(No Model.) 3 Sheets—Sheet 1.

C. A. BULLARD.

CORN HARVESTER.

No. 511,403 Patented Dec. 26, 1893.

Fig. 1.

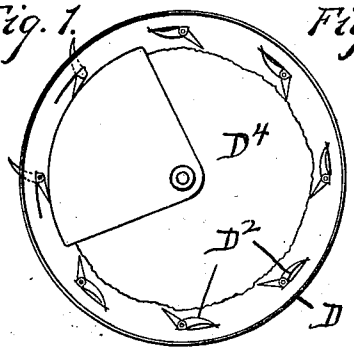


Fig. 2.

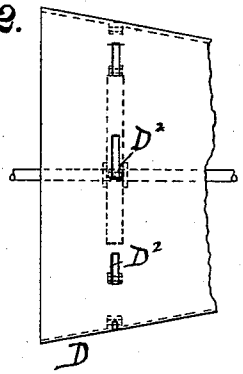


Fig. 5.

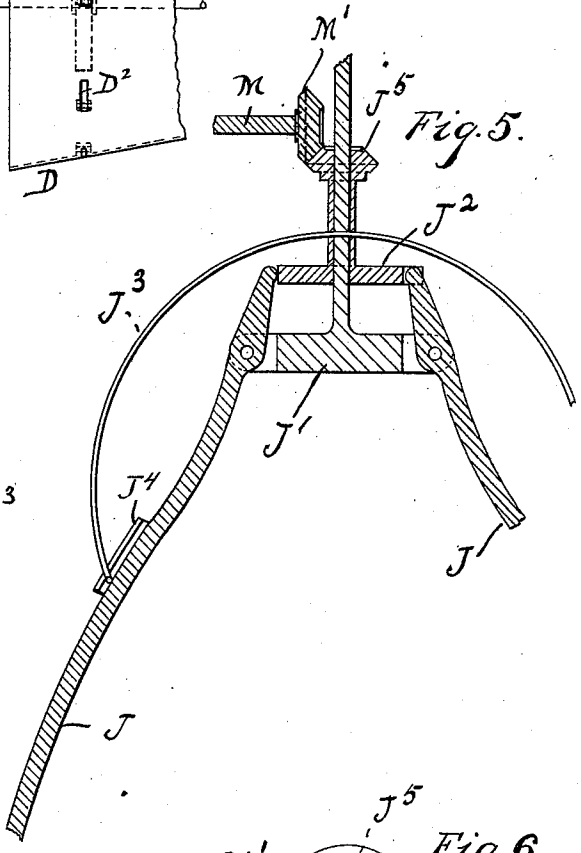
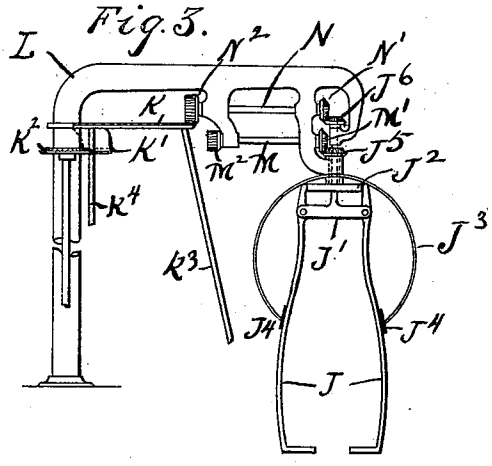


Fig. 3.



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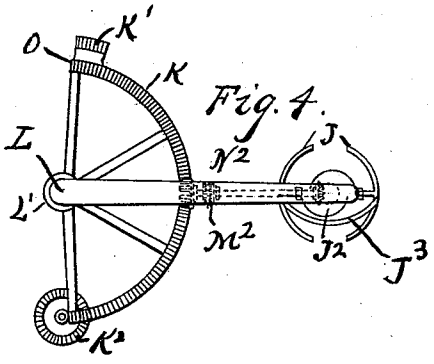
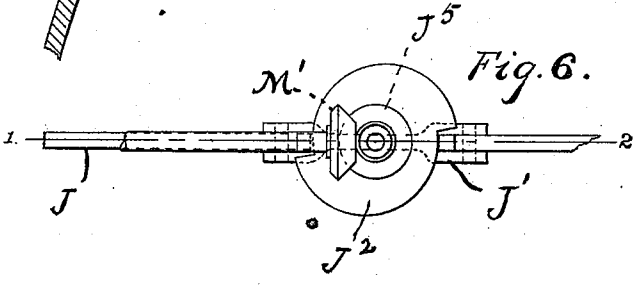


Fig. 6.



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CORN HARVESTER.

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Fig. 7.

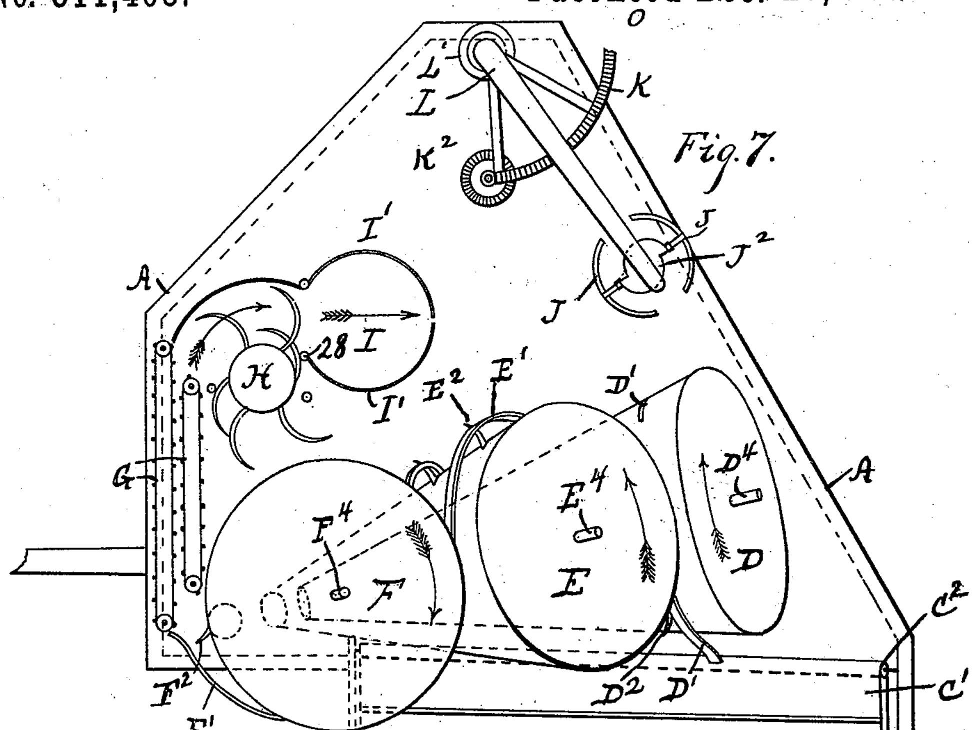
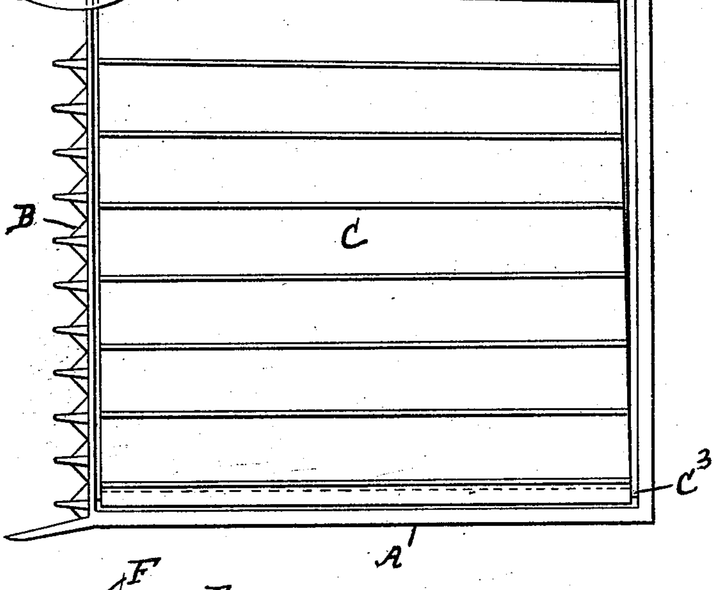

Fig. 8.

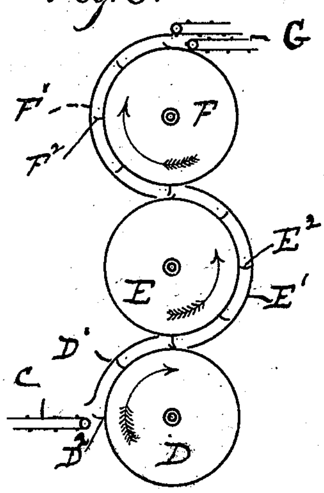

Fig. 9.

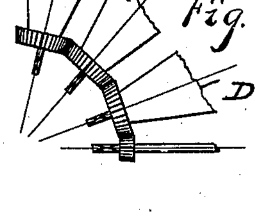

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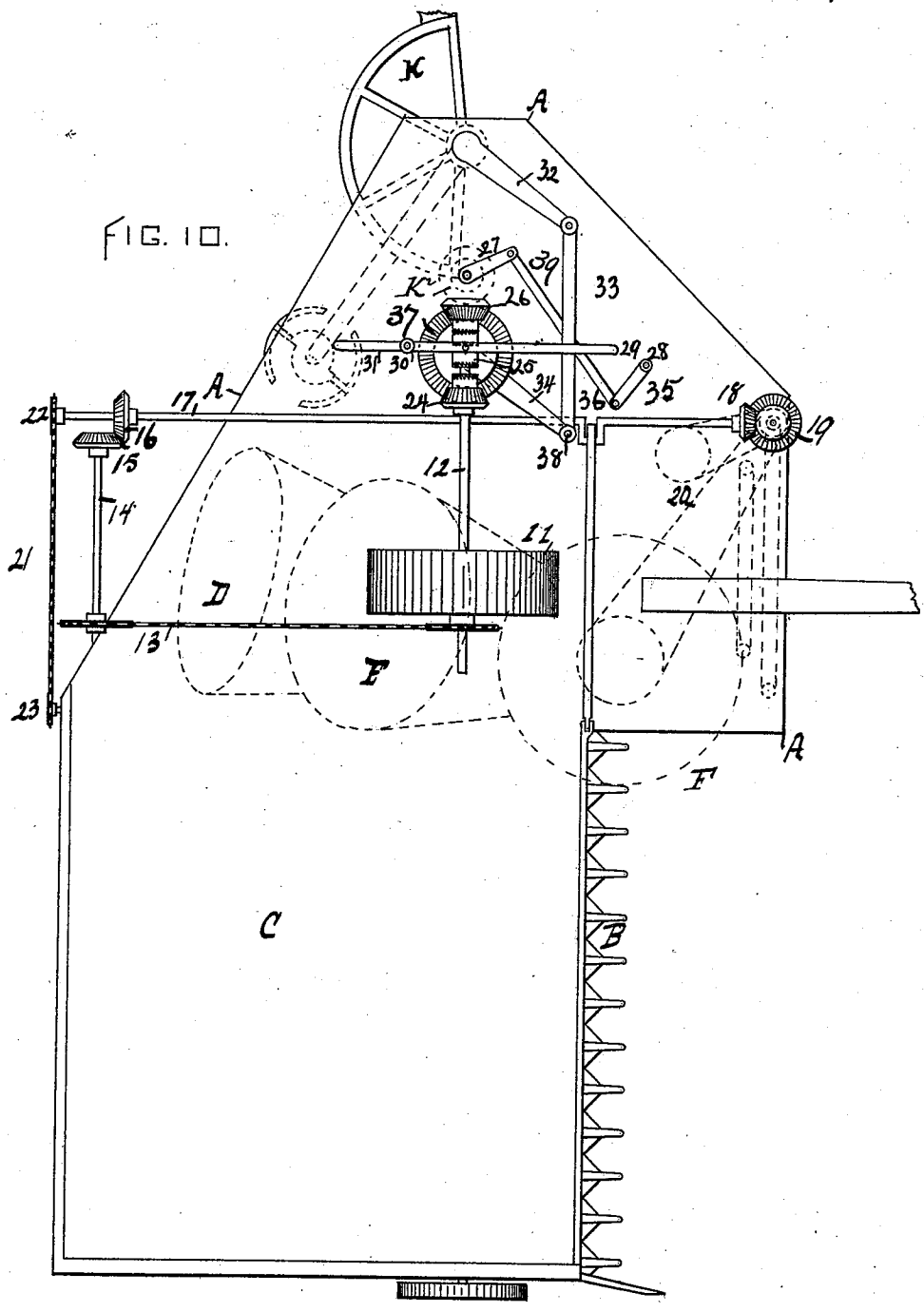
FIG. 10.



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UNITED STATES PATENT OFFICE.

CHARLES A. BULLARD, OF SHARON, MICHIGAN.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 511,403, dated December 26, 1893.

Application filed February 15, 1893. Serial No. 462,424. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BULLARD, of Sharon township, in the county of Washtenaw and State of Michigan, have invented a new and useful Improvement in Corn-Harvesters, of which the following is a specification.

My invention relates to corn-harvesters, and consists in the various improvements hereinafter described and pointed out in the claims.

Referring to the accompanying drawings—Figure 1, is an end view of one of the elevating cones, and Fig. 2, is a side elevation of a portion of one of the elevating cones. Fig. 3 is a side elevation of the swinging crane by which sheaves are removed from the machine. Fig. 4, is a plan of the same. Fig. 5, is a section on the line 1, 2, Fig. 6. Fig. 6, is a plan of the apparatus shown in section in Fig. 5. Fig. 7, is a plan of the harvester as a whole. Fig. 8, is a diagraphic representation of the cones, their guards, and auxiliary conveying belts, showing the relative motions of the cones. Fig. 9, is a detail view showing the method of gearing the elevating cones together; and Fig. 10, is a bottom plan view of the entire machine.

A, A, A, is the frame of the machine. B, is an ordinary cutter-bar; C, a traveling canvas platform, raised or tilted up at C′.

D, E, and F, are cones for raising the corn-stalks into a vertical position. Said cones turn upon shafts F^4, E^4, D^4. Said shafts are placed in the same vertical plane, extend at an angle to each other, and all point to the same center as shown in Fig. 9. The canvas C, travels laterally toward the cones D, E, F, running on rollers C^2, and C^3. The roller C^3, is horizontal and the end of the roller C^2, which is at the position marked C′, in Fig. 7, is raised, the other end of said roller being on a level, or in the same horizontal plane as the roller C^3, so that the top ends of the corn-stalks carry up in the direction of a vertical position, thus obviating the necessity of large bungling cones or a large number of cones, in order to bring the stalks into a vertical position.

D^2, E^2, F^2, are fingers upon the cones D, E, F, adapted to engage with the corn stalks as the cones revolve, and raise said stalks to a vertical position.

D′, E′, F′, are guards adapted to hold said stalks in engagement with the fingers D^2, E^2, F^2. These guards are on opposite alternate sides and conform to the shape of the cross section of the cones, as shown in Fig. 8 in which figure the platform canvas is indicated at C. G, are upright traveling canvas carriers.

H, is an ordinary packer with fingers similar to those already in use on grain binders.

L, is an automatic crane employed to deliver the sheaf clear and away from the machine, and also to impart to the sheaf a rotary motion so as to spread out its lower part to adapt it to stand in an upright position, as hereinafter described.

J, J, are clasping-arms pivoted to the ends of the horizontal arm of the crane L, so as to turn in a horizontal plane.

J^2, is a double cam secured to a sleeve which surrounds the shaft connecting with the yoke J′, and pivoted to the end of the horizontal arm of the crane L.

J^3, is a spring the ends of which rest in sockets J^4, upon the arms J, J. The spring J^3, acts by its resilience to force the arms J, J, open.

J^5, is a bevel gear wheel upon the sleeve connecting with the cam J^2, and J^6 is a bevel gear wheel upon the shaft connecting with the yoke J′.

M, and N, are horizontal shafts pivoted so as to turn in bearings upon the end of the horizontal arm of the crane L.

M^2, is a gear wheel upon one end of the shaft M, and M′, is a bevel gear wheel upon the other end of said shaft. The teeth of the bevel gear wheel M′, mesh with the teeth of the bevel gear wheel J^5.

N^2, is a gear wheel upon the inner end of the shaft N, and N′, is a bevel gear wheel upon the outer end of said shaft. The bevel gear wheel N′, meshes with the bevel gear wheel J^6.

K, is a horizontal stationary toothed sector, the teeth of which mesh with the teeth of the gear wheel N^2.

K′, is a small horizontal toothed sector rigidly secured at one side of the sector K. The teeth of the sector K′, engage with the teeth of the gear wheel M^2, when said gear wheel is brought over said sector by the swinging of the horizontal arm of the crane L.

K^2, is a bevel wheel turning in a horizontal plane located at the inner end of the sector K, and adapted to engage with the gear wheel M^2, when said gear wheel is brought over said bevel wheel by turning of the horizontal arm of the crane L.

The operation of the above described device is as follows: The standing stalks are cut by the knife B, and fall upon the carrier C, by which they are conveyed to the cone D, and at the same time are brought a little way toward a vertical position because of the rising of said carrier toward the corner C'. The stalks are then taken by the fingers D^2, brought still farther toward a vertical position and passed along to the fingers E^2, and by them still farther elevated and passed to the fingers F^2. The fingers F^2, raise the stalks to a vertical position and pass them to the belts G, by which they are passed to the packer H, and thereby formed into a bundle or sheaf in the inclosure I. The clasping arms J, J, being spread apart by the spring J^3, the crane L, is turned until said arms are in position to grasp the sheaf. At this position of the crane, the wheels K^2, M^2, engage with each other. The rotation of the wheel K^2, acts through the wheel M^2, shaft M, and bevel gear wheels M', J^5, to turn the double cam J^2, thus closing the arms J, J, thus grasping the sheaf. The crane L, is now turned back toward the rear of the machine drawing the sheaf out of the inclosure I. As the crane L, turns, the wheel N^2, is rotated by the sector K, thus imparting a rotary motion to the arms J, J, and consequently the engaged sheaf, through the shaft N, bevel gear wheels N', J^6, and yoke J'. The rotary motion of the sheaf causes the lower ends of the stalks to spread apart by centrifugal force. When the sheaf has been carried beyond the machine the teeth of the wheel M^2, engage with the teeth of the sector K', and the shaft M, is rotated thereby, turning the double cam J^2, as before described, until the upper ends of the arms J, J, are opposite the narrower width of the cam J^2, thus allowing the arms J, J, to be spread by the outward pressure of the spring J^3, releasing the sheaf, which is thus dropped vertically down beyond the machine. The stalks being spread out at the lower end of the sheaf form a large base, so that the sheaf will remain standing in a vertical position.

The means of conveying motion to the various parts of the machine is indicated in Fig. 10 and briefly described as follows:—The drive-wheel 11 imparts motion through the shaft 12 to the clutch 25, which is fastened to the shaft 12 by means of a sliding key or feather. The two bevel gears 24, and 26 are fastened loosely to the shaft 12, so that they impart motion only when clutched. The clutch 25 is provided with the ordinary loose collar and yoke lever for throwing. The opening of the inclosure I, by the withdrawal of the shock therefrom partially revolves the shaft 28 and the lever arm 35, which is fastened to it. The pin 36 striking the end of the lever arm 29 throws the clutch 25 into engagement with the clutch on the gear wheel 26. This causes the large gear wheel 37 and lever 34 to revolve until the crane L, has completed its partial revolution when the clutch is thrown out. The lever 34 being thus set in motion imparts its motion to the crane L through the lever 32 and connecting rod 33, the lever 32 being fastened to the upright column of the crane. When the crane L, has swung around enough to deliver the shock, the lever 34 will have passed around so that the pin 38 which projects above the lever 34 will strike the end 31 of the lever 29 31, and this said lever being pivoted at 30, throws the clutch 25 so as to disengage the gear 26 and engage the gear 24, thus reversing the motion of the crane. Motion is given to the gear wheel K^2, through the lever 27 keyed upon the same shaft with said gear wheel, the connecting rod 39 and lever 35. The upright traveling canvas is moved by means of the sprocket chain 13, shaft 14, gears 15 and 16, shaft 17 and bevel gear wheels 18 and 19; and sprocket chain (shown dotted) 20 rotates the cones. The canvas C, is moved by sprocket chain 21 and sprocket wheels 22, and 23.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination in a corn-harvesting machine, of a tilted carrier C, C', and a series of elevating cones D, E, F, substantially as and for the purpose described.

2. The combination in a corn-harvesting machine of a swinging crane, clasps J, J, pivoted to said crane and means for giving said clasps a rotary motion substantially as shown and for the purpose described.

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Witnesses:
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