G. VAN DYKE.

Straw and Hay-Cutter.

No. 219,661. Patented Sept. 16, 1879.

Fig. 1.

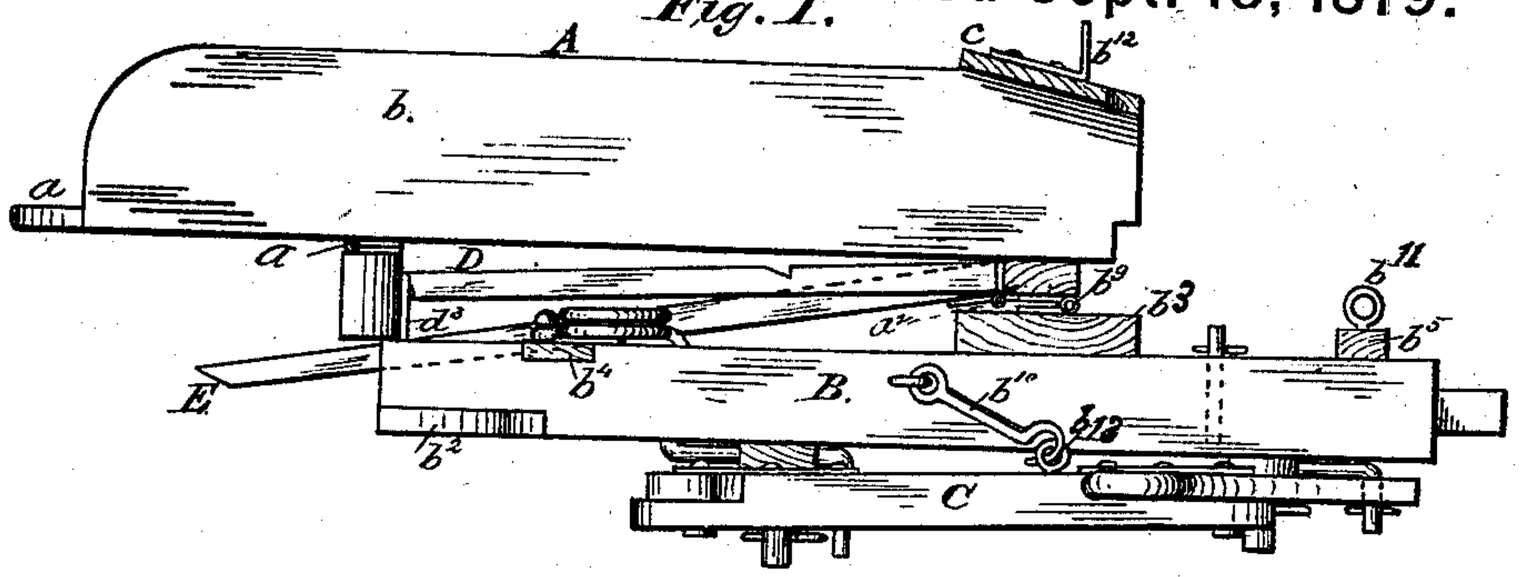


Fig. 2.

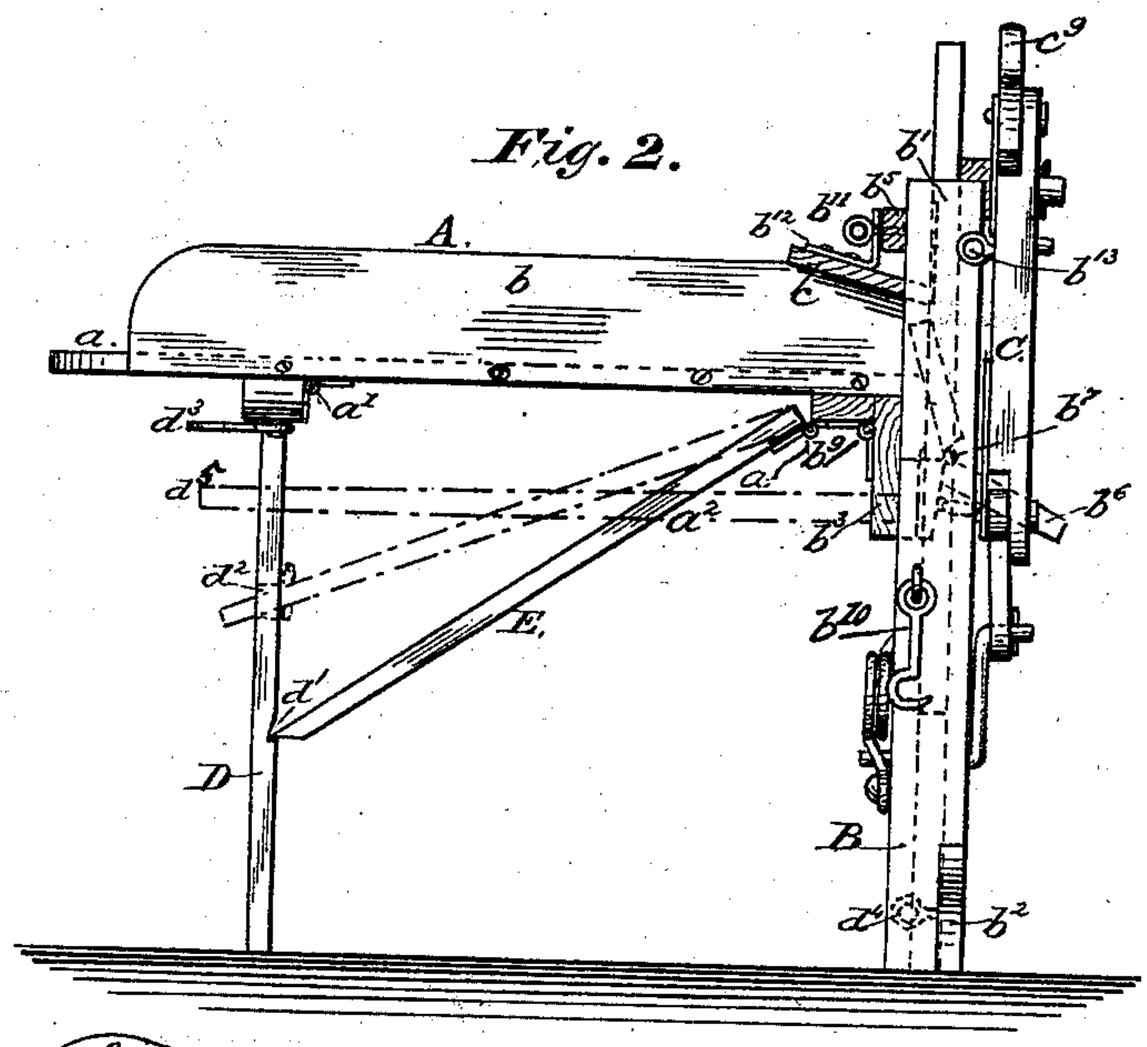
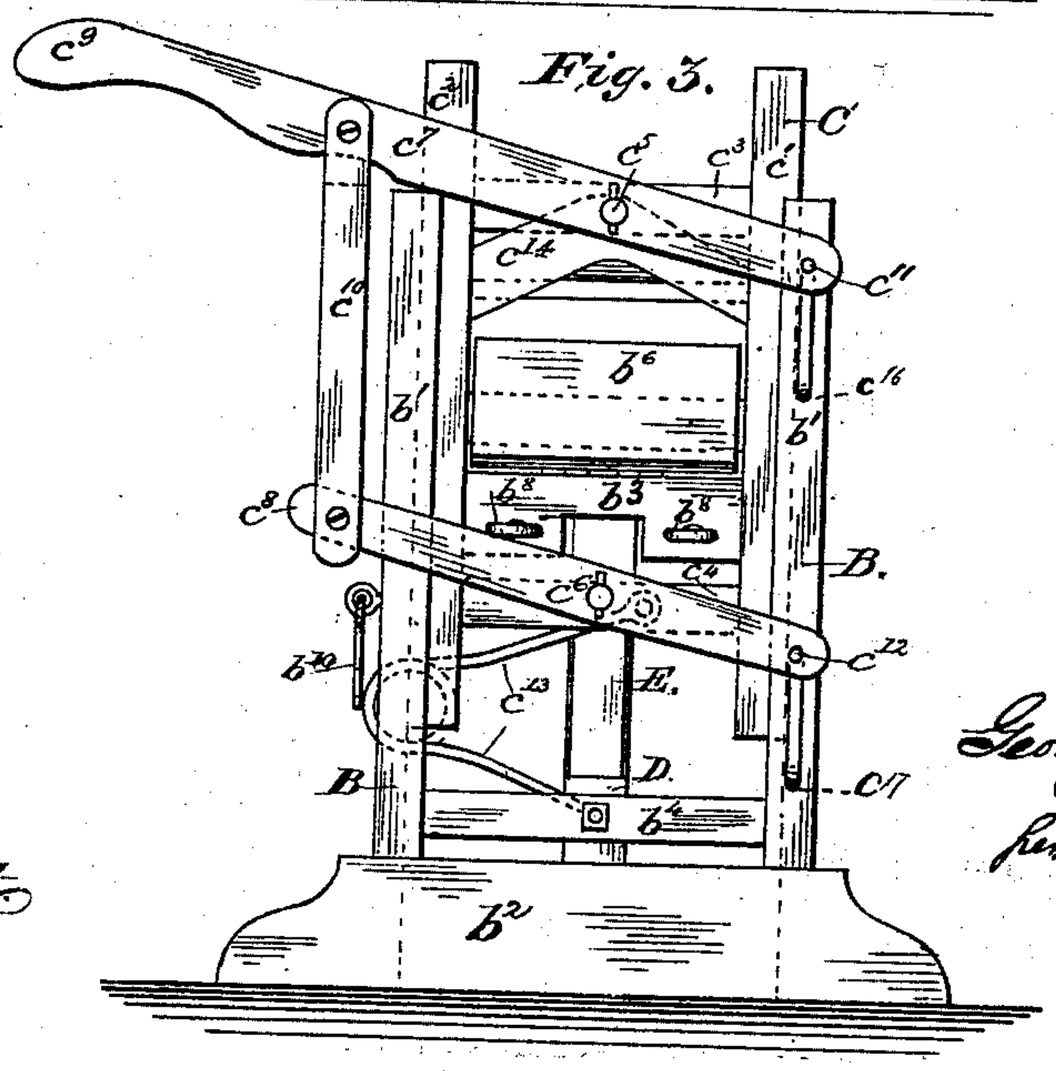


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE VAN DYKE, OF SKANEATELES, NEW YORK.

IMPROVEMENT IN STRAW AND HAY CUTTERS.

Specification forming part of Letters Patent No. **219,661,** dated September 16, 1879; application filed October 29, 1878.

To all whom it may concern:

Be it known that I, GEORGE VAN DYKE, of the town of Skaneateles, county of Onondaga, and State of New York, have invented certain new and useful Improvements in Straw, Hay, and Corn-Stalk Cutters, of which the following is a clear and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my straw-cutter folded for storage or transportation; Fig. 2, a side elevation of the same in an open or unfolded condition, and Fig. 3 a front elevation of the same in an unfolded condition.

Like letters of reference indicate like parts in all of the figures.

The object of my invention is to adapt straw-cutters to be readily folded, in order that they may occupy less space, and hence reduce the cost of their transportation from the maker to the consumer, and this without weakening the operative parts or rendering them liable to get out of order; and, further, to so construct them that they may be firmly secured in a folded and in an unfolded condition, thus making, when folded, a secure rigid shipping-package without the necessity of further securing and protecting devices—such as crates or boxes—and, when unfolded, a firm, staunch support for the operation of the machine.

My further object is to render the action of the cutting-knives uniform, even, and direct, thus reducing the friction of the moving parts as much as possible.

In the drawings, A represents the feed-box, which is shown as of the usual construction, consisting of the bottom, the sides *b*, (one only being shown,) and cross-board *c*. These may, if preferred, be united to each other by hinge-joints at all their points of juncture, except any one of them, which may be provided with and secured by screws or bolts, thus adapting the feed-box itself, as an element of the machine, to be folded flat; but in practice the feed-box occupies so little space compared to that occupied by the whole machine that I prefer to attach the sides, bottom, and cross-board to each other rigidly, as shown.

B represents the front frame-work or supports; C, the cutting apparatus; D, the back support, and E the connecting-brace.

The front supports consist of the two uprights B B, provided upon their inner opposite faces with the ways or grooves b^1, (shown in dotted lines in Figs. 2 and 3,) and connected by the base-piece b^2 and cross-plate b^3 and cross-bars b^4 and b^5.

The cutting apparatus consists of the sash c^1, c^2, c^3, and c^4, (see Fig. 3,) c^1 and c^2 being the uprights, and c^3 and c^4 the cross-bars thereof. From the center of each of these cross-bars project studs c^5 and c^6, upon which the operating-levers c^7 and c^8 are pivotally affixed, the former extended as a handle, c^9. These operating-levers are connected pivotally to the bar c^{10} and the oscillating cranks c^{11} and c^{12}, and these cranks are connected pivotally to the upright B at c^{16} and c^{17}.

Upon the rear side of the cross-bar b^4 is attached the end of the spring c^{13}, whose other end is attached to the rear side of cross-bar c^4 of the sash C.

In operation, it will readily be seen that the sash, to which is attached the V-shaped cutting-knife c^{14}, moves perpendicularly in the grooves b^1, and that if the pivotal point of attachment of the lever c^7 at c^{11} were a fixed pivotal point on the upright B, then, as said lever c^7 approached a horizontal line passing through c^9, c^5, and c^{11}, the sash would bind in the groove b^1. In other words, the upright c^2 would be forced into its groove b^1, and the upright c^1 out of its groove b^1—that is, the tendency would be in that direction; and it will as readily be seen that if the lever c^7 only were attached pivotally to the oscillating crank c^{11} the above objections would exist at the lower end of the sash.

To overcome this tendency to bind I provide the oscillating cranks c^{11} and c^{12}, and connect the levers c^7 and c^8 by means of the bar c^{10}, whereby perfect parallelism is secured between the sash C and the uprights B, and the least possible amount of power is lost by friction. The oscillating cranks, being pivotally attached both to the levers c^7 and c^8 and the uprights B B, contribute greatly to the even easy action desired.

The spring c^{13} is of sufficient stiffness to return the sash knife and levers to their normal or raised position, as shown in Fig. 3, thus saving labor upon the return stroke and al-

ways presenting the working parts in position for operation.

Now, in order to adapt a straw-cutter to be folded, I have found it necessary to locate all the operative mechanism in a compact, firm, and practically isolated and independent portion of the machine. This is embraced in the front supports, B B. These are provided with four cross-bars, viz., b^2, b^3, b^4, and b^5, thus rendering them strong and staunch for the operation of the cutting-knives and their attending mechanism, all of which is contained by them. This entire frame-work is attached by a hinge-joint, b^9, to the feed-box.

Thus, by so locating, as stated, the operative parts and attaching to the front of cross-bar b^3 the delivery-shelf b^6 by a hinge-joint, (as shown in a folded condition by dotted lines in Fig. 2,) the feed-box and all of the operative mechanism are adapted to be folded substantially in a flat condition.

When in use the delivery-shelf is folded outwardly and rests upon the stops b^8 b^8, Fig. 3, which stops also serve to limit the upward movement of the sash C by the contact of cross-bar c^4 with said stops. As a further necessity to adapt my machine to be folded, I have connected the back support, D, to the feed-box A by means of a hinge-joint, a^1, and in like manner have attached the brace E to the front portion of the feed-box at a^2.

The brace E may be retained in its open or unfolded condition by a simple notch, d^1, or may pass through an aperture and be held by a pin, as shown at d^2; or the hinge-joint a^2 may be discarded and a rigid cross-bar be passed through a similar aperture and be secured in position therein and in the recess in cross bar b^3 (shown in Fig. 3) by pins or bolts, or in any well-known suitable manner, as shown by dotted lines d^5, Fig. 2.

Now, having thus adapted my straw-cutter to be folded by disposing the operative parts within the supports, rendering the delivery-shelf foldable, connecting the frame-work, feed-box, back support, and the brace by hinge joints, nothing remains but to provide suitable fastening devices, located in such positions as shall not interfere with the operation of the machine when unfolded, and also such as shall permit the machine to be rigidly secured in an unfolded condition. Those shown at b^{10} and b^{13} and at d^3 and d^4, I have found, by experiment, to be the simplest and best adapted to serve the double purposes required of them.

To fold my straw-cutter for transportation, I first fold the delivery-shelf up into the supports B B and depress the handle until the shelf is retained between the knife c^{14} and lever c^7. The fastening device b^{10}, attached to the upright B, is then connected to the eye or staple b^{13} on the connecting-bar c^{10}. The resistance of the spring c^{13} tends to keep the parts locked together. I then remove the bolt b^{11}, which passes through the bracket b^{12}, Fig. 2. I then remove the free end of the brace E from the back support, D, and fold them both up against the bottom of the feed-box. I then fold the feed-box and front frame-work toward each other upon the hinge-joint b^9 and attach the fastening device d^3 to an eye upon the inner side of the base-piece b^2. (See d^4, Fig. 2.)

All parts of the machine are now firmly secured in a flat condition for storage or transportation. To set up the machine, these steps are reversed.

It is evident that the front supports, B B, might be rigidly attached to the feed-box, and such frame-work made in sections connected by a hinge-joint nearly on a line with the bottom of the feed-box, when the cutting mechanism might be moved entirely within the upper or the lower section, and such section folded on said hinge-joint beneath the box; but this I consider embraced within my invention, although I have shown what I consider a preferable construction; and it is evident that the feed-box, front and back supports, and the connecting-brace might be rigidly but removably attached to each other without departing from the spirit of my invention.

It will be observed that the hinged chute is held in a folded or upright position by means of the knife in the sash and the front of the box A, thus avoiding the necessity of providing an additional fastened device for the shelf in order to retain it in a folded position when it is desired to pack the machine for transportation.

What I claim as new, and desire to secure by Letters Patent, is—

As an improvement in foldable straw-cutters, a hinged chute or delivery-shelf, in combination with the front supports, B B, sash C, and box A, as shown and described.

GEORGE VAN DYKE.

Witnesses:
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