(No Model.) 2 Sheets—Sheet 1.

G. SCHUBERT.

COMPRESSOR AND DISCHARGING MECHANISM FOR GRAIN BINDERS.

No. 473,021. Patented Apr. 19, 1892.

Fig. 1.

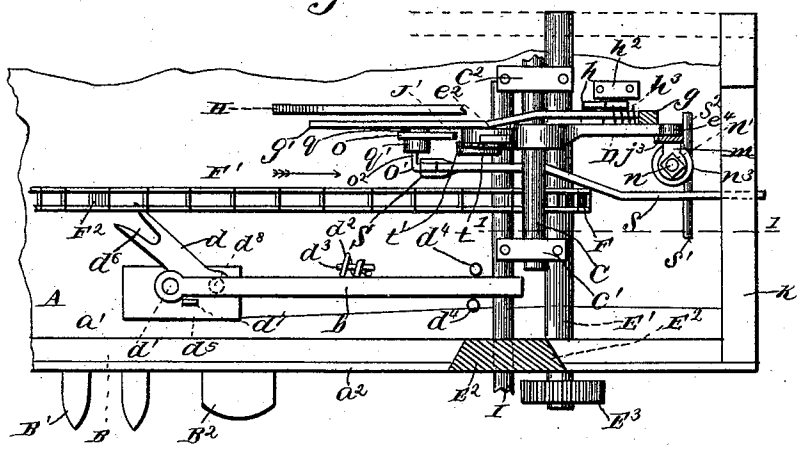


Fig. 12.

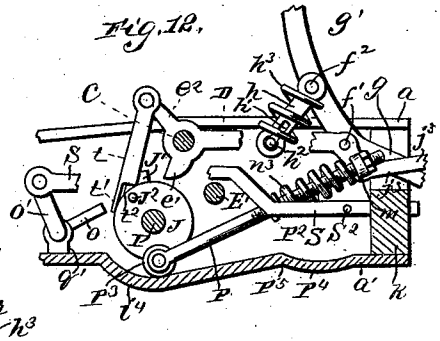


Fig. 2.

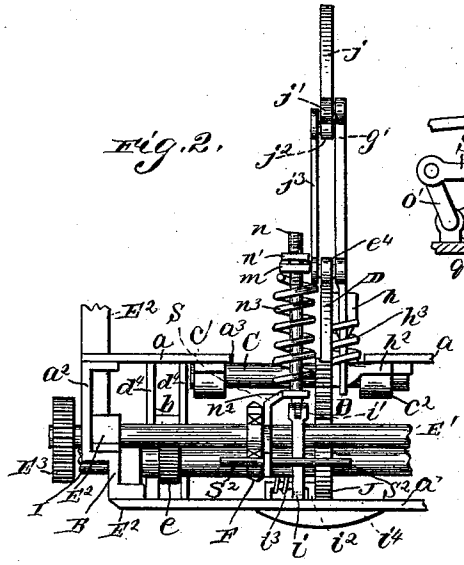


Fig. 13.

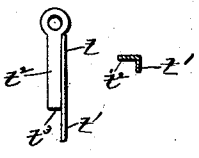
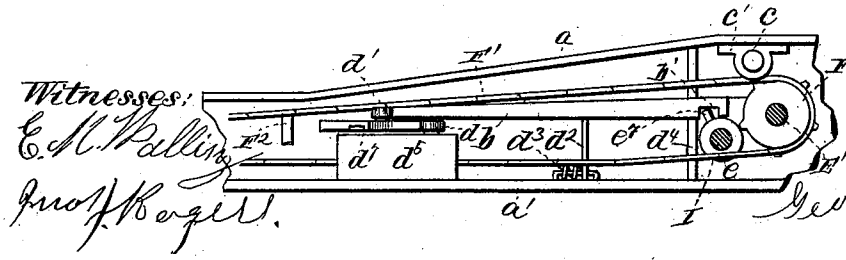


Fig. 5.



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Inventor:
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(No Model.) 2 Sheets—Sheet 2.

G. SCHUBERT.

COMPRESSOR AND DISCHARGING MECHANISM FOR GRAIN BINDERS.

No. 473,021. Patented Apr. 19, 1892.

Fig. 3.

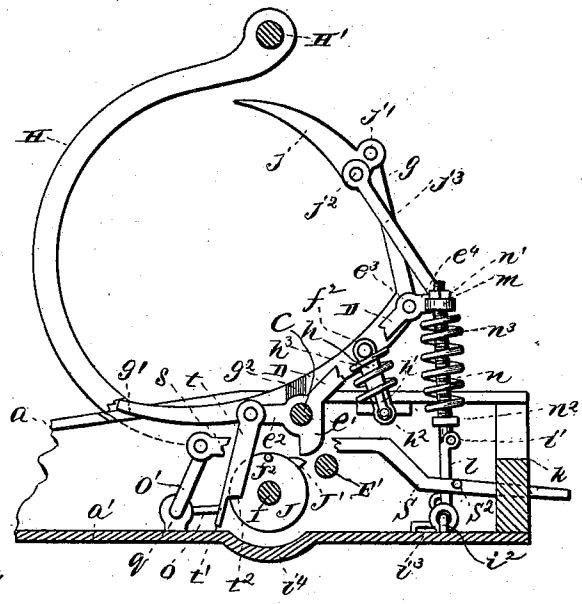


Fig. 6.

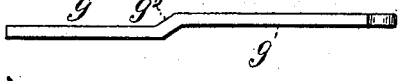


Fig. 7.

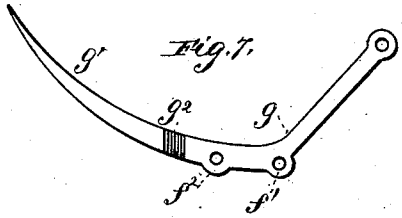


Fig. 8.

Fig. 4.

Fig. 9.

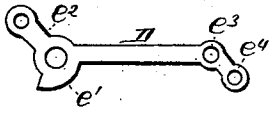


Fig. 11.

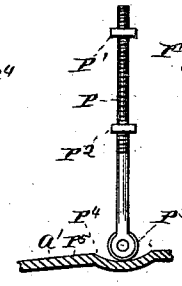
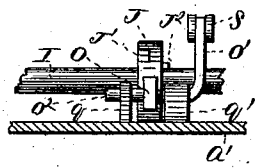


Fig. 10.



Witnesses:
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Jno. J. Bagley.

Inventor:
George Schubert

UNITED STATES PATENT OFFICE.

GEORGE SCHUBERT, OF WALNUT, TEXAS.

COMPRESSOR AND DISCHARGING MECHANISM FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 473,021, dated April 19, 1892.

Application filed March 16, 1891. Serial No. 385,308. (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 certain new and useful Improvements in Compressors and Discharging Mechanism for Grain-Binders; 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.

This invention relates to improvements in compressing and discharging mechanism and a starting mechanism for grain-binders constructed on an ordinary harvester-platform, so as to adapt the well-known "Appleby" type of binders to be used on an ordinary harvester-platform, the sheaf to be formed direct on the platform, thus adapting the above-mentioned cord-tying mechanism to be used in connection with the conveyer invented by myself and patented February 17, 1891, No. 446,473.

By the above-named improvements the binder or tying mechanism can be placed below the upper plate of the platform in a narrow space and the needle placed a suitable distance above. The upper plate of the platform forms the usual breast-plate. Thus it will be seen that the sheaf can be formed and bound direct on the inner end of the platform, the platform being extended far enough beyond its inner cutting-point to locate the said binder. Heretofore it has often been the practice to place the binder or tying mechanism above and the needle below. This was done so as to preserve a free and perfect discharge for the bound sheaf. By so placing the needle below and the binder above, a large space is necessary below the point where the sheaf is formed for the retreating of the needle, so that elevating and packing mechanism had to be employed, and with such elevating and packing mechanism I dispense.

The objects of my improvements are, first, to construct a compressor so that its curvature is inward somewhat, in conformity with the sheaf to be bound, and that said curvature diminishes, and, finally, the said compressor straightens out or curves outward as the compressor is moved back, so as to secure a clear passage for the discharge of the bound sheaf; second, to construct a discharging-arm, so as to be operated by the compressor and making such discharging-arm a part of the compressor; third, to construct such compressor and discharging-arm so that they can be operated by pins or projections secured to a disk secured to a suitable shaft in the platform; fourth, to provide a suitable stopping and starting mechanism operated by the conveyer above mentioned to stop and start the binder-shaft to operate its compressor. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a portion of a harvester-platform provided with my improvement, the upper plate being removed, so as to show the construction below said plate. Fig. 2 is an end view looking grainward, the inner sill being left off, so as to show parts beyond in full lines, the needle, needle-shaft, and a part of the U-frame being left off. Fig. 3 is a longitudinal sectional view on line 1 1, Fig. 1, showing a side view of the needle and the compressor in position. Fig. 4 shows the compressor moved back out of position, so as to give a clear space for the discharge of the bound sheaf, the discharging-arm being elevated, the needle being omitted in this view. Fig. 5 is a side view showing the locking and starting bar and lever. Fig. 6 is a plan view of the discharging-arm detached from the compressor, and Fig. 7 is a side view of same. Fig. 8 is a detail view of the locking-lever. Fig. 9 is a detail view of the first and main operating-link of the compressor. Fig. 10 is a view of the tripping-dog, looking in the direction of the arrow in Fig. 1. Fig. 11 is a modified form of the prop which can be employed instead of the collapsible prop shown in Figs. 2, 3, and 4. Fig. 12 shows the operation of said prop, and Fig. 13 is a side and cross-sectional view of the dog *t*.

Referring to the drawings, A designates the platform, provided with a finger-bar B, carrying the guards B′ and the usual shoe B^2. The platform is provided with two plates, an upper plate *a* and a lower plate *a′*. The lower plate *a′* is secured to the lower flange of bar B, and the upper plate *a* is secured to the upper flange of bar B. The finger-bar B is provided with an upright flange a^2 on its stubbleward extension. To said flange a^2 is secured the U-frame or main frame E^2, to support the binder mechanism, (said frame is

only partly shown in the drawings and is of ordinary construction and is in general use and need not be described,) a suitable distance from the shoe B^2. The plate a is slightly elevated from the shoe B^2 stubbleward, so as to provide more room for the binder mechanism.

C designates the compressor-shaft extending across the slot a^3, in which the conveyer operates, and having its bearings C′ and C^2 secured to the plate a, as seen in Fig. 5. On said shaft is secured the compressor. Any number of such compressors can be secured to said shaft, one in the present instance.

E′ designates the conveyer-shaft, provided with a sprocket-wheel F to operate the chain F′, by which the conveyer is operated, as described in Letters Patent above mentioned. Said shaft is located stubbleward from shaft I and shaft C far enough so that its sprocket-wheel F will clear the said shafts. Said shaft is provided with a bearing in the rear sill of the platform A, and its front bearing is secured to the finger-bar B. Shaft E′ is also provided with a pinion E^3 on its forward projecting end, from which it receives its motion.

I designates the binder-shaft, having its bearing in the U-frame and provided with the disk J. To said disk J are secured the stud J^2 and the projection J′ for the purpose hereinafter described. The gearing to operate this shaft I has been described and claimed in an application filed January 30, 1891, Serial No. 379,744.

H designates the needle secured to the shaft H′. Said shaft has its support in the U-frame. The needle H is constructed in any well known and suitable form.

Referring now to the locking and starting mechanism of the shaft I, e designates a collar secured on shaft I and provided with a stud extending into the notch b' on bar b. The collar e is located on shaft I on line with the pivot of lever d. Said lever d is pivoted on a fulcrum d^8, secured in the block d^5, (shown in dotted lines in Fig. 1,) and provided with a stud d', to which is pivoted the bar b, and has its free end slotted, as seen at d^6 in Fig. 8, and projecting in the passage-way of the chain F′ and operated by the lug F^2, secured to the chain F′. The bar b is of a suitable length to start the binder at the proper time, as I prefer to locate the lug F^2 near the conveyer-head, so as to not pass over or come in contact with the sprocket-wheel F. The connection of lever d with bar b is on line with the collar and the fulcrum of lever d, so that pressure from the bar b will not operate the lever d. d^2 is a spring coiled once or twice around the staple d^3, with one end resting on the plate a' and its other end against the bar b, as shown in Fig. 1, so as to prevent said bar from shifting forward and operating the lever. d^4 d^4 are guides secured to plates a and a', and form guides to prevent the bar from working off the stud e^7.

Referring now to Figs. 3 and 4, the compressor is constructed in sections. D is the first link and it is secured to the shaft C and provided with the elbow e^3 and extension e^4, the projection e', and the lug e^2. To the elbow e^3 is pivoted the arm g at f', and to the upper end of arm g is pivoted the section j with its stubbleward-projecting lug j' connected with the upper end of the section j^3. j^3 is pivoted to the inner and lower portion j^4 of part j, and its lower end is pivoted on the lug m. Said lug m is pivoted in the rear extension e^4 and extends beyond the rod j^3 and is provided with an opening through which extends the upper end of the rod n, by which the compressor is held in an upright position. Said rod n is provided with a toggle-joint i' and its lower part i is pivoted on a staple i^2, secured to the plate a'. i^3 is a spring coiled once or twice around the staple i^2, with one end resting on the plate a' and its other end against the rod i, thus holding the prop n in an upright position when straightened until the weight of the compressor begins to bear on it. The rod n is threaded to near the joint i' and provided with nuts n^2 and n'.

n^3 is a coiled spring on the rod n, with its lower end resting on the nut n^2 and its upper end against the lug m. The nut n' is to prevent the rod n from disengaging the lug m, and by the nut n^2 the tension of the spring n^3 is regulated, and also by running the nuts up the compressor is pitched farther forward, thus adapting itself for a variety of smaller sheaves, and by running the nuts down the compressor will adapt itself for a variety of larger sheaves.

h designates a rod or link pivoted to the arm g at f^2, with its lower end slotted at h' to work on the stud h^2, said stud h^2 being secured to the plate a.

h^3 is a coiled spring on the link h, with its upper end against the arm g and its lower end on the stud h^2. Said spring h^3 is first compressed (when the sheaf is to be discharged) by the compressor moving stubbleward until the sheaf is clear of the tying apparatus and somewhat elevated by the arm g', after which time said spring will expand, and thus will impart an additional speed to the arm g' to that received from the compressor as the latter is moved stubbleward, and thus the sheaf will be pitched clear of the machine or to a suitable point where a bundle-carrier may be located. The spring h^3, in connection with the spring n^3, also furnishes to the compressor its necessary elasticity of compression. The discharging-arm g' sinks beneath the plate a when the compressor is elevated, as seen in Fig. 3, and is crooked at g^2 so as to clear the needle in its operation. To the free end of arm or projection e^2 is pivoted the dog t, formed of angle-iron, as seen in Figs. 1 and 13, with its narrow flange t' resting on the periphery of the disk J and having the lower part of its broad flange t^2 cut out to receive the stud J^2.

S designates a trip-rod provided with a

cross-rod or stud S^2, as seen in Fig. 2. By the stud S^2 any number of compressors can be tripped simultaneously with the trip-rod S. Said cross-rod or stud is located on the stubbleward side of the part or rod *i* when the latter is in an upright position and the trip-rod drawn stubbleward, so as to trip the rod *i* when the trip-rod S is drawn grainward, and thus allow the joint *i'* to fold and allow the compressor to drop down, moving with its free end stubbleward to or beyond a horizontal position or below the level of the platform. The free or stubbleward end of the trip-rod has a guide in the sill *k* and extends toward the grainward, being crooked near its center so as to clear the shaft E' and the sprocket-wheel F, and its grainward end is connected to the crank *o'*. Said crank *o'* is provided with a shaft o^2, extending through the brackets *q* and *q'*, secured to the plate *a'*. Between said brackets *q* and *q'* on its shaft o^2 is secured the dog *o*, made of any suitable length, and the brackets *q* and *q'* are located a suitable distance from the shaft I, so as to bring the dog *o* in close proximity with the periphery of the disk J, so that said dog *o* will be operated by the projection J' on the disk J. The projection J' extends only partly across the periphery of the disk, so that it will not interfere with the narrow flange *t'* on the dog *t*.

The platform extends far enough stubbleward to provide room for the prop, and the sill *k* is notched so as to allow the compressor to sink a proper distance beneath the level of the platform. The plate *a* is provided with slots at suitable places for the working of the compressor, discharging-arm, and the needle. i^4 designates a depression in the plate *a'*. Said depression is to provide room for the disk J and the projection J' to rotate. The projection J' is located on the periphery of the disk J, as seen in Fig. 10, and at a point so as to come in contant with the dog *o* to trip the compressor as soon as the knot in the cord around the sheaf is sufficiently formed, and the compressor is thus tripped by elevating the free end of the dog *o*, which moves the trip-rod grainward by the crank *o'*. The pin or stud J^2 is located near the edge of the disk and in relation to the projection J', so as to come in contact with the shoulder t^3 as soon as the compressor has been tripped and elevate said dog *t*, thus forcing the compressor down, as seen in Fig. 4. The flange *t'*, resting on the periphery of the disk, will cause the stud J^2 to shift from under the shoulder t^2 at the proper time as the disk rotates, and as the stud J^2 has shifted from underneath the dog *t* the projection J' comes in contact with the downward projection *e'* on the link D, and thus elevates the compressor again in position, as seen in Fig. 3, ready for the next gavel of grain to be compressed against it by the needle. The trip-rod S is shifted stubbleward by the rod *i* coming in contact with the stud S^2 as the compressor is raised and the prop *n* straightened, the link or rod *h* being pivoted with its lower end a proper distance stubbleward from the shaft *c* and with its upper end to the section *g'* at f^2 a proper distance from the pivot *f'* to impart an increase of movement to the section *g* over that of section D, and the section j^3 is pivoted with its lower end on the outside of the compressor or on the stubbleward side and with its upper end to the section *j* on the grainward side or the inner side of the compressor, thus imparting an increase of movement to the section *j* over that of section *g*, thus causing the section *j* to project forward or grainward when the compressor is in normal position, and to project outward when the compressor is in position for the bundle to be ejected. Said increase or variation of movement of the sections of the free end of the compressor can be increased or decreased by changing the positions of the pivots and the length of the sections, as will be readily understood.

In Fig. 1 the U-frame E^2 has been partly omitted. The needle-shaft and part of the needle have also been omitted.

In Fig. 11 is shown a modified form of the rod or prop P, provided with the nuts P' and P^2 and having at its lower end the roller P^3. P^4 is a depression in the plate *a'* to prevent the roller P^3 from escaping when not so desired. The plate *a'* should be slanting from the point P^5 to the depression i^4. The prop P, when employed, is provided with a spring n^3 and with its upper end extending through the lug *m* and with its anti-friction roller P^3 in the depression P^4. Said anti-friction roller P^3 is moved out of the depression P^4 by the trip-rod S^2, when the roller P^3 will roll grainward and allow the compressor to come down, as described.

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

1. In a grain-binder, the combination, in a compressor constructed in sections, of the section D, secured on the shaft C and provided with a projection e^2, a dog *t*, pivoted thereto, a lug *m*, pivoted in the stubbleward end of section D, a shaft I, having a disk J, provided with a projection J' and a stud J^2 to engage with the dog *t*, a dog *o*, secured to a crank-shaft o^2 in position to be engaged by the projection J', a trip-rod pivoted to the crank *o'* and provided with a stud S^2, a movable or collapsible prop connected to said lug *m*, and a link *h*, pivoted to the platform and with its other end pivoted to the section *g*, said section *g* pivoted to the section D and provided with a discharging-arm *g'*, as shown, and for the purpose described.

2. In a grain-binder, the combination, in a compressor constructed in sections, of the section D, secured on the shaft C and provided with a projection E^2, a dog *t*, pivoted thereto, a lug *m*, pivoted in the stubble end of section D, a shaft I, having a disk J, provided with a projection J' and a stud J^2 to engage with the dog *t*, a dog *o*, secured to a crank-shaft o^2 in

position to be engaged by the projection J′, a trip-rod pivoted to the crank o' and provided with a stud S^2, a movable or collapsible prop connected to said lug m, a link h, having a slot h' to operate on a stud h^2, secured to the platform and with its other end pivoted to the section g, a spring h^3 on said link h, and the section g, pivoted to the section D and provided with a discharging-arm g', as shown, and for the purpose described.

3. In a grain-binder, the combination of a compressor constructed in sections, the section D, secured on the shaft C and provided with projections e' and e^2, a dog t, pivoted to the projection e^2, a shaft I, having a disk J, provided with a projection J′ and a stud J^2, a link h, pivoted to the platform and with its other end pivoted to the discharge-arm g', formed integral with the section g, and the section g, pivoted to the section D, substantially as and for the purpose described.

4. In a grain-binder, the combination, in a compressor, of a section D, secured on a shaft C and provided with a projection e' and a projection e^4, a lug m, pivoted in the projection e^4 and perforated to receive the upper end of a prop, a section g, pivoted at f' to the section D at e^3 and having its upper end pivoted with the stubbleward projection, of the section j, a section j^3, pivoted with its lower end on the lug m or extension e^4 and with its upper end pivoted to the section j on its inner side at j^2, so as to impart an increased movement to the section j, a link h, pivoted with one end to the platform and with its other end to the section g, a movable or collapsible prop, as shown, and a shaft I, having a disk J, provided with a projection J′, as shown, and for the purpose described.

5. In a grain-binder, the combination, in a compressor, of a section D, secured on a shaft C and provided with a projection e^2, a dog t, pivoted thereto, a lug m, pivoted in the projection e^4 and perforated to receive the upper end of a prop, a section g, pivoted at f' to the section D at e^3 and having its upper end pivoted with the stubbleward projection of the section j, a section j^3, pivoted with its lower end on the lug m or on the extension e^4 and with its upper end pivoted to the section j on the inner side, so as to impart an increase of movement to the section j, a link h, pivoted with one end to the platform and with its other end to the section g, so as to impart an increase of movement to the section g as the section D is operated, a movable or collapsible prop extending with its upper end through the lug m, a shaft I, having a disk J, provided with a projection J′ and a stud J^2, a dog o, secured to a crank-shaft o^2 in position to be engaged by the projection J′, and a trip-rod pivoted to the crank-shaft o' and provided with a stud S^2, as shown, and for the purposes described.

6. In a grain-binder, the combination, in a compressor, of a section D, secured on a shaft c, a lug m, pivoted in the projection e^4 and perforated to receive the upper end of a prop, a section g, pivoted at f' to the section D at e^3 and having its upper end pivoted with the stubbleward projection of the section j, a section j^3, pivoted with its lower end on the lug m and with its upper end pivoted to the section j on the inner side, a link h, having a slot h' to operate on a stud h^2 and with its other end pivoted to the section g, a prop extending with its upper end through the lug m, and a spring n^3 on said prop, as shown, and for the purpose described.

7. In a grain-binder, the combination, in a compressor, of a section D, secured on a shaft c and provided with a projection e^2, a lug m, pivoted in the projection e^4 and perforated to receive the upper end of a prop, a section g, pivoted at f' to the section D at e^3 and having its upper end pivoted with the stubbleward projection of the section j, a section j^3, pivoted with its lower end on the lug m and with its upper end pivoted to the section j on the inner side, a link h, having a slot h' to operate on a stud h^2 and with its other end pivoted to the section g at f^2, a spring h^3 on said link, a movable or collapsible prop extending with its upper end through the lug m, a spring n^3 on said prop, nuts on said prop, as shown, and for the purpose described, the section g being provided with a discharging-arm, as shown, a shaft I, having a disk J, provided with a projection J′ and a stud J^2, a dog t, pivoted to the projection e^2, a dog o, secured to a shaft o^2 in position to be engaged by the projection J′, and a trip-rod pivoted to the crank o' and provided with a stud S^2, as shown, and for the purpose described.

8. In a grain-binder, a shaft I, provided with a collar or disk e, a stud e^7, secured to said disk e, a rod or bar b, having a notch b' formed in its stubbleward end to engage with the stud e^7, a lever d, pivoted in the platform with its free end projecting in the passage-way of the conveyer-chain, a stud F^2 on said conveyer-chain, the bar or rod b, pivoted to the projection d' on the lever d, guides d^4 d^4, a spring d^2, and a stud or projection d', as shown, and for the purpose described.

9. In a grain-binder, a shaft I, provided with a collar or disk e, a stud e^7, secured to said disk e, a rod or bar b, having a notch b' formed in its stubbleward end to engage with the stud e^7, a lever d, provided with the projection d' and pivoted in the platform and having its free end bifurcated and projecting in the passage-way of the conveyer-chain, a stud F^2 on said chain, the bar or rod b, pivoted to the projection d', guides d^4 d^4, a spring d^2, as shown, and a stud or projection d', as shown, and for the purpose described.

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

GEORGE SCHUBERT.

Witnesses:
J. F. WAMBLE,
W. T. HOWELL.