

(No Model.)

G. ESTERLY.
GRAIN BINDING MACHINE.

No. 327,931.

Patented Oct. 6, 1885

Fig. 1.

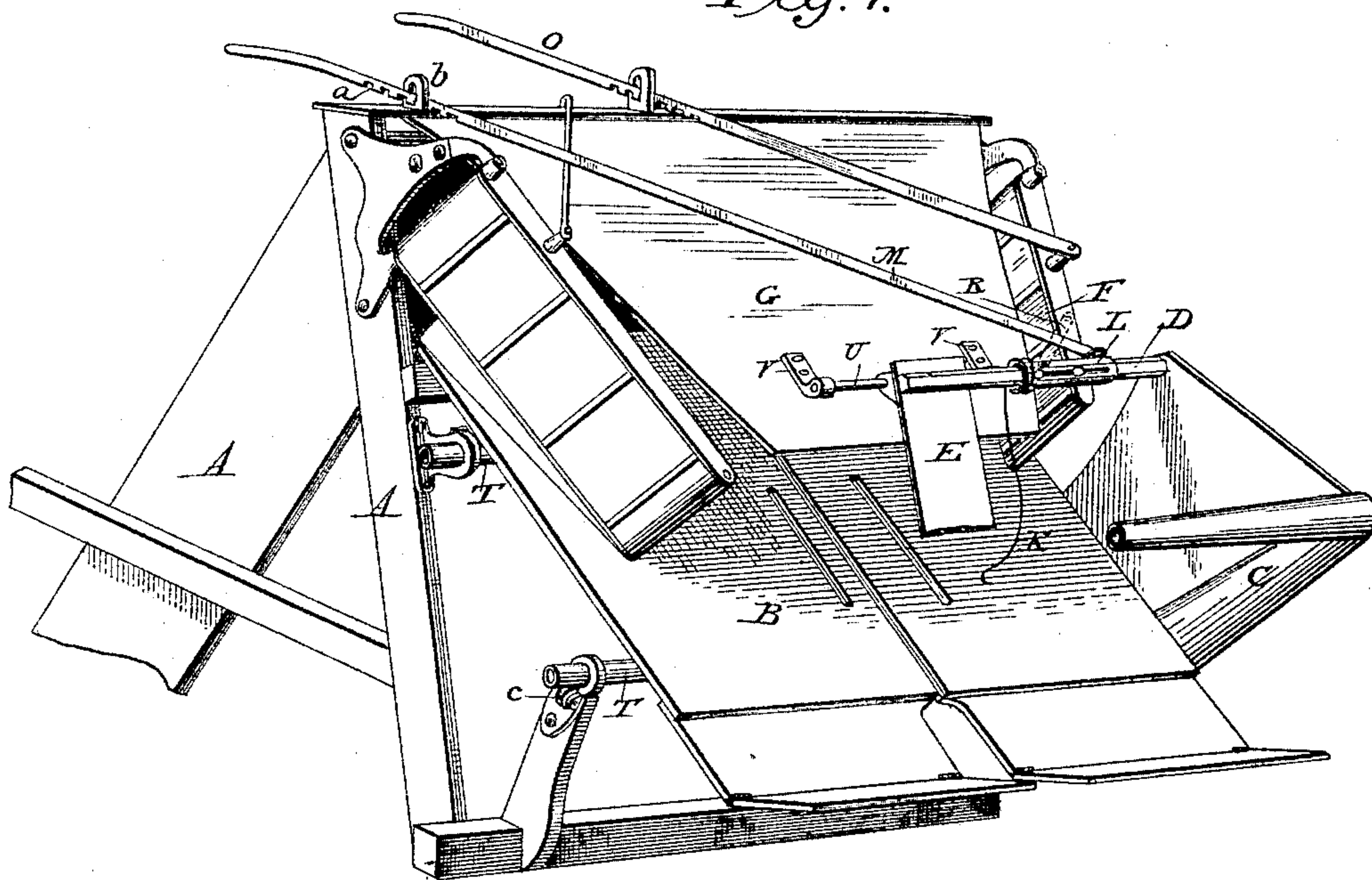


Fig. 2.

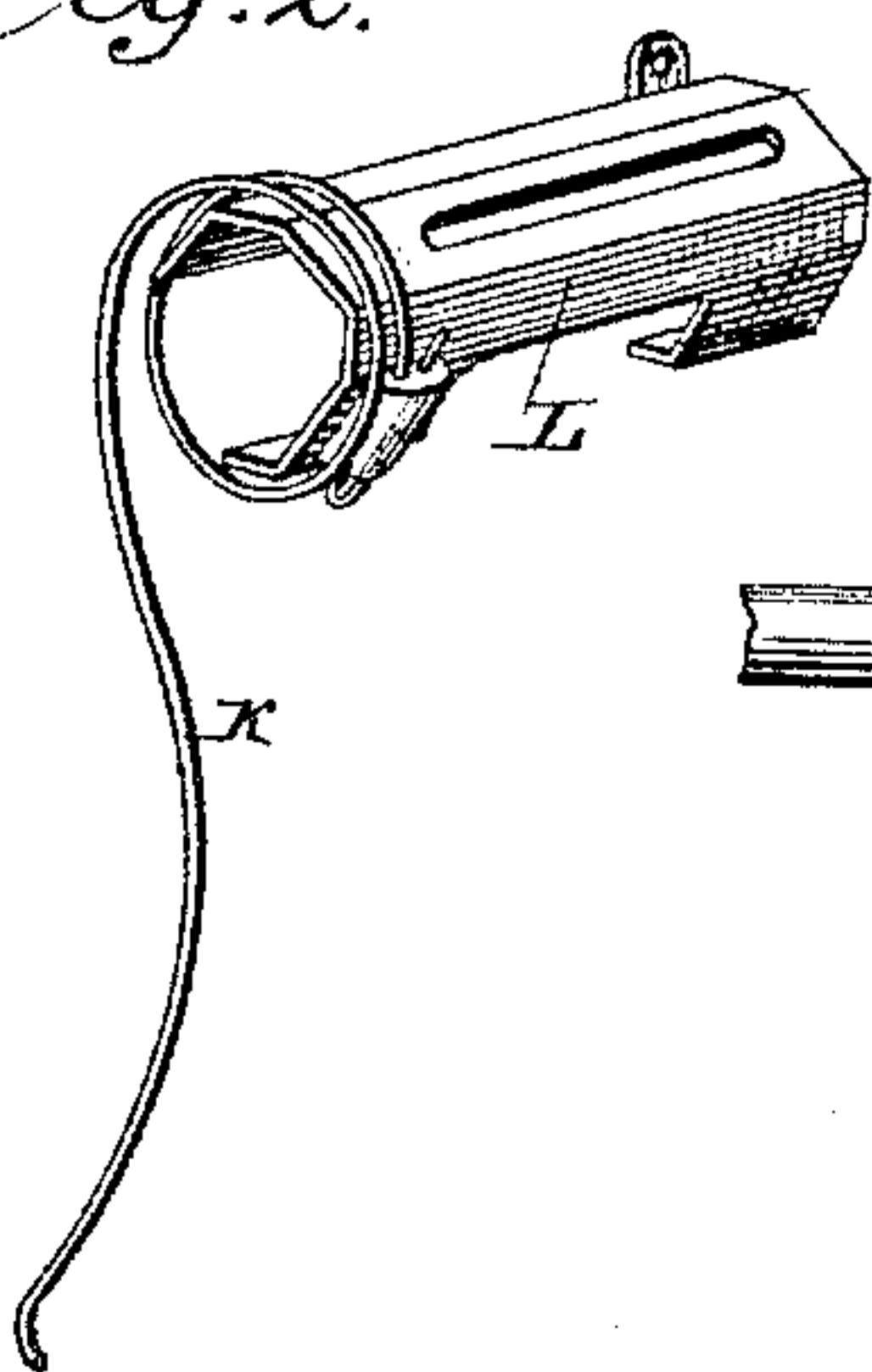
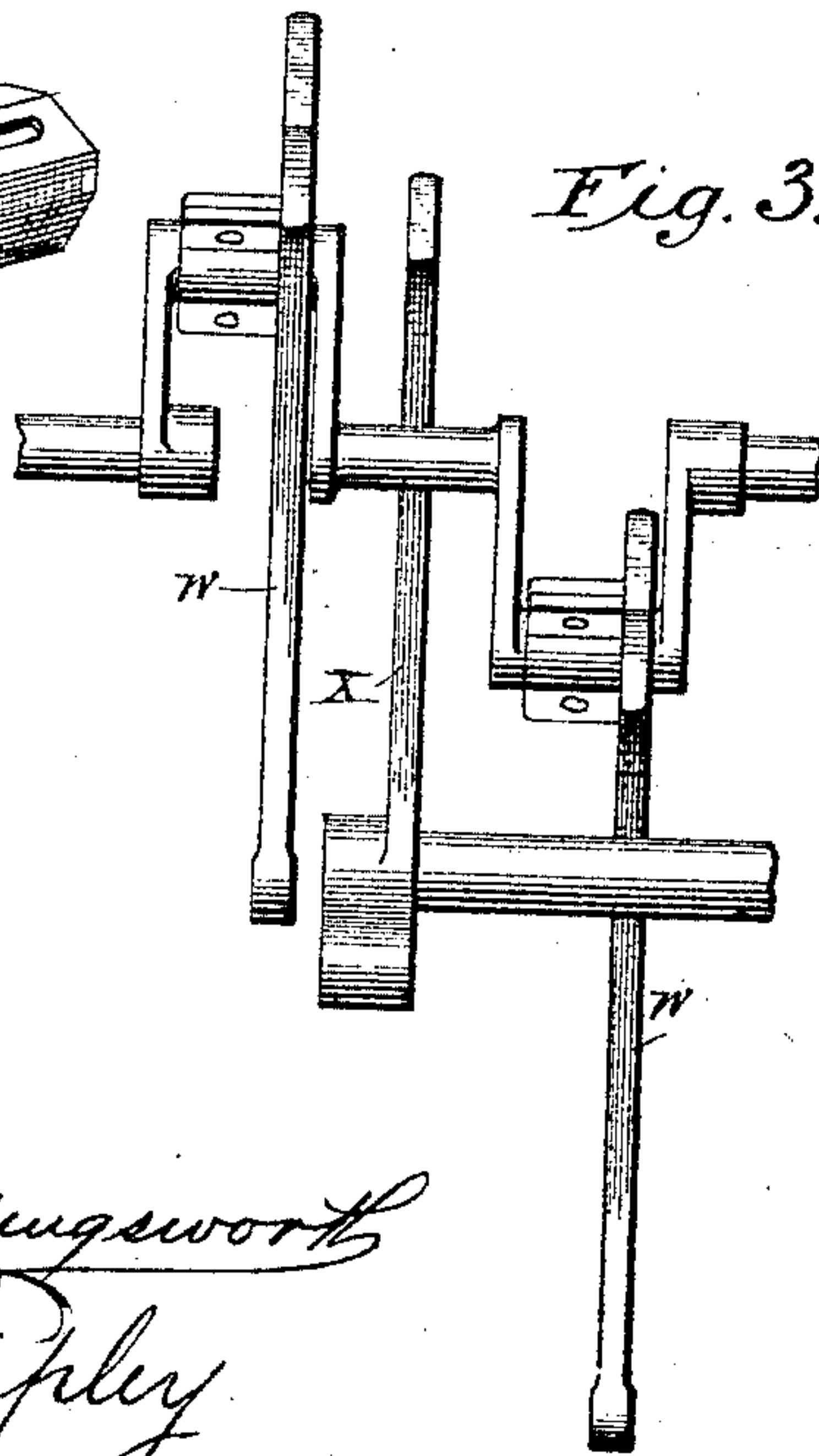


Fig. 3.



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GEORGE ESTERLY, OF WHITEWATER, WISCONSIN, ASSIGNOR OF ONE-FOURTH TO GEORGE W. ESTERLY, OF SAME PLACE.

GRAIN-BINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 327,931, dated October 6, 1885.

Application filed January 25, 1884. Serial No. 118,720. (No model.)

To all whom it may concern:

Be it known that I, GEORGE ESTERLY, of Whitewater, in the county of Walworth and State of Wisconsin, have invented certain Improvements in Grain-Binding Machines, of which the following is a specification.

This invention has reference more especially to those binding-machines in which upright endless aprons are employed to act on the butts of the moving grain for the purpose of adjusting the same longitudinally, to the end that the binding mechanism may apply the band at the middle. It is the special aim of the invention to retain the grain in its proper position after it has been adjusted by and carried beyond the butter or adjuster apron.

To this end it consists in combining, with the apron, an adjustable finger arranged below or beyond its end, to assist in arresting the movement of the grain.

It also consists in the peculiar manner of mounting and connecting said finger in order that it may be adjusted forward and backward to suit the varying positions of the adjuster apron.

It also consists in an improved sliding joint for connecting the sheet-metal covering or decking, which overlies the main wheel or grain passage, with the adjustable binder.

It also further consists in combining, with the needle or binder arm, grain-packing arms located on opposite sides thereof, the arm nearest the head of the grain acting in closer proximity to the needle than the other, the object of this arrangement being to prevent the grain from being thrown out of position by the action of the packer.

Referring to the accompanying drawings, Figure 1 is a perspective view of a portion of a harvester-frame, the binding-table, and such portions of the binding mechanism as are necessary to an understanding of my invention. Fig. 2 is a perspective view, on a larger scale, of the grain-detaining finger and the devices for supporting and adjusting the same. Fig. 3 is an elevation illustrating the position of the two packers with respect to the needle.

The machine represented in the drawings is substantially the same, as regards its general

construction and mode of action, as that represented in Letters Patent of the United States granted to me August 1, 1882, No. 262,026, and No. 266,254, October 17, 1882, and such features as are not represented herein may be constructed in accordance with said patents.

A represents the elevator-frame, commonly known as the "A frame," of the harvester, and B the binding-table, inclined downward and outward from the top of the elevator-frame in such manner as to overhang the main wheel on the stubble side.

The grain is delivered from the harvester-platform, by elevating mechanism of any ordinary character, in a continuous stream upon the upper edge of the binding-table, and, descending thereon, is compacted and bound at a point near the lower edge of the same.

The packing mechanism for moving the grain downward, the compressor or trip-arm against which the grain is compacted, and the devices for applying and securing the band may all be constructed in the manner represented in Patent No. 266,254, above referred to.

C represents a rigid standard, commonly known as the "binder-gear" standard, the upper end of which overhangs the binding-table from the forward side, to give support to the shaft which carries the ejector-arm and the gears for imparting motion to various parts of the binding mechanism.

D represents a horizontal bar maintained at its forward end by rigid supports, and also overhanging the grain-table from the forward side.

E represents what is commonly known as the "breast-plate," arranged above the binding-table in the usual manner, and connected with the extremities of the bar D and standard C, this plate serving to act upon the grain from above and co-operate with the binding-table in effecting its confinement and compression.

F represents the endless adjuster belt or apron, arranged to travel around two upright rollers at the forward side of the binding-table to act on the butts of the grain, the lower roll being sustained in a frame which swings about the axis of the upper so that the frame and apron may be swung laterally, to vary

the inclination or obliquity of the active face of the apron with respect to the path of the grain. The rear vertical face of the apron, acting against the butts of the grain, pushes the same backward in an endwise direction to a greater or less extent, according to the position in which the apron is placed.

For various reasons it is found necessary in practice to limit the length of the adjuster-apron F, which terminates at a point below which the grain is carried. It is found that owing to this fact the grain, after being carried below the apron, is liable to slide endwise, and thus lose the adjustment which was effected by means of the apron. It is to avoid this difficulty, and also to retain the short grain in proper position for binding, that my improvement is particularly designed. For this purpose I provide a depending elastic finger, K, located adjacent to the lower end of the adjuster-apron F, but extending downward above or upon the surface of the binding-table at a point below or beyond the lower end of the apron, so that the butts of the grain, after passing below the end of the apron, encounter and are held in position by the said finger. The finger is advantageous not only in that it holds the short grain and prevents the same from working or sliding forward, stringing out the bundle to an undue length, but also, in case of exceedingly long grain, that it sustains the butts and prevents them from sliding downward, as occurs in machines of ordinary character. In order that the arm K may retain its proper relative position with respect to the apron and remain in close proximity thereto under its various adjustments it is made adjustable forward and backward. It may be supported for this purpose by means of any suitable character, but it is preferred to attach the upper end of the finger, as shown in Figs. 1 and 2, to a sleeve or plate L, sustained by and arranged to slide forward and backward upon the horizontal bar D, before mentioned, which overhangs the binding-table. The plate L may be slotted and secured in position by means of bolts passed through the slots, as in Fig. 1, or otherwise confined in place.

The adjustment of the finger may be effected by connecting with its supporting-sleeve L a rod or handle, M, extending thence upward and backward to a point adjacent to the driver's seat. This adjusting bar or rod may be provided or combined with means for locking it in position, the most simple means being to provide the bar with a series of notches, *a*, on the under side in order that it may be engaged with a stationary eye or guide, *b*, secured on the main frame.

The adjusting-apron may be controlled in its position by means of an independent rod or handle, O, as represented in Fig. 1; or, if preferred, the sleeve which carries my detaining-finger K may be connected in any suitable manner with the frame of the adjuster-

apron, or with the devices for adjusting said frame, so that the apron and the finger will be adjusted simultaneously and compelled to retain their proper relative positions, the finger moving backward and forward with the apron, so that it will under all circumstances act upon the grain at a point near the butts.

A simple means for thus connecting the movable finger and the frame with the adjuster-apron is a link, R, as represented by dotted lines in Fig. 1.

I am aware that depending spring-fingers fixed in position have been employed to assist in holding grain from falling down during the accumulation of the gavel. The fingers being immovable, it followed that whenever the adjuster-apron was moved forward the fingers would act upon the grain at a point more or less distant from the ends.

While I have described the grain detaining finger in connection with an endless adjuster-apron, it is to be understood that it may be employed in connection with adjusting-boards having a longitudinal or vibratory motion, as in various Letters Patent granted to Travis, Case, Olin, and others.

The binder-frame is mounted, as usual in machines of this class, to move forward and backward on the harvester-frame.

The binder-frame is provided, as usual, with horizontal sustaining-rods T, attached thereto and extending in a forward and backward direction through supports attached to the harvester-frame.

The shield or decking G, overlying the grain table and passage, to confine the grain, is secured firmly to the harvester-frame, and is connected at its lower edge to the adjustable binder by means of a sliding joint in essentially the same manner and for the same purpose as described in Letters Patent No. 262,026, granted to me on the 1st day of August, 1882.

In place of the joint represented in the original patent, I represent in the drawings a device of improved construction for the same purpose. The present connection consists simply of a horizontal rod, U, mounted at its ends in plates V, riveted or otherwise secured firmly to the decking. A central portion of this rod is extended through ears or studs on the under side of the movable breast-plate E. As the binder is adjusted forward and backward, the rod serves to maintain a connection between the parts and to retain the lower edge of the decking firmly in place with respect to the breast-plate and other moving parts. In this manner the lower edge of the decking is held down in place and prevented from being forced upward by the accumulation of grain thereunder. The construction represented in the drawings is superior to that of the original patent, in that it admits of the edge of the decking being extended downward beneath the joint and below the upper edge of the breast-plate.

For the purpose of forcing the grain downward over the binding-table I make use of packer-arms W, arranged to rise alternately with a circulatory motion through slots in the binding-table on opposite sides of the needle-arm X. In their general construction and mode of action these packers and the needle-arm are identical with those represented in Letters Patent No. 266,254. Hitherto it has been the custom to arrange the two packers at unequal distances from the binder-arm, the one next the butts of the grain nearer the needle than the one next the heads. In practice it is found that when the binding-cord is drawn taut the packer nearest the heads of the grain, having the greatest leverage thereon, will pull the grain off from the binding cord during the commencement of the formation of the gavel, the result of this action being that more or less grain is discharged from the machine in an unbound condition. To avoid this difficulty I locate the packer which acts on the butt-ends of the grain at a greater distance from the needle than the packer which acts upon the heads. In practical operations of the machines, I have discovered that by thus arranging the packers at different distances from the needle, I am enabled to retain the grain in the required position with respect to the binding-cord and to prevent the usual escape of the unbound grain. The essence of my invention in this regard consists in the employment of two packers, located on opposite sides of the needle, the packer which acts upon the butts being located at a greater distance from the needle than the one which operates upon the heads; and it is manifest that this improvement is applicable in connection with packers of the various types in common use.

It will be observed that the lower portion of the binding-table, over which the bundle is discharged after being bound, has its upper surface depressed or thrown backward below the level of the remaining portion, this construction being adopted to facilitate the release of the bundle, and relieve the machine from a portion of the strain which would otherwise be encountered. In Letters Patent of the United States issued to me on the 17th day of July, 1883, No. 281,623, is described and shown a binding table, the lower portion of which has a backward inclination toward the edge, the upper and lower portions of the table having their surfaces in planes which stand at an angle to each other. The present arrangement differs therefrom in that the lower portion of the table is set bodily backward or downward with its surface in a plane parallel to the surface of the upper or remaining portion of the table. This arrangement is found to give in action better results than that described in the original patent. The

lower edge of the table is provided with the usual hinged bars or guards, which are maintained in an upright position to hold the gavel during the binding operation, and subsequently depressed to admit of the bundle being discharged over them.

What I claim as my invention is—

1. In combination with a butt-adjusting device, substantially as described, to effect the longitudinal movement of the grain, a detaining-finger located below or beyond the adjuster and adjustable in the direction of the length of the grain, substantially as described and shown.

2. In combination with the grain-supporting surface, the endless butt-adjusting apron F and the elastic detaining-finger K, adjustable in the direction of the length of the grain, as described and shown.

3. In combination with the adjuster-apron, the grain-detaining finger K, located below or beyond said apron, and the manual-operating device extending thence to a point adjacent to the driver's seat, whereby the driver is enabled to determine the position of the finger at will.

4. In combination with a movable butt-adjusting mechanism, substantially as described, a detaining-finger located below or beyond said mechanism, and a connection, substantially as described, whereby the adjusting device and the finger are caused to move forward and backward in unison.

5. In a grain-binding machine, the combination of the needle-arm and the two circulatory packers located on opposite sides of the needle, the packer which acts next to the butts of the grain being located at a greater distance from the needle than the other.

6. In a grain-binding machine, the combination of the two circulatory alternately-acting packers and an intermediate needle or binder arm arranged to vibrate in a plane nearer the packer which acts upon the heads than the packer which acts upon the butts, whereby the cord is laid in such a position with respect to the packers as to prevent the grain from being thrown out of position thereby.

7. In combination with the harvester-frame and the binder movable forward and backward thereon, the decking G, secured rigidly at its upper edge to the harvester-frame, the plates V, secured to the lower edge of the decking, and the rod U, seated in said plates and extended through a projection on the binder, as described and shown.

GEORGE ESTERLY.

Witnesses:

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E. I. THOMPSON.