(No Model.) 4 Sheets—Sheet 1.

J. S. DAVIS.

GRAIN CARRIER FOR HARVESTERS.

No. 285,580. Patented Sept. 25, 1883.

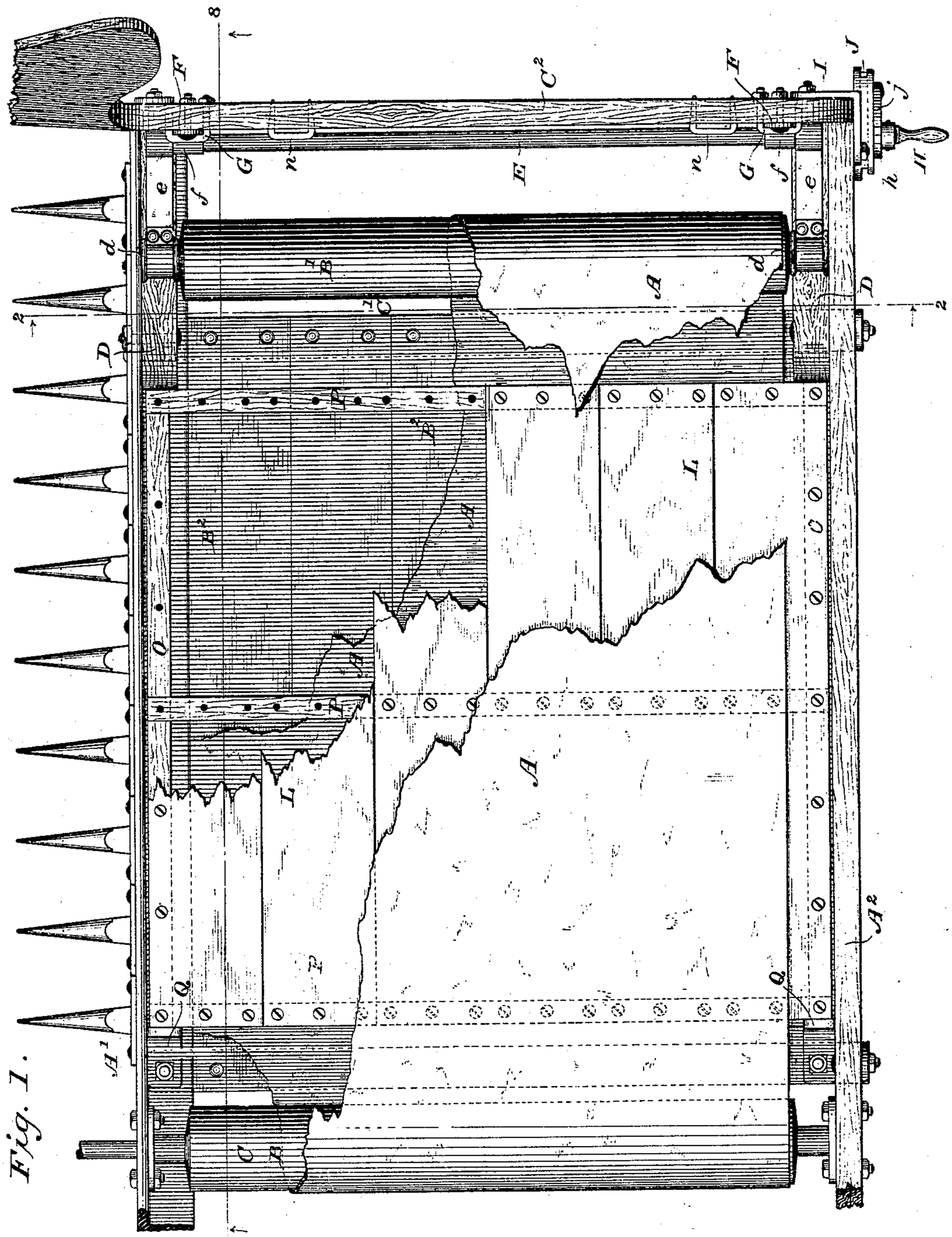

Fig. 1.

WITNESSES

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Alfred C. Newman.

INVENTOR

John S. Davis

By his Attorneys,

Baldwin, Hopkins & Peyton.

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Fig. 2.

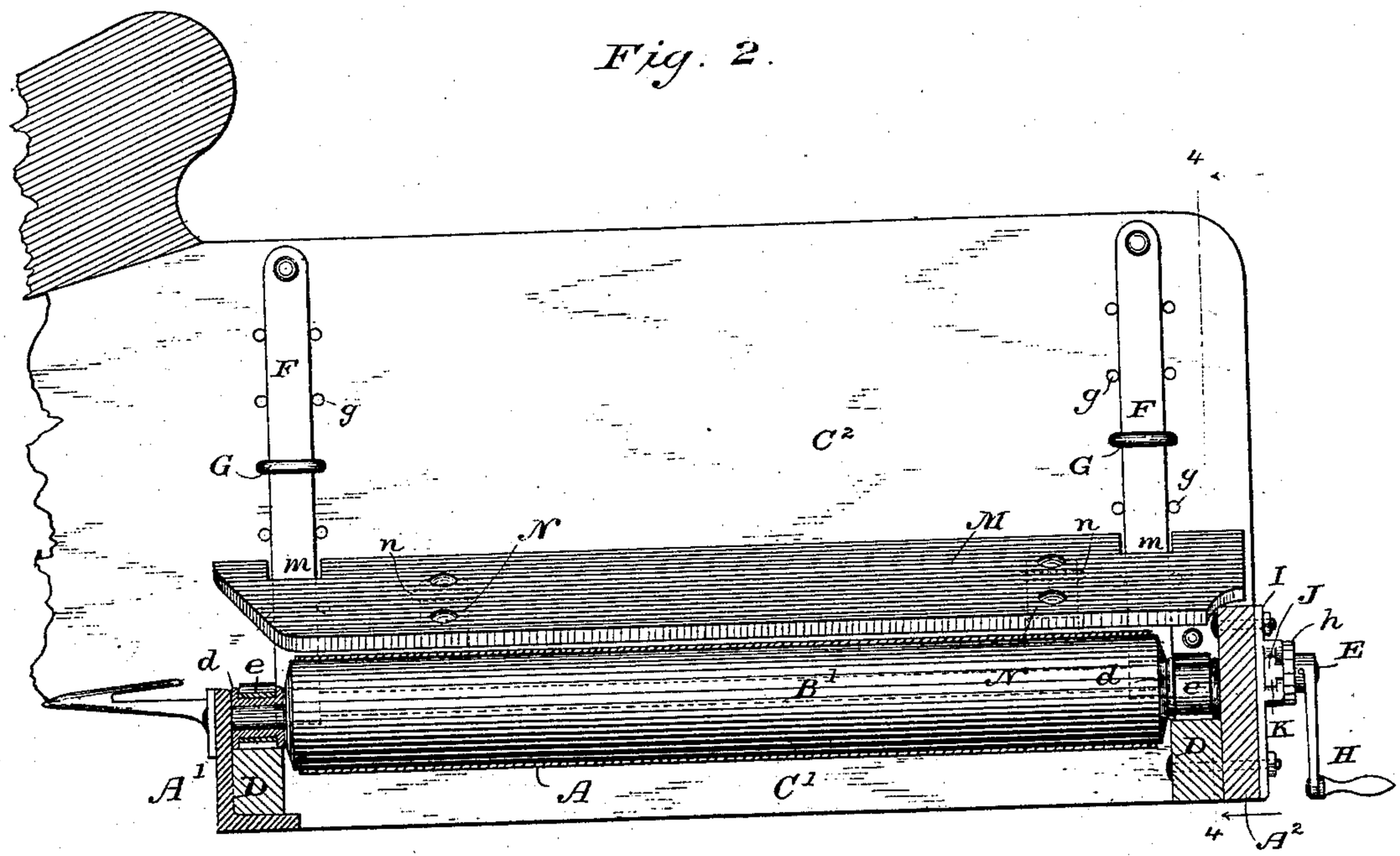

Fig. 5.

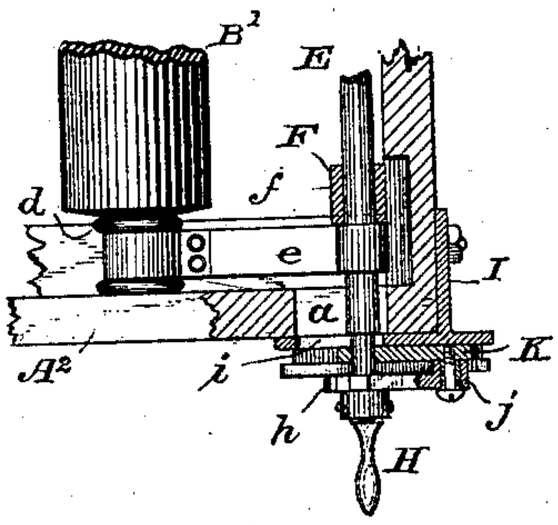

Fig. 6.

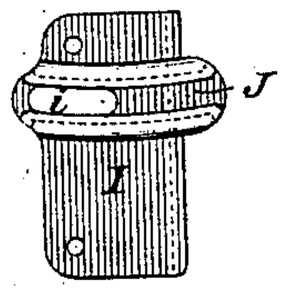

Fig. 7.

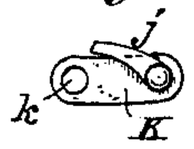

Fig. 4.

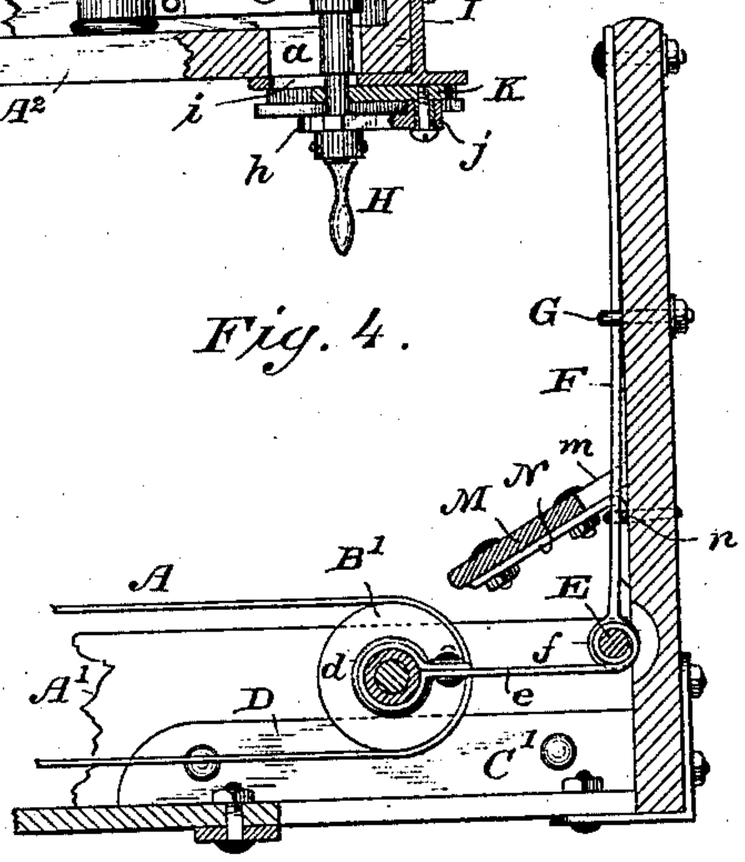

Fig. 3.

WITNESSES

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(No Model.)

4 Sheets—Sheet 3.

J. S. DAVIS.

GRAIN CARRIER FOR HARVESTERS.

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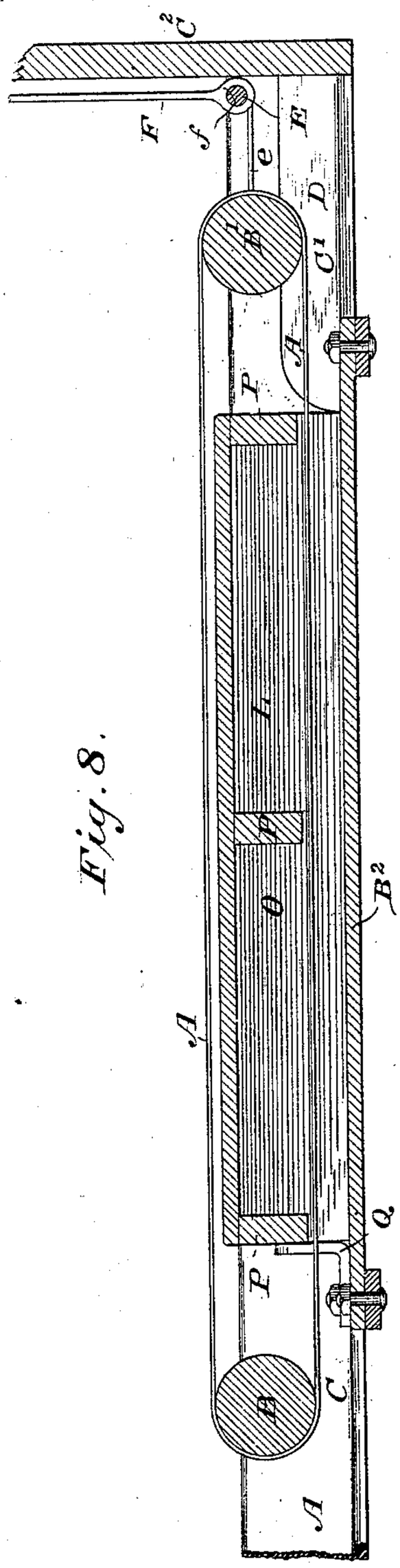

Fig. 8.

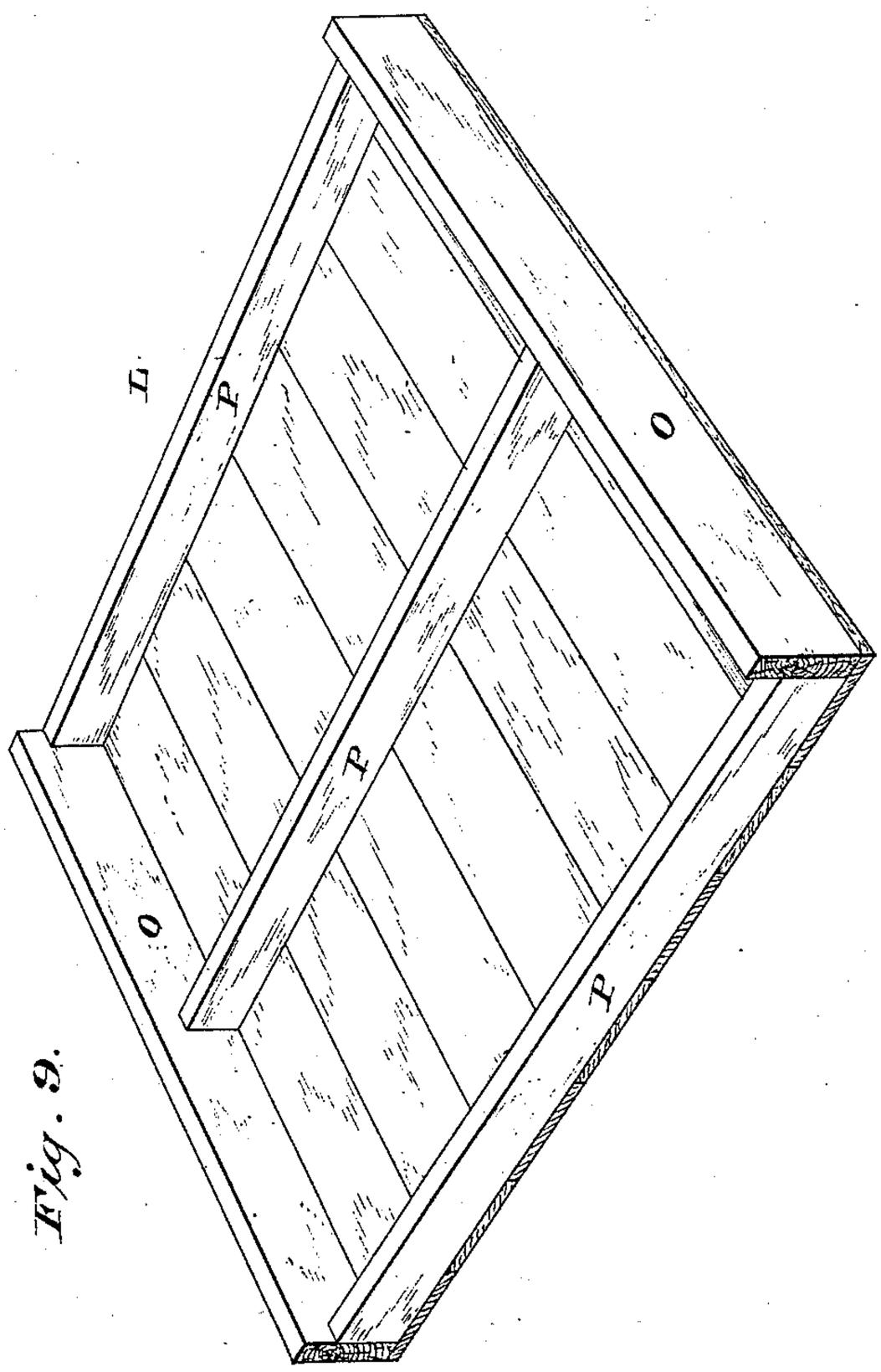

Fig. 9.

WITNESSES

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GRAIN CARRIER FOR HARVESTERS.

No. 285,580. Patented Sept. 25, 1883.

Fig. 10.

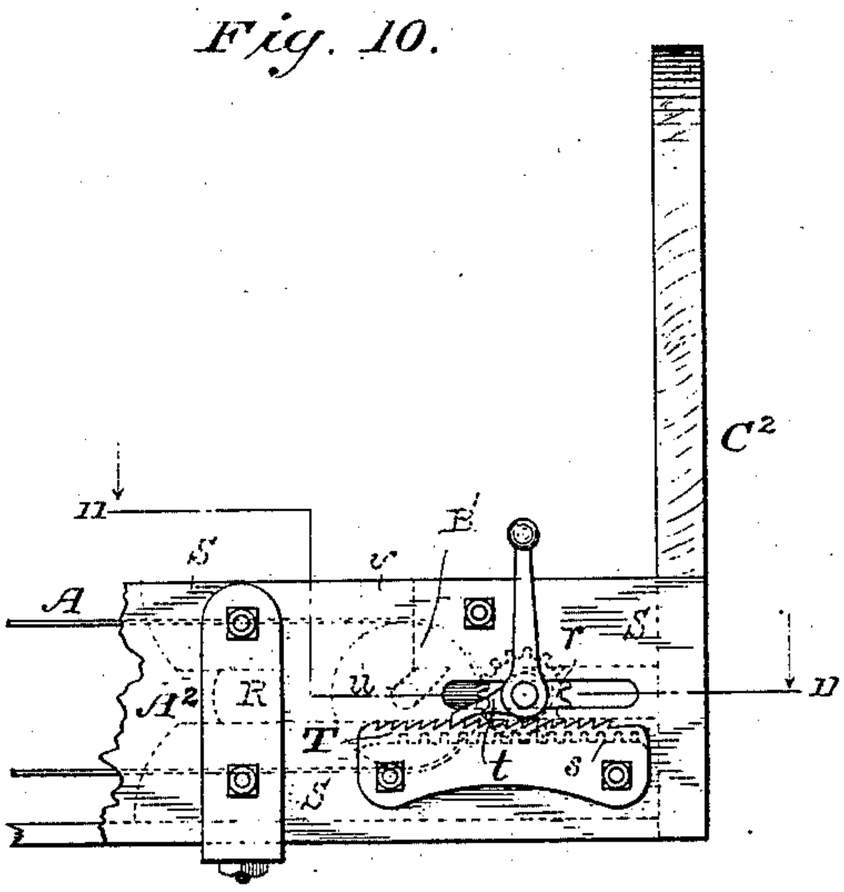


Fig. 12

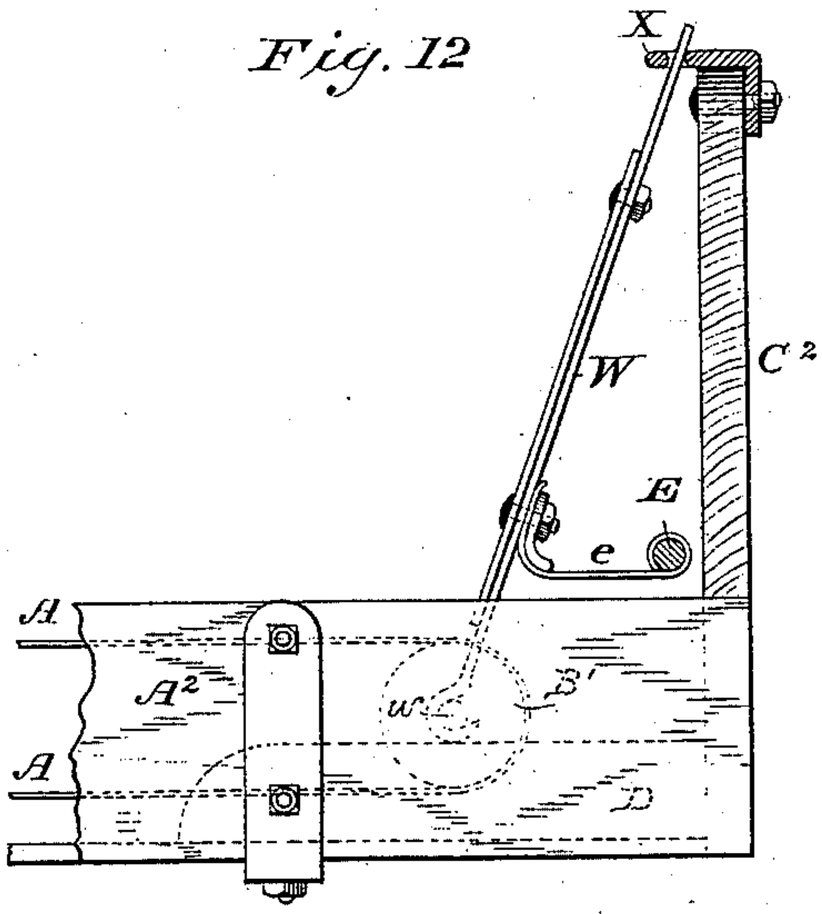
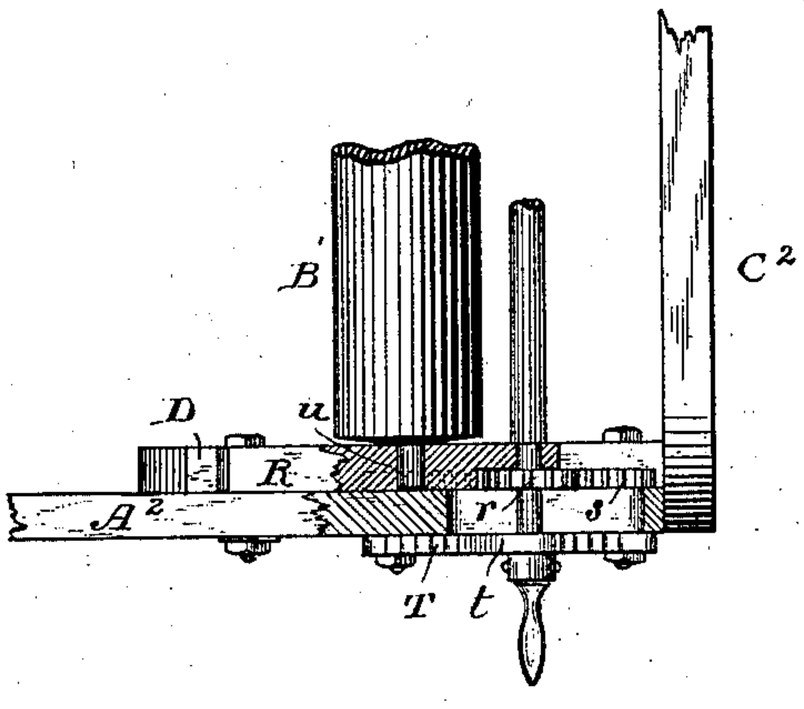


Fig. 11.



WITNESSES

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Alfred C. Newman.

INVENTOR

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By his Attorneys,

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UNITED STATES PATENT OFFICE.

JOHN S. DAVIS, OF TOLEDO, OHIO.

GRAIN-CARRIER FOR HARVESTERS.

SPECIFICATION forming part of Letters Patent No. 285,580, dated September 25, 1883.

Application filed May 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. DAVIS, of Toledo, in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Grain-Carriers for Grain-Binders and other Machines, of which the following is a specification.

My invention relates to improvements in grain-carriers of the class composed of endless aprons, belts, or chains, and chiefly employed, in connection with grain-binding harvesting-machines, to deliver the grain as cut from the harvester-platforms to the binding mechanism, my improvements particularly pertaining to that type of such class of grain-carriers having canvas aprons, and in which provision is made for tightening and loosening the aprons.

My objects mainly are to provide simple, readily-operated, and easily-accessible mechanism by which an endless carrier may be held under suitable tension while in operation and slackened when inoperative; to provide for the ready removal of one of the carrier-supporting rollers from its working position to allow of the rolling up of the carrier, so as to occupy but small space and admit of its being readily covered to protect it from exposure to the weather; to provide readily-removable means for preventing sagging of the carrier and for covering the carrier when rolled up, and to provide in simple way for the automatic or self adjustment of the carrier, so as to equalize the tension upon the front and rear edges of the apron, (or the front and rear belts or chains of a series,) thus guarding against imperfect work resulting from unequal stretching or shrinking or inequality in the lengths of the front and rear portions of the carrier.

My improvements consist in a novel organization of mechanism and in certain combinations of devices hereinafter particularly pointed out by the claims, and described in connection with the accompanying drawings, which show those parts of a harvester (the platform and its immediate attachments) illustration of which is thought to be sufficient to show an organization of mechanism in accordance with my invention and some modifications thereof.

Essential features of my improvements may be used without others, either in connection with a platform or as applied to elevating-aprons or inclined carriers—such, for instance, as used for conveying grain from the inner ends of platforms to receivers or binding-receptacles; and the details of construction and arrangement of parts may be modified to conform to the tastes of different constructers and to suit the varying circumstances (peculiarities of construction of the platforms, &c.) under which the carrier is to be worked.

Figure 1 is a plan view, parts being broken away and removed. Fig. 2 is a view partly in elevation and partly in section on the line 2 2 of Fig. 1. Fig. 3 is a view showing a rear elevation of the outer end of the platform, the carrier-adjusting mechanism, &c. Fig. 4 is a view partly in rear elevation and partly in section on the line 4 4 of Fig. 2. Fig. 5 is a view partly in plan and partly in section on the line 5 5 of Fig. 3. Figs. 6 and 7 are detail views representing a slotted bracket, which is adapted for attachment to the rear outer corner of the platform, and a pawl carried by a plate adapted to slide in a guideway of the bracket. Fig. 8 is a view partly in rear elevation and partly in section on the line 8 8 of Fig. 1. Fig. 9 is a view in perspective (looking at the under side) of a frame adapted to be removably adjusted between the inner and outer rollers of the carrier to prevent sagging of the carrier, and serving also as a cover for the carrier. Fig. 10 is a view showing a rear elevation of the outer end of the platform, with a modification of the carrier-adjusting mechanism. Fig. 11 is a view partly in plan and partly in section on the line 11 11 of Fig. 10. Fig. 12 is a view partly in rear elevation and partly in vertical section, showing the outer end of the platform and another modification of the carrier-adjusting mechanism.

The endless carrier A shown is formed of one piece of canvas, and is supported upon cylindrical rollers B B′, instead of being constructed, as it may be, if preferred, of a series of belts mounted upon corresponding series of rollers in a well-known way. The rollers cross the platform at or near its inner and outer ends. The inner or driving roller, B, is actuated in suitable way to rotate it in fixed bearings secured to the finger-beam A′ and the back beam,

A^2, of the platform. The platform bottom or boarding B^2 is of a length less than the distance between the rollers, thus providing open spaces C C′ beneath the rollers.

In order that the distance between the carrier-supporting rollers may be varied to properly stretch or slacken the carrier, and provide for the frequently-occurring variations in its length, the outer or driven roller, B′, is adapted to be adjusted toward and away from the driving-roller, and to be secured in its adjusted position by mechanism outside of the carrier and beyond its driven roller, or between it and the ordinary grain-board or divider-fence C^2. By providing adjusting mechanism outside of the carrier and beyond the roller B′, instead of between the rollers and between the upper and lower surfaces of the carrier, as has heretofore sometimes been the case, ready access is afforded to the mechanism for inspection and repair, and the adjustable roller may be quickly removed and replaced, as soon to be made apparent. I also provide novel means by which the roller is so supported as to be self-adjusting to a limited extent, that it may yield at either end, or bodily, for a well-known purpose, as fully described in United States Letters Patent No. 252,081, of January 10, 1882.

The roller-adjusting mechanism, in its preferable form, is as follows: Bearing blocks or rails D D are fixedly attached at the outer ends and to the insides of the finger-beam and the back beam. The outer roller has its shaft ends or journals provided with small loosely-fitted annularly-recessed or end-flanged bearing-rollers *d d*, which rest on the bearing-blocks and between the roller and the finger-beam at front and the roller and the back beam at rear. Heavy leather or other strong flexible straps, *e e*, are looped and secured about the bearing-rollers. The flanges of these rollers prevent disengagement of the straps from them, while admitting of the straps being secured loosely about them, so as not to prevent rotation of the bearing-rollers on the journals of the roller B′ as it is being adjusted by moving the rollers along the bearing-blocks. Each strap *e* is secured at its end opposite that connected to its bearing-roller to an adjusting-shaft, E, parallel with the driven roller, and supported between this roller and the grain-board C^2. Yielding arms F F (best made of spring steel) are supported by attachment to the grain-board above the level of the driven roller, and have eyes or bearings *f f* at their lower ends, and about on a level with the center of the roller. The shaft E is supported in the eyes of the arms F F near its ends. The tendency of the spring-supporting arms is to draw the driven roller toward the grain-board, and thus keep the carrier taut. The elasticity of the spring-arms, or the drawing force exerted by them on the roller, may be adjusted as desired. As shown, the spring-arms are detachably secured at their upper ends to the grain-board, near its top edge, by bolts, and the arms are further secured to the grain-board by adjustable clip-bolts G G, which are secured at the desired distance from the bearing ends of the arms by means of the series of holes *g g* and nuts. It will be obvious that the nearer to their upper ends the arms are clipped against the grain-board by the clip-bolts the greater will be the resiliency of the spring-arms and the less the force exerted by them. By adjusting the clip-bolts in the lowermost pairs of holes and drawing them up tightly by their nuts, the shaft E becomes, practically considered, rigidly supported by the arms F F.

To rotate the adjusting-shaft E in its supports, whether the supports are in their yielding or their rigid condition, and so either winding the straps about the shaft or unwinding them, according to whether it is desired to tighten or to slacken the carrier or to increase or lessen the distance between the carrier-rollers, I employ means as follows: The rear end of the adjusting-shaft passes through a slot, *a*, in the back beam, A^2, at the outer rear corner of the platform, and is provided with a crank, H, and a ratchet, *h*, (best formed together and fixed to the projecting end of the shaft by a single cross-pin or equivalent removable fastening.) A corner clip or angle-bracket, I, at the rear outer corner of the platform, firmly secured to the grain-board and back beam by bolts, is provided with a slot, *i*, and a guideway, J, correspondingly and slightly curved, for a purpose which will presently be apparent. The slot *i* corresponds or registers with the slot *a*, and the reduced projecting rear end of the adjusting-shaft passes through this bracket-slot, the crank and ratchet being outside of the bracket. A pawl, *j*, is pivoted to a slide-plate, K, fitted to reciprocate in the guideway J, and the end of the adjusting-shaft passes through an opening, *k*, Fig. 7, near the end of the slide-plate opposite that to which the pawl is pivoted. The shaft passes loosely through the pawl-slide opening, so that it may turn freely, and the width of the slot or opening into the guideway, between its upper and lower flanged ribs, is somewhat greater than the diameter of the pawl-pivot, which reciprocates in the slot, and enters by it to the slide-plate K, to which it is screwed. The pawl may act by gravity alone on the ratchet or be provided with a spring.

From the above description it will be understood that by turning the adjusting-shaft the tension under which its yielding supports are held may be varied and the strain on the carrier-roller be increased or lessened. Obviously, as the straps are wound about the adjusting-shaft, the strain, both on the spring-arms and on the roller B′, is increased, and as the spring-arms yield the shaft, ratchet, and pawl move with them inward or toward the roller. It is further obvious that in unwinding the straps the tension of the springs

becomes less, that the shaft moves with the arms toward the grain-board, and that the pawl and ratchet move with the shaft, so that, in whatever position within the range of its sliding movement or reciprocation the shaft may be left, it is locked. When the shaft of the adjusting mechanism is held in fixed bearings, as when its supporting-arms are rendered rigid or their equivalent employed, the tension on the carrier may be adjusted in the same way as above described, except that, instead of the driven roller being left self-adjusting, it is positively held in its adjusted position.

When it is desired to displace the outer roller for any purpose, but especially for the purpose of rolling or folding the carrier into a compact bundle at the inner end of the platform, so that it may be readily covered and protected from rain, dew, &c., the tension on the carrier is removed, and the straps *e e* are slackened until the roller B′ can be lifted and the bearing-roller slipped from its end journals. The roller may then be withdrawn from the carrier, or it may be left with the carrier about it, and the carrier be rolled up and covered with straw or otherwise, as with the frame L, hereinafter to be described.

In order to prevent the falling of grain as cut beyond the outer end of the carrier or outside of the roller B′, and to prevent the entrance of straggling stalks to the space C′, while admitting of this space being made of such area as to allow of a wide range of adjustment of the carrier and facilitate access to the adjusting mechanism and driven roller, a shield or deflector-guard, M, is provided. This shield is supported by the grain-board C^2, overhangs the space C′, is inclined, and extends far enough inward to direct any grain which may fall upon it to the carrier. The shield is detachably connected with the grain board, so that it may be removed and replaced to allow access to and removal of the adjusting mechanism. The shield is preferably made with a continuous surface of wood notched or recessed at *m m*, so as not to interfere with the spring-arms F F, and provided with hooks or bent hanger-irons N N, fastened to its under surface, and engaging with eyes or staples *n n*, fixed to the grain-board. The hooks engage the staples and bear upon the grain-board in such manner that the tilting of the shield is prevented, as will readily be understood from inspection of the drawings.

To prevent injurious sagging of the carrier, and also provide a cover for it when rolled up, a light platform or frame, L, Figs. 1, 8, and 9, is constructed in such manner that it may be interposed between the upper and lower surfaces of the carrier, and be removably supported in front and in rear thereof. The frame is made thicker, or so as to project downward farther at its front and rear edges than elsewhere, and its extent from front to rear exceeds the width of the carrier by at least the combined thickness of the downwardly-projecting front and rear portions or supporting-bars, O O. These front and rear pieces, together with narrower pieces P—in this instance three in number—extending crosswise of the carrier, and light boarding closely joined together and fastened to the pieces, make up the frame. The vertical width of the front and rear pieces or supports, O, is sufficiently greater than the vertical width of the pieces P to enable the lower surface of the carrier to pass beneath the frame close to the under surfaces of the pieces P and between the pieces O, while the frame is supported by the last-named pieces resting at front upon the horizontal portion of the angular finger-beam, and at rear upon the bottom or boarding B^2 of the grain-platform, close to the back beam, A^2. The vertical portion of the finger-beam and the back beam prevent movement of the frame L backward or forward, and, as its surface is in contact with or close to the upper portion of the carrier, injurious vertical movement of the frame is prevented. Movement of the frame lengthwise of the platform is prevented by suitable means, as by stops Q Q, secured to the finger-beam and to the platform-bottom or back beam near the driving-roller and the bearing-blocks D D.

From the above description it will be understood that the frame L may readily be removed from its normal position by slackening the carrier, so that the frame may be lifted and slipped out of place in front or rear, and then used to protect the carrier when it is bundled up.

It is obvious that the construction of the frame L may be varied in various ways—as, for instance, by substituting for the front and rear rail-supports, O, mere supporting-feet or short corner-posts, and that sheet metal may be substituted for the boarding. It is also obvious that were the angle-iron finger-beam dispensed with its equivalent for preventing the forward movement of the frame might readily be provided—as, for instance, by providing the front stop, Q, and front bearing-block, D, with vertical slots to be engaged by lips or lugs on the frame-support, or by slotting the ends of the front support so as to engage with lugs of the stop and block.

The following are mentioned as some of the modifications of my improvements, to be used, if preferred, to the hereinbefore particularly described devices for which they may be substituted: In lieu of rotating the adjusting-shaft E, a rock-shaft may be used, and be provided with arms or cranks connected with the straps *e e*, so that by the rock of these arms away from the grain-board the carrier may be slackened, and by rocking them toward the grain-board, and, if necessary, through slots therein, the carrier may be stretched. Instead of attaching the adjustable supports of the shaft E to the grain-board, a special frame or uprights at the outer end of the platform may be provided for the shaft-supports. In

lieu of the smooth-surfaced or one-piece removable shield M, a skeleton shield may be employed, and the shield may be hinged in place, so that it may be swung up out of the way to get at the adjusting mechanism. A series of curved or inclined rods independently and removably attached to the grain-board, or such rods fixedly secured to a common shaft attached to the grain-board, or its equivalent, in such way as to rock or to be removable, would answer for the shield. Again, the shield may be secured to the adjustable supports of the roller. Figs. 10 and 11 represent sufficiently full to be understood a modification of the roller-adjusting mechanism. In these figures the roller B′ is not yieldingly supported or self-adjusting, and the adjusting-shaft, while still having the rotating and sliding movements, as before, is mounted to rotate in sliding bearing-blocks for the end journals of the roller. Only one end of the roller and its rear bearing-block, R, are shown, the front and rear supports of the roller being alike, and the adjusting-shaft passing through both of them, and acting by means of a fixedly-attached pinion, *r*, at each end, upon a fixed rack, *s*. These racks are secured beneath the level of the sliding bearing-blocks and the lower guideway-rail of the pair of rails S S, for each block is cut away to allow the racks to be secured in proper position (fastened to the finger-beam and to the back beam) and engaged by the pinions. A pawl, *t*, loose on the rear end of the adjusting-shaft, just inside of its crank, engages a detent-rack, T, to hold the shaft in its adjusted position. The bearing *u* (see dotted lines, Fig. 10) for the roller-journal in each block R is open-topped and inclined, so that while ordinarily the roller will be held in proper position, with its end journals in the bottoms of their bearings, it may readily be removed when the bearings are brought in line with or beneath vertical slots or channels *v* in the top rails, S, of the guideways for the bearing-blocks. Fig. 12 sufficiently represents a way of mounting the shield upon adjustable arms, which are provided at their lower ends with bearings for the end journals of the roller B′, and are connected with a suitably-mounted and properly-actuated rotating adjusting-shaft by means of straps. But one of the pair of arms W is shown. These arms are located in such position that their lower ends, respectively, are inside of and close to the vertical portion of the finger-beam and to the back beam. At its upper end each arm W passes loosely through a slotted bracket, X, fastened to the grain-board. As the adjusting-shaft is rotated the bearing *w* at the lower end of each arm W moves along the bearing-block upon which it is supported, and the arms play at their upper ends endwise through the slots of their brackets. By making the bearings *w* open at rear, as shown, the journals of the roller B′ may be slipped into and out of them. To disconnect the roller from its bearings, it is only necessary to sufficiently slacken the carrier to admit of the roller-journals being displaced from their bearings, after which the arms W are slightly elevated by sliding them endwise in their slotted brackets to raise their bearing ends high enough to allow them to be passed over and back or outside of the roller.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of an endless carrier, its inner and outer supporting-rollers, adjustable bearings for the outer roller, and the adjusting-shaft outside the carrier and beyond the outer roller thereof, and connected with the bearings of said roller, for the purpose described.

2. The combination of the platform, the endless carrier, its driving and driven supporting-rollers, adjustable bearings for the ends of the driven roller, the adjusting-shaft connected at its ends with the bearings of the driven roller, and means for turning and securing the adjusting-shaft, substantially as and for the purpose set forth.

3. The combination, substantially as hereinbefore set forth, of the endless carrier, its driving and driven supporting-rollers, adjustable bearings for the ends of the driven roller, and the turning adjusting-shaft connected at its ends with the driven-roller bearings and supported in bearings which are adapted to be moved during adjustment of the shaft, for the purpose described.

4. The combination, substantially as hereinbefore set forth, of the platform, the grain-board, the outer roller of the carrier, the roller-adjusting shaft between the grain-board and carrier, and means for turning and securing the adjusting-shaft, for the purpose described.

5. The combination of the outer roller of the carrier, the grain-board, toward and away from which the roller is adjustable, and the inclined shield supported by the grain-board and overhanging the space in which the roller is located, substantially as and for the purpose hereinbefore set forth.

6. The combination, substantially as hereinbefore set forth, of an endless carrier, its driving and driven supporting-rollers, adjustable bearings for the driven roller, and automatically-yielding and positively-adjustable mechanism outside the carrier and beyond the driven roller, by which to vary the distance between the rollers and yet leave the driven roller free to yield slightly at either end or bodily.

7. The combination, substantially as hereinbefore set forth, of the platform, the carrier, its inner and outer rollers, adjustable bearings for the outer roller, the grain-board, and automatically-yielding supporting mechanism for the adjustable bearings, for the purpose described.

8. The combination, substantially as hereinbefore set forth, of the carrier, the outer roller, its adjustable bearings, and the turning adjusting-shaft connected with the roller-bear-

ings and movable toward or away from the roller during adjustment.

9. The combination, substantially as hereinbefore set forth, of the carrier, the driven supporting-roller, its adjustable bearings, the turning and reciprocating shaft connected with the bearings and serving to adjust the roller, and the pawl and ratchet for securing the shaft in its adjusted position.

10. The combination, substantially as hereinbefore set forth, of the carrier, its roller having adjustable bearings, the adjusting-shaft connected with the bearings, yielding supports for the shaft, and means for turning and securing the shaft, for the purpose described.

11. The combination, substantially as hereinbefore set forth, of the outer carrier-roller, its adjustable bearings, the adjusting-shaft connected with the bearings, the grain-board, and the shaft-supports having connection therewith, for the purpose described.

12. The combination, substantially as hereinbefore set forth, of the platform, the carrier, its driving and driven rollers, adjustable bearings for the driven roller, the adjusting-shaft outside the carrier and beyond its driven roller, and the straps connecting said bearings with the adjusting-shaft, for the purpose described.

13. The combination, substantially as hereinbefore set forth, of the platform, the carrier, its driving and driven supporting-rollers, adjustable and detachable bearings for the driven roller, the adjusting-shaft outside the carrier and beyond its driven roller, and the straps connecting said bearings with the adjusting-shaft, for the purpose described.

14. The combination, substantially as hereinbefore set forth, of the platform, the carrier, its driving and driven supporting-rollers, adjustable bearings in which the driven roller is removably mounted, the adjusting-shaft connected with said bearings, the grain-board, and the spring-arms attached to the grain-board and supporting the adjusting-shaft.

15. The combination of the grain-board, the spring-arms attached thereto, the adjusting-shaft mounted in bearings of the spring-arms, and means for adjusting the spring-arms to vary their resiliency, substantially as and for the purpose set forth.

16. The combination of the grain-board, the adjusting-shaft, its supporting-arms, and the shield, substantially as and for the purpose hereinbefore set forth.

17. The combination of the grain-board, the spring-arms, and the adjustable clip-bolts, substantially as and for the purpose hereinbefore set forth.

18. The combination of the carrier, the detachably-mounted adjustable driven supporting-roller, and the removable (or adjustable) shield, substantially as and for the purpose hereinbefore set forth.

19. The combination of the slotted guideway-bracket, the turning and reciprocating adjusting-shaft, the ratchet on the shaft, the pawl sliding with the shaft, the carrier-roller and its adjustable bearings, connected with the adjusting-shaft, substantially as and for the purpose hereinbefore set forth.

20. The combination of the back beam, slotted at its outer end, the turning and sliding shaft projecting through the slot of the back beam, means for holding the shaft in its adjusted position, the carrier, and the adjustable outer roller thereof, actuated by the adjusting-shaft, substantially as and for the purpose hereinbefore set forth.

21. The combination of the platform, the finger-beam, the back beam, the carrier, the frame interposed between the upper and lower portions of the carrier, and removably supported in front and rear thereof, and means by which to prevent movement of the frame lengthwise of the platform, substantially as and for the purpose hereinbefore set forth.

22. The combination, substantially as hereinbefore set forth, of the carrier, its adjustable and detachably-mounted roller, and the removably-supported frame, serving both to prevent sagging of the carrier and as a cover for it when rolled up, as described.

In testimony whereof I have hereunto subscribed my name this 30th day of April, A. D. 1883.

JOHN S. DAVIS.

Witnesses:
ELMER HAGENBAUGH,
J. H. SOUTHARD.