6, as seen in Figs. 1 and 4.

i^2 is a dog pivoted to the lever g^5 at X' and curved in position, as shown, to engage with the shoulder f^{10} in the shifting-bar.

i^3 is a bracket secured to the plate A in front of the shifting-bar in position to form a guide for the free end of the dog i^2.

o is a coiled spring resting with one end against the lever g^5 and with its other end against the finger-bar A^3.

i^4 is a dog pivoted near its center to the plate A on the rear side of the shifting-bar and slightly grainward of the shaft a, with its stubbleward end bent forward at i^6, as shown in Fig. 18, with its end of proper size and length and in position to engage with the notch f^9. The grain end of the dog i^4 extends in the passage-way of the projection J^9 and is beveled forward, as shown in Fig. 4.

i^5 is a spring secured on the bracket f^{15}, as shown, and extending with its free end grainward to meet with the stubbleward end of the dog i^4 and tends to press said dog i^4 forward to engage with the notch f^9.

h designates a shaft journaled with its lower end in the plate A and with its upper end in the plate A' at the front end of the shaft a.

h' and h^2 are bevel-pinions secured to near each end of the shaft h. The lower flange of the finger-bar is cut out at h^7 to provide room for the bevel-pinion h^2.

h^4 is a shaft journaled with its grain end in a bearing h^5 and provided with a bevel-pinion h^3 in position to engage with the bevel-pinion h'. The stubbleward end of said shaft h^4 extends to the harvester-frame. (Not shown in the drawings.)

D designates a cross-bar pivoted on the fulcrum e on the rear edge of the plate A' and on the grainward side of the shaft a and extending with its longer end rearward beyond the rear edge of the platform. Its front end has a short crook grainward, and then extends forward with its end flush with the front edge of the finger-bar, as shown in Figs. 1 and 3.

c is a strip secured on the grainward side of the bar D with its lower edge projecting downward in position to be engaged by the shoulder f^7 of the shifting-bar.

D' is a bar pivoted with its front end to the grain-board b^7 near the rear edge of the plate A' and just above said plate A' and extending rearward the same distance as the bar D. The rear ends of said bars D and D' are perforated, as shown, to receive bolts.

D^2 are strips secured to the bars D and D' by suitable bolts passed through any of the perforations. Any number of strips D^2 may be employed and shifted to any of the perforations in the bars D and D' to receive long or short grain.

D^3 is a bell-crank pivoted to near the upper edge of the vertical flange of the plate A^2 on the grainward side of the bar D with its upper arm connected by a rod D^6 to a lug D^7, secured to the under side of the bar D, with the lower arm connected by a rod D^4 to the toggle-joint D^5. Said toggle-joint is formed of two arms, with one arm pivoted to the lower edge of the rear of the platform and with its upper arm pivoted to the lug D^8, secured on the under side on the bar D', so that when the bar D is elevated the rod D^4 will be drawn stubbleward, and thus drawing straight the toggle-joint and elevating the rear end of the bar D' simultaneously with the bar D.

g designates a trip-lever pivoted in a slot g^3, formed in the plate A' and in the strip A^4 on a pin g^4, passed through the strip A^4 and one of the perforations in the lower end of the trip-lever, curved upward in position to rest, with its heel, on the front end of the bar D, and thence bent to project vertically and perforated near its upper end. g' is a draw-rod secured in one of the perforations in the lever g and extends, with its other end, to a foot-latch usually secured to the operator's foot-board. (Not shown in the drawings.) By changing the pin g^4 to one of the different perforations in the horizontal end of the trip-lever or changing the draw-rod g' to different perforations in the vertical end of said trip-lever g the pressure on the draw-rod can be adjusted as the operator may see necessary.

The operation may be summarized as follows, viz: The shaft h^4 receives its power from

the harvester-gearing (not shown in the drawings) and rotates the bevel-pinions h' and h^2 in one direction, as indicated. When the conveyer is at rest, the gear-shifting bar is in the position as seen in Fig. 17, with the shoulder f^7 in engagement with the strip c. When the desired quantity of grain has accumulated on the platform, which is readily determined by weight after a short practice, the operator allows the draw-rod to shift grainward, thus allowing the front end of the bar D to elevate, allowing the rear end of the bars D and D′ to lower to the platform and allowing the grain to rest flat on the platform. As the front end of the bar D is elevated the projection c is disengaged from the shoulder f^7 of the shifting-bar, thus allowing the spring K to move the shifting-bar grainward until the collar f^5 is adjacent the bracket f^4, when the spring-pressed hook i^6 of the dog i^4 will have engaged with the notch f^9 and lock the gear-shifting bar in position. As the gear-shifting bar is thus shifted grainward the inclined slot f', carrying the bearing i' of the shaft a, will lower said bearing i', and thus engage the bevel-pinion h^6 with the bevel-pinion h^2, thereby starting the conveyer. As the conveyer is started on its stubbleward movement the roller d^5 is guided to the top of the plate A^2 by the guide d^6 moving the free end of the arm d and d' slightly stubbleward, as seen in Fig. 2. As the conveyer moves stubbleward the lug d^7 on the chain b' moves against the rearward-projecting end j^2 of the lever j, depressing said end, and thus elevating its grainward end and disengaging the rearwardly-projecting end J^8 of bracket J from the stud j^5. Said bracket J will now be moved against the shoulder f^7 by the spring K. As the conveyer nears the end of its stubbleward movement the lug d^7 moves against the end J^5 of the bracket J′, moving it stubbleward, thereby compressing the spring K, and as the projection J^9 on the lower stubbleward end of the bracket J′ moves past the stud j^6 it will come in contact with the grain end of the dog i^4, pressing it forward, thus disengaging the hook i^6 from the notch f^9 and unlocking the shifting-bar. The spring K, being compressed, will now move the shifting-bar and the bracket J stubbleward, thereby disengaging the bevel-pinion h^6 from the bevel-pinion h^2 and engaging it with the bevel-pinion h', thus reversing the movement of the conveyer. As the shifting-bar is thus moved stubbleward until the collar f^6 is adjacent the bracket f^4 in position, as seen in dotted lines in Fig. 1, the dog i^2 engages with the shoulder f^{10} and locks said shifting-bar in position. As the conveyer starts on its grainward movement the lug d^7 on the chain moves against the rearward-projecting end of the lever j^3, depressing said end and elevating its opposite end, thereby disengaging the rearwardly-projecting end J^5 of the bracket J′ from the stud j^6, and as the conveyer nears the grain end of its movement the lug d^7 moves against the end of the bracket J and moves it grainward over the stud j^5, and as the projection J″ on the bracket J passes over the stud j^5 the projection J^6 on the grainward end of the bracket J moves against the lever g^5, shifting it forward, and thus disengaging the dog i^2 from the shoulder f^{10}, when the spring K will move the shifting-bar grainward until the shoulder f^7 thereon comes against the projection c, as seen in Fig. 17, when the bevel-pinion h^6 will be disengaged from the bevel-pinion h' and the movement of the conveyer ceases until again started by the operator, as heretofore stated. As the conveyer nears the stubble end of its movement the roller d^5 of the conveyer will pass through the notch n beneath the plate A^2, and as the conveyer starts on its grainward movement the roller d^5, detained by the spring d^8, will fold the arms d and d' grainward until the projection d^2 rests on the upper strand of the chain b', when the roller d^5 will be drawn through underneath the spring d^8, when the arms d and d' will be in position, as seen in dotted lines in Fig. 5. As the conveyer thus folded nears the grain end of its movement the free end of the arms d and d' come in contact with the guides b^6 and are partly unfolded or elevated, and at the time that the roller d^5 passes from under the guide or spring d^6 the grainward movement of the conveyer ceases. The spring K is coiled close enough on the shank f^2 so that it is entirely compressed at the time the shifting-bar is unlocked, so that the conveyer will act by the bracket J or J′ direct on the shifting-bar and shift said shifting-bar until the gearing is disengaged in case the spring K should fail to do so. Thus no breakage can occur.

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

1. In a harvester, the combination, with a platform having a slot, of a chain operated in said slot, conveyer-arms pivoted on said chain, an extension d^4 on one of the arms d, an antifriction-roller on said extension d^4, adapted to engage with the inwardly-projecting edge of the plate A^2, projections d^3 and d^2, projecting inward in position to engage with the chain b', a notch n in the inwardly-projecting edge of the plate A^2, a spring secured to the plate A^2, partly closing with its free end the passage-way of the roller d^5, a guide d^6 near the grain end of the slot, guides b^6, as shown, and means to operate the conveyer-chain, as described.

2. In a harvester, the combination, with bars D and D′, pivoted on the platform, projecting with their free ends rearward, of strips D^2, secured to the rear ends of said bars D and D′ to receive the grain, as and for the purpose described, a projection c on the bar D, said bar extending forward, as shown, a trip-lever g, pivoted in the platform in position to rest with its heel on the forward-projecting end of the bar D, a draw-rod attached to near the

free end of the trip-lever, as shown, a toggle-joint pivoted with one end to the platform and with its other end to the bar D′, a bell-crank pivoted to the platform and connected with one arm to the toggle-joint and with its other arm to the bar D, as shown, a conveyer-gearing for operating the conveyer, and a gear-shifting bar, all as shown and described.

3. The combination of a gear-shifting bar formed substantially as shown and described and located lengthwise in guides in a harvester-platform to be shifted endwise alternately in opposite directions to operate a movable bearing i', a shaft a, journaled in the movable bearing i' and in a pivoted bearing, gearing to operate the shaft a, substantially as described, to operate a sprocket-wheel on said shaft a, a chain b' on said sprocket-wheel, conveyer-arms pivoted to said chain b', means to operate the conveyer-arms, substantially as described, and brackets on the gear-shifting bar, projecting with their free end in the passage-way of the lug d^4 on the chain b', substantially as and for the purpose described.

4. In a harvester, the combination, with a platform, of a bar i, pivoted in said platform, projecting with its free end stubbleward, a bearing i', formed on the free end of the bar i, an antifriction-roller i^7, pivoted on the bar i, adjacent the bearing i', in position to engage with the inclined slot f' in the gear-shifting bar, a shaft a, journaled in the bearing i' and in a pivoted bearing a^2, bevel-pinion h^6 on the shaft a, adapted to engage alternately with the bevel-pinions h' and h^2 to operate a sprocket-wheel b, a chain on said sprocket-wheel to operate a conveyer, the gear-shifting bar located in the platform, and means to operate said gear-shifting bar, substantially as shown, and for the purpose described.

5. In a harvester, the combination, with a harvester-platform, of a gear-shifting bar in said harvester-platform, an inclined slot in said gear-shifting bar, a vertically-moving bearing i' on the free end of a bar i, an antifriction-roller i^7, pivoted adjacent the bearing i' to engage with the inclined slot f', a shaft a, journaled in the bearing i' and in a pivoted bearing a^2, a bevel-pinion h^6 on the shaft a, adapted to engage alternately with bevel-pinions h' and h^2 to operate a sprocket-wheel b on the shaft a, a conveyer operated by a chain b', operated by the sprocket-wheel b, a lug d^7 on said conveyer-chain, a projection c on the bar D, said bar D, pivoted on the platform, a trip-lever g, pivoted in the platform, a draw-rod on said trip-lever to operate the bar D, a bracket J on the gear-shifting bar, adapted to engage with the stud j^5 and with its free end extending in the path of the lug d^7, a lever j, pivoted in the platform to engage with the bracket J and with its other end projecting in the path of the lug d^7, a dog i^3, pivoted with one end to a spring-pressed lever g^5, with its other end in a guide in position to engage with the gear-shifting bar, a projection J^6 on the bracket J to engage with the free end of the spring-pressed lever g^5, and a bracket J on the gear-shifting bar, having the rearward projection J^9 to operate the dog i^4 and engage with the stud j^6 and with its upper part in position to be engaged with the lug d^7, a lever j^3, pivoted in the platform in position to engage with one end with the rearward projection J^9 and with its other end in position to be engaged by the lug d^7, a spring i^5 to force the projection i^6 in contact with the gear-shifting bar, collars f^5 and f^6, and a spring K on the gear-shifting bar, as shown, and for the purpose described.

GEORGE SCHUBERT.

Witnesses:
JNO. J. ROGERS,
J. A. MCCLELLAN.