

(No Model.)

L. MILLER.
GRAIN BINDER.

No. 322,951.

Patented July 28, 1885.

Fig. 1.

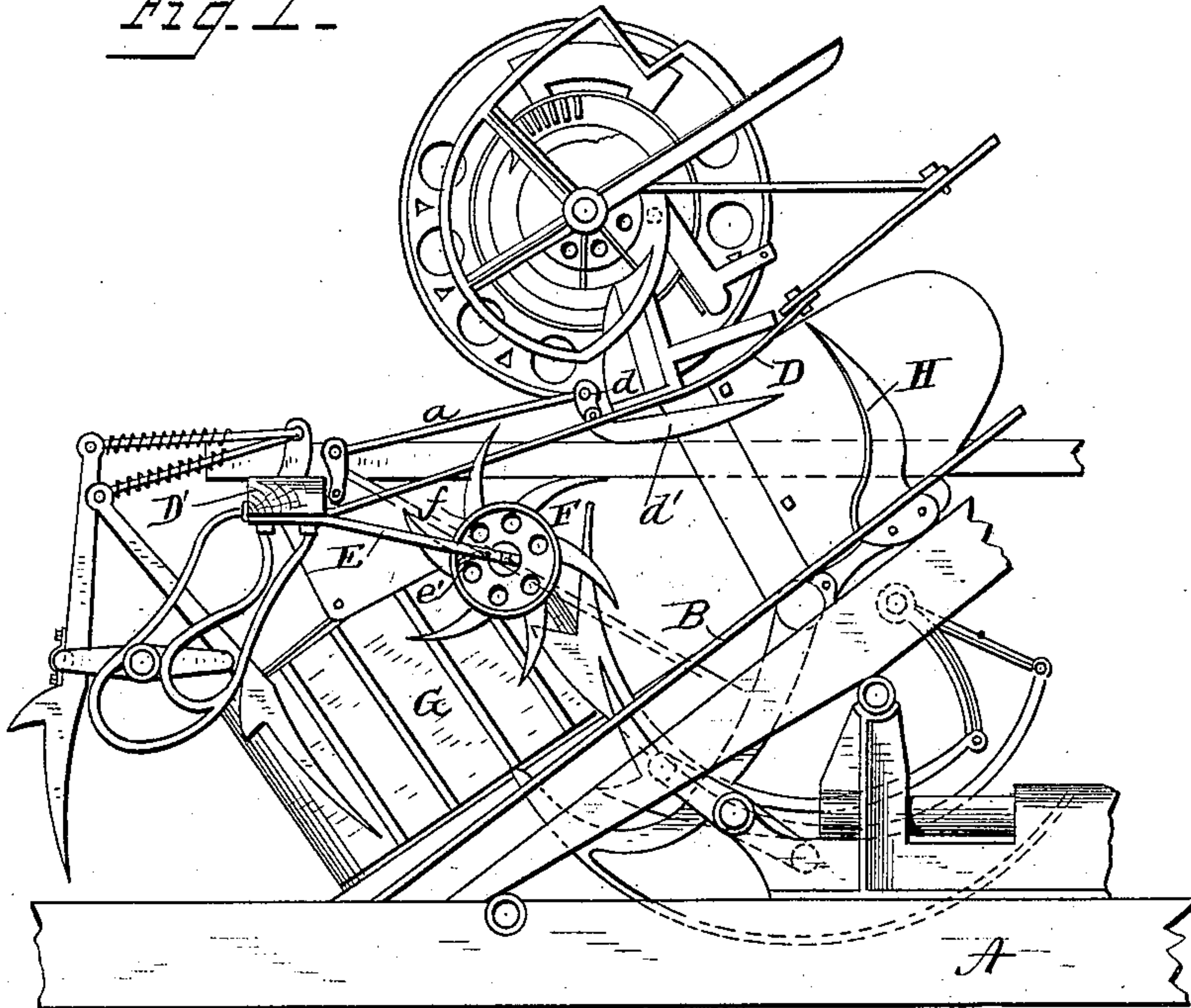


Fig. 2.

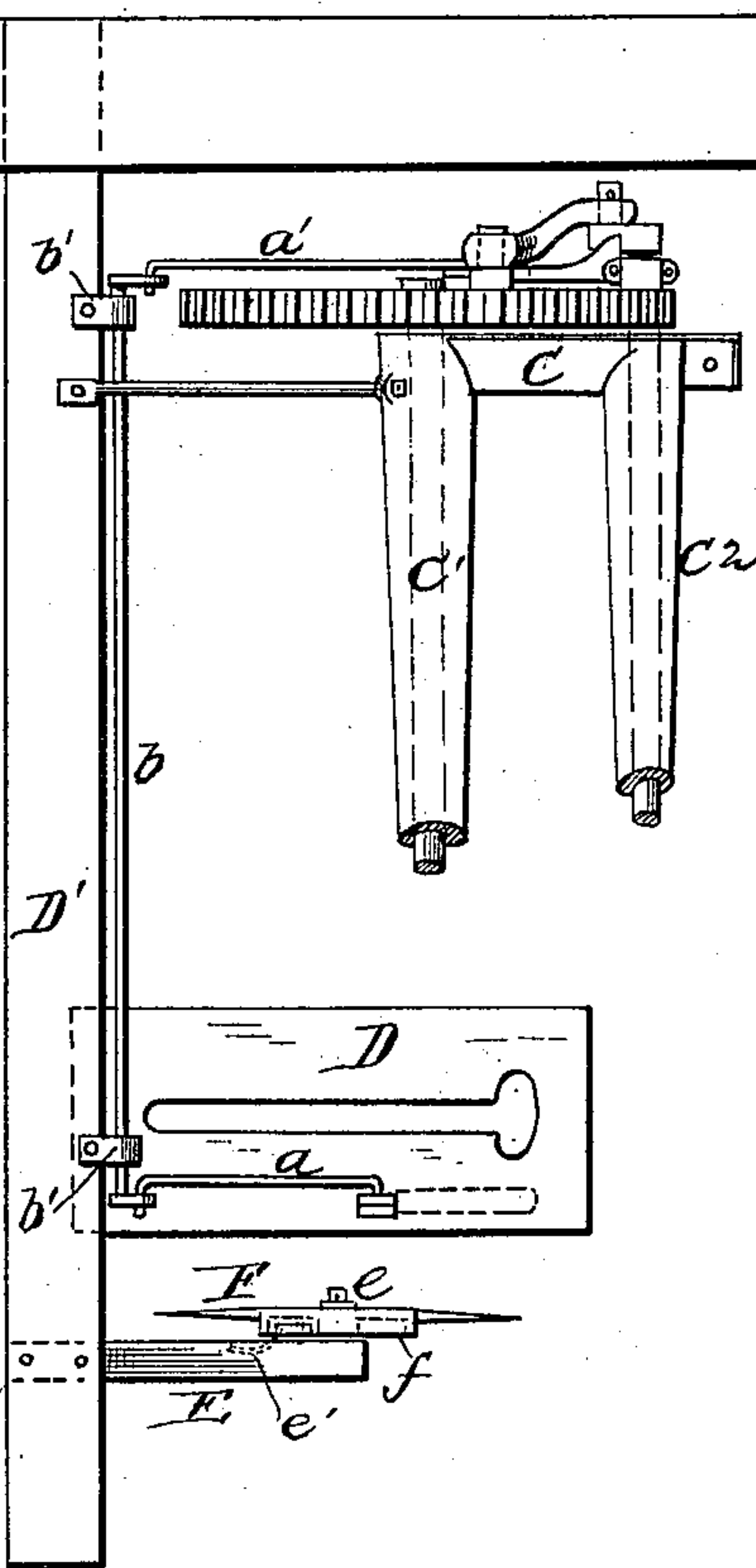
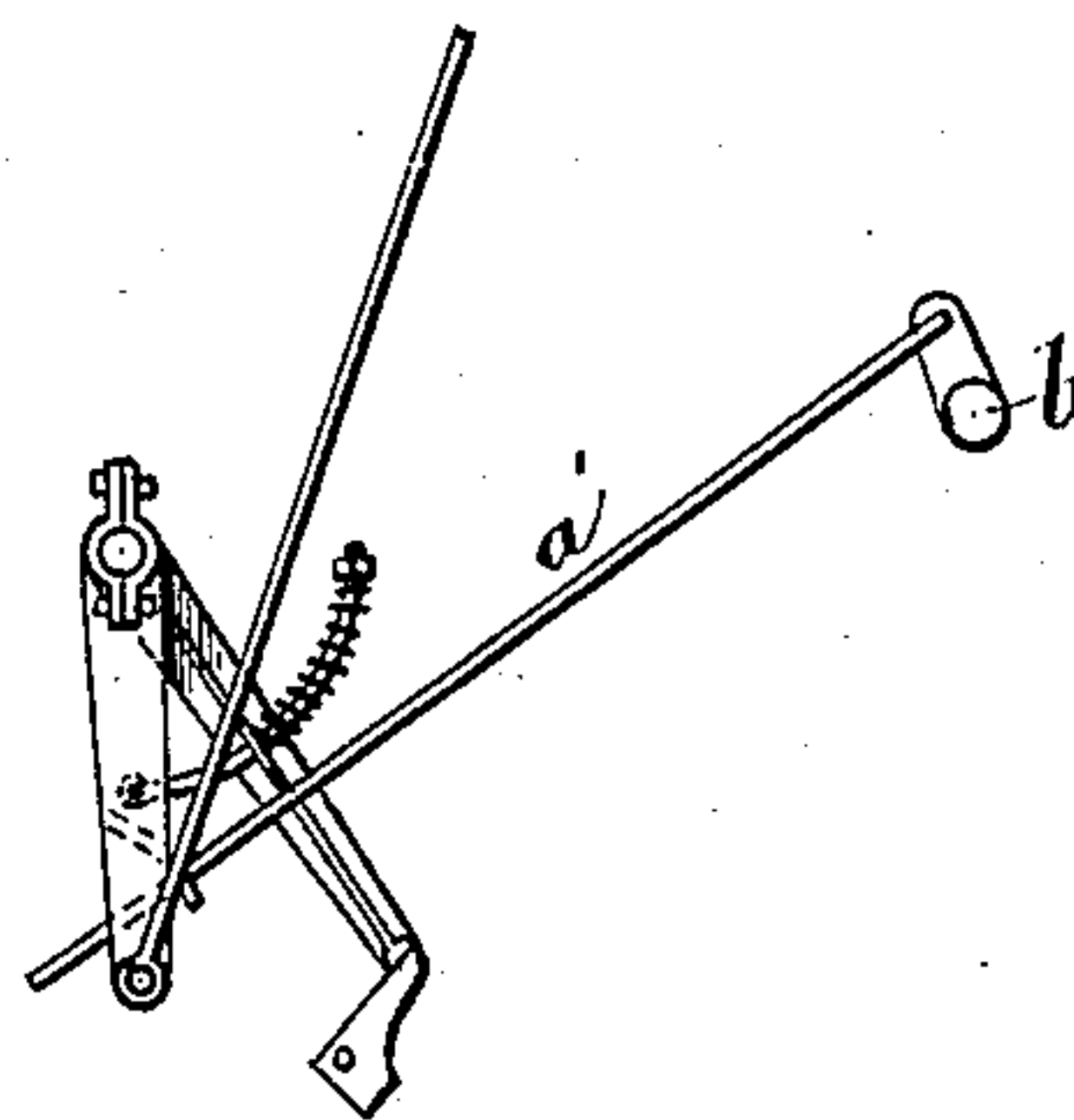


Fig. 3.



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LEWIS MILLER, OF AKRON, OHIO.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 322,951, dated July 28, 1885.

Application filed June 9, 1883. (No model.)

To all whom it may concern:

Be it known that I, LEWIS MILLER, of Akron, county of Summit, and State of Ohio, have invented a new and useful Improvement in Grain-Binding Harvesters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a novel arrangement of star-wheel or wheel having long arms or teeth for holding the grain on the inclined elevating binder-table interposed between the platform-carrier and the top of the driving-wheel, said star-wheel being actuated by the grain moving upward over said table, and being held against backward rotation and serving to hold the grain, when released by the packers, against backward movement on said inclined table.

It further relates to the combination, with the binder-table, knotter-shield, and revolving bundle-discharging arm or arms, of a yielding arm or lever pendent below the knotter-shield, and connecting devices extending thence outside of the path of the revolving bundle-discharger to the binding mechanism trip, for tripping and setting in motion the binder mechanism under the pressure of the grain on said yielding pendent arm or lever; also, to the combination of said yielding pendent arm with the knotter-shield, the binder-table arranged below said shield, and the compressing and binding mechanisms operating in connection with said binder-table, as hereinafter explained.

In the accompanying drawings, Figure 1 represents a rear elevation of so much of a grain-binding harvester as is necessary to show my improvements. Fig. 2 is a plan or top view of a portion of the same, and Fig. 3 is a detail view of the tripping devices.

The machine in its organization or general construction and arrangement of parts is similar to that described in Letters Patent granted to me April 24, 1882, No. 276,448, and will therefore not be described in detail herein further than is necessary to an understanding of the improvements herein claimed.

A represents the main or platform frame; B, the inclined elevating binder-table, interposed between the platform-carrier and the

top of the driving-wheel, and C the gear-standard, with its tubular arms C' and C² projecting from its rear face, one above and the other underneath the binder-table, and forming bearings, the lower one for the needle-shaft and the upper one for the shaft actuating the knotter, the latter shaft carrying the revolving bundle-discharging arm or arms C³. Suspended from the upper arm, C', is a transversely-slotted plate, D, which forms a "breast-plate" or knotter-shield through the slot in which the needle passes to the knotter. This plate D occupies the inclined position shown, and is attached at its lower end to the longitudinal bar D', forming the support for the reel-standard and the pickers, and which is connected with and upheld by the gear-standard and driver's foot-board in a manner described in another application referred to. This breast-plate serves the double purpose of holding down or compressing the grain upon the binder-table and of protecting the knotter, which without it would be liable to catch the straw, and thereby have its proper action interfered with.

To the bar D' or other suitable support is secured an arm or arms, E, the end of which, overhanging the inclined binder-table B, is provided with a stud-shaft, e, on which is mounted a star-wheel, F, the arms of which are made long enough to reach down into close proximity with the table B, and are by preference made to curve backward from the direction of its rotation and toward the grain-platform for facilitating their movement by and their clearance from the grain.

The hub of wheel F has an annular groove formed in its rear face, or it may be in the form of an annular flange, f, surrounding its hub, and thus forming a groove, and within this groove is a pawl, e', pivoted at its inner end to the arm E, with its outer end held up in contact with the inner face of flange f by any suitable arrangement of spring or weighted heel end, thereby forming a friction-pawl for preventing the backward rotation of wheel F, the arrangement being such that the arms on the lower side of the wheel can move outward and upward as the wheel is revolved by and with the grain which is being moved up the inclined binder-table by the pickers and packers;

but any tendency of the grain to slide backward or down the inclined table when the packers are withdrawn will cause the pawl *e'* to bind upon the flange *f*, preventing the backward turning of the wheel, and thereby preventing also any backward movement of the grain on the table, the points or arms of the wheel serving to hold the grain firmly against such movement. This is regarded as important, as it prevents the pounding and thrashing out of the grain incident to the use of intermittently or alternately acting packers, or the equivalent thereof, which alternately grasp and release the ascending grain.

Ordinarily a single wheel, *F*, adapted to act upon the straw in rear of the binder-arm or needle and near the heads of the grain will be sufficient, especially when an endless apron or butter is employed to carry upward and hold the butts of the grain on the inclined elevating-table; but additional star-wheels may be employed, and they may be arranged both in rear and in front of the needle and packers, if desired. Instead of the friction-pawl arrangement described, any usual or preferred form of pawl and ratchet may be employed for preventing backward rotation of the star-wheel.

Just alongside of the slot for the needle in the breast-plate *D* is an arm or lever, *d*, which passes through a slot in the breast-plate, and is pivoted to the latter, the portion *d'* pendent below said plate forming a yielding abutment adapted to be acted upon by the upward pressure of the grain as the latter accumulates on the binder-table in quantities sufficient to form a bundle. This pressure upon and upward movement thereby of the arm *d'* of the lever *d* rocks the upright arm of the latter, and the latter acts through a rod, *a*, on a crank-shaft, *b*, mounted in bearing-brackets *b'*, secured to the bar *D'*, and thence through a sliding rod, *a'*, on the binder-mechanism trip, which is similar to the well-known Appleby trip, in which connection is made with the compressor, instead of with the independent tripping-lever hereinabove described.

By the arrangement described the trip-actuating arm or lever is located above the grain and forms a yielding abutment, which, by the pressure of the grain upon it, is crowded upward out of the path of the bundle in being discharged by the action of the bundle itself, while by the connection described I am enabled to get around the path of the revolving discharging arm or arms, thereby overcoming a difficulty that has heretofore prevented the use of the trip-actuating arm in the described relation to the overhanging knotter-shield, and to the revolving discharging-arms on the knotter-actuating shaft, while at the same time obviating the necessity of

employing mechanism other than the moving grain for withdrawing said trip-actuating device from the path of the bundle in being discharged.

In the construction herein described the lever-arm *d'* is not designed to act as a compressor, but independently thereof, the compressor being indicated at *H*, the lever *d d'* operating merely to trip and set in motion the binding mechanism when a certain degree of pressure of the accumulating grain on said arm is reached, and may be used in lieu of the compressor and packer-trips described in another application referred to, or as auxiliary or supplemental thereto, thereby giving increased certainty of action at the desired time, or when a certain degree of pressure of the grain is attained.

Having now described my invention, what I claim as new, is—

1. The combination, with the inclined elevating binder-table interposed between the grain-platform and the driving-wheel, of a star-wheel adapted to be rotated by the grain moving upward over said table and to prevent backward movement of the grain on said table, substantially as described.

2. The combination, with the inclined elevating-binder table and the packers for moving the grain upward on said table, of the star-wheel arranged above and adapted to be rotated by the grain moving upward over said table, and the endless butter, all for holding the grain against backward movement on said inclined table, substantially as described.

3. The combination, with a binder-table and packers for moving the grain on said table, of a star-wheel arranged to be rotated by the grain moving over said table, preventing a backward movement of said grain, substantially as described.

4. In a grain-binding harvester, the combination, with a binder-table located on the grain side of the drive-wheel, of a binder-arm operating from beneath said table, a knotting mechanism supported above said binder-table, a rotating discharge-arm connected with and operated by the knotter-actuating shaft, a yielding arm or abutment pendent from the knotter-support, and connections extending from said arm on one side of the rotating discharge-arm around the path of the latter to the binder-mechanism trip on the opposite side of said discharge-arm, for the purpose and substantially as described.

In testimony whereof I have hereunto set my hand this 2d day of June, A. D. 1883.

LEWIS MILLER.

Witnesses:

N. N. LEOHNER,
J. LEET YOUNG.