C. L. TRAVIS.
Grain-Binder.

No. 209,149. Patented Oct. 22, 1878.

Fig. 1.

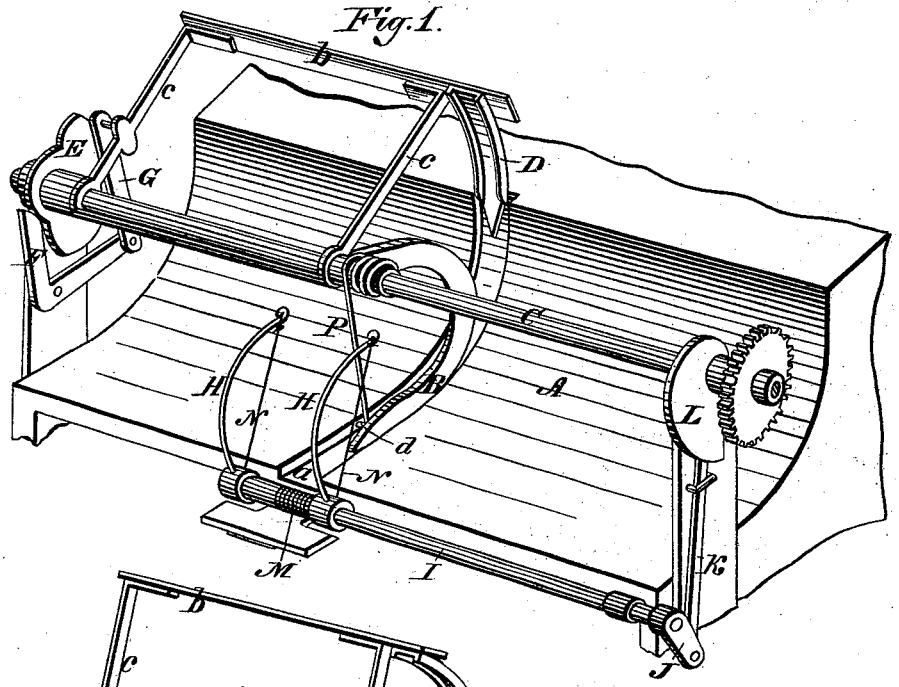


Fig. 2.

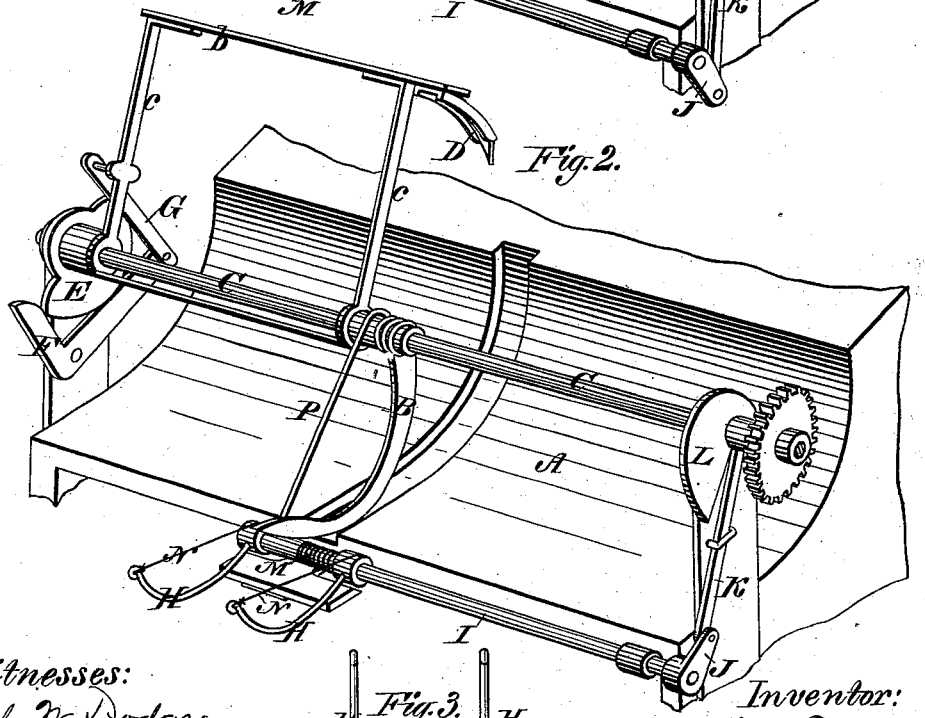
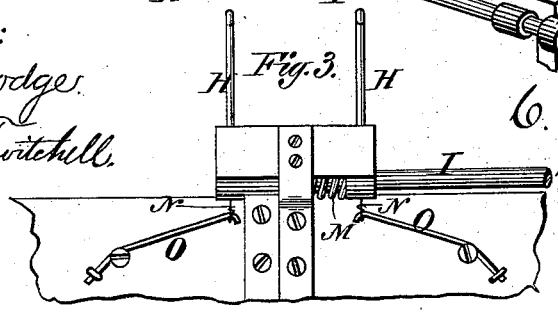


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES L. TRAVIS, OF MINNEAPOLIS, MINNESOTA.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **209,149**, dated October 22, 1878; application filed September 30, 1878.

To all whom it may concern:

Be it known that I, CHARLES L. TRAVIS, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Grain-Binders, of which the following is a specification:

The object of this invention is to secure a perfect separation of the grain which is to form each bundle or gavel from the mass of loose inflowing grain delivered from the conveyer or elevating mechanism, the invention being designed more particularly for use in connection with that class of binders in which the binder or wire-carrying arm has a continuous rotary motion.

The invention consists in the use of a vibrating divider or cut-off arm, arranged in a peculiar relation to the grain-receiver or binding-table and the binder-arm, to descend through the moving grain and prevent the further admission of the same to the receiver while that portion within the receiver is being bound; in hanging said divider upon the shaft which carries the binder-arm; in a peculiar arrangement of cams for operating the divider-arm; and in rocking or vibrating compressor-arms attached to the rear or delivery side of the receiver, and arranged to rise and fall at proper intervals and hold the grain while being bound, and subsequently release the bound bundles; and also in certain minor details of construction hereinafter described.

Figure 1 represents a perspective view of the improvements and the receiver of the binding-machine to which they are applied, the divider-arm being shown in its depressed position to shut off the flow of grain to the binder, and compressor-arms being in position to grasp and effect the binding of the bundle within the receiver. Fig. 2 represents a similar view, showing the parts in the position which they occupy at the instant of the delivery of the bound bundle from the machine, the divider-arm being elevated to admit the grain to the receiver to form the next bundle. Fig. 3 is a bottom-plan view, showing the manner in which the outer compressing-arms are operated.

The improvements are applicable to machines of different forms and constructions, but, as represented in the drawing, are designed particularly for application to the machine for which Letters Patent were granted to Olmsted, Travis, and Chute, dated April 23, 1878, No. 202,747.

A represents the concave receiver, into which the elevating or conveying mechanism delivers the grain and in which it is bound. B represents the binding or band-carrying arm, attached to the horizontal shaft C, and arranged to revolve always in one direction and to travel in its course through the transverse groove or channel in the receiver and pass the band-fastening devices, which will be located at the point *a*, at the lower edge of the receiver.

The binder-arm and band-fastening devices may be constructed and arranged as in the patented machine above referred to, or in any other suitable manner, these elements forming no part of the present invention.

D represents the divider-arm, curved in the arc of a circle, and arranged to descend at suitable intervals into or against the upper edge of the receiver, to form a bar against the further admission of grain.

As shown in the drawing, the divider-arm is attached to a transverse bar, *b*, which is in turn attached to and supported by two arms, *c*, which have their inner ends mounted upon and around the shaft C of the binder-arm, so that the divider-arm D moves in the arc of a circle concentric with the binder-arm. At its outer end the binder-arm shaft C is provided with a cam, E, which acts against an elbow-lever, F, pivoted to the main frame, and which, in turn, is pivoted to a link, G, connected with one of the arms, *c*, by which the divider-arm is sustained. The shape of the cam and the arrangement of parts are such that, as the binder-arm descends to separate the grain to form a bundle from the loose mass, it is preceded by the divider-arm, the point of which descends against or into the upper edge of the receiver, as represented in Fig. 1, where it remains during the continued downward movement of the binder-arm and the compression and binding of the bundle.

After the completion of the binding operation, and as the binder-arm delivers the bound bundle from the machine, the cam E, through intermediate devices, elevates the divider-arm, and loose grain is admitted to the receiver to

form the next bundle. It will thus be seen that by the intermittent rising and falling motion of the divider the inward flow of grain to the receiver is arrested at proper intervals, and a clean severance is effected between that portion which is to form the bundle and the loose portion above the receiver, the loose grain lodging against and being held back by the divider-arm.

For the purpose of compressing the grain and holding the same while being bound, two upright curved arms, H, are attached to a rock-shaft, I, located at the outer edge of the receiver or binding-table, and the under side provided with a crank-arm, J, connected to a sliding bar, K, which is acted upon by a cam, L, attached to the binder-arm shaft C. The form of the cam L is such that as the binder-arm descends with and against the grain to form a bundle through the intermediate parts, it causes the arms H to assume an upright position and support the grain on the outside against the pressure of the binder-arm on the inside, as represented in Fig. 1, and that as soon as the binding operation is completed the cam rolls the parts and permits the arms H to turn outward and downward, as represented in Fig. 2, so that the bundle may be discharged over them by the binder-arm. The outward movement of the arms H is rendered instantaneous by means of a spiral spring, M, applied to their shaft, as shown in Figs. 1 and 2. In order that in the compression of the grain a yielding pressure may be applied thereto, a cord, N, is extended from the outer end of each curved arm H to the inner end of the same, and there attached to a spring, O, secured to the under side of the receiver or frame, as represented in all the figures. These cords serve not only to exert a yielding pressure upon the bundle, but also as straight guides or supports, which admit of the bundle being readily discharged over the curved arms without danger of lodging or engaging therein. As an additional means of securing a spring-pressure upon the bundle, a spring-arm, P, is attached to the shaft of the binder-arm and extended outward in a straight line, or approximately a straight line, to the forward end of the binder-arm, where it plays between two supporting studs or pins, *d*, on the side of said arm.

The operation of the parts is as follows: A bundle having been delivered from the machine, the compressor-arms are elevated at the outer side of the receiver, and during the upward and forward movement of the binder-arm the divider remains in an elevated position, permitting the grain to pass under it to the receiver. As the point of the arm descends toward the grain, and slightly in advance, the divider descends and checks the flow of grain into the receiver, and in this position the divider remains while the binder-arm continues its movement downward and outward to effect the compression and binding of the bundle, after which the foregoing operation is repeated.

Having thus described my invention, what I claim is—

1. The combination, in a grain-binder, of a receiver, A, with a binder-arm rotating in one direction only, and a vibrating divider, D, mounted on the binder-arm shaft and actuated therefrom by intermediate devices, substantially such as shown.

2. The combination of the stationary grain-receptacle, the rotary binding-arm, and the compressor-arms, hinged at their lower ends to the outer side of the receptacle, and arranged to turn down at suitable intervals to admit of the bound bundle being discharged over them, as set forth.

3. The combination of the receiver with the rotary arm B and the vibrating divider-arm mounted on concentric axles.

4. In combination with the binder-arm shaft and the arms H, the rock-shaft I, crank J, rod K, and cam L.

5. The combination of the receiver, the binder-arm revolving in one direction only, the divider-arm located at the top of the receiver, and the arms H, hinged at the rear edge of the receiver, said parts being arranged to move in relation to each other in the manner and at the times set forth.

6. The curved compressor-arms H, in combination with the cords N connected with tension-springs.

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