

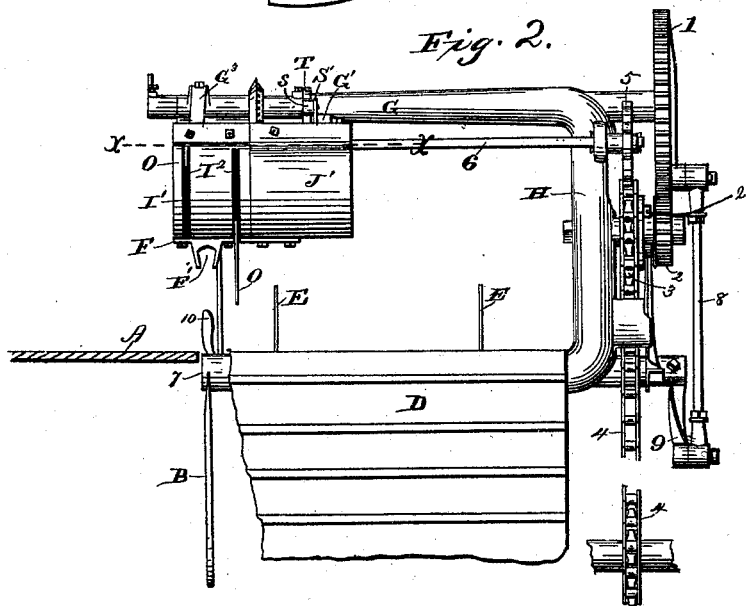
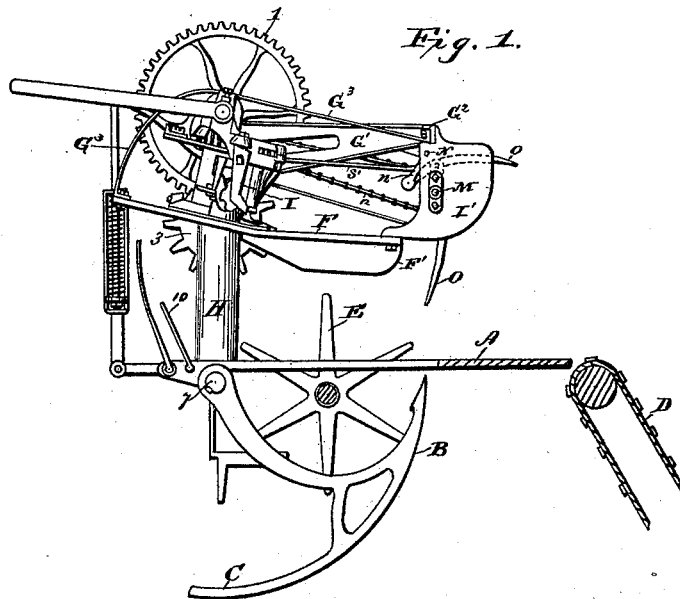
(No Model.)

4 Sheets—Sheet 1.

M. E. BENEDICT.
GRAIN BINDER.

No. 417,853.

Patented Dec. 24, 1889.



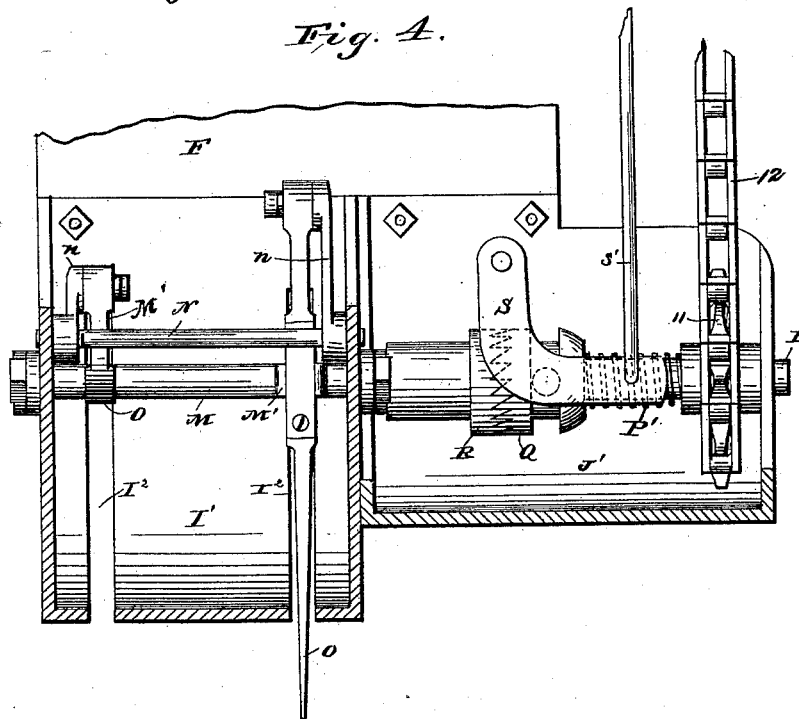
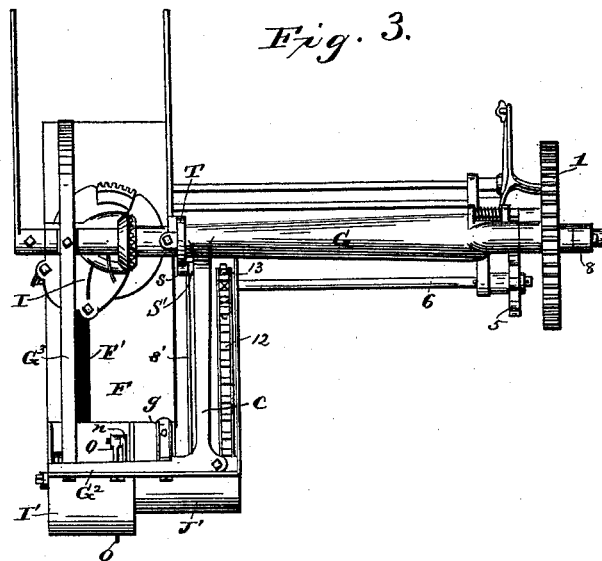
Witnesses.
Chas. R. Burr.
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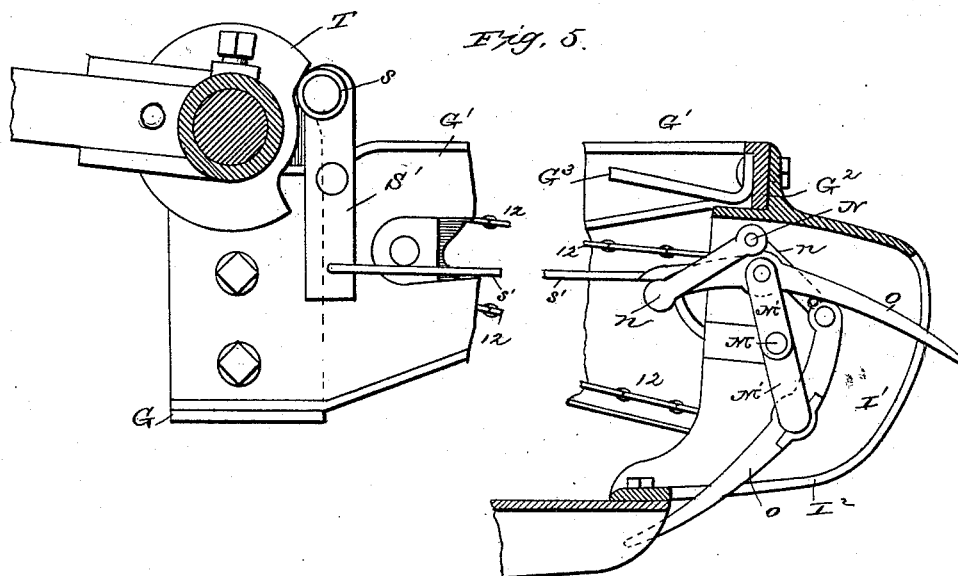
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Witnesses

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(No Model.)

4 Sheets—Sheet 4.

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Fig. 6.

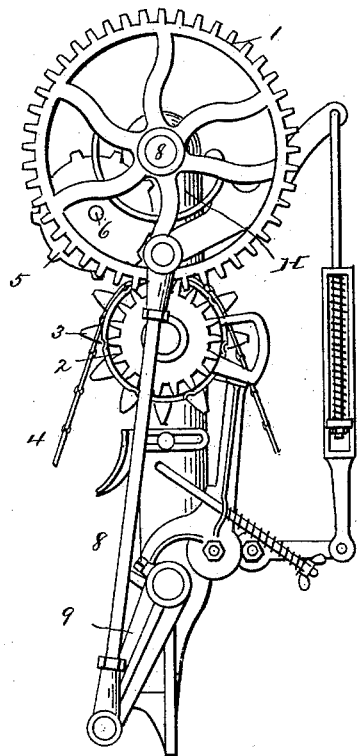
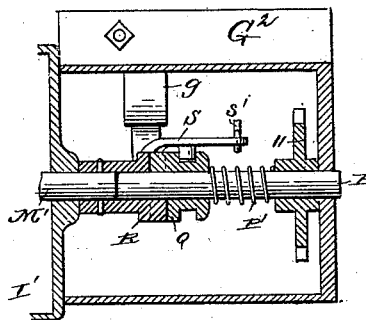


Fig. 7.



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UNITED STATES PATENT OFFICE.

MILTON E. BENEDICT, OF PERRY, NEW YORK.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 417,853, dated December 24, 1889.

Application filed July 25, 1888. Serial No. 281,034. (No model.)

To all whom it may concern:

Be it known that I, MILTON E. BENEDICT, of Perry, in the county of Wyoming and State of New York, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and to the figures and letters of reference marked thereon.

My present invention relates to improvements in grain-binders; and it has for its object to improve the construction and arrangement of the devices for feeding the grain to the binding apparatus; and it consists in certain novelties of construction and combination of parts, all as will be hereinafter fully described, and the novel features pointed out in the claims at the end of this specification.

In the drawings, Figure 1 represents a sectional view through the table of a binder, showing the application of my invention; Fig. 2, a side view of the same; Fig. 3, a top plan view with a portion of the casing for the pickers removed; Fig. 4, a sectional view on the line *x x* of Fig. 2. Fig. 5 is a detail view showing the construction of the cam and lever for operating the clutch, the end of the casing being removed to show the pickers; Fig. 6, an end view showing the general construction and operation of the gearing for operating the knotting mechanism. Fig. 7 is a horizontal sectional view showing the clutch for operating the picker-shaft.

Similar letters of reference in the several figures indicate similar parts.

The letter A represents the grain-table, of ordinary or any approved construction; B, the binding-arm, pivoted below and vibrating up through a slot in the same, carrying the cord, and provided with the ordinary grain cut-off C on its outer side.

D is an elevator, a belt being shown merely as one form for carrying the grain from the platform to the binding-table, and E grain-packers (in the present instance represented by arms on a shaft operating through the table in the usual manner) to pack the grain against the cord. The elevator and packers shown will serve to indicate the position of

these parts, which may be of any approved form.

H represents a standard forming a part of the binder-frame, having an overhanging tubular arm G, in which the knotting-shaft operates, and secured to said arm G is an arm G', having at its outer end the lateral extension G², which is bolted to the upper portion of the casing I', in which the picker-fingers operate. To the bottom of this casing is secured one end of the breast-plate F, having the usual slot F' and supported directly from the arm G through the knotter-frame, while its other end is connected to a rod or brace G³, fastened to the top of arm G and extension G², for the purpose of steadying and bracing the parts.

The knotting mechanism I may be of any of the ordinary types, and is, as before intimated, preferably supported below the arm G.

The shaft for operating the knotter extends through the arm G, and is provided on its rear end with a large gear-wheel 1, meshing with a gear 2, the latter being connected so as to be driven from sprocket-wheel 3, mounted on a stud on the frame, a suitable clutch 21 being interposed in said connection. The wheel 3 is driven from a suitable constantly-rotating shaft by a chain 4, and the teeth are made a trifle larger than usual, extending beyond and parallel with the chain, and mesh with a wheel 5 on a shaft 6, supported on arm G, from which shaft the pickers are operated, as will be described. The shaft 7, carrying the binder-arm, is vibrated from the wheel 1 by means of a pitman 8, connected to an arm 9 on said shaft, and the clutch 21 between wheels 2 and 3 is adapted to be operated at proper times to cause the connection and disconnection by means of a tripping-arm 10, arranged beneath the knotter in the ordinary or any preferred manner.

The operation of the various parts described, causing the placing of the cord around the grain and, in connection with any well-known form of knotter, tying it, will be understood by one skilled in the art. Suffice it to say, however, that wheel 3 is continuously rotated, and the connection and disconnection of the knotter are accomplished at determinate lines in the usual way.

The inner and lower portion of the casing

I' is provided with slots I² I² for the passage of the picker-fingers, and at opposite ends it is provided with bearings for the ends of a shaft M, having two or more cranks M' formed thereon on opposite sides, as shown.

O O represent the picker-fingers, preferably curved as shown, and journaled on the cranks M' M', while their rear ends are pivoted to links n n, hung upon a shaft or rod N, secured to the casing. The points at which the links are pivoted on the shaft N are preferably a short distance above the circle described by the cranks when rotated, and the length of the links is such that they nearly reach the plane of the axis of shaft M, so that the pickers when moving down will describe an arc with a radius nearly the length of the pickers, the pivotal point being the point of connection with the link, which latter remains nearly stationary during the downward movement. This construction also causes the upward and forward movement of the pickers to be of very short duration, as they will then be turned on an arc with the crank as the center of motion.

The slotted face of the casing I' is preferably so shaped relative to the line of movement of the operating ends of the pickers that the latter will be retracted during the upward and forward movement, but will be projected to nearly their full length during the downward and rearward movement.

As a means for operating the pickers at the proper times and protecting the mechanism, I provide a supplemental casing J', secured to the arm G' and the breast-plate, and in its outer end journal one end of a shaft P, the other end extending into a clutch-section R on shaft M and rotating loosely therein part of the time, as shown in Fig. 7. Upon the shaft P, near one end, is splined a movable clutch-section Q, adapted to be moved into and out of engagement with the stationary section, the former operation being caused, preferably, by a spring P' and the latter by devices farther on described. The outer end of shaft P is provided with a sprocket-wheel 11, connected by a chain 12 with a corresponding wheel 13 on shaft 6, which is driven continuously in one direction.

S indicates a bell-crank lever pivoted upon bracket g in the casing, having a pin entering a groove in the clutch-section Q, operated in one direction by spring P' and in the other by tension on the rod s', connected to one end and to the end of a lever S', pivoted on the arm G', said lever having a small roller s thereon, normally held in engagement with a cam T on the knotter-shaft. This cam and lever are so shaped and positioned that the lever will be moved and the clutch-sections separated during the binding operation, but will be permitted to engage and rotate the picker-shaft while the bundle is being formed.

The parts are all so arranged and connected that the grain falling on the platform is elevated and deposited upon the table, where the

packers pack it against the cord extending from the eye of the binder-arm to the knotter. The pickers are also operated from the shaft 6 in the manner described and act upon the top of the grain, preventing its lodgment against casing I' and feeding it under the breast-plate.

When sufficient grain has accumulated to form a bundle, an ordinary tripping device, operated by lever 10, throws the wheel 2 into operation, causing wheel 1 and the knotter-shaft to be operated and the upward movement of the binder-arm through the grain on the table. As soon as the binding-arm starts upward the cam T causes the disengagement of the clutch Q R and holds the clutch disengaged all the time the knotter-shaft is rotating and forming the knot. When, by the continued motion of the wheel 1, the knot has been tied, and while the binding-arm is descending, the depressed portion of cam T reaches the roller s on the lever S', thereby allowing the spring P' to engage the clutch-sections and cause the rotation of the shaft M and pickers G, as before described. During the time the knot is being formed the binding-arm is of course elevated, and the grain being fed against it by the elevator will press up against the breast-plate and casing I'; but the latter will hold it and prevent its becoming entangled in the picker-operating devices, and when the latter are again thrown into operation the fingers, moving outward and downward, will carry it beneath breast-plate and into proper position, another bundle being formed against the cord, as before.

In this form of binder, were no pickers provided at the end of the breast-plate, the grain might clog at this point, and were no casing employed covering the whole of the operating devices for them the grain would soon become wound in them, interfering with their proper operation.

The arrangement of the pickers at the outer end of an arm supported entirely upon the overhanging arm of the frame and the manner of operating them from a shaft extending close to said arm are advantageous, as the machine is thereby rendered more compact and more free space is provided over the binding-table than in prior arrangements, where the shaft operating the pickers is a long one, extending clear to the side of the machine, where the driving mechanism for the knotter is located. In said prior devices it is also necessary to provide a guard for these shafts their entire length, or else the grain is liable to become twisted around them—in the first instance increasing the weight and cost of the machine, and in the second serious inconvenience in operation; but in my present machine the construction of the pickers is such that they operate in very small space and are protected from all liability of the grain clogging them, and, moreover, the machine is much simpler and can be made cheaper than the forms open to the above-noted objections.

I claim as my invention—

1. In a binder, the combination, with the standard, the overhanging arm supporting the knotting mechanism, and the intermit-
5 tingly-rotated knotter-shaft, of the arm extending from the outer end of the overhanging arm, the short picker-shaft having the sprocket-wheel, and the pickers supported entirely upon said last-mentioned arm, the ro-
10 tating shaft mounted in bearings upon and close to the overhanging arm, the sprocket-wheel on the shaft, and the chain connecting the two sprockets, substantially as described.
2. The combination, with the standard, the
15 overhanging arm, the shaft extending close to the arm, the intermittingly-rotated knotter-shaft and the knotting mechanism supported on the overhanging arm, the arm extending from the outer end of said overhanging arm,
20 the casing at the end, and the breast-plate connected to the casing and overhanging arm, of the short picker-shaft, connections embodying a chain between the picker and first-mentioned shafts, and a clutch operated from
25 the knotter-shaft for causing the rotation of the pickers, substantially as described.
3. In a binder, the combination, with the

arm G, the arm G' thereon, the breast-plate, and the slotted casing connected to the last-mentioned arm and breast-plate, of the short
30 picker-shaft journaled in the casing and the pickers operated thereby, the shaft mounted in bearings upon and extending close to and parallel with the arm G, and connections—
35 such as a chain—between said shaft and the picker-shaft for operating the latter from the former, substantially as described.

4. In a binder, the combination, with the arm G, the knotter-shaft, the knotter, the arm G', the picker-shaft supported entirely on the
40 outer end thereof, and the pickers connected thereto, of the shaft extending close to and parallel with the knotter-shaft, connections—
45 such as a chain—for operating the picker-shaft from the last-mentioned one, a clutch arranged between the two shafts, a spring for causing the normal engagement of the clutch, and a cam on the knotter-shaft for disengag-
ing the clutch-sections during the tying of the knot, substantially as described.

MILTON E. BENEDICT.

Witnesses:

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