

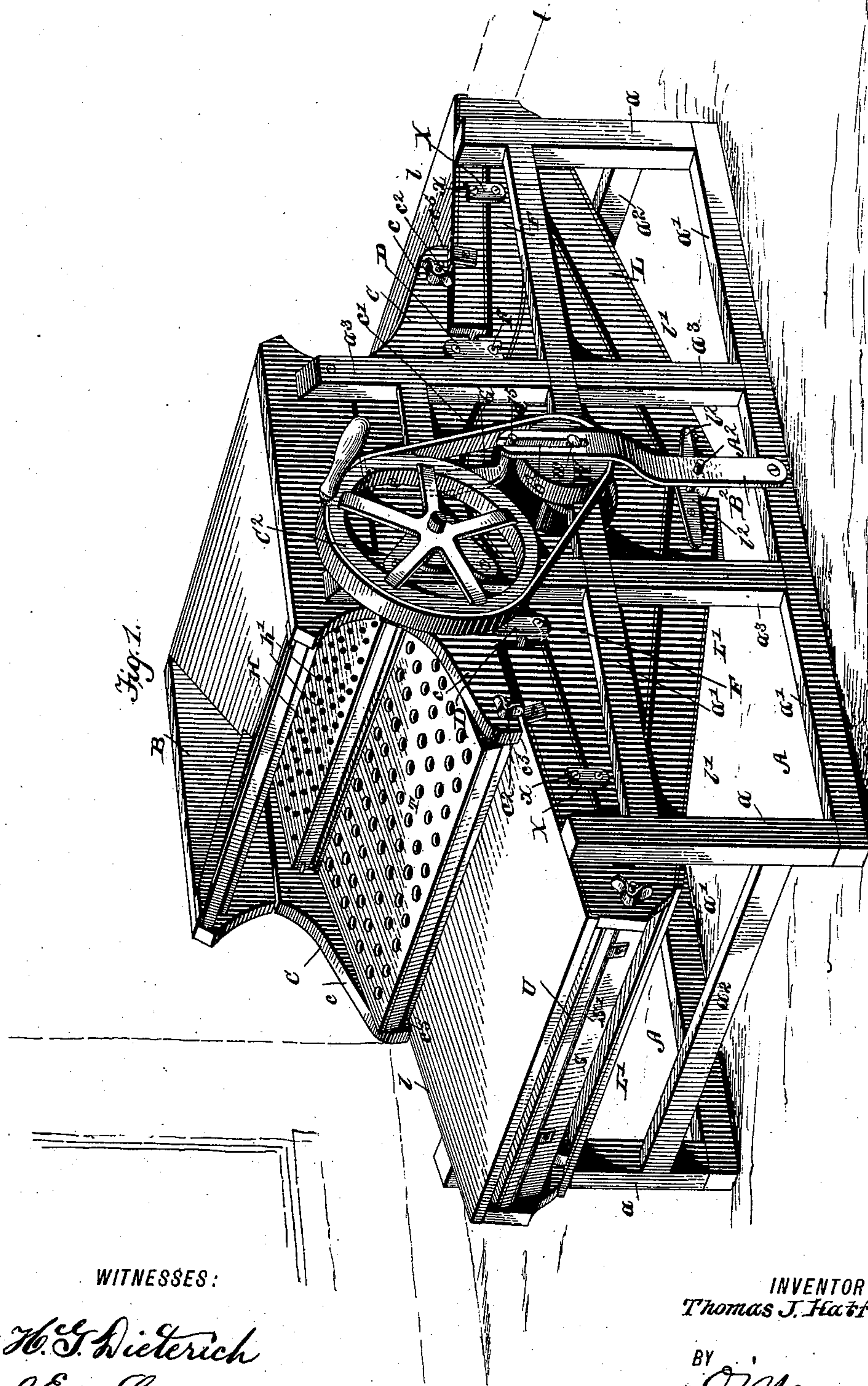
(No Model.)

3 Sheets—Sheet 1.

**T. J. HATFIELD.**  
**GRAIN AND SEED CLEANER.**

No. 574,354.

Patented Dec. 29, 1896.



**WITNESSES:**

H. G. Dieterich  
J. Edw. Lockett

INVENTOR  
Thomas J. Hatfield

BY *O'Neal & Co.*  
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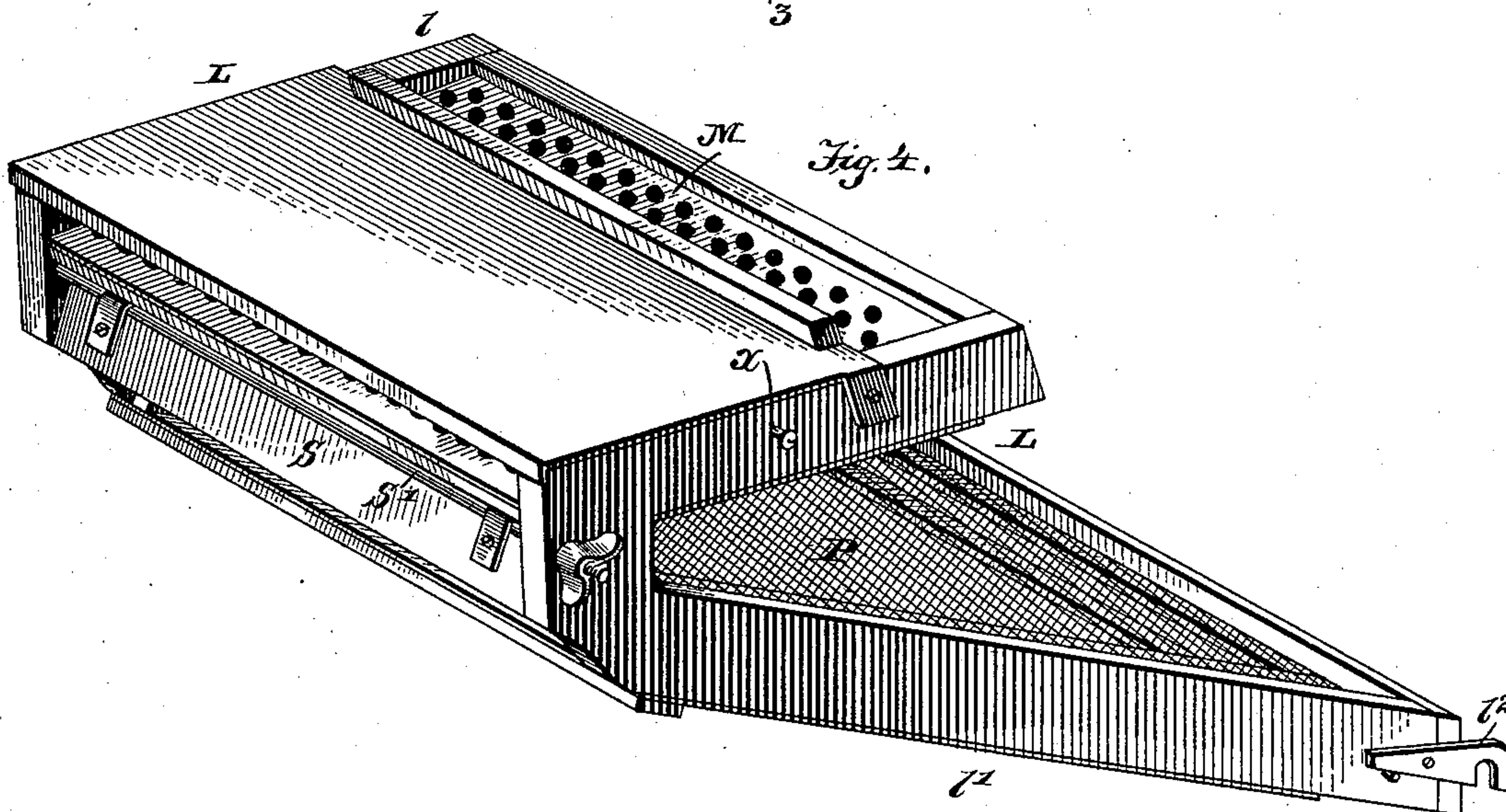
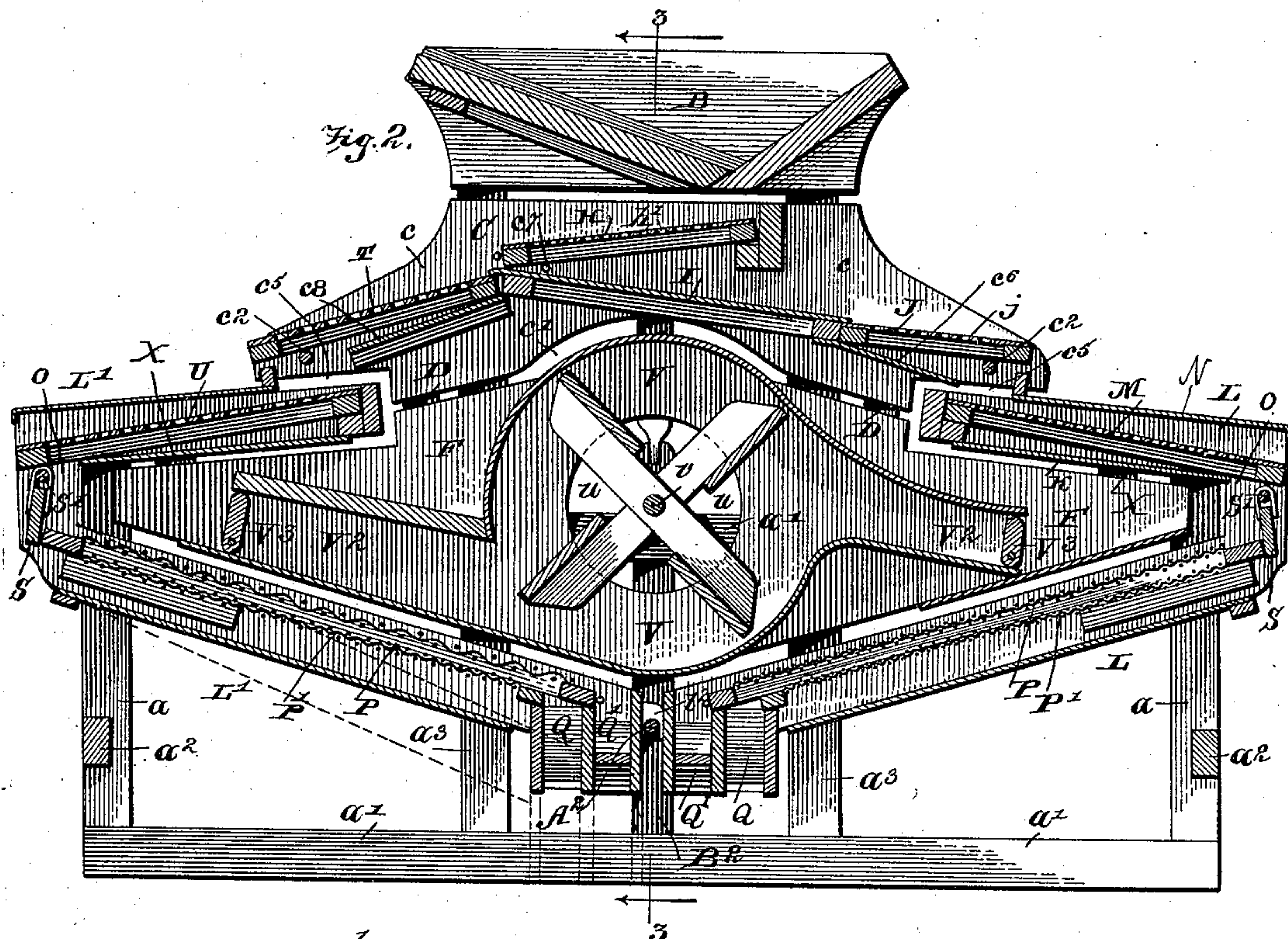
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Fig. 3.  
B

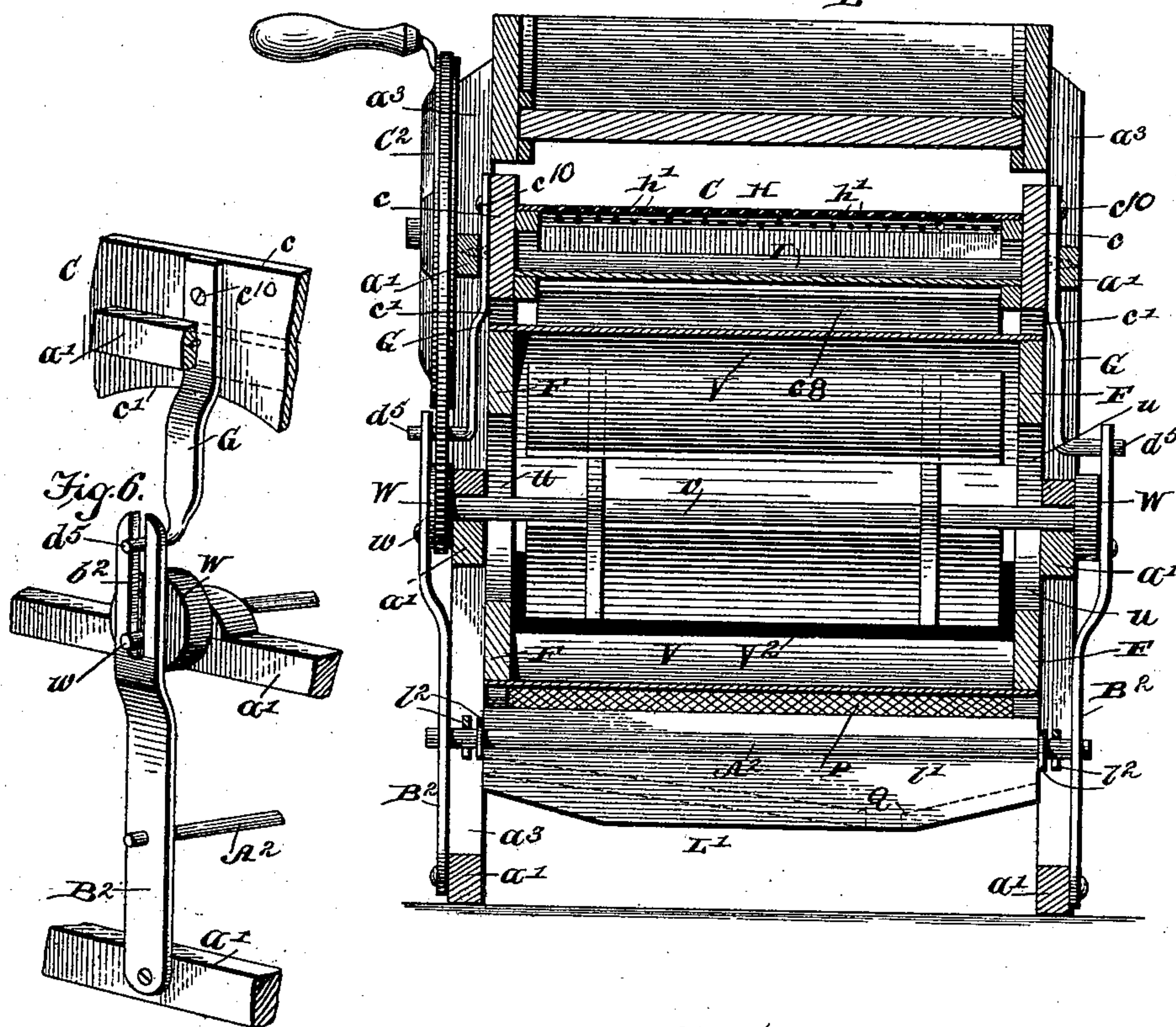
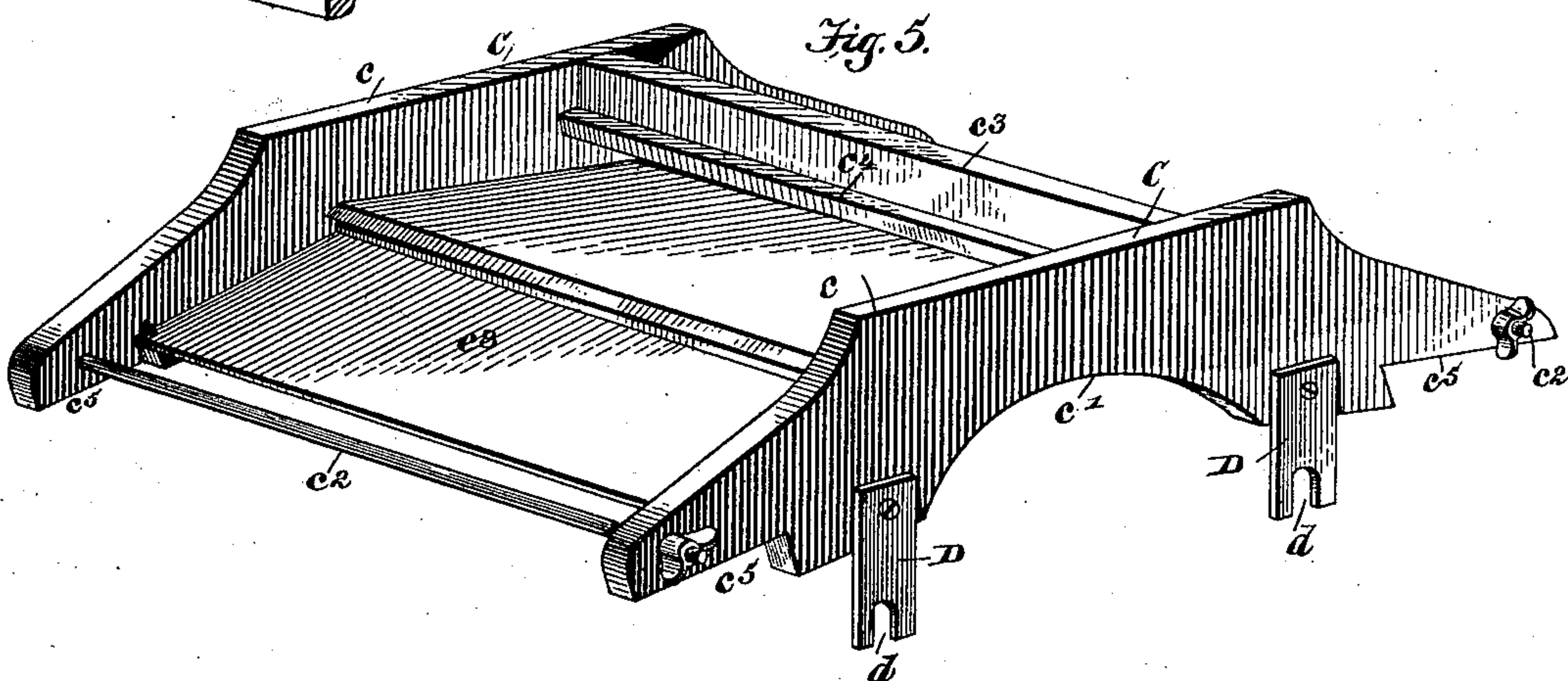


Fig. 6.



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# UNITED STATES PATENT OFFICE.

THOMAS J. HATFIELD, OF DUBLIN, INDIANA.

## GRAIN AND SEED CLEANER.

SPECIFICATION forming part of Letters Patent No. 574,354, dated December 29, 1896.

Application filed January 27, 1896. Serial No. 577,028. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS J. HATFIELD, residing at Dublin, in the county of Wayne and State of Indiana, have invented a new and Improved Grain Cleaner and Separator, of which the following is a specification.

My invention is in the nature of an improved grain cleaning and separating mill; and it primarily has for its object to provide a mill of this character of a simple and economical structure in which the several shoe or screen carrying frames can be quickly set in position and in which the several parts are so arranged and combined as to provide a machine of this character of great capacity, easily manipulated or operated, and which will effectively serve for its intended purposes.

My invention also seeks to provide a machine of the character stated having the shoe or shaking gearing so arranged that it can be quickly adjusted and set to permit of a quick removal of the grading-screen carrier or shoe members without requiring the drawing of a single screw or bolt.

Furthermore, my invention has for its object to provide a separating and cleaning mill having a double set of separating and cleaning devices which can be operated in unison or one set operated while the other set is held in a non-operative condition.

With other objects in view, which hereinafter will appear, my invention consists in a combined cleaning and separating mill, such as will be first described in detail and then be specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved grain cleaning and separating machine. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a transverse vertical section taken on the line 3 3 of Fig. 2. Fig. 4 is a perspective view of one of the grading-screen-carrying shoes. Fig. 5 is a perspective view of the detachable separator shoe or frame hereinafter referred to, and Fig. 6 is a detail view of the shaking or shoe-vibrating mechanism.

Referring now to the accompanying drawings, in which like letters indicate like parts in all the figures, A indicates the main frame of my improved separator and cleaning ma-

chine, which consists of four upright posts *a* at each side, horizontal tie-pieces *a'* *a'* and transverse brace-beams *a''*, arranged substantially in the manner shown in Figs. 1 and 2. The central timbers *a'''* *a'''* are extended and form the supports for the hopper B, which is secured thereto detachably or fixedly in any desired manner, preferably with bolts and nuts. Beneath the hopper is held a separating mechanism C, which is so constructed as to be readily adapted to separate all kinds of grain.

The separator C, the construction of which is most clearly shown in Fig. 5, consists of the cheeks *c* *c*, having curved cut-away portions *c'* to admit of the separator being held down close over the centrally-disposed fan-chamber, presently referred to, such cheeks being joined at the ends by cross-rods *c''* *c''* and the connecting-bar *c'''*, having a ledge *c''''*, such cheeks being further joined by the transverse grain and chaff slide portions *c''''''* *c''''''*, as will hereinafter appear, such cheeks also having cut-out portions *c''''''''* *c''''''''* in their outer ends, as shown.

The separator frame or shoe C is held to vibrate under the hopper, and for such purpose and to permit of its being quickly lifted out from the main frame when the hopper is removed without drawing a single screw or bolt such frame has pendent metal rest members D D, having notched or socket ends *d* *d*, which are adapted to seat upon lugs *f* *f* on the sides of the main frame, as clearly illustrated in Fig. 1, such cheeks *c* *c* being also pivotally connected centrally, as at *c''''''*, with the upper vibrator-arms G, the detail construction and the operation of which will appear farther on.

By referring again to Fig. 2 it will be observed that the hopper is disposed centrally of the machine and the separator-frame below it, but extended at each end thereof, it being also observed that when fitted in place the connecting-piece *c'''* and ledge *c''''* are at a point to one side of the discharge end of the hopper, and the slide members *c''''''* *c''''''* are disposed at a point near the opposite ends of the frame C and incline downward.

Directly under the hopper and resting with one end upon the ledge *c''''* and the other end upon studs *c''''''* on the cheek-pieces *c* is dis-



posed a separator-screen H, having a screen-plate having small holes  $h'$ , through which the small grain as it passes from the hopper falls onto a transverse slide-plate I, inclined in a direction reverse to the incline of the screen H, and which leads the small grain onto a second separating-screen J, held on the slide-plate  $c^6$  and the adjacent cross-rod  $c^2$ , the front end of which is held to discharge onto a slide-plate N, carried by the cleaner-shoe L, and from which it passes into a suitable receiver. (Not shown.) The smaller grain as it passes onto the screen J passes through the screen-plate  $j$  onto the slide-plate  $c^6$ , from which it is discharged onto the screen M, carried by the shoe L, through which it passes onto a solid slide-plate K, which leads it to the throat O, where it drops down onto the grading-screen P P', of different mesh, from which the graded grain passes into transverse troughs Q Q', which troughs, as also the screens P P', are carried by the shoe-frame L.

By reference to Fig. 4 it will be observed that the shoe-frame L consists of side pieces formed practically Z-shaped, the upper portion  $l$ , however, shorter than the lower portion  $l'$ , the apex or outer end of such frame having a grain-board S secured to a pivot-rod S', which can be readily turned and held to its adjusted position in such a manner as to project the said board upward or downward as may be desired to suit the grain. In the opposite end of the separator-frame is held a separator-screen T of large mesh, through which the large grain passes onto the slide-plate  $c^8$ , from which it passes onto a separating-screen U, held in the upper end of a shoe L', constructed exactly like the shoe L and having similarly-arranged throat, grain-board, grading-screens, and receiving-troughs, as shown, the separating and grading screens at one side being arranged to separate and grade the large grain, while the similar devices at the opposite side are for separating and grading the small grain, such construction and arrangement of parts rendering the machine of great capacity and enables me to separate wheat from oats and all kinds of grain.

It will be observed by reference to Fig. 2 that the machine is cased in at the sides at points between the agitator and the lower portions of the shoes L L' by the side boards F, which have central apertures  $u u$ , forming an air-inlet for the fan-chamber and a passage for the ends of the fan-shaft  $v$ , which is journaled in the side timbers of the main frame and carrying the crank-disks W W, provided with crank-pins  $w w$ , as clearly shown in Figs. 1 and 6.

V indicates the fan-chamber, disposed centrally of the machine and formed at the ends with extended blast-throats  $V^2$ , in the ends of which are pivoted valves  $V^3$ , adapted to be operated from the outside of the machine in any suitable manner, so that the air can be deflected upward and downward as may be desired.

One of the essential features of this invention is the peculiar manner in which the shoes L L' are connected to the main frame, whereby they can be quickly and easily removed when it is desired to change the screens carried thereby. For this purpose forked linked members X are pivoted to the side portions of the main frame, the forked ends of which are adapted to receive the studs  $x x$  on the upper members of the shoes L L', such links X forming swinging bearings for the upper ends of the said shoes L L'. The lower ends of the shoes L L' have hook members  $l^2$  at the lower ends, which are adapted to fit loosely on a cross-rod  $A^2$ , the ends of which are secured to swing or vibrator arms  $B^3$ , pivoted at the lower end on the base-timber of the main frame and having their upper end slotted, as at  $b^2$ , to receive the crank-pin on the fan-shaft disk and the crank member  $d^5$  of the swinging bar G, as most clearly shown in Fig. 6. The fan-shaft disk is belted to a main drive-wheel  $C^2$ , journaled on the main frame, which may have a handle member, as shown, or a band-pulley member, (not shown,) it being understood that while I have shown a plain disk and belt-drive mechanism the disk wheel  $C^2$  may be in the nature of sprocket-wheels and the belt a sprocket-chain.

So far as described it will be readily apparent that either shoe L or L', or both, may be quickly lifted from the machine by disengaging the hook members  $l^2$  from the rod  $A^2$  and by lifting the upper ends from engagement with the links X. If desired, one shoe L' may be lifted from the rod  $A^2$  (see dotted lines, Fig. 2) and remain idle as the grain is separated, cleaned, and graded by the mechanism at the opposite end of the machine, it being understood that when operated in this manner the screen under the hopper is removed. Thus either of the shoes L L' or the separator-frame may be lifted from the main frame without removing a screw or bolt further than to disconnect the swinging members G G.

In use my machine will clean and separate and grade all kinds of grain without shifting or changing of screens. The grain as it passes onto the first screen-plate is separated, the large grain going to one side to be separated, cleaned, and graded and the small grain going to the other side, the chaff or other light impurities passing out over the slide-plates at the ends and blown off by the fan-blasts, which are produced by the single fan forcing the blast through the opposite throat or chute portion.

By providing an agitator means constructed as shown a simple but positive side motion to the separator J and the shoes L L' in alternate reverse directions is effected.

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

1. In a machine as described, the combination with the fan, the crank on the fan-



shaft, the hopper and separator-shoe, of the vibrating levers  $B^2$ , one pivoted at each side at its lower end, to the main frame, and at its upper end engaging the crank of the fan-shaft, the rod  $A^2$ , and the shoe  $L$ , detachably hung at the lower end on the rod  $A^2$ , and having a swinging connection with the main frame at the upper end all arranged substantially as shown and described.

2. In a machine as described the combination with the fan-shaft having crank-disks  $W$   $W$ , having crank-pins on the separator-frame arranged substantially as described, of the arms  $B^2$ , pivoted at the lower end to

the main frame, the cross-rod  $A^2$ , the shoe  $L$ , 15 pivotally connected to the main frame at the upper end and having its lower end mounted on the said cross-rod  $A^2$ , said arms  $B^2$ , being slotted as at  $b^2$ , to receive the pins  $w$ , the arms  $G$ , pivotally connected to the main 20 frame, having crank portions  $d^5$ , fitting the slotted ends of the arms  $B^2$ , and having their upper ends connected to the separator-frame substantially as shown and described.

THOMAS J. HATFIELD.

Witnesses:

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G. W. MURRAY.