J. P. BULLOCK & J. F. APPLEBY.

GRAIN ADJUSTER FOR HARVESTER BINDERS.

No. 266,949. Patented Oct. 31, 1882.

Fig. 1.

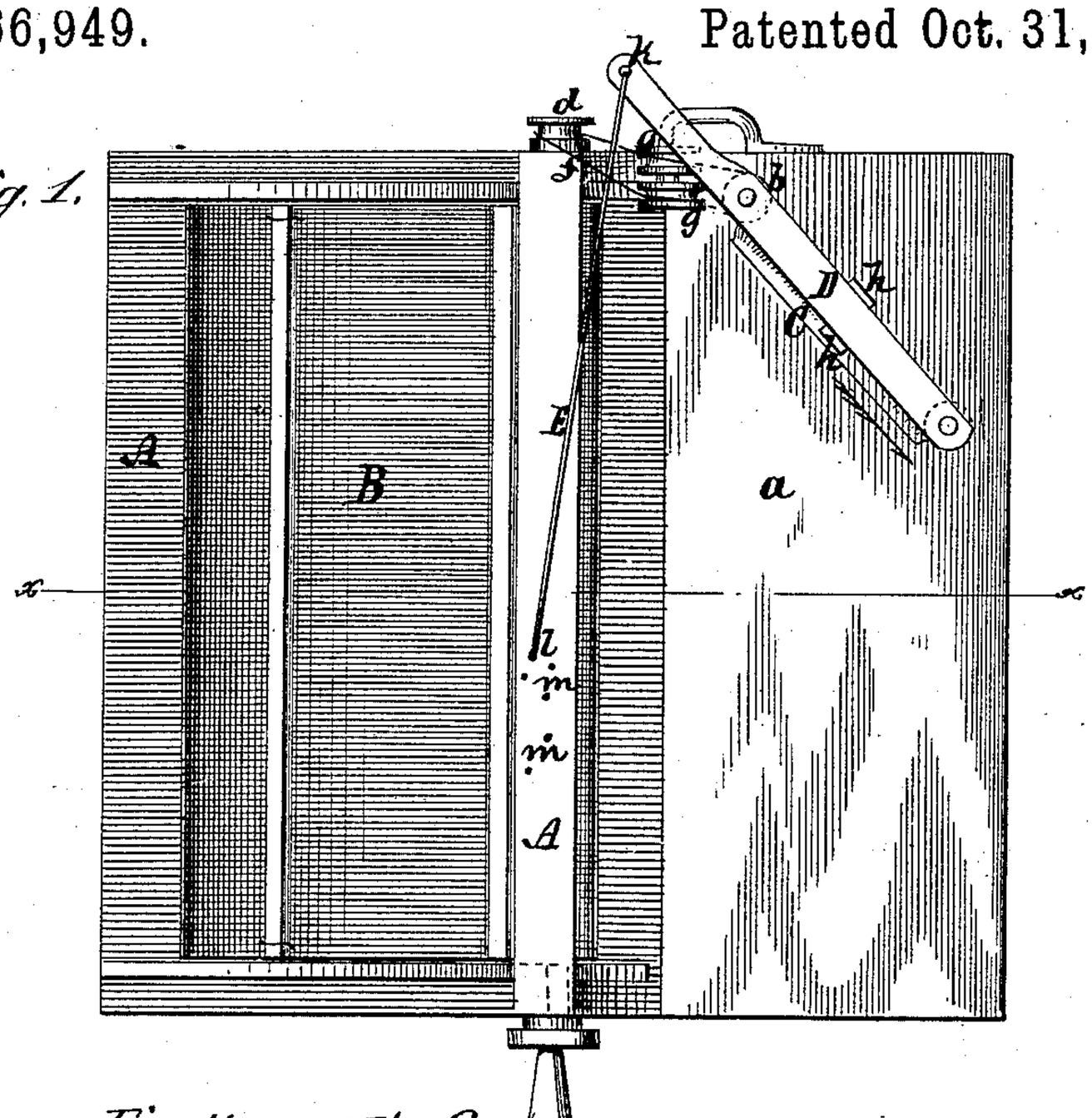
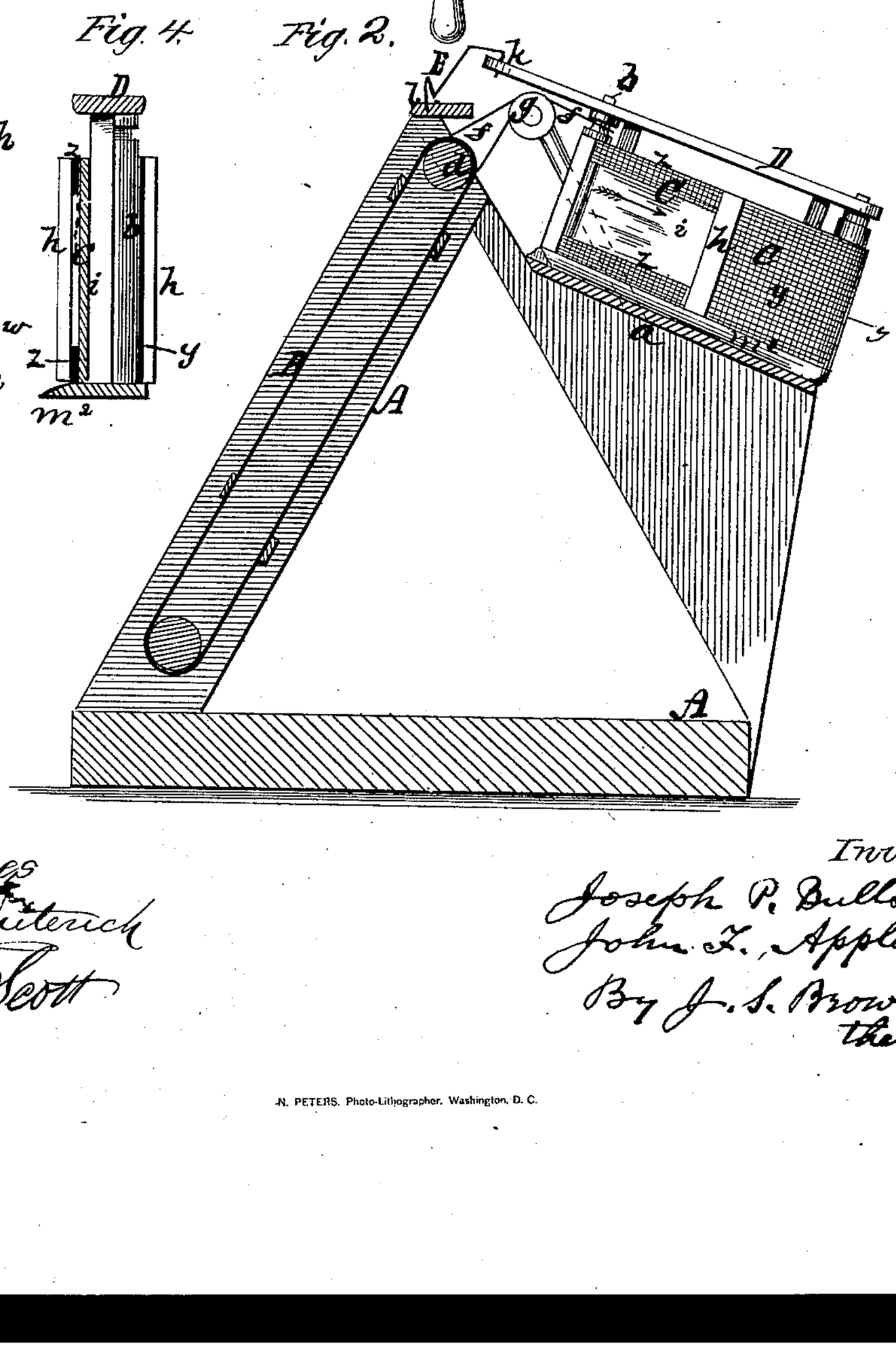


Fig. 3.

Fig. 4.

Fig. 2.



Witnesses
David L. Dieterich
Alex. Scott

Inventors,
Joseph P. Bullock
John F. Appleby
By J. S. Brown
their attorney.

UNITED STATES PATENT OFFICE.

JOSEPH P. BULLOCK AND JOHN F. APPLEBY, OF BELOIT, WISCONSIN.

GRAIN-ADJUSTER FOR HARVESTER-BINDERS.

SPECIFICATION forming part of Letters Patent No. 266,949, dated October 31, 1882.

Application filed September 2, 1879.

To all whom it may concern:

Be it known that we, JOSEPH P. BULLOCK and JOHN F. APPLEBY, of Beloit, in the county of Rock and State of Wisconsin, have invented a new and Improved Grain-Adjuster for Harvester-Binders; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1 is a top view of the grain-elevator and receiving table or surface of a harvester adapted for binding and provided with our grain-adjusting attachment. Fig. 2 is a vertical section thereof in a plane indicated by the line *x x*, Fig. 1. Fig. 3 is a horizontal section of the grain-adjuster detached. Fig. 4 is a vertical cross-section of the same at the line *w w* of Fig. 3.

The same letter designates the same part in all of the figures.

As is well known to those familiar with the subject-matter of machinery for the cutting and binding of grain, it is always desirable to have the binding of the cut grain—*i. e.*, the tying of the gavels into sheaves—done at a given point lengthwise of the bunch of stalks, (about the middle thereof;) and as, in harvesters adapted to have the binding done on the machine, the cut grain is usually delivered with the butts in a given relative position to the grain-conveying contrivance, some means must be adopted to compensate or provide for the variable lengths of the cut grain, so that the latter, be it of long or short growth, may be bound with equal facility and at about the same point lengthwise of the gavel or bundle. One of the usual provisions for the accomplishment of this object has been the employment of some sort of means by which those appliances of the harvester which serve or contribute to the purposes of binding may be adjusted relatively to those parts of the machine which perform the operations of cutting the grain and conveying it to the locality at which it is to be gathered into gavels and bound into sheaves. Another provision for the accomplishment of this object has been in the use of a deflector composed of a board arranged edgewise on the receiving-table, pivoted at its upper end, and adapted to be set and held at different angles, according to the length of the grain, and designed to cause the descending stream of grain to be shifted sidewise; but the construction of a machine adapted to the cutting and binding of grain with the binder portions adjustable relatively to the other parts is not, however, desirable, provided that the binding could be as efficiently and conveniently done with these two parts of the machine maintained always in a fixed relation toward each other, especially in that species of machines in which are used what are called "automatic" or "self-binding" mechanisms; and in practical operation a plain-faced deflector board or surface is not an efficient means for effecting the designed adjustment of the grain-stalks endwise. The butt-ends of the stream of grain will lag by contact with the stationary surface of such a designed deflector or adjuster, and the grain will not be properly guided to the binder or the point at which the binding is to be done.

To provide for use a harvester in which the binding of the cut grain (either by hand or by automatic binding mechanism) may be more efficiently and conveniently done than heretofore while operating on grain of various lengths (or heights of growth,) and without having to change the relative positions of the grain cutting and conveying and the binder portions of the machine, is the main object of our invention, which to this end consists essentially in the employment of an adjuster and deflector composed of a traveling operative surface mounted in an adjustable frame and provided with suitable means for operating it, and by which the cut grain, while passing from the delivery end of the conveyer to the binder, shall be perfectly adjusted lengthwise of its stalks and to an extent corresponding to the length of the grain, so as to effect the presentation of the grain always in a given relative position to the binder devices of the machine and in the proper condition for binding, all as will be hereinafter more fully explained.

In the accompanying drawings, A represents the frame, and B the elevating-apron, of one of the well-known forms of elevator contrivance for carrying upward from one side of the grain-platform or carrier-apron (and discharging at one side of the harvester) the cut grain; and

a represents an inclined descending receiving table or surface, extending from the uppermost end of the apron B. This descending table or receiving-surface *a* is made, as shown, about equal in length (from its front to its rear edges) to the middle of the endless apron B, and of a width sufficient to permit the reception and adjustment upon it of the discharged grain before the passage of the latter to a point at which it is to be gaveled, (either by hand or by mechanism for performing that operation.) On top of the said descending table or surface *a*, and at or near its forward inner corner, is pivotally attached the novel adjusting device or contrivance, which consists of an endless apron, C, mounted on suitable rollers located at either end of a frame, D, the said frame being arranged vertically and edgewise of its apron on said table *a*, and being capable of adjustment about its point of pivotal attachment, in a manner and for a purpose to be presently explained.

The adjusting-apron C may be, and is by preference, provided with a series of projecting slats or ribs, *h*, which will strike against the butts of the grain and facilitate the descent of the latter at the butt-ends while it is being adjusted lengthwise, and the said apron may be composed of either a single web widthwise, as seen at *y*, Fig. 2, or of two narrow webs, as seen at *z z* in said figure. In the last-mentioned form of adjuster-apron it is necessary and in the other desirable to have the contrivance provided, as shown at *i*, with a board located immediately back of the operative surface of the said adjuster-apron, in order that in one case the single web may be supported against the thrust of the grain-butts against which it has to act and in the other case the butts of the grain may be prevented from becoming entangled with the two narrow webs and other moving parts of the adjuster. For a like reason, and to prevent any grain from getting wedged in between the bottom of the adjuster and the table *a*, on which it rests, the bottom or frame piece, m^2, of the former is by preference made with a chamfered-off edge, as most clearly seen at Figs. 2 and 4. The apron C is driven (in the direction indicated by arrow at Figs. 1 and 2) by a belt, *f*, banded from the upper roller, *d*, of the elevator to the upper grooved end of the roller *b* of said apron, the belt *f* being properly guided and held in place while running by intermediate guide-wheels, *g g*, suitably mounted on the machine.

The adjuster-frame D being mounted to swivel or turn on an axis coincident with that of the roller *b*, the turning of said frame (to set it at different degrees of obliquity to the axis of the upper end of the elevator-apron) may be effected without any derangement of the belt and pulley driving devices of the apron C, and the upper bar of the said frame D being extended, as seen, said frame may be conveniently held in any required position by means of a rod, E, one end of which is connected at *k* to said extended portion of the frame D and the other end, *l*, of which is made to engage with some one of a series of holes, *m*, in the top of the elevator-frame A.

In view of the foregoing description and what is clearly shown in the drawings, but little explanation of the mode of operation of the contrivance made the subject-matter of our application seems to be necessary.

It will be understood that when cutting grain of the greatest height to which the harvester is adapted the adjuster-frame D should be set to a position nearly or quite at right angles to the line of discharge from the upper end of the elevator-apron B of the stream of grain, and that as the grain being harvested may be more or less short the adjuster must be set at a greater or less angle than that shown in the drawings to perform the function of guiding and forcing backward and endwise the stalks of the stream of grain being discharged from the upper end of the elevator-apron B, and thus insuring the placement of the stalks in the proper relation endwise to the binder to insure the convenient and successful application of the cord or band to the middle of the gavel; and it will be seen that by thus adjusting the outflowing stream of grain between the point of its exit or discharge from the elevator and the point at which it is designed to be subjected to the binding operation the binding may be efficiently performed by the same machine on grain of different lengths without any adjustment relatively of the binder devices and the elevator mechanism.

It will be understood that by our improved adjuster we are enabled to not only act on the stream of grain while it is in a descending and sort of floating condition, so to speak, but to affect the butt-ends in a positive manner in two ways, viz: first, in a manner tending to deflect their course of travel, and, second, in a manner to feed along (rather than retard the travel of) the butts during the deflection widthwise of the stream of grain; and it will be seen that by the addition to the traveling deflective surface (of the adjuster) of the ribs *h*, or devices for making the feeding of the butts by the adjuster more positive, a greater degree of perfection in the general operation of the contrivance is attained, while by hanging the adjuster so as to vibrate about the axis of its upper apron-roller, *b*, the movement of said adjuster (to set it at various angles) does not interfere with the simple means provided for driving the apron thereof.

What we claim as of our invention, and desire to secure by Letters Patent, is—

1. In combination with the receiving table or surface of a harvester provided with an elevator which discharges the cut grain onto said table, a deflector and adjuster having a traveling operative surface and means for causing said surface to move at a proper speed, all substantially as set forth.

2. A deflector or adjuster provided with an

endless apron and mounted on or over the receiving-table of a harvester, so as to vibrate, for the purposes of adjustment, about an axis coincident with that of the upper and driving roller of the apron, as and for the purposes set forth.

3. An endless belt moving in the direction of the grain-delivery and operating in contact with the stubble end of the grain on its passage from the elevator to deliver it to a binding mechanism, substantially as set forth.

JOS. P. BULLOCK,
JOHN F. APPLEBY.

Witnesses:
J. S. BROWN,
T. C. DAY.