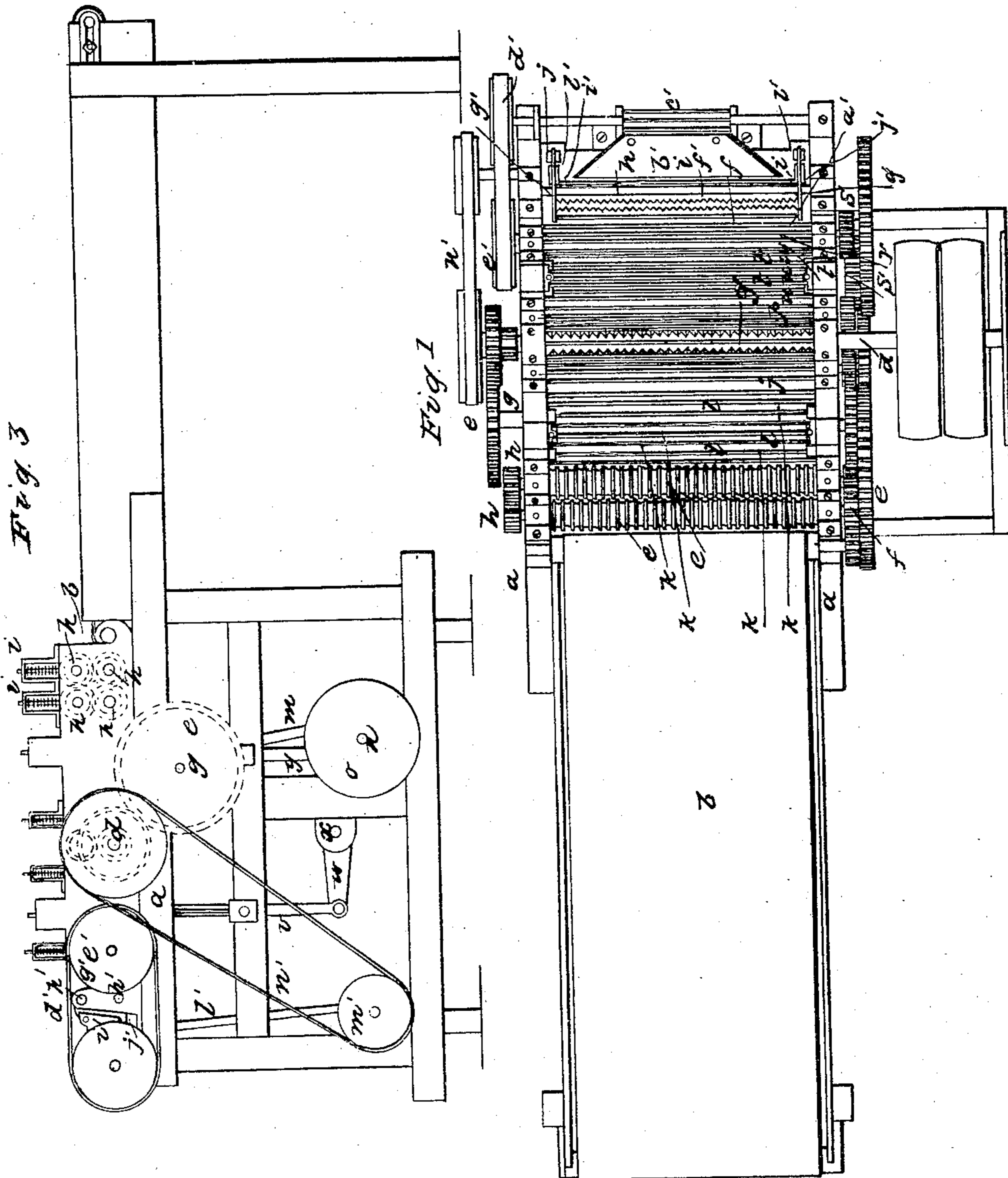


O. S. LEAVITT.
Flax and Hemp Brake.

No. 9,973.

Patented Aug. 30, 1853.

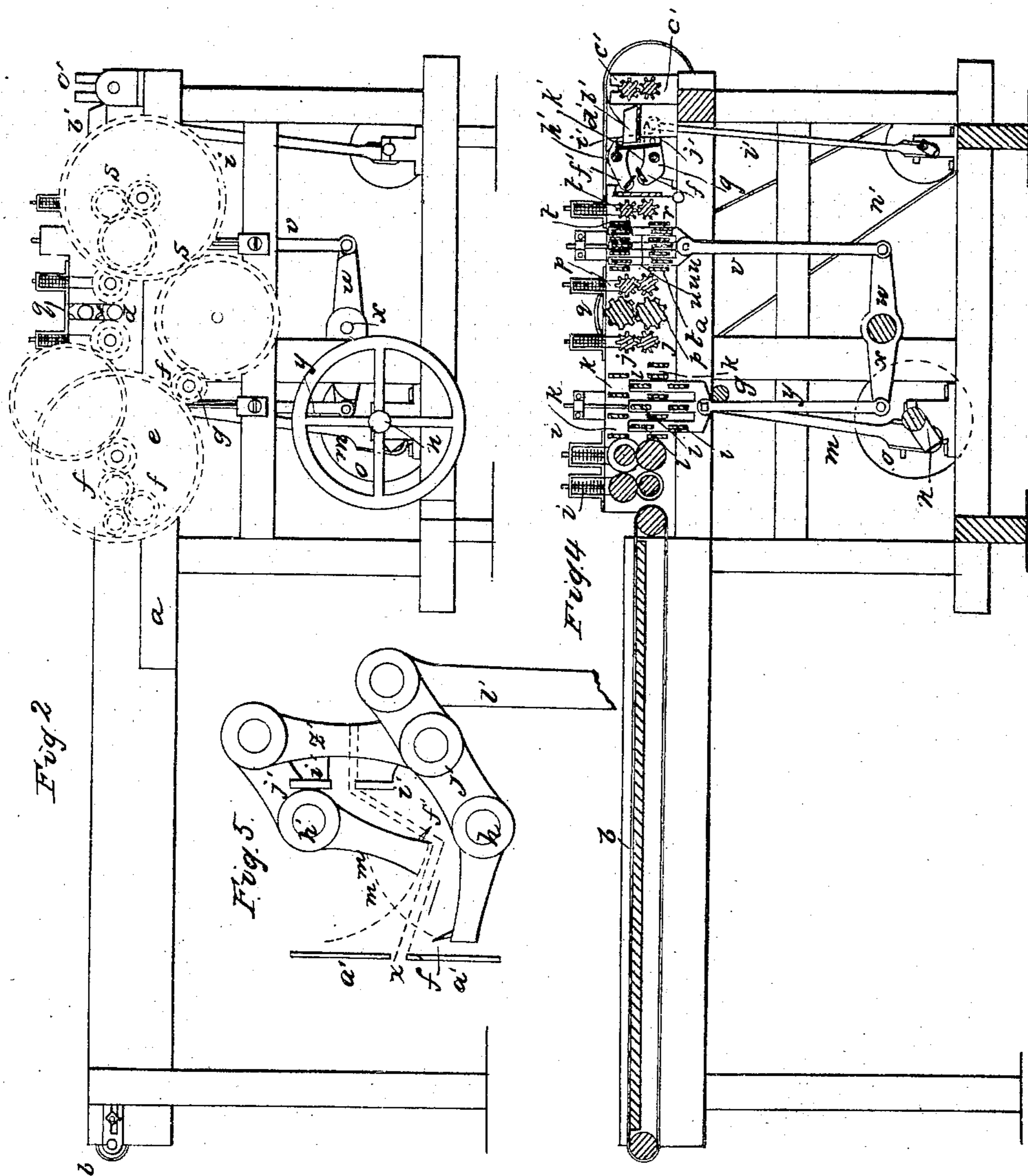


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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

O. S. LEAVITT, OF MAYSVILLE, KENTUCKY.

IMPROVEMENT IN HEMP AND FLAX BREAKING MACHINES.

Specification forming part of Letters Patent No. 9,973, dated August 30, 1853.

To all whom it may concern:

Be it known that I, O. S. LEAVITT, of Maysville, in the county of Mason and State of Kentucky, have invented certain new and useful Improvements in the Machine for Breaking Flax and Hemp, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of the machine; Figs. 2 and 3, side elevations of the right and left hand sides of the machine, with the driving-pulley omitted, and Fig. 4 a longitudinal vertical section.

The same letters indicate like parts in all the figures.

In my improved machine the flax (or hemp) to be broken is fed to the machine on an endless apron, which supplies it to two pairs of grooved rollers, from which it passes between an upper and lower set of stationary blades, the spaces between the blades of each set being sufficient to break the stalks in given lengths by means of blades, which work vertically in the space between the blades of each set. The movable blades are also made in two sets, with a space between the two sufficient for the passage of the flax or hemp, and hence the blades have a breaking motion up and down. From these blades the flax or hemp passes to and is carried along by two pairs of fluted rollers, so far apart as to admit between them two fluted and toothed rollers, which rotate with much greater velocity than the fluted feed-rollers on each, so that the flax or hemp held and carried forward by the feed-rollers is acted upon on both surfaces by the alternate rows of flutes and teeth, to strip off the broken fragments of bark or woody part of the plant. Thence the flax or hemp passes between another set of breaking-blades, similar to the first set but with the blades nearer together. During this last breaking operation the flax or hemp is also held and carried forward by another pair of fluted feed-rollers, which deliver it between two stationary blades, beyond which the fibers are finally stripped and cleansed of the impurities by two vibrating combs—that is, two blades whose edges are serrated and hung on the ends of vibrating arms, which give to them a reciprocating and curvilinear combing action. Thence the fibers pass through a slot in a plate hung to the other ends of the vibrat-

ing arms, by the vibration of which a scraping action is produced on the sliver of fibers, which then pass between the oblique sides of a trough to two fluted delivery-rollers.

In the accompanying drawings, *a* represents the frame, which may be varied at pleasure, and *b* an endless feed-apron, which supplies the flax or hemp to be broken to two pairs of rollers, *c c*, grooved in the direction of the periphery. In each pair the grooves of the under roller receive the fillets of the upper one, and the grooves in the rollers of the first pair are opposite the fillets of the second pair. Motion is communicated from the driving-shaft *d* by two trains of cog-wheels and pinions, *e e f f f f*, on opposite sides of the frame and an intermediate shaft, *g*, and the upper rollers receive motion from the under ones by means of pinions *h h h h* at one end. The upper rollers are borne down to make pressure by springs *i i*, for which weighted levers may be substituted. As the stalks of flax or hemp pass between the first pair of these rollers they are crushed longitudinally, and then more effectually crushed by passing between the second pair, by reason of the grooves of this pair being opposite the fillets of the first pair. From these rollers the flax or hemp passes to and between a pair of fluted feed-rollers, *j*, and between these and the grooved rollers there are two sets of stationary blades, *k k*, each set consisting of four, (more or less,) the blades of the upper set being placed just over those of the lower set, and with sufficient space between the two sets for the free passage of the flax and hemp, which, in passing through, is broken by the up-and-down motion of two sets of blades, *l l*, connected together at each end and sliding vertically on ways in the sides of the frame, and operated by a connecting-rod, *m*, at each end operated by a crank-shaft, *n*, receiving motion from some first mover by a belt or pulley, *o*. The movable blades work in the spaces between the stationary blades, so that in moving up they break against the upper set of stationary blades, and in moving down, against the lower set of stationary blades. Beyond the pair of feed-rollers *j* there is another and like pair, *p*, and in the space between the two pairs there are two flying rollers, *q q*, one above the other, the lower one of which is also the driving-shaft, the two being geared together at one end by pinions. These fly-rollers are

fluted longitudinally and every alternate flute is cut into teeth along the edge, so that these rollers, by their quick motion, act alternately by their straight and toothed edges on the upper and lower surface of the fibers, as they pass between them in a distended state, to strip off the broken pieces of wood. From the second pair of feed-rollers, *p*, the fibers pass to and between a third pair, *r*, operated by a train of cog-wheels, *s s*, and between this and the second pair of feed-rollers there is a set of stationary and movable blades, *t t* and *u u*, similar to the first set before described, except that the blades are nearer together. The movable blades of the second set are operated by connecting-rods *v v*, jointed to two arms, *w w*, of a rock-shaft, *x*, which receives motion by connecting-rods *y y* from the first set of movable blades. The third pair of feed-rollers deliver the fibers through a slot, *z*, in a plate, *a'*, from which they pass between the oblique sides of a trough, *b'*, in the form of a sliver to and between a pair of fluted delivery-rollers, *c'*, receiving motion by a belt, *d'*, from a pulley, *e'*, on one of the third pair of feed-rollers; but between the third pair of feed-rollers and the trough the fibers are acted upon first by two combs, *f' f'*, one above the other, placed in a reversed oblique direction and attached each to the arms *g' g'* of a rock-shaft, *h'*, the two rock-shafts being connected to vibrate together by a plate, *i'*, jointed at each end to the rear arms, *j' j'*, of the two rocker-shafts. These comb-plates are serrated or toothed, as repre-

sented in the drawings, (shown by the enlarged section, Fig. 5,) and by their vibrating action and position they alternately have a short combing action on the fibers, which answers the double purpose of dividing the wider hurls of hemp or flax and loosening and throwing off the most adherent shives, the sliver or sheet of fibers at the same time, to aid this operation, being carried alternately up and down by passing through a slot in the plate *i'*. The two rock-shafts receive the required rocking motion by means of connecting-rods *z' z'*, joined to the rear arms of the lower rock-shaft and to two cranks on a crank-shaft, *m'*, which is rotated by a belt, *n'*, on one end of the driving-shaft.

Having thus described the construction and operation of my invention, I do not wish to be understood as limiting myself to the precise construction and arrangement of parts herein specified, as I have only described the mode of application which I have essayed with success.

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

The combing apparatus, as described, in connection with the pieces *i i'*, which move alternately up and down to hold the hemp or flax against the action of the combs *f f'*.

O. S. LEAVITT.

Witnesses:

JOHN L. SMITH,

THOMAS E. WILLIAMS.