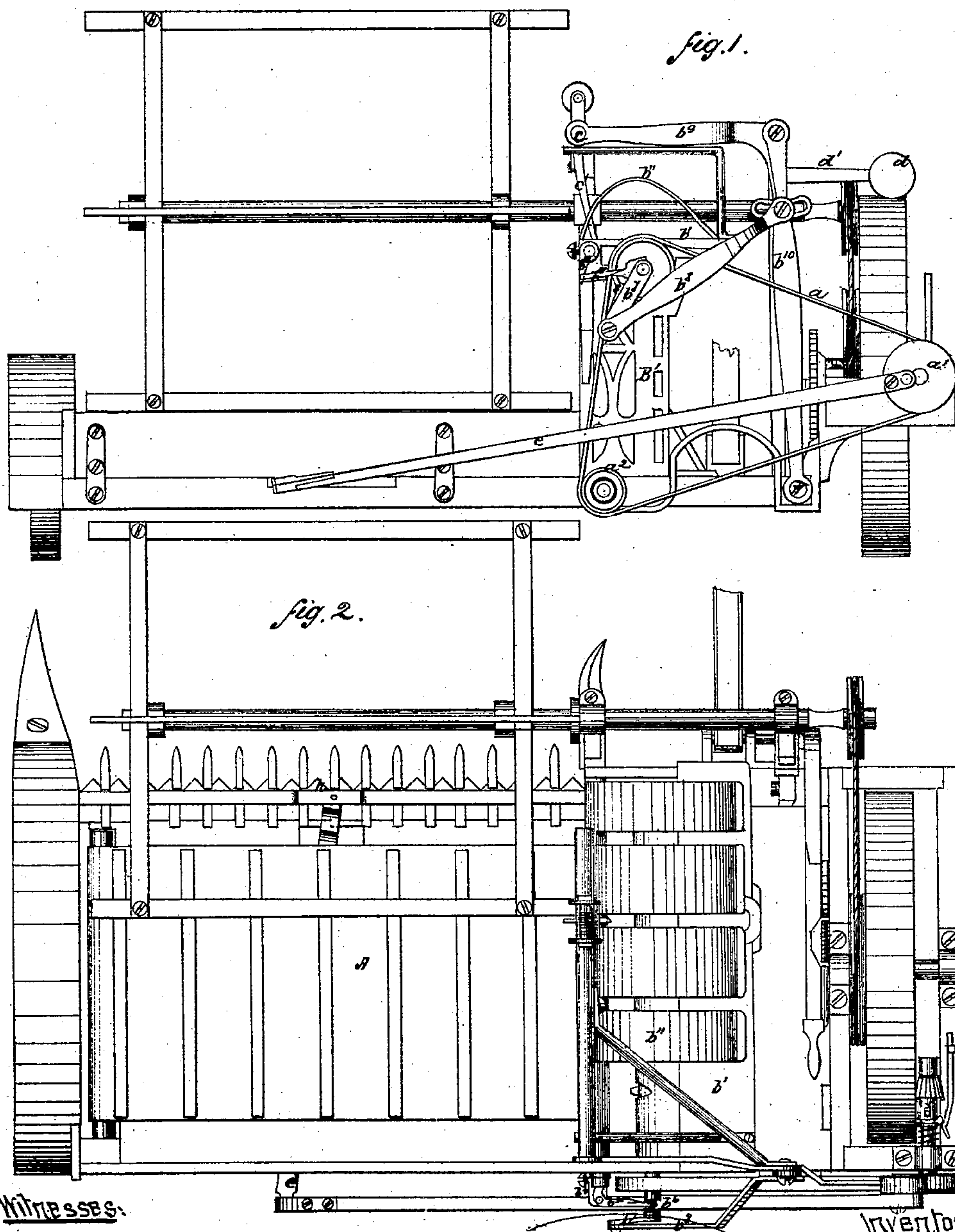


G. H. SPAULDING.

Grain Binder.

No. 103,673.

Patented May 31, 1870.



WITNESSES:

Victor Hagmann
L. A. Pettit

Inventor:

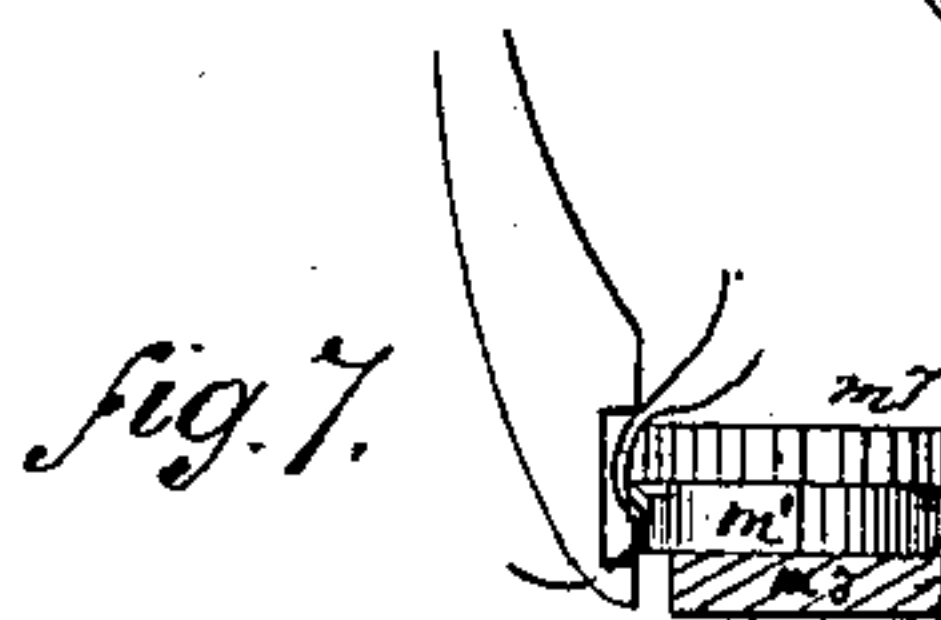
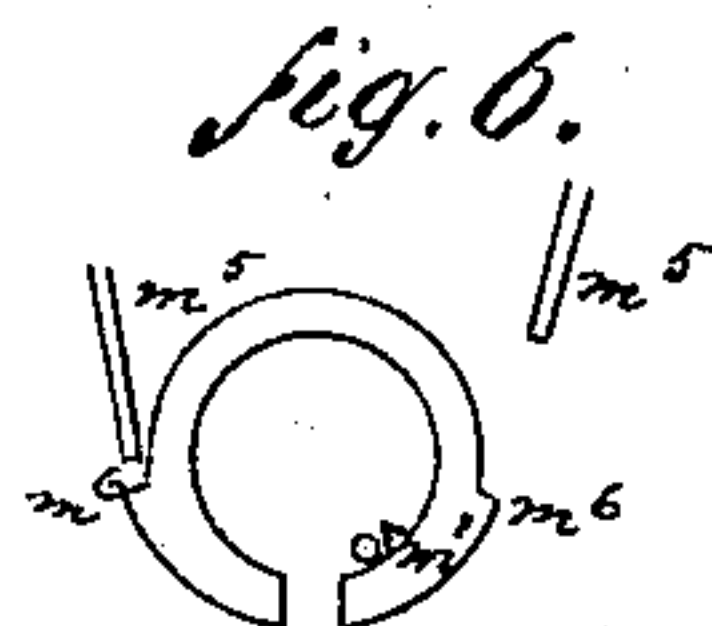
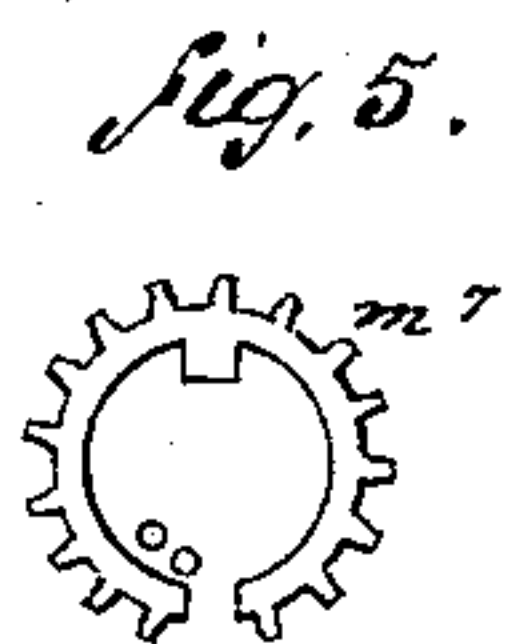
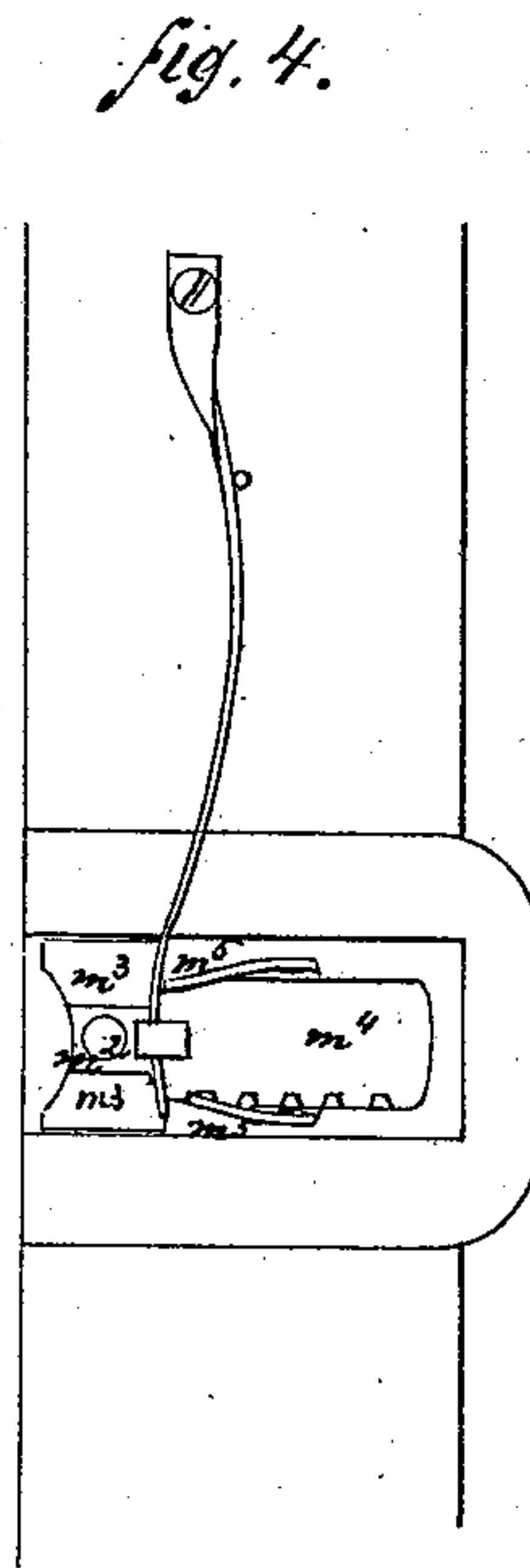
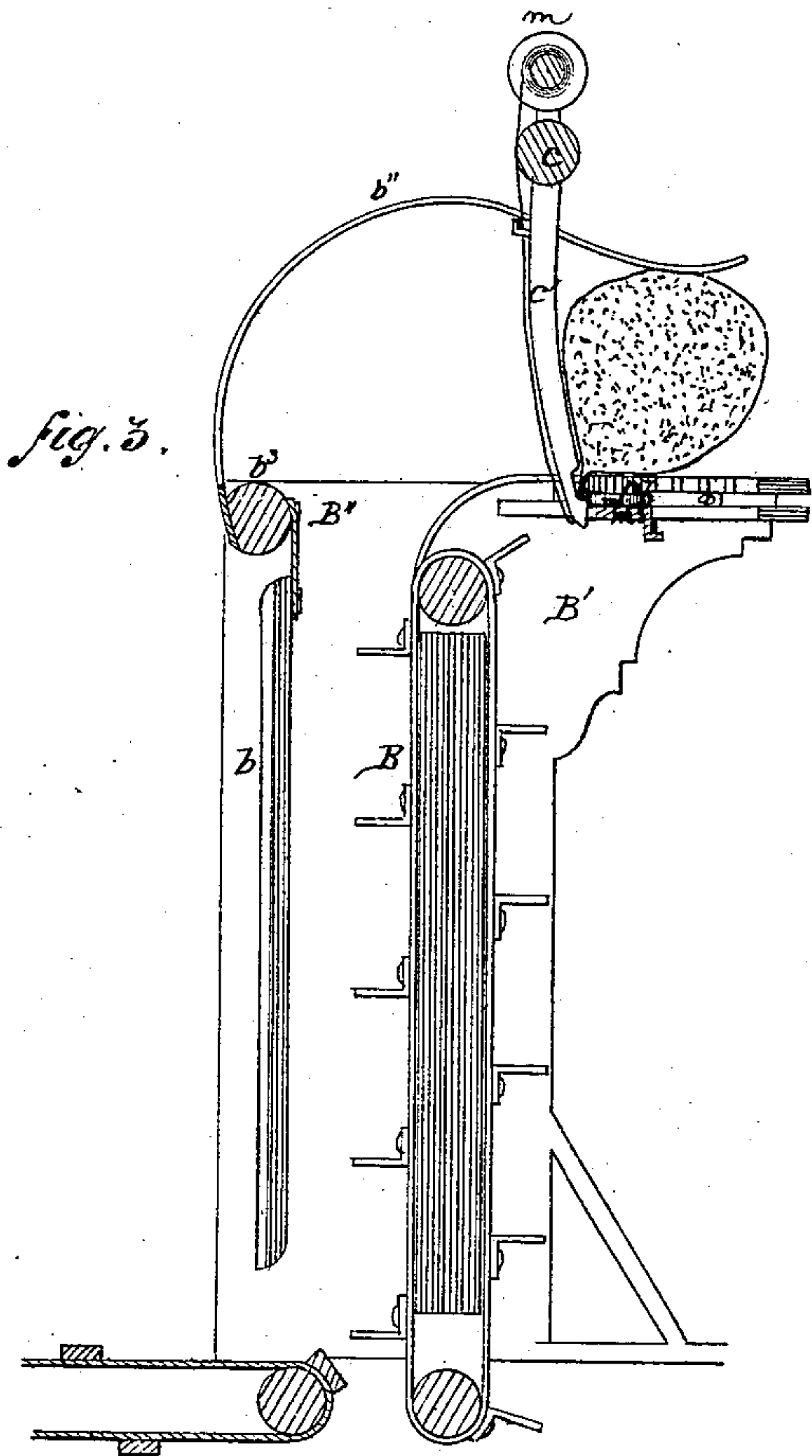
~~G. H. Spaulding~~
per ~~Wm. H. H.~~
Attorneys.

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Victor Hagmann
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Inventor:

G. H. Spaulding
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UNITED STATES PATENT OFFICE.

GEORGE H. SPAULDING, OF ROCKFORD, ILLINOIS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. 103,673, dated May 31, 1870.

To all whom it may concern:

Be it known that I, GEORGE H. SPAULDING, of Rockford, in the county of Winnebago and State of Illinois, have invented a new and Improved Automatic Grain-Binding Harvester; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a plan view. Fig. 3 is a transverse vertical section of the binding apparatus. Fig. 4 is a plan of the under side of the binding apparatus. Fig. 5 is a detached plan of the twisting-wheel m^7 . Fig. 6 is a detached plan of the wire-cutting wheel m' ; and Fig. 7 is a side elevation of the wheels m' m^7 in position on the slide m^3 , with the binding-finger thrusting the wire into them.

This invention consists, principally, in a mechanism that binds the gavel in the same movement that sweeps it from the binding-table; also, in a mechanism that always produces gavels of the same size; also, an automatic device for giving motion to the binding apparatus that receives its motion from the accumulation of grain; also, a binding device that receives the grain between two surfaces, and thus compresses it; also, a spool for holding binding wire or string that partakes of the same motion as the binding-finger; also, in arranging the binding-wire in such a manner that when the bundle is formed such wire shall be partly around the same; also, a peculiar construction of the twisting, holding, and cutting device, and one that receives its motion from the binding-finger; and in sundry other combinations and arrangements, as will hereinafter more fully appear.

In the drawing, A is an endless apron placed on the platform just in rear of the sickle-bar. The endless apron is rotated by a band, a , passing around a wheel, a' , located in one end of the master-wheel frame, and receiving motion from the master-wheel through intermediate gearing, the band a also passing over a wheel, a^2 , fixed on one end of one of the endless-apron shafts. The endless apron conveys the cut grain to the vertical elevating-apron B, which is rotated by two shafts, one stationed at the

top and the other at the bottom of the vertical transverse frame-work B', which rests on the main horizontal frame-work.

The elevating-apron B has a flap, b , hung in front of it, which keeps the grain on the apron as it ascends. The cut grain is conveyed by the elevating-apron into a receptacle formed by the binding-table b' , placed along the top of the transverse frame B', and the curved compressing-fingers b'' , which at one end are affixed to a shaft, b^3 , supported in the tops of the end pieces, B'', of the transverse frame B', while the free ends of the compressing-fingers rest upon the outer edge of the binding-table.

As soon as the quantity of the cut grain beneath the compressing-fingers becomes too great for them to restrain, it lifts them up, such lifting being effected in every instance by precisely the same amount of grain, and rotating the shaft b^3 to a sufficient extent to cause the arm b^4 , projecting at right angles from the end of such shaft, to act upon one extremity of the bent lever b^5 , and, through such lever, to throw the sliding clutch b^6 of the upper shaft of the elevating-apron into gear with the crank b^7 , loosely pivoted upon the end of such shaft.

The crank b^7 , through the medium of the connecting rod, b^8 , oscillates the elbow-lever b^9 , pivoted at its elbow in the upper end of the side vibrating arm, b^{10} , the pin which connects the rod b^8 and elbow-lever b^9 passing through a slot made transversely of the side vibrating arm.

The elbow-lever b^9 bears at its upper end the bar c , from which the discharging-fingers c' project downward, said bar and lever being so firmly connected and braced that the former is maintained parallel with the binding-table. At the time when the compressing-fingers b'' begin to rise, the discharging-fingers rest on the shaft b^3 between the compressing-fingers.

The oscillation of the elbow-lever b^9 draws the discharging-fingers c' forward over the binding-table and sweeps the gavel off. The gavel is always of the same size, whether there be a heavy or thin crop. The discharging-teeth are then near the outer edge of the binding-table, and the side arm, b'' , is swung to the end of its throw in that direction, leaning sufficiently to cause the weight d , affixed to the outer end of an arm, d' , projecting from the

lower extremity of the elbow-lever b^9 , to drop, and thus raise the discharging head clear of the table as it is moved backward.

When the discharging-teeth have arrived at a point above the shaft b^3 , an arm, e , on the inner side of the crank b^7 strikes the sliding clutch b^6 and throws it out of gear with the crank. The discharging-teeth then drop upon the shaft b^3 , and are in position to sweep off the next gavel. Here we have an automatic device for operating the discharging apparatus which receives its motion from the accumulation of grain. The compressing-fingers prevent the straw from expanding, and thus form a compact bundle, as any bundle must be that is made up between two surfaces. The gavel falls from the table into a space made for the purpose between the transverse partition and the master-wheel.

If the elevating-belts are made sufficiently long, the master-wheel may be placed beneath the binding-table and a shorter machine be produced, which may readily pass through gates.

The gavel, when formed, is bound with wire or cord wound on a spool, m , that is attached to the upper side of the rake-bar c , and partakes of the motion of the discharging apparatus in order that there may be less wire drawn from it in binding than there would be if the spool was stationary. The wire runs down the rear side of the binding-finger c' , which is made longer than and of different shape from the discharging-fingers, so as to qualify it to operate the binding device. The wire passes through a hole in the lower end of the binding-finger, and the end of the wire is first passed by hand up between a ring, m' , and the stud that sustains the ring, said stud projecting upward from a slide, m^3 , that sits transversely of the slot m^4 , made crosswise of the binding-table, the sides of the slot being tongued and the sides of the slide being correspondingly grooved. The ring m' has an opening in one side which admits the wire.

Prior to the accumulation of the gavel the point of the binding-finger rests on the shaft b^3 , as before stated, and the wire stretches directly across the chamber between such shaft and the binding-table, its end being held fast between the ring m' and stud m^2 . Consequently the gavel is formed under the wire and bends the latter upward and presses it against the ring m' and causes the wire to enter a second time the opening in the ring. Then the binding-finger is set in motion, in the manner before explained, and draws the wire against the rear side of the gavel and lifts the latter above the ring m' and thrusts the wire for a third time into the opening in the ring. There is a second ring, m^7 , also having an opening in its side and resting on the lower ring, m' , and supported by the stud m^2 . The upper ring receives the second and third folds of the wire between itself and the stud at the same time that the lower ring receives them. The binding-finger on reaching the two rings

pushes them before it along the slot m^4 . At the commencement of its movement along the slot m^4 the ring m' receives a slight turning by means of dogs m^5 , extending from recesses in the slides of the slot and striking teeth m^6 , formed in the periphery, such turning being sufficient to cause a knife, with which the ring m' is furnished, to cut off both branches of the binding-wire inclosed within it, leaving one end of the wire still held fast by the said ring. The upper ring has teeth in its periphery which engage with racks made in the sides of the slot and rotate said upper ring as it travels along the slot m^4 . Owing to such rotation the ring m^7 twists the ends of the wires that have just been cut by the ring m' beneath the gavel, and thus completes the binding of the gavel. Arrived at the outer end of the slot m' the binding-finger ascends, as above explained. The slide m^3 , with its two rings, is sent back to the other side of the binding-table by the action of a spring beneath the latter. The ring m^7 liberates the twisted ends of the wires at the beginning of the return motion, and allows the gavel to drop off the table into the space provided for it. This is the operation that is performed in the case of every gavel.

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

1. The sway-bar e' , combined both with the elbow-lever b^9 , that bears the rake-head, and the rod e , that connects it with the crank, substantially as and for the purpose described.

2. A gavel-discharger that is automatically thrown into gear through the raising of the compressing-fingers by the accumulation of the gavel, substantially as described.

3. The combination of the elevator B, flap b , and compressing-fingers b'' , arranged and operating as described.

4. The combination of the stationary horizontal slotted table, the twisting device, and the discharging mechanism, constructed and operating as described.

5. The compressing-fingers b'' , combined with the binding-table in the manner described, so that the cut grain is received and compressed between two surfaces, one movable and the other stationary, substantially as described.

6. The combination of a spool for holding wire or string with the binding-finger in the manner described, so that the two devices partake of the same motion, for the purpose set forth.

7. The device for holding, cutting, and twisting the band, constructed and operating as set forth.

8. A holding, cutting, and twisting device moving horizontally in a slot made crosswise of the binding-table and receiving its motion from a separate binding-finger, substantially as specified.

GEO. H. SPAULDING.

Witnesses:

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ADDISON V. TEEPLE.