(No Model.) 2 Sheets—Sheet 1.

E. J. SANFORD.

CUTTING APPARATUS FOR REAPERS AND MOWERS.

No. 304,458. Patented Sept. 2, 1884.

Fig. 1.

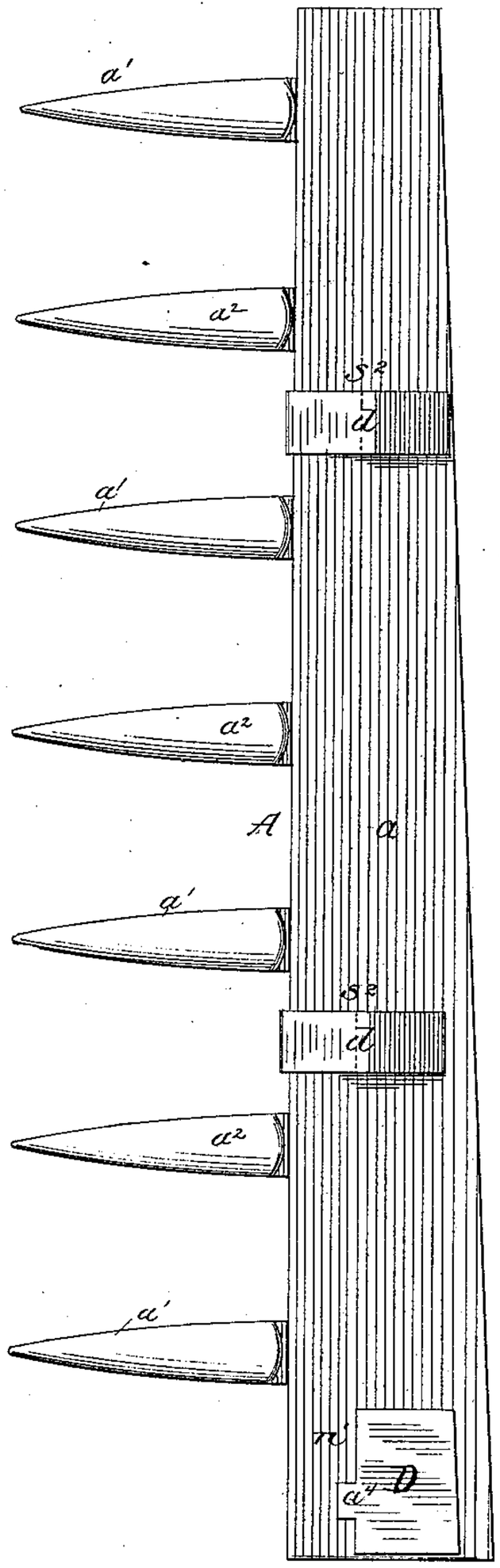


Fig. 3.

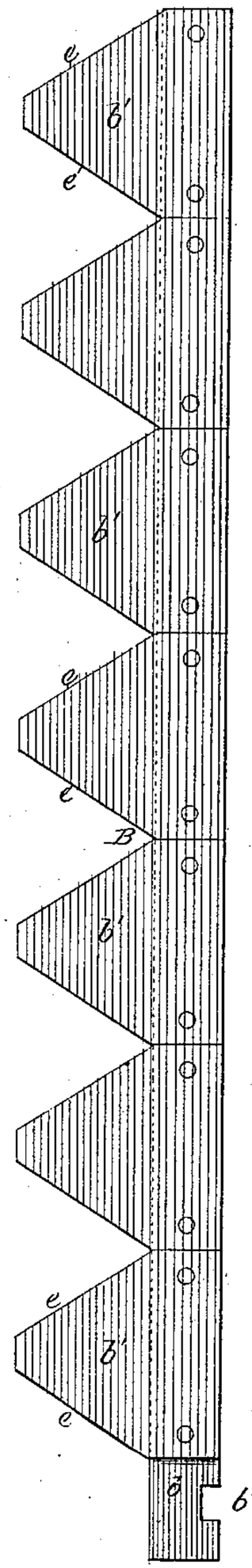
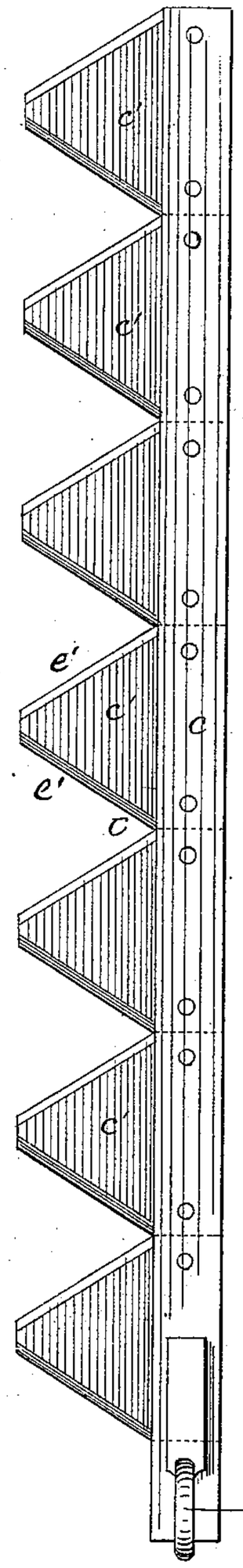


Fig. 5.



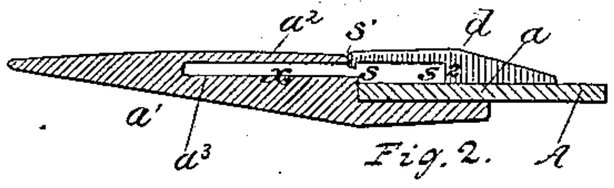


Fig. 2.

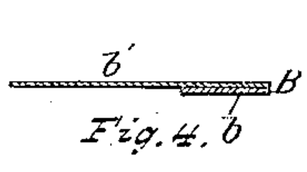


Fig. 4.

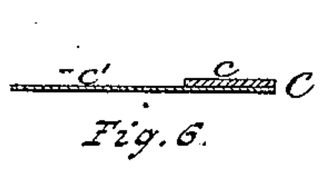


Fig. 6.

Witnesses.
Charles Selkirk
Henry T Sanford

Erasmus J. Sanford
Inventor.
by his attorney
Alex. Selkirk

(No Model.) 2 Sheets—Sheet 2.

E. J. SANFORD.

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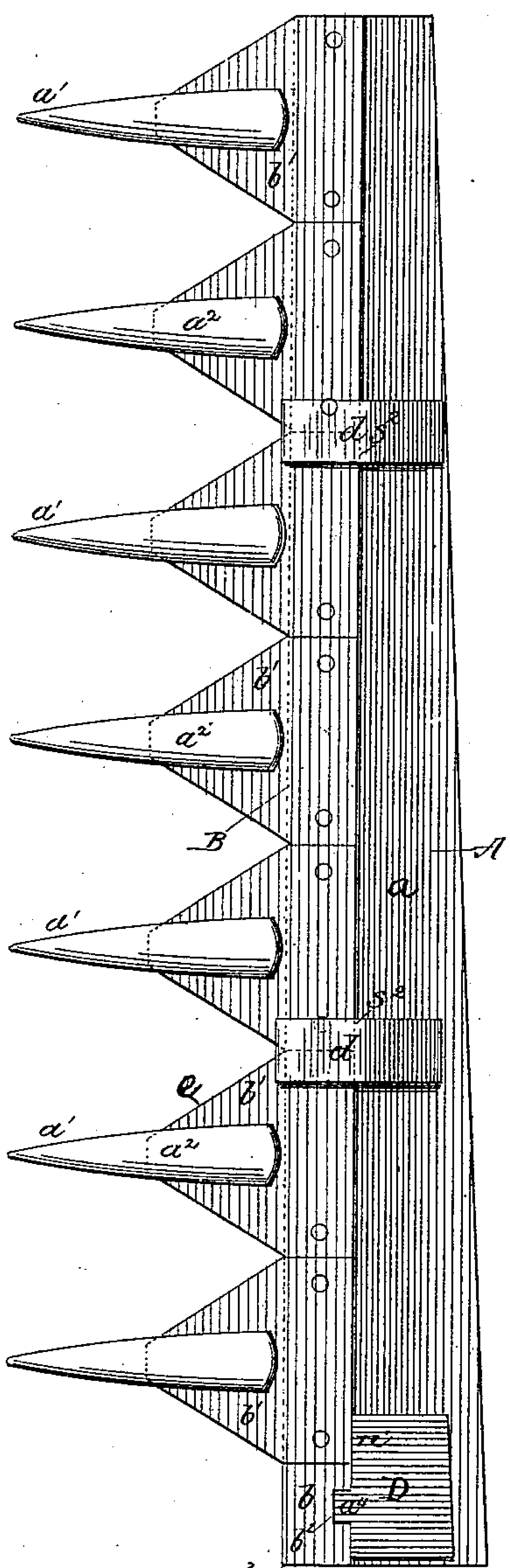
Fig. 7.



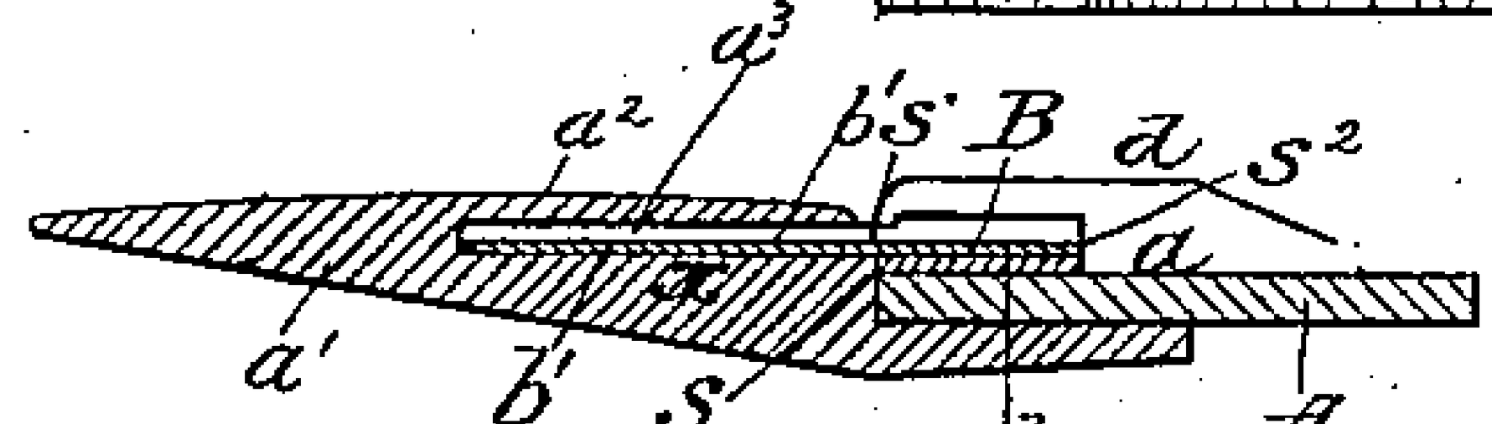


Fig. 8.

Fig. 9.

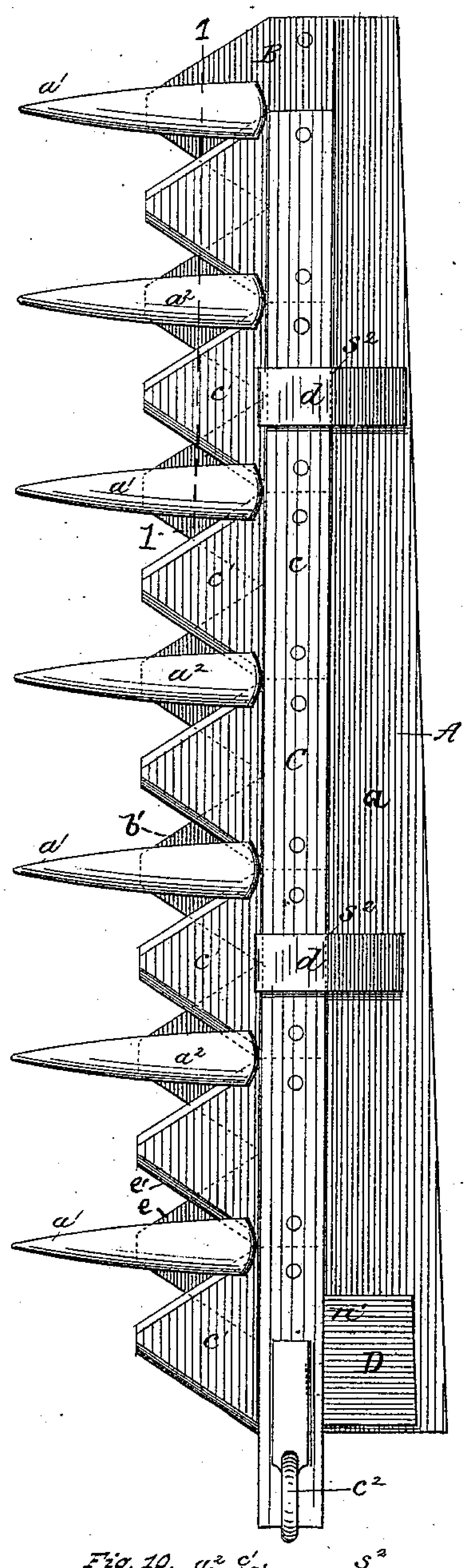
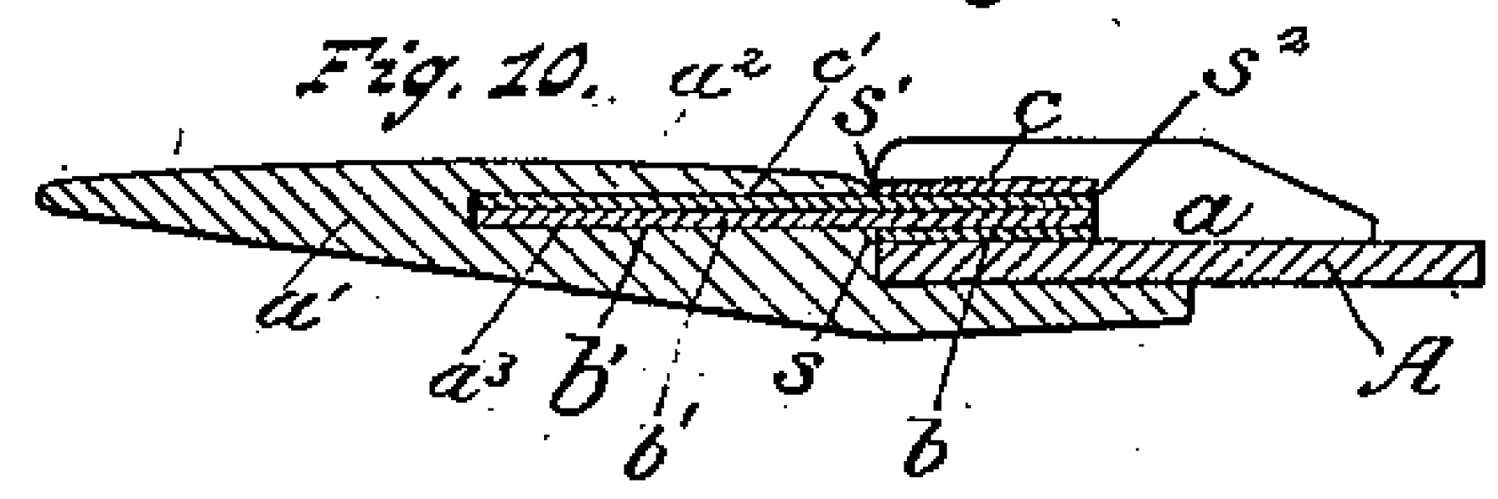


Fig. 10.



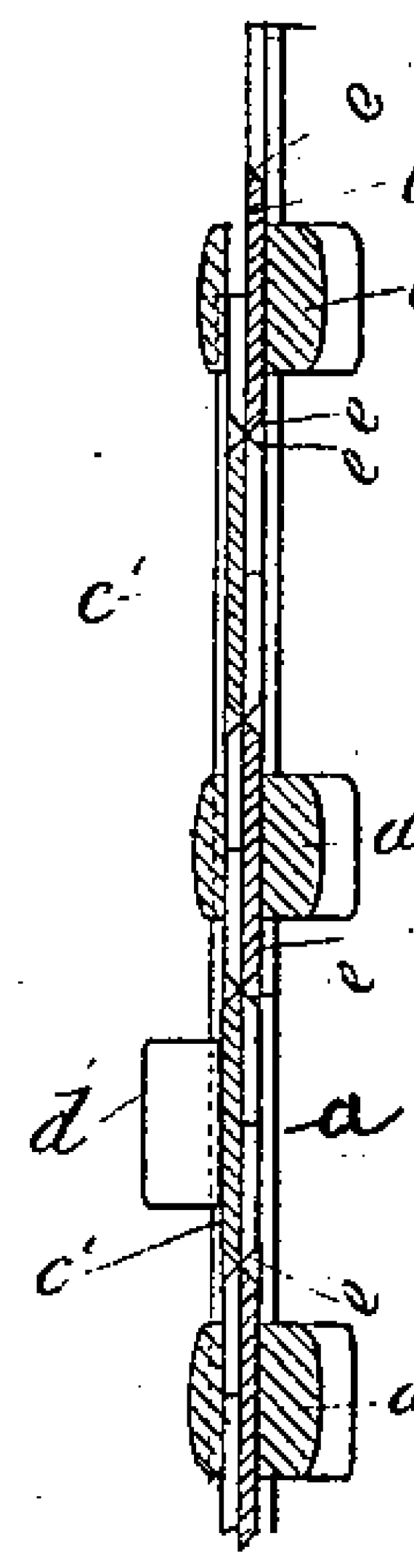


Fig. 11.

Witnesses. Charles Selkirk
Henry T Sanford

Erasmus J. Sanford
Inventor,
By his attorney Alex. Selkirk

N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

ERASMUS J. SANFORD, OF LAWRENCE, NEW YORK.

CUTTING APPARATUS FOR REAPERS AND MOWERS.

SPECIFICATION forming part of Letters Patent No. 304,458, dated September 2, 1884.

Application filed September 19, 1883. (No model.)

To all whom it may concern:

Be it known that I, ERASMUS J. SANFORD, a citizen of the United States, residing in the town of Lawrence, in the county of St. Lawrence and State of New York, have invented certain new and useful Improvements in Cutting Apparatus for Mowers and Reapers, of which the following is a specification.

My invention relates to cutting apparatus for mowers and reapers; and it consists in the construction and combination of the parts, as hereinafter described, and particularly pointed out in the claims.

The objects of my invention are to provide a simple, durable, and efficient cutting apparatus, in which is employed a finger-bar adapted to receive and securely hold a removable stationary cutter-bar, and also receive and hold a reciprocating cutter-bar for co-operating with the stationary cutter-bar, and to permit both cutter-bars to be readily removed and replaced at will. I attain these objects by the means illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a plan view of the finger-bar; Fig. 2, a cross-section of the same; Fig. 3, a plan view of the removable stationary cutter-bar detached; Fig. 4, a cross-section of the same; Fig. 5, a plan view of the reciprocating cutter-bar detached; Fig. 6, a cross-section of the same; Fig. 7, a plan view of the finger-bar and removable stationary cutter-bar when combined and arranged for use; Fig. 8, a cross-section of the same; Fig. 9, a plan view of the finger-bar, stationary cutter-bar, and reciprocating cutter-bar when combined and arranged; Fig. 10, a cross-section of the same; and Fig. 11, a longitudinal vertical section of the same, line 1 in Fig. 9.

The same letters of reference refer to like parts throughout the several figures.

A represents the finger-bar, which is composed of the stiff broad bar *a* and guard-fingers *a' a'*, securely attached thereto. Each guard-finger is provided on its upper side with the guard-lip a^2, and between this guard-lip and the main portion of the finger is the horizontal slot a^3. This slot is made with a length forward from the front edge of the bar *a* sufficient to receive the knives of the cutter-bars, and with a vertical extension sufficient to receive the thicknesses of the knives of the upper and lower cutter-bars, and allow those of the former to freely move therein. The bar *a* is so arranged in such relation to the slots a^3 in the guard-fingers that its upper surface will be a little below the plane of the surfaces *x* at the lower side of the slots, so as to provide at the front edge of the bar, at each guard-finger, a shoulder, *s*. Securely fixed to the upper flat side of the bar *a* by bolts or rivets at proper intervals are keepers *d*. Each keeper is formed with shoulder s^2, parallel with the front edge of the bar *a*, and at its forward end with a downward-projecting shoulder or lip, *s'*, thus forming a space between the forward portion of said keeper and the upper surface of the bar *a* of a length equal to the width of bars *b* and *c* of the cutters B and C, and of a height equal to the combined thicknesses of said bars and their attached knives. The upper side of said space is on a plane a little above the plane of the upper side of the slots a^3 in the guard-fingers, while the depending lips *s'* extend down to said plane. Securely fixed to the heel end of the finger-bar by bolts or rivets is holding-plate D. It is made, preferably, of sheet-steel, and has a thickness equal to the thickness of the bar *b* of the stationary cutter-bar. This holding-piece is provided with the tongue a^4, which projects forward from the edge *n'* about half an inch. This edge *n'* is on a line with the shoulders s^2 of the keepers *d*.

B is the stationary cutter-bar, which is composed of the bar *b* and the cutting-knives *b' b'* securely fixed thereto, preferably by rivets. These knives are made of tempered steel and with a V-shaped form with truncated front ends, as shown. The edges *e* of each knife are extended from the front ends back to the bar *b* on equal angles and are so arranged as to produce V-shaped notches or spaces between them corresponding in size and angle with the knives as they project forward. The bar *b* is made of thin metal, preferably steel, and of a width equal to the length of the space between the shoulder-lip *s'* and shoulder s^2 of the keepers *d*. The heel end of the bar *b* is made to project beyond the last knife on the bar, and is provided with a notch, b^2, corresponding in size and form with the tongue a^4 of the holding-piece D on the finger-bar. This

cutter-bar B is placed in position in the finger-bar A by laying its outer end flat on the heel or inner end portion of the latter, with the outer knife entered into the slot of the inner finger-guard, and then moving it endwise, passing its bar *b* beneath the keepers *d*, and its knives beneath the lips of the guard-fingers until the notch b^2 corresponds with the holding-tongue a^4 when the heel end is dropped so that notch b^2 will be engaged by said tongue and the latter bar will be locked securely in place with the front edge of the bar *b* bearing against the shoulders *s* of the guard-fingers *a'*, and the rear edge bearing against the shoulders s^2 of the keepers, and with the lower sides of the knives resting on the surface *x* at the lower side of the slot a^3 of the guard-fingers, all as shown in Fig. 8. In this position the holding-tongue a^4 will co-operate with notch b^2 to prevent the cutter-bar from shifting in either direction endwise while the shoulders *s* and s^2 will prevent the cutter-bar from shifting edgewise, and at the same time the bar *b* will be firmly supported on the upper surface of the bar *a* and the knives be uniformly supported by the surfaces *x* of the guard-fingers *a'*, so that this cutter-bar will be held from tilting in either direction. When this cutter-bar is in use each knife will be central in relation to the guard-finger *a'*, and the angular edges of the adjoining knives will meet at a point central between the adjoining guard-fingers *a'*, and the rear ends of the guard-lips a^2 will be on a line with the points of meeting of said edges. When it is desired to remove this cutter-bar, the operator will simply raise its inner end so that notch b^2 will be disengaged from tongue a^4 and then draw it out from all the keepers and slots in the finger-bar.

C is the reciprocating cutter-bar, which is composed of the bar *c* and knives *c'*, rigidly secured to the same, preferably by rivets. The bar *c* is made with a width and thickness corresponding with the bar *b* of the fixed cutter-bar B. The knives *c'* correspond in form and number with the fixed knives *b'*, and have their edges *c' c'* formed at the same angle as the edges *e e* of said fixed knives.

Secured to the heel end of the bar *c* is the eye c^2 for connection with a pitman (not shown) connecting with the crank for reciprocating the cutter-bar. This reciprocating cutter-bar is inserted in place in the finger-bar A by laying its outer end flat on the heel-end of the fixed cutter-bar B, moving it endwise toward the outer end of the finger-bar, and guiding the knives through the slots in the guard-fingers and the bar *c* beneath the keepers in the usual manner. When in place, the reciprocating cutter-bar will be as shown in Figs. 9 and 10, with the lower surfaces of its knives *c'* in contact with the fixed knives *b'*, and with the bar *c* held down by the keepers *d*, its front edge bearing against the shoulders or lips *s'* and its rear edge bearing against the shoulders s^2 of the keepers. The reciprocating cutter-bar C will operate to hold down the fixed cutter-bar B in its seat, and will prevent its heel end springing upward and disengaging the holding-notch and tongue b^2 a^4. The cutting-edges of the reciprocating knives are beveled on their upper sides, while those of the fixed knives are beveled on their under sides. The surfaces in contact will wear each other and unite to keep the edges sharp.

By my above-described improvements I dispense with grooves and ways in the finger-bar or guard-finger, or both, as heretofore used; and I provide efficient and simple means for holding both cutter-bars in place, with the lower one securely held from moving in any direction, and with the other free to move horizontally endwise. The fingers *a'* are not weakened in their forwardly-projected portions by bolt-holes or notches, as in former inventions, where each finger has attached to it an individual knife or edge-plate. The advantageous results secured are that the plane and smooth surfaces of the finger-bar and guard-fingers provide supports for the plane smooth surfaces of the stationary cutter without the least liability of any foreign substances accumulating between them so as to clog, while at the same time the shoulder ends *s* of the guard-fingers do not operate as a continuous groove to hold foreign substances. The upper and lower knives can be readily removed for sharpening, or for storage, when not to be used, without removing bolts, as heretofore required.

I do not broadly claim a removable stationary cutter-bar, for I am aware that upper and lower removable cutter-bars have been employed; but in some instances the lower cutter-bar is secured to the fingers by bolts or screws passing through longitudinal slots in the rear end portion of each guard-finger, and is so arranged that the fingers form a support for the bar carrying the knives, while they do not in the least give direct support to the forwardly-projected portions of the knives, as in my invention. In another instance the removable lower cutter-bar is supported wholly in grooves or recesses made in the guard-fingers, while the knives have only slightly angular edges to project each side of the guard-fingers only a short distance, thereby producing between the knives almost a square form of notch into which the grass and straw will bunch. By my improvements all these objectionable features are wholly removed, and the cutting apparatus is made more simple, less expensive in construction and repairs, more durable, and more effective in operation.

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

1. In a cutting apparatus for mowers or reapers, the combination of the finger-bar *a*, the guard-fingers *a' a'*, provided each with a horizontal slot, a^3, having its lower side, *x*, above the plane of the upper surface of the bar *a*, and the shoulders *s*, at the front edge of said bar, keepers *d d*, provided with shoulders or

lips s' and shoulders s^2, and the plate D, fixed to the heel end of said bar, and provided with the locking-tongue a^4, substantially as and for the purpose set forth.

2. In a cutting apparatus for mowers or reapers, the combination of the finger-bar a, guard-fingers a', having horizontal slot-surfaces x, and shoulders s, the keepers d, provided with shoulder-lips s' and shoulders s^2, the plate D, having the locking-tongue a^4, the removable stationary bar b, provided with a holding-notch, b^2, adapted to engage with said holding-tongue a^4, and the V-shaped knives b', secured to said bar, substantially as and for the purpose set forth.

3. In a cutting apparatus for mowers or reapers, the combination of the finger-bar a, the guard-fingers a', having horizontal slots a^3 and shoulders s, keepers d, having shoulders or lips s' and shoulders s^2, the holding-tongue a^4, secured to said bar, removable stationary cutter-bar b, provided with holding-notch b^2, the V-shaped knives b', secured to said bar, the reciprocating cutter-bar c, and V-shaped knives c', secured to said bar, substantially as and for the purpose set forth.

ERASMUS J. SANFORD.

Witnesses:

FRANK L. CHANDLER,

A. D. BIBBINS.