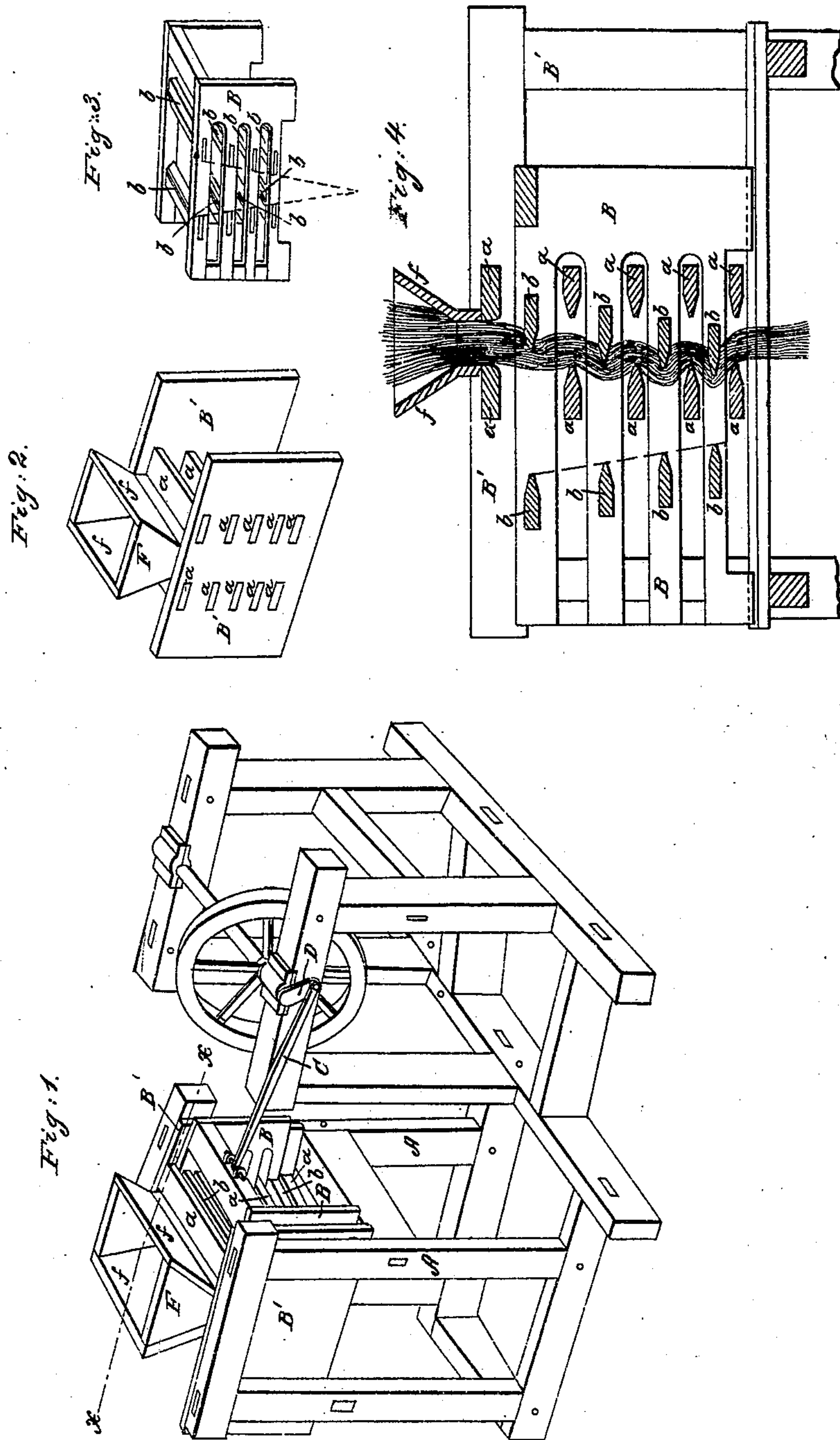


S. STAFFORD.

Hemp Brake.

No. 17,900.

Patented July 28, 1857.





# UNITED STATES PATENT OFFICE.

STEPHEN STAFFORD, OF CARROLL COUNTY, MISSOURI.

## IMPROVEMENT IN HEMP-BRAKES.

Specification forming part of Letters Patent No. 17,900, dated July 28, 1857.

*To all whom it may concern:*

Be it known that I, STEPHEN STAFFORD, of the county of Carroll and State of Missouri, have invented a new and useful Machine for Breaking and Preparing Hemp for Market; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of a hemp-breaking machine embracing my improvements. Fig. 2 represents a perspective view of the fixed sash and feeding-hopper. Fig. 3 represents a perspective view of the vibrating sash; and Fig. 4 represents a cross-section through the line *xx* of Fig. 1, showing the arrangement of the swords.

The object of my improvements is to obtain a more equable distribution of the action of the swords or beaters of hemp-breaking machines throughout the entire series of such swords or beaters, to diminish the liability of the swords to break or cut the thready fibers of the stalks, and also to prevent the vibrations of the stalks from extending upward to the hand of the attendant.

My improvements for effecting these objects consist, first, in arranging the swords in their respective sashes at unequal distances apart, the spaces between their faces decreasing from the upper sword of the series, which first acts upon the hemp, to the lower sword, which last acts upon it, by which arrangement the action of the different swords becomes more uniform, and the lower swords are rendered more effective in separating the woody part of the stalks from the thready fiber or (as it is termed) "harl," than by the mode heretofore adopted of arranging the swords at uniform distances apart throughout the series; second, in arranging the swords in either the movable or fixed sash, so that the spaces between their corresponding edges will decrease from the upper to the lower set of the series, so that at the end of the motion of the vibrating sash the nearness with which the edges of the swords in the two sashes approach each other and the distance to which they interlock will increase from the upper to the lower set in the series, by which means the liability of the harl to cut and break is much diminished, as the stalk is not bent short until the woody portion is crushed or broken.

In the accompanying drawings a hemp-breaking machine embracing my improvements is represented.

A strong frame, A, well braced, supports the breaking apparatus, which consists of two sashes, B B', one, B', of which is fixed to the frame, and the other, B, movable, vibrating back and forth within the stationary one. In the fixed sash, B', two series of horizontal bars, *a*, or (as they are termed) "swords" are arranged directly opposite each other, and between the sides of the framing forming the sash to which their ends are secured. The spaces or vertical distances between the swords decrease by successive gradations from the upper to the lower sword forming the series. The horizontal distances between the breaking edges of two series of swords remain the same throughout, so that their edges are in the same vertical plane. In the vibrating sash B two other series of swords are also arranged in the same manner as those in the fixed sash B', with this exception, that the horizontal distance between the breaking edges in the two series diminish from the upper to the lower sword by regular gradations. This sash is supported by V-shaped ways on the under side, and the swords *b* alternate with those in the fixed sash and vibrate back and forth between them. At the end of the motion in either direction the lower swords only in the two sashes interlock. The distance they interlock decreases from the lower sword upward, so that the upper swords are separated a short distance, owing to which the stalks of hemp when subjected to their action are crushed and broken without being bent, except in a slight degree, after which it becomes sufficiently flexible to be bent short when coming under the action of the lower swords without injury to the harl.

A hopper, F, for feeding the hemp to the breakers, is located on the top of the frame over the stationary swords. The opposite sides *ff* of this hopper slope inward until the space between them is contracted to the width of the space between the series of stationary swords. This width is preserved regular and uniform for a sufficient distance to hold the hemp and prevent the vibration communicated to it by the swords from extending to the hand of the operator and switching the hemp from his hand. The hemp passes vertically between the swords, and the whole length of the stalk



is broken without being reversed, and discharged at the bottom instead of being drawn out and discharged at the top, as in other machines.

A pitman, C, hinged to the movable sash at one end and pivoted to a crank, D, on a horizontal shaft, communicates a vibratory motion to the sash. Owing to the vertical spaces between the swords being diminished from the upper to the lower swords of the series, their action upon the stalks is rendered more uniform as the hemp in passing through the machine becomes gradually decreased in bulk, and as the spaces between the swords are also decreased these spaces are filled by the hemp when the swords interlock at the end of their motion, by which means the stalks are not only subjected to the whipping action of the edges of the lower swords, but are also subjected to the abrading action of the sides of the swords, which renders them more effective in removing the woody fiber from the harl.

I do not confine myself to arranging the vibrating swords, so that the spaces between their edges shall decrease from the upper to the lower sword in the series, as the stationary

swords may be arranged in that manner, and the vibrating swords arranged with their edges in the same plane. Neither do I limit myself to the number of swords composing each series, as these may be varied at pleasure.

Having thus described my improvement in hemp-breaking machines, what I claim, and desire to secure by Letters Patent, is—

1. Arranging a series of swords in a sash at unequal distances apart and parallel to each other, the spaces between them decreasing from the upper to the lower sword of the series, for the purpose described.

2. Arranging a series of swords in a sash so that the edges of the under sword will project beyond the edge of the sword next above it throughout the entire series, for the purpose described.

3. The combination of the swords in the stationary sash with those in the movable sash when arranged, respectively, in each sash, in the manner described.

STEPHEN STAFFORD.

Witnesses:

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WM. R. HYNES.