

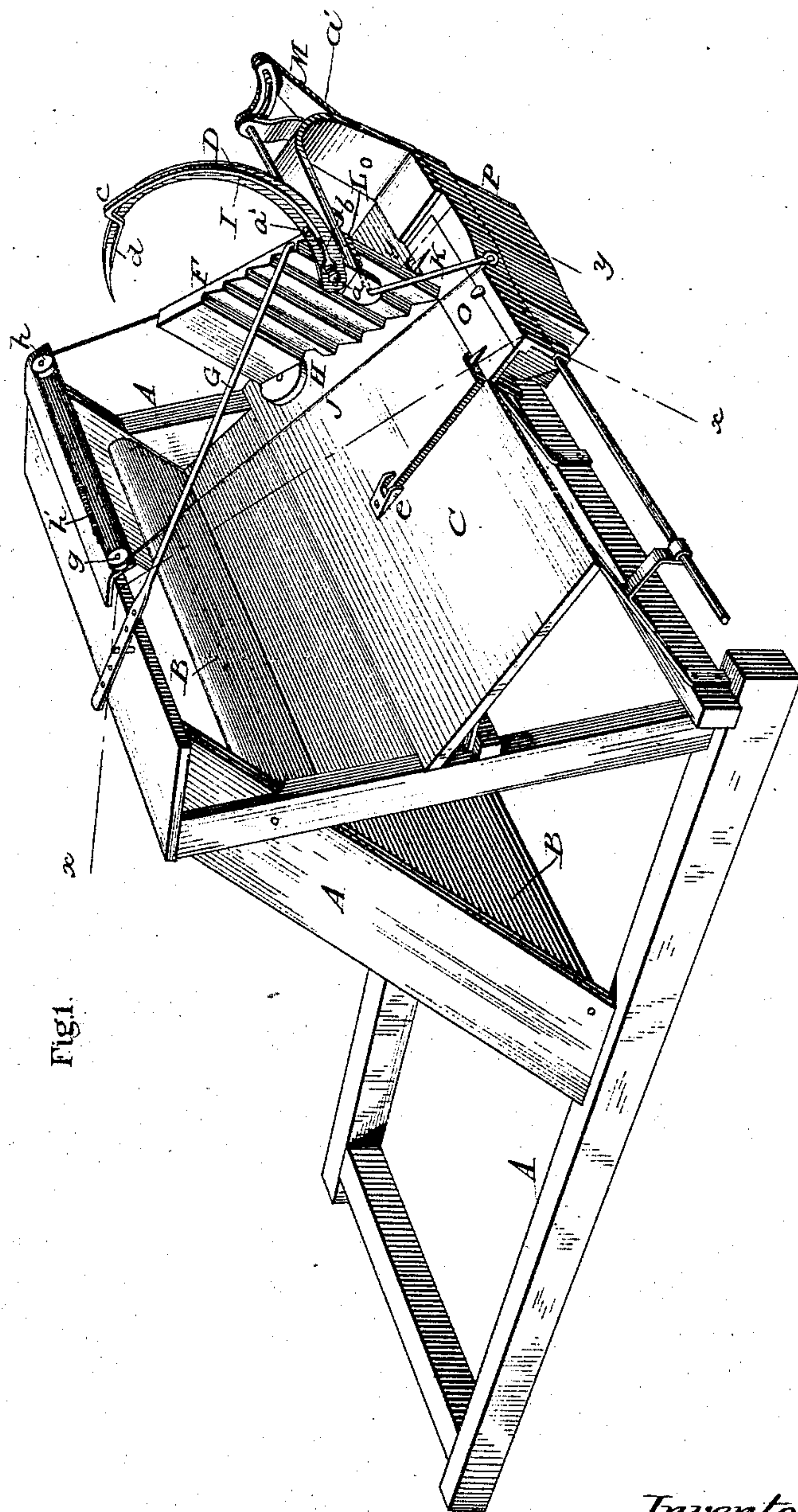
(Model.)

2 Sheets—Sheet 1.

C. L. TRAVIS.  
Grain Binding Machine.

**No. 241,451.**

**Patented May 10, 1881.**



*Attest.*

Sidney F. Hollingsworth  
Nathan Lane

*Inventor.*

C. L. Travis  
By Dodge & Co  
Attys



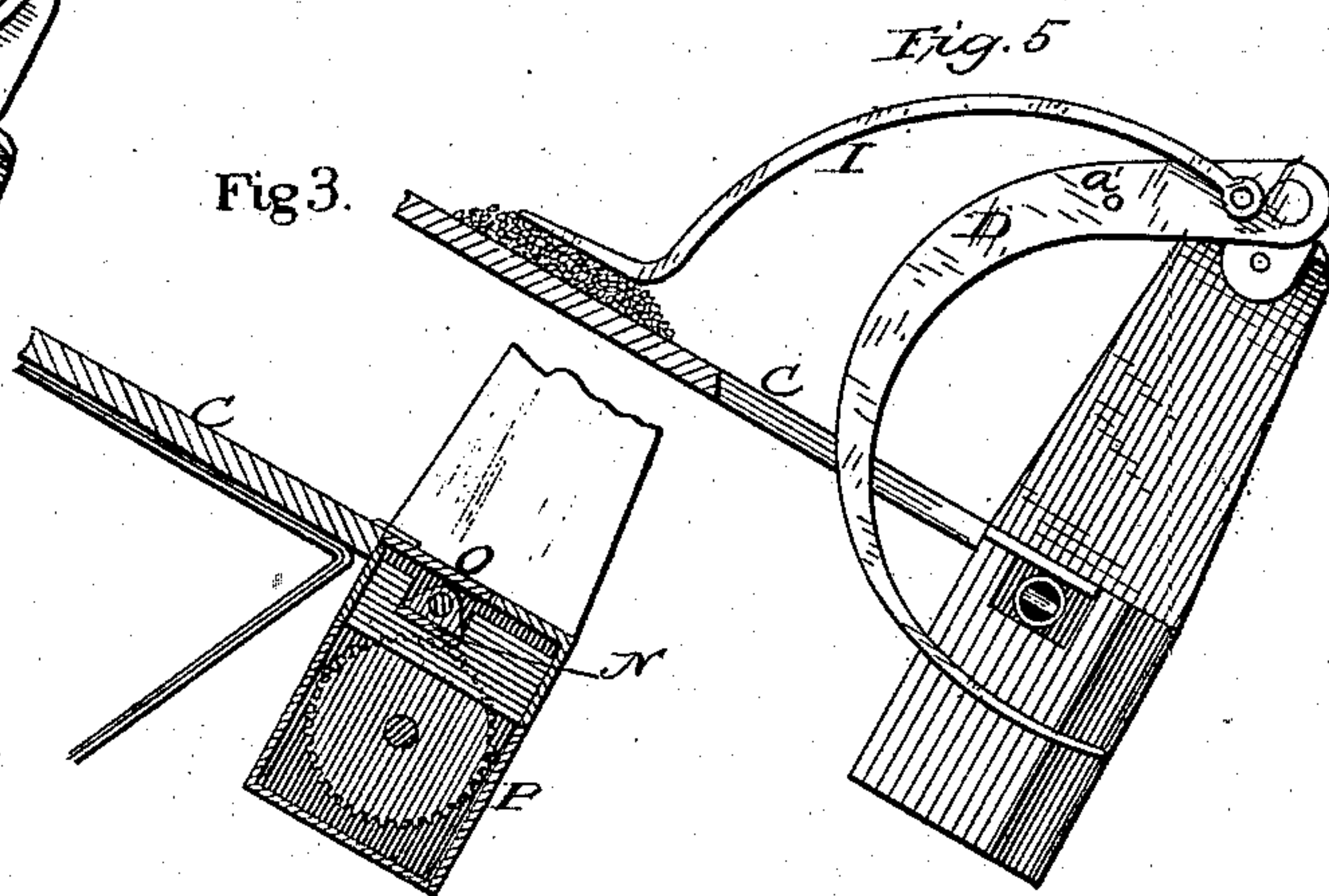
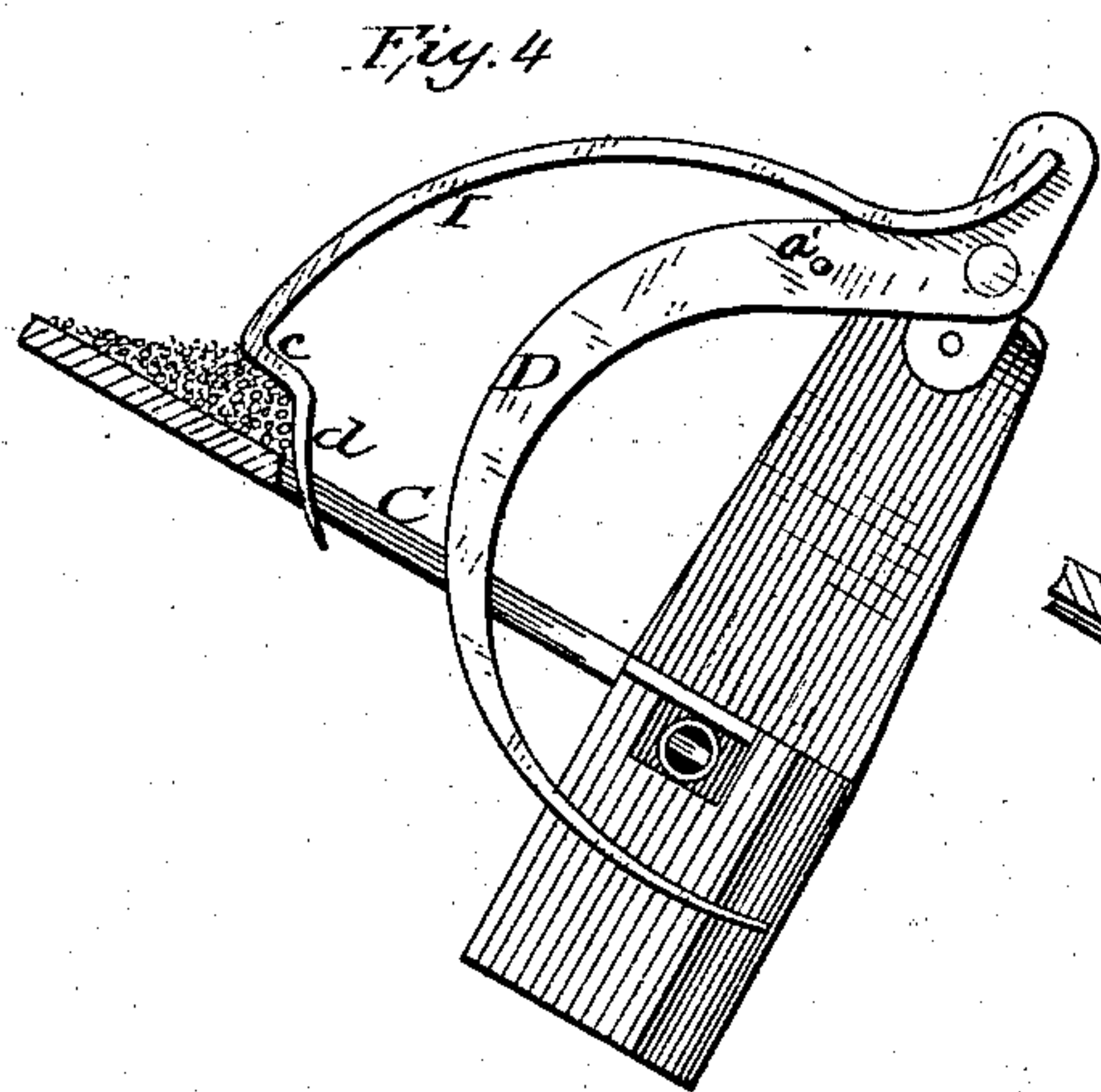
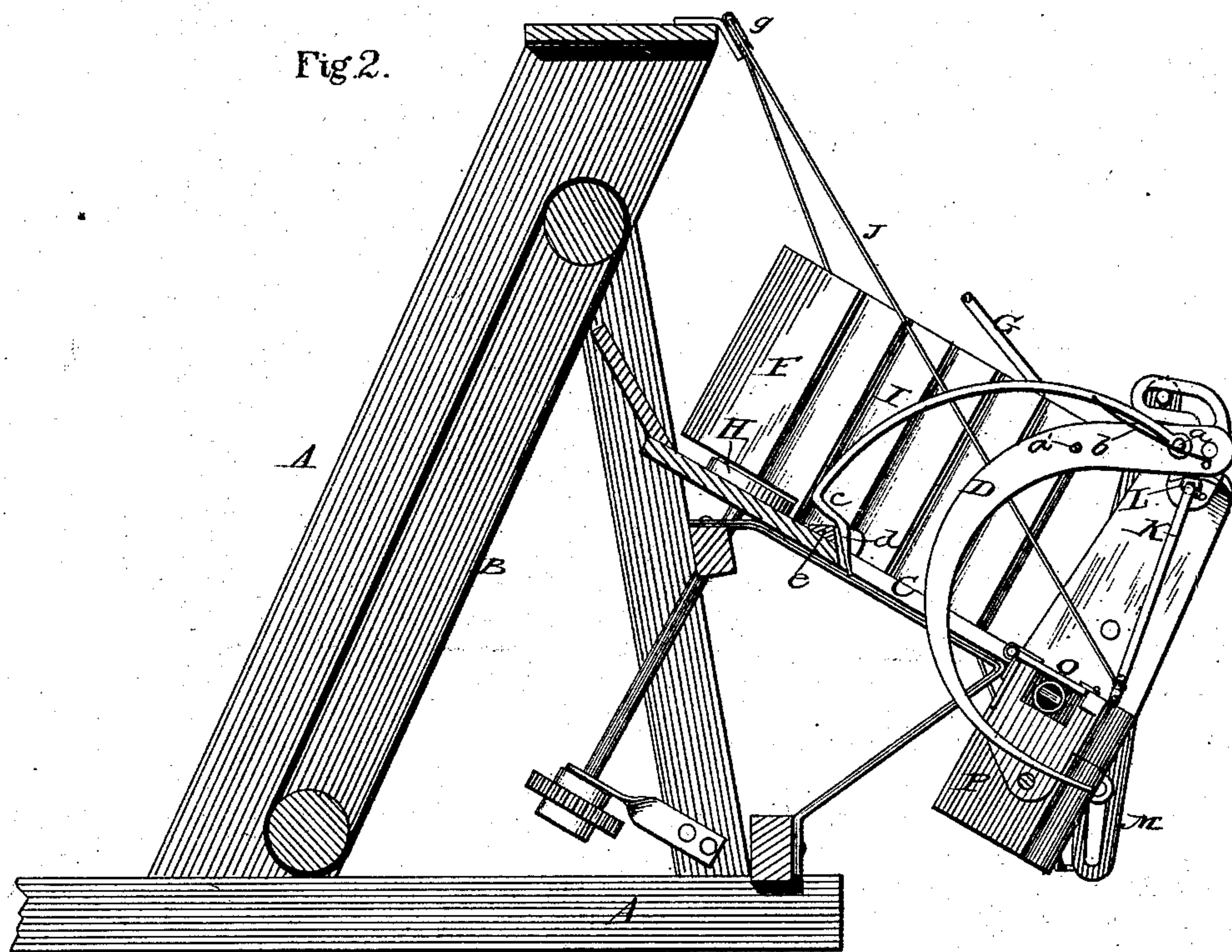
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# UNITED STATES PATENT OFFICE.

CHARLES L. TRAVIS, OF MINNEAPOLIS, MINNESOTA.

## GRAIN-BINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 241,451, dated May 10, 1881.

Application filed April 10, 1880. (Model.)

*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-Binding Machines, of which the following is a specification.

My present invention relates to various improvements, some of which are applicable to binding-machines in general, but which are intended more particularly for use in the machines for which Letters Patent have hitherto been granted to me.

One feature of the present invention consists in a vibrating butting-board located across one end of the binding-table, operated by means of a crank connected therewith and revolving in a substantially horizontal plane.

Another feature consists in a presser device to act upon and hold the loose grain on the binding-table during the separation of the bundle or gavel therefrom.

Another feature consists in a divider which pierces the stream of grain on the table from above at the proper point to separate a gavel therefrom, and then pushes back bodily the entire front of the mass remaining behind the gavel, so as to effect an entire and complete separation of the gavel from the mass.

Another feature consists in the construction and arrangement of the divider in such manner that it serves the double purpose of compressing the free grain and forcing the same backward from the gavel.

Another feature consists in a compressing-cord, arranged in a peculiar manner to act upon the gavel during the binding operation.

Another feature consists in a peculiar manner of mounting and arranging the knot-tying device and attendant parts in such manner that it may be instantly removed by hand without disconnecting or disarranging the other parts.

Except in the features constituting part of the present invention, the binder may be of any ordinary and suitable construction, and it may be applied to any harvesting-machine adapted to receive it.

The drawings represent my improved devices applied to the frame of an ordinary harvester in which the grain is carried over and delivered outside of the main wheel.

Figure 1 represents a perspective view of the

machine; Fig. 2, a vertical cross-section of the same on the line  $xx$ ; Fig. 3, a vertical cross-section on the line  $yy$ ; Fig. 4, a view illustrating the action of the combined divider and compressor; Fig. 5, a view illustrating the construction and action of the grain-holding compressor in a modified form.

A represents the frame of a harvesting-machine; B, the elevator-apron, by which the grain is carried over the main wheel and delivered upon the inclined grain-receiver or binding-table C, which is located on the outer side of the harvester-frame, as usual.

D represents the vertically-vibrating binder-arm mounted on one end of a horizontal rock-shaft, sustained in an overhanging arm or bracket located at the outer side of the binding-table, as shown in the drawings.

The construction and arrangement of the binding-table, the binder-arm, and its attendant mechanism, and the knotting devices and their driving mechanism located at the outer edge of the table, is essentially the same as in the machine described in my application for Letters Patent filed February 27, 1880, to which reference is made for a detailed description thereof.

The first feature of the present invention is the means for actuating the vibrating butting-board F, which is used to advance the butts of the grain on the binding-table and to move the grain endwise in order to cause the application of the band at the proper point thereon. This board is arranged and moves in the same, or essentially the same, manner as that shown in my prior patent granted upon the application above alluded to. The lower end of the board is held at the upper edge by a swinging rod or sway-bar, G, which has one end adjustably secured to the top of the harvester-frame, as in the former machine. The upper end of the board, instead of being driven as before, is mounted upon a crank-pin or wrist of a wheel, H, which is located upon or within the grain-table and rotated in a plane parallel with the face of the same. In the present instance the crank-wheel is mounted upon a shaft extended down through the table and provided with a pulley, to which motion will be communicated from any suitable part of the harvester or binder gearing. The rotation of the crank-wheel



H causes the board to swing against the grain and downward toward the outer edge of the table, and then backward and upward to the original position.

5 The present devices for moving the board are cheaper, more simple, and more easily operated than those in the former machine, and are noiseless in their action.

10 The essential feature of the present arrangement is the connection of the board to a crank rotating in the plane of the table, or substantially so, and the form of the crank and the details of connection may be changed, if desired.

15 The next feature of the present invention is the grain holding or compressing device to act upon and hold back the loose grain remaining on the table when the gavel is separated therefrom. This arm may be varied in form and arrangement provided it acts upon the loose  
20 grain to hold the same firmly in place as the gavel is removed therefrom by the binder-arm or equivalent device. In the drawings this grain-holding device is made in the form of an arm, I, curved to correspond with the binder-  
25 arm, and pivoted at its upper end to said binder-arm in advance of the shaft or axis of the latter. The arm I is free to swing upward or backward from the binder-arm, but during the elevation of the latter the arm I remains closed  
30 against its side, being sustained by a pin, *a'*, on the binder-arm, and held down upon the pin by a spring, *b*, as shown in Fig. 1. The lower end of the arm I is bent inward, as shown at *c*, and thence downward, as shown at *d*,  
35 Figs. 1, 2, and 4. The end *d* is pointed and designed to pierce the mass of loose grain with the binder-arm, while the part *c* is designed to bear upon the top of the loose grain which remains on the table outside of the binder-arm  
40 and hold the same firmly in place upon the table or receiver, as shown in Fig. 4. When the machine is in action the grain flows down upon the table. The binder-arm and arm I descend together and pierce the grain, and the  
45 latter, stopping above the table, holds the grain beyond or outside of the binder securely in place, while the binder-arm continues its movement downward through a slot in the table, as  
50 shown in Fig. 2, thereby carrying the gavel outward and separating it in a clean and perfect manner from the remaining grain. Owing to the peculiar location of the pivot which connects the holding or dividing arm to the binder-  
55 arm, the end of the former is caused to move toward the inner side of the table while acting upon the grain, and is thus caused to crowd the grain outside of the binder-arm backward from the gavel. The extent of the backward  
60 movement thus given to the divider may be increased to any desired extent by fixing the pivot of the divider a greater distance above or in rear of the shaft or axis on which the binder-arm swings.

65 The arrangement represented in Fig. 4 will give a much greater movement than that shown in the other figures.

While it is preferred to have the divider both pierce the grain and compress it upon the table, it may be constructed, as in Fig. 5, to act  
70 merely by compression, or it may be adapted to simply force the grain backward without compressing the same. The compressing end may be modified as desired.

While it is preferred to attach the dividing-arm to the binder-arm, as shown, it may be  
75 mounted on an independent support and actuated by any suitable mechanism.

As regards the compression of the grain on the table to hold it during the separation of the gavel, my invention includes any and all  
80 devices adapted to that end.

Many modifications in the form and arrangement of the device will suggest themselves to the skilled mechanic.

The drawings represent a small slotted block  
85 or shoulder, *e*, mounted upon the grain-table to act in conjunction with the divider-arm. This block, although advantageous, is not a necessity, and may be omitted.

It is to be noted as an important characteristic of my divider that it moves back bodily  
90 against the loose grain, and that the grain at the surface of the table is pushed back in the same manner as that at the top of the mass or stream. This pushing back of the entire front  
95 or end of the mass, at the bottom as well as at the top, is of great importance, in that it secures a much more perfect separation than could otherwise be attained. It is manifest  
100 that a divider which has little or no motion at the surface of the table will leave the grain undivided at that point.

The next feature of the invention is the compressing-cord. This cord (shown at J) is  
105 attached at one end to the lower end of a swinging arm, K, hung from the binder-arm support and urged outward and upward by a spring, L, as shown in Fig. 1. The end of the arm K  
110 is arranged to swing down to the outer edge of the binding-table, or nearly so. The cord is passed from the arm upward to a pulley, *g*, on top of the harvester-frame above the elevator;  
115 thence along the frame to a second pulley, *h*, on the front of the frame, and thence downward to the lower end of the vibrating-lever M, by which the binder-arm is actuated, as indicated in Figs. 1 and 2. As the binder-arm  
120 descends the lever M, drawing upon the cord, causes the same to pull down the arm K and draw tightly over the top of the gavel, so that the grain is compressed between the table, the  
125 cord, and the binder-arm. As the binder-arm rises the cord is slackened and the arm K elevated to permit the escape of the bound bundle over the outer side of the binding-table. In order to apply a yielding pressure to the  
130 grain and to relieve the parts a strong spiral spring, *h'*, is introduced into the cord, as represented in Fig. 1.

I am aware that compressor-cords have been  
130 arranged in various ways, and in connection with swinging binder-arms and other arms and



devices; but the arrangement shown herein I believe to be both new and superior to other arrangements.

The knot-tying mechanism, which may be of any suitable construction, but preferably of the construction shown in the previous application hereinbefore referred to, is all mounted on a plate, N, which is seated from the top into bearings in the metal base-frame, as represented in Figs. 1, 2, and 3. The frame, which is made with a closed upper surface to sustain the grain as usual, is provided in said surface with a hinged door or lid, O, the opening of which exposes and releases the plate N, so that the plate and entire binder device may be lifted out by hand. In order that this may be done conveniently the parts are recessed in the top to permit the plate to be dropped into place, and to hold it in position without the employment of screws or other fastenings, which require the use of tools to release them.

By mounting the tying mechanism as described, the attendant is permitted to examine, remove, and replace the same readily at any time.

The door or lid when hinged may be fastened down by a button or similar fastening, or it may be arranged to slide off endwise, in which case no fastening devices will be required.

I do not claim, broadly, herein a plate sustaining the entire tying device, and removable at will from the machine, as the same will be made the subject of a separate application. The present invention is limited in this regard to the peculiar construction and arrangement of the removable plate herein described and claimed.

The base-frame, which carries the mechanism in its under side, is closed at the top and sides and at both ends of the tying device, and to the under side of the frame there is applied a box or casing, P, adapted to cover the under side of the tying device and to fit upward around the same tightly against the under side of the main frame, as shown.

The part P may be secured by crowding it tightly to its place or by the use of buttons, hooks, screws, or other fastenings.

I do not claim as my invention a dividing-finger which ascends through a small guiding hole in the table and tips backward at the upper end, so as to push back the grain at the top of the mass without pushing back that which lies immediately upon the surface of the table. My invention is confined to a divider, which moves back the entire front of the mass remaining behind the gavel in such manner as to cause a separation at the surface of the table as well as at the top of the mass.

I hereby disclaim the following: In combination with the binder-arm, a separator-arm actuated to pass up alongside the binder-arm, between the gavel and the incoming stream of grain, and then move back against said stream. This disclaimer, however, is not designed to cover a divider which moves back at the sur-

face of the table, so as to force back that portion of the grain lying immediately upon said surface, but is designed to cover a divider which has a rocking or tipping motion backward from a small hole or bearing in the table, whereby the grain is forced back at the top of the mass.

I do not claim herein the broad idea of a divider and a binder-arm which separate after piercing the grain in such a manner as to force grain remaining on the table behind the gavel backward from the latter, the same constituting the subject-matter of a separate application; neither do I claim herein the application of the weight of the binding-machine, or any portion thereof, to produce friction for the purpose of sustaining the binder-arm in an elevated position; nor do I claim herein any other feature or features which may be shown in my prior application for patent filed February 27, 1880.

Having thus described my invention, what I claim is—

1. The combination of the binding-table, the butting-board located thereon, and the crank located in or upon the table and arranged to operate the board, as shown and described.

2. The combination of the binding table, the butting-board, and the crank having the upright wrist seated in or connected with the board.

3. The combination of a grain table or receiver, a binder-arm which descends through the grain to separate the gavel from the remainder, and a divider which descends with the binder-arm through the grain and there pushes the remaining grain backward away from the gavel.

4. In a grain-binding machine, an arm or device arranged to descend upon the loose grain in or upon the receiver or table and hold, by compression, the portion from which the gavel is separated.

5. In a grain-binding machine, the combination of a table or receiver to hold the loose grain, an arm to separate the grain for a bundle from the remainder, and a compressing device to hold the remaining grain firmly in place during the separation of the bundle therefrom.

6. The combination of the swinging binder-arm and the divider-arm pivoted thereto and arranged to push the grain backward, as shown.

7. The combination of the vibrating binder-arm and the supplemental arm attached thereto and arranged to descend and press on top of the grain, as described and shown.

8. The divider-arm, constructed and arranged to both pierce the grain and press thereon.

9. The combination of the binding-table, the pendulous arm K, located at the outer side of the table, the compressing-cord passed from the free end of the arm over the table, a binder-arm arranged to swing downward toward arm K, and a positively and intermittently acting mechanism, substantially such as described,



arranged to tighten the cord upon the grain as the binder-arm descends.

10. The combination of the binding-table, the binder-arm, the pendulous arm K, the compressor-arm cord connected at one end rigidly to the arm and at the other end to a positively-acting take-up mechanism, and the spring arranged to elevate arm K when the cord is released.

11. The combination of the swinging arm K, the compressor-cord, a positively-acting take-up mechanism arranged to tighten the cord around the grain upon the table, and a spring-connection between the cord and take-up mechanism, whereby the cord is caused to act with yielding pressure upon the grain.

12. The combination of the knotting mechanism, the plate supporting said mechanism entire, and the frame provided with the door

or lid in its face, and with a seat to sustain and hold the plate.

13. The combination of the binder-frame, the loose removable plate seated therein, and provided with the entire tying device, and the door or lid arranged to secure the plate in place.

14. In a grain-binding machine to which the grain is delivered in a continuous stream, the combination of a binding table or receiver, a binder-arm, and a divider arranged to pass through the mass of grain with the binder-arm and then move bodily backward and push back the grain lying immediately on the face of the table away from the gavel.

CHARLES L. TRAVIS.

Witnesses:

CHAS. R. CHUTE,  
C. H. BENTON.