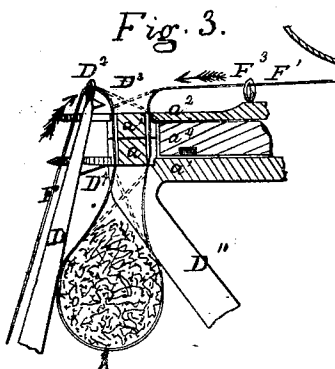
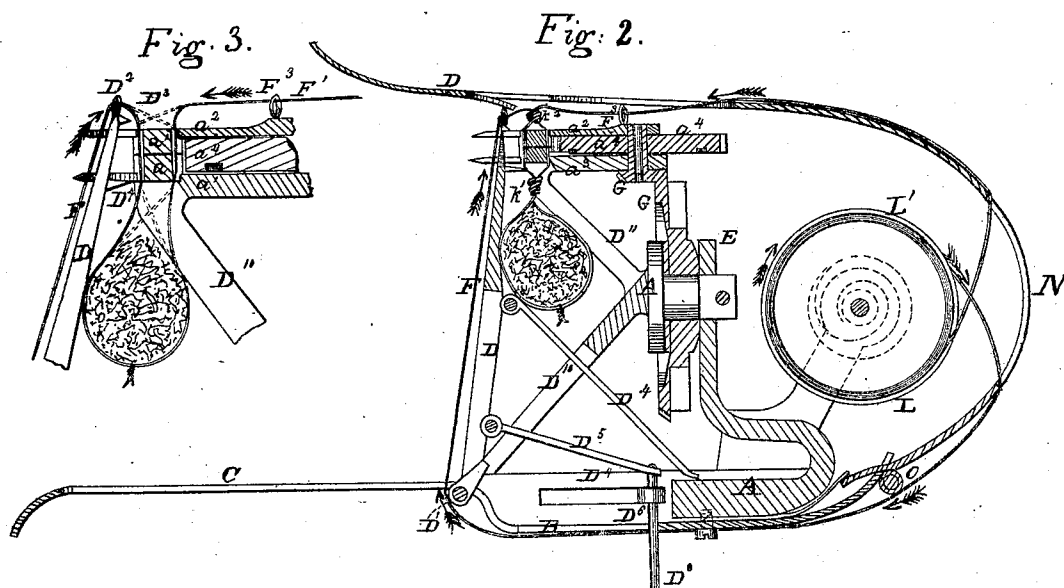
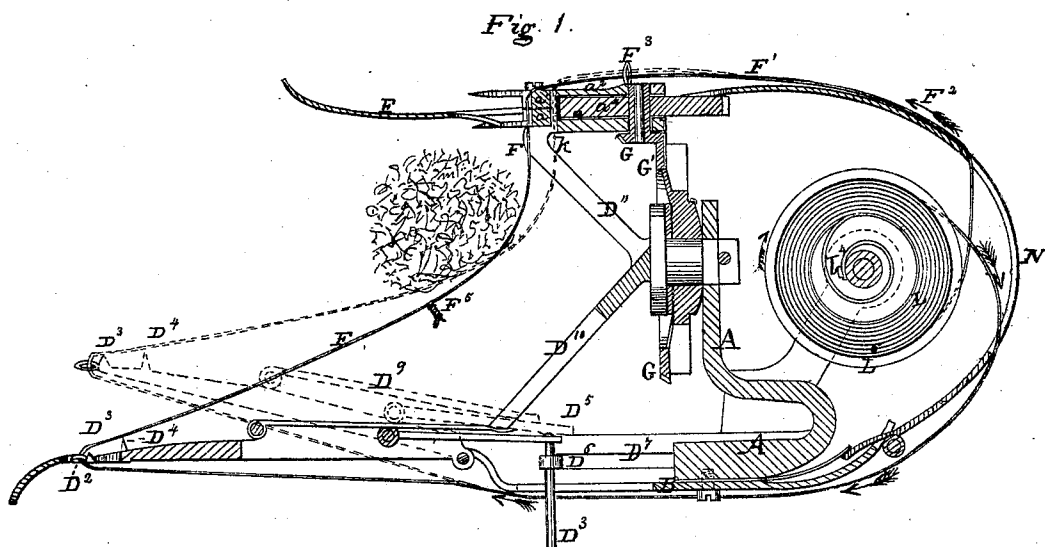


CHARLES B. WITHINGTON.

Improvement in Grain Binders

No. 123,967.

Patented Feb. 20, 1872.



Witnesses:

Matr Brooks
Frank Blockley

Inventor:

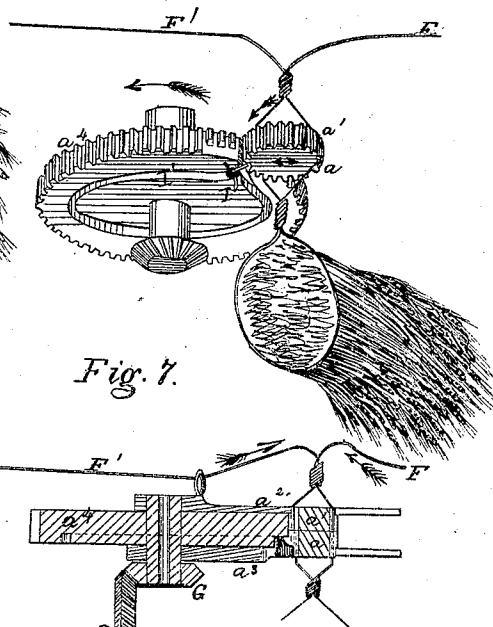
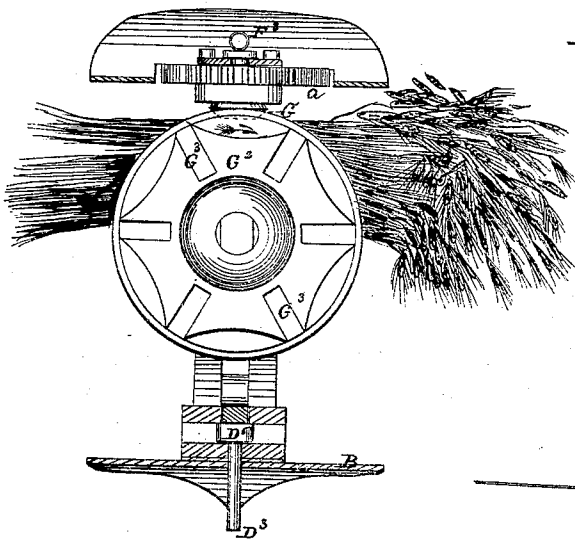
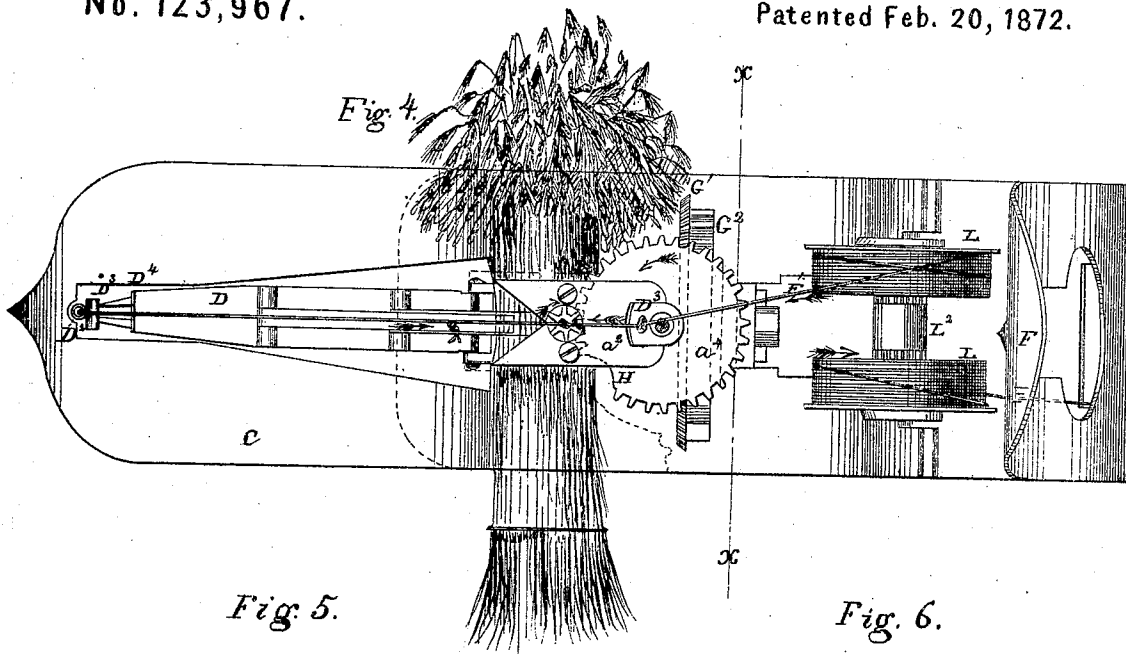
C. C. Withington
PER *[Signature]* Atty's

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UNITED STATES PATENT OFFICE.

CHARLES B. WITHINGTON, OF JANESVILLE, WISCONSIN.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. 123,967, dated February 20, 1872.

To all whom it may concern:

Be it known that I, CHARLES B. WITHINGTON, of Janesville, in the county of Rock and State of Wisconsin, have invented a new and Improved Binding Attachment for Reapers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

This invention relates to improvements in binding attachments for reaping-machines; and consists in a combination, on a support or frame adapted for attachment to any machine, and in any position relatively to the apron so that the grain may be raked from the said apron to the said binding attachment, of a revolving, twisting, and cutting head and a condensing and wire-carrying arm, under an arrangement whereby two wires, supplied from two separate spools in opposite directions, the one through the twisting-head and the other through the condensing and carrying arm, twisted together between the said two devices at the beginning, when the condensing-arm is in the position for receiving the gavel, may be automatically passed around the bundles and twisted thereon in an efficient way, the attendant being only required to connect and disconnect the operating mechanism with the driving-gear of the reaper from time to time as the grain accumulates in a way common to such machines. The invention also consists in an improved arrangement of twisting-head for twisting and cutting the wires; also, in an improved arrangement of condensing and wire-carrying arms; also, in an arrangement of operating devices for driving the twisting-head.

Figure 1 is a longitudinal sectional elevation of my improved binding attachment, showing the position when receiving the gavel previous to the movement of the condensing-arm. Fig. 2 is a similar sectional elevation, showing the position after the bundle is completed and previous to the cutting of the wires. Fig. 3 is a detail on the same section, showing the position when the gavel has been condensed and previous to twisting. Fig. 4 is a plan view. Fig. 5 is a sectional elevation taken on the line *xx* of Fig. 4. Fig. 6 is a perspective

view of the operating-gears of the twisting-head, and Fig. 7 is a sectional elevation of Fig. 6.

Similar letters of reference indicate corresponding parts.

A is the supporting-frame of the apparatus, adapted for connection to the reaper at the side of the apron by bolting through the part B, and arranging it so that the shield extension C will project along the top of the apron in the direction the grain is to be received from, and serve as a shield to prevent it from catching and clogging on the condensing-arm D, hinged at D¹ to the base B, and arranged to swing down and lie in a slot provided for it in the shield C, as shown in Figs. 1 and 4. This condensing-arm is provided with an eye, D², at the swinging end, and two projections, D³ and D⁴, on the upper face below the eye; it is also provided near the hinged end with a link, D⁵, hinged to it, and connected to a cross-head, D⁶, arranged to slide back and forth in the slotted guides D⁷ placed on the base B. This cross-head has a bolt, D⁸, projecting downward through the base B for the connection of a pitman-rod or other reciprocating device to be connected to the reaping-machine in any way, to be set into motion and thrown out again when it is required that the condensing-arm shall move. D⁹ is another link, hinged at one end to the condensing-arm, the other end being arranged to slide back and forth on the link D⁵ to act in conjunction with the braces D¹⁰ and D¹¹ of the vertical part E of the frame for compressing the gavel into as small compass as possible previous to the binding operation. The twisting-head consists of two small pinions, *a* *a*¹, journaled, one above the other, between plates *a*² *a*³, a driving-wheel, *a*⁴, and a sliding catch-bar, *a*⁵, all supported on the top of the braces D¹¹ in such a position that the wire F, carried by the condensing-arm D, may be pressed between two of the teeth of the pinions when it is moved up after receiving the gavel, the said plates *a*² and *a*³ being notched in the projecting ends, as clearly shown in Fig. 4, to guide the end of the arm properly. The spaces between the teeth of these pinions are cut deep enough to receive the wire and carry it around without crowding the teeth of the driving-wheel *a*⁴, and shoulders are turned on the teeth on the upper

side of the pinion a^1 and the lower side of the pinion a to form the journals for the said pinions in the plates a^2 and a^3 of sufficient size to provide space between the walls of the holes in the said plates, wherein the pinions work, and the bottoms of the grooves between the teeth for the wires to be carried around by the pinions after being received in the said grooves. F^1 is another wire, carried from the spool in the direction of the arrow F^2 through the guide-eye F^3 and down in front of the pinions, as shown at F^4 , to the point F^5 , where it is joined by twisting to the end of the wire F in beginning the operation. These pinions both gear with the wheel a^4 , to be turned by it in the twisting operation during nearly one revolution of the same. This wheel is turned by the beveled pinion G , to the shaft of which it is connected, and the said pinion gears with a large beveled wheel, G^1 , to the back of which a slotted wheel, G^2 , is connected, which has six, more or less, radial slots, G^3 , to which motion is to be imparted intermittingly by a wheel with one tooth, arranged on any part of the machine so as to be thrown into gear or out by hand-levers or otherwise with any constantly-moving part, and to gear with the said slotted wheel so as to move it the distance between two slots at one revolution of the said one-toothed wheel. The said one-toothed wheel, gearing with this slotted wheel, is also designed to so act with the sections between the slots of the wheel G^2 , which are curved to fit the periphery of the one-toothed wheel for the most part of its circumference, that the said wheel G^2 will be arrested by the other and prevented from turning until the part of the other wheel bearing the tooth gearing with the slots arrives at the point for engaging in one of the slots G^3 . When the tooth of the driving-wheel leaves the slot wherein it has engaged to turn the wheel G^2 , the next slot is in the right position for receiving the tooth in its next movement. The wheels G and G^1 are so calculated, in respect of the number of the teeth, that the movement of the slotted wheel G^2 one stage will impart a full revolution to the wheel a^4 . This wheel a^4 has three or more teeth removed, as at H , Fig. 4, and at the lower side, and in advance of the cavity H , in the direction of the movement of the wheel, three or more teeth are cut away when they act on the lower pinion a , so that just previous to the arrival of the cavity H , where the teeth are wholly removed at the pinions, the lower one will stop while the upper one will continue. At the same time that the said lower pinion ceases to move a sliding pawl, I , arranged in a groove in the plate a^3 , and having a stud taking into a cam-groove, I^1 , in the lower face of the wheel a^4 , is moved forward to engage the teeth of the said lower pinion and hold it from turning, so that the other, being continued in motion, will cut the wires previously twisted. The gearing by which the wheel a^4 is turned is also arranged so that when the said wheel stops the cavity

H will front the pinions, leaving them free to turn independently of the said wheel, so that when the gavel is moved upon the condensing-arm D by the rake and onto the binding-wires F F^1 , causing an increase of tension thereon, the force of the said tension on the pinions will turn them so that the wire will be carried to the back side thereof, as shown in the dotted line K , whereby, when the arm D rises up and engages the part F of the joined wires with the pinion, one part will be on one side and the other opposite, as shown in Fig. 3. Hence, when the twisting-pinions are set in motion, which takes place as soon as the wire F is presented, the wires will be twisted together above and below the pinions, one of the twists, K^1 , securing the bundle, and the other, K^2 , uniting the wires ready for the next operation. The projections D^3 and D^4 at the end of the arm D project above and below the pinions far enough to carry the wire to the bottom of the groove between the teeth receiving it. The wires F and F^1 are wound on two separate hollow drums, L L^1 , on one shaft, L^2 ; they have coiled springs L^3 arranged in the hollow spaces, connected at one end to the shaft, as at L^4 , and merely pressing at the other end L^5 against the inner face of the rims of the drums, being coiled closely so as to bear with considerable friction thereon. As the wires wind off in opposite directions, these springs are coiled in opposite directions also, and the spring for each drum is arranged so as to have a tendency to force the drum in the direction to produce tension on the wire. As the wire is wound off, and the drums turned thereby, the springs, owing to the friction of the outer coil on the inner face of the drums, will be for a short time wound up until the friction on the said face ceases to be greater than the tendency of the spring to uncoil, when the latter will slip back to the original position; and these operations will be continually repeated, maintaining an even tension on the wires without requiring any adjustment of parts, and holding the shaft on which the drums are fixed from revolving either way. N represents a shield or guard of thin sheet metal or other substance, hinged to the base B at O , passing over the twisting-head, and projecting beyond at P , so as to insure the passing of the straw under the projections of the plate a^3 , and prevent them from passing over to the top of the twisting-head and clogging the same. The said guard-plate is slotted so as to drop down over the twisting-head, as represented in Fig. 1. It is raised by the end of the condensing-arm D , when it goes up to deliver the wire to the pinions, sufficiently to allow the said arm to advance to the pinion, and drops down again as soon as the arm goes back.

This mode of forming the bands from two wires by twisting them around the bundle and together for the next band, and disposing the wires so that the gavel is delivered into the bight of the said wires, I consider a very important element of my invention, for by it I

am enabled to dispense with the complicated and expensive mechanism necessary for passing single wires or cords around the gavels, and am thereby enabled to greatly simplify and cheapen binding mechanism.

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

1. The method herein described of binding grain or straw by the use of two wires, which produce a double twist on the bundle, and which reconnect automatically for the binding of the next bundle, as specified.

2. The improved twisting and cutting head herein described, consisting of the pinions a^1 , wheel a^4 , plates a^2 and a^3 , and sliding pawl I, all combined, arranged, and operating substantially as specified.

3. The combination, with the pinion and wheel a^4 , of the pinion G, beveled wheel G^2 , and slotted wheel G^1 , when all arranged as specified.

4. The combination of the condensing-arm link D^5 , reciprocating cross-head D^6 , guides D^7 , base B, and guard C, substantially as specified.

5. The combination of the condensing-arm D, link D^3 , and braces D^{10} and D^{11} , when all arranged substantially as specified.

6. The combination, with the twisting-head, of the guard N, substantially as specified.

CHAS. B. WITHINGTON.

Witnesses:

JAMES CHURCH,
E. F. STAFFORD.