G. H. SPAULDING.

HAND-BINDER.

No. 185,459. Patented Dec. 19, 1876.

Fig. 1.

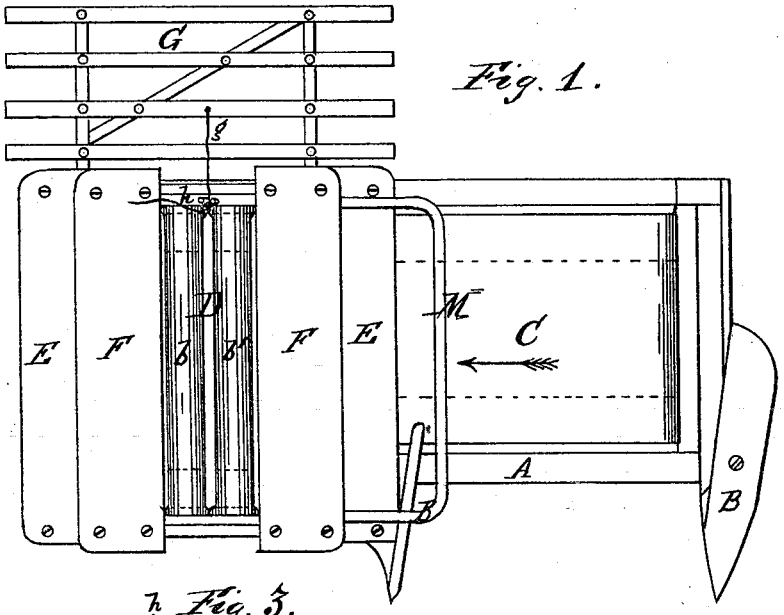


Fig. 3.

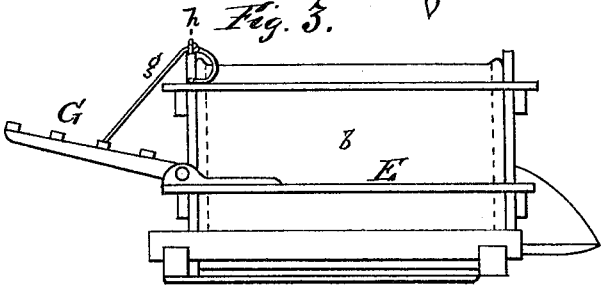
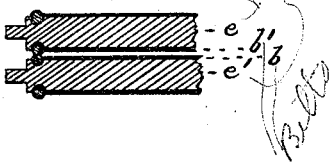
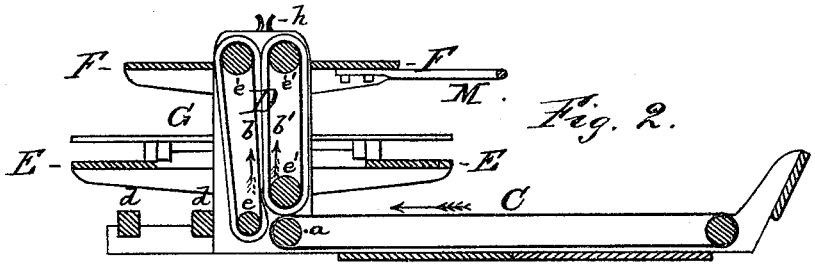


Fig. 4.



Roller
Belts

Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE HENRY SPAULDING, OF ROCKFORD, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO WM. A. KNOWLTON, OF SAME PLACE.

IMPROVEMENT IN HAND-BINDERS.

Specification forming part of Letters Patent No. **185,459**, dated December 19, 1876; application filed May 13, 1876.

To all whom it may concern:

Be it known that I, GEORGE HENRY SPAULDING, of Rockford, in the county of Winnebago and State of Illinois, have made an invention of certain new and useful Improvements in Binder-Harvesters; and that the following is a full, clear, and exact description and specification of the same.

The objects of my invention are to deliver the grain in bunches or gavels at a sufficient elevation above the raking-platform to enable the gavels to be bound conveniently; also, to enable two operators to bind the grain upon a harvester without interfering with each other's acts; also, to reduce the labor expended in taking the grain from the grain-elevating mechanism.

To this end my invention consists of certain combinations and arrangements of mechanical instrumentalities, of which the following are the principal, viz: a duplex elevator, consisting of two endless belts, arranged with their acting faces parallel, or thereabout, to each other, and arranged to move with substantially equal speeds, and with their delivery ends at the same level, or thereabout; two binders' tables or grain-platforms, arranged at opposite sides of the opposite ends of the duplex elevator; two binders' foot boards or supports, upon which the binders are supported while binding the grain; a tipping sheaf-table, upon which the sheaves are accumulated until it is deemed expedient to drop them on the field; a collecting-conveyer, by means of which the cut grain is collected and delivered to the elevator.

This conveyer may consist of a single belt, either plain or fitted with cleats, or it may consist of a series of belts, either plain or fitted with teeth.

The combinations and arrangements of these instrumentalities, which I claim as new, are set forth at the close of this specification.

In order that they may be fully understood I have represented in the accompanying drawing, and will proceed to describe, the mode in which I have embodied them in a working machine.

Figure 1 of the said drawings represents a plan of certain parts of a binder-harvester embodying my invention in the best form at present devised by me. Fig. 2 represents a vertical section of the same at the line $x\,x$ of Fig. 1. Fig. 3 represents a side view of the same, and Fig. 4 represents a section of its parts.

The finger-beam A of the machine is, in practice, fitted with the usual cutting apparatus, composed of slotted guard-fingers and a reciprocating scalloped cutter. At the outer end of the finger-beam A is the divider B, by means of which the grain to be cut is divided from that to be left standing, and at the inner end of the finger-beam is the fender B′, which directs the grain toward the inner end of the cutting apparatus. Immediately behind the finger-beam A is the collecting-conveyer C, which, in this instance, consists of an endless belt of canvas supported upon rollers, to one, *a*, of which a revolving motion is imparted, to cause the upper surface of the collecting-conveyer to carry the cut grain toward that side of the machine at which it is to be bound into sheaves.

Motion may be imparted to the roller *a* by means of a chain or belt, and other gearing connecting it with the main running wheel; but as the construction of such transmitting mechanism or gearing is well known by manufacturers of binder-harvesters, I do not deem it necessary to either represent or describe it.

At the delivery end of the collecting-conveyer is the duplex elevator D. This device consists of two endless belts, *b b′*, of canvas, each of which is supported upon two rollers, *e e e′ e′*, which are so arranged in the machine that the adjacent faces of the two aprons are upright and parallel with each other, or nearly so. One of the belts, *b′*, has its lower roller above the surface of the collecting-conveyer C, so that the grain on the latter can pass under the end of that elevating-band to the face of the other, *b*. The end of the other band, *b*, is close to the end of the collecting-conveyer, so that the grain delivered by the latter is within the range of the former. The upper or delivery ends of the two belts are at the same level, so that the grain which is raised is either centered at the diverging delivery

ends of the belts, or, if permitted to accumulate, is distributed laterally in opposite directions by the outward movement of the belts over their supporting-rollers. The two belts are driven from the main driving-wheel by means of suitable transmitting mechanism or gearing, so that their adjacent faces move in the same upward direction and with equal speeds. The main driving-wheel is arranged to run between the cross-beams *d d* of the frame. As the construction of such transmitting mechanism or gearing is well understood by constructers of harvesters, it is not deemed necessary to represent it. In order that the belts may be kept in their proper positions, a bolt rope is sewed into each edge of each belt, and a corresponding groove is made in each belt-roller to receive the inner half, or thereabout, of each of these roped edges. (See Fig. 4.)

The duplex elevator carries the grain upward by grasping it between its adjacent rising and moving faces, and discharges the grain at its upper end, where the divergence of the belts forms a species of mouth or receptacle, in which the grain, if not removed, accumulates in a gavel. In order that the grain may be readily removed and bound by two binders, a binders' foot-board, E, is arranged at each side of the upright elevator, one of these foot-boards E being at the outer side of the elevator, and the other foot-board being at the inner side of the elevator. This arrangement enables two or more binders to ride upon the machine in convenient positions to grasp the gavel at the upper end of the elevator and remove it therefrom without being in the way of each other, and without being obliged to expend, in the transfer of grain to separate binding-tables, time that might otherwise be available for binding. A guard, M, is attached to the machine at about the level of the binders' table, to prevent the binder upon the inner platform from being accidentally thrown off, and also to prevent the conveyer beneath from being injured or obstructed by the fall of the binder upon it.

In order that the grain may be conveniently bound, two binders' tables, F F, are provided, one of them being at the outer side of the upright elevator, and the other table being at its inner side, so that the binder, standing upon either foot-board E or E, may move the gavel toward him, and may bind it into a sheaf. The binders may drop the sheaves on the ground; but as it is convenient to have them collected in shocks, I have combined with the binding appliances a dropping sheaf-carrier, G. This implement is hinged to the rear ends of the binders' foot-boards, so that its rear can turn up or down; it is constructed, by preference, of slats, so that it is of light weight, and it is fitted with a cord, *g*, by means of which it may be drawn upward and held in a raised position, as seen in Fig. 3.

The cord has a large knot made in it, which can be engaged with a fork, *h*, at the top of the elevator-frame, so that the rope may be readily secured for the purpose of holding the carrier in a raised position, or may be readily loosed, for the purpose of permitting the carrier to tip down and discharge the sheaves with which it is loaded. The sheaves as bound are thrown upon the carrier, and when a number have accumulated on it one of the binders or the driver of the machine disengages the rope from the fork, drops the sheaves, draws up the carrier by the rope, and secures it by engaging the knot at the rope with the fork *h*.

The mechanism thus described possesses several important advantages, thus: The grain is collected in a gavel or bunch at as high a level or higher than the binding-tables; hence the binders do not have to raise the gavels in transferring them to the binding-tables, and they do not have to dig their hands down into a deep receptacle to seize the gavel, but merely to grasp the gavel and draw it sidewise. The elevator-bands are, by preference, made without projections, as the effect of such projections would be to grind upon the grain accumulating at the upper end or mouth of the elevator, which would be prejudicial. Such projections also might injure the fingers of the binders when grasping the gavel.

It will be noticed that the leading feature of the machine is the duplex elevator, consisting of endless belts, whose adjacent surfaces move in the same direction with equal speed, or thereabout, and whose upper ends are at the same level, or thereabout. This duplex elevator is arranged, by preference, with its rising faces upright; but it may be inclined, if found expedient. When this elevator is used in combination with binders' tables or platforms at about the same level as its delivery end, the diverging space between the upper ends of its members forms a receptacle, in which a gavel or bunch of grain collects by additions to its under side, thus obviating the necessity of a special grain-receptacle. As the grain is shoved up into the receptacle against that already therein, the gavel is more or less compacted and prepared for binding. Moreover, as this receptacle is comparatively shallow and the gavel or bunch, when large enough to form a sheaf, projects upward from it, but little exertion is required on the part of a binder to grasp the gavel and draw it to a convenient position for binding.

In the construction of the duplex elevator round leather belts may be substituted for bolt rope; or the canvas may be stitched to the faces of flat leather belts, and the rollers supporting the belt may have flat grooves in them adapted to such belts. There may also be strengthening-belts between those at the margins of the elevator-belts.

Where the binders' tables are mentioned in any of the claims, the term is to be considered

as having a general meaning as regards the plane of the tables with reference to the top of the elevator.

I claim as my invention—

1. The combination, substantially as before set forth, of the collecting-conveyer and the duplex elevator, constructed with the delivery ends of its members at the same level.

2. The combination, substantially as before set forth, of the duplex elevator, constructed with the delivery ends of its members at the same level, the binders' tables, arranged at opposite sides of the upper end of the duplex elevator, and the binders' supports, arranged at opposite sides of the duplex elevator, and below the level of the binders' tables.

3. The combination, substantially as before set forth, of the two binders' tables, the elevator, arranged between the two binders' tables, and the dropping sheaf-carrier, arranged at the rear of said two tables, where it is in a convenient position to receive the sheaves from both binders' tables.

Witness my hand this 18th day of April, A. D. 1876.

GEORGE HENRY SPAULDING.

Witnesses:

BYRON GRAHAM,

D. B. ALEXANDER.