

SANFORD & MALLORY.

Hemp and Flax Brake.

No. 34,698.

Patented March 18, 1862.

Fig. 1.

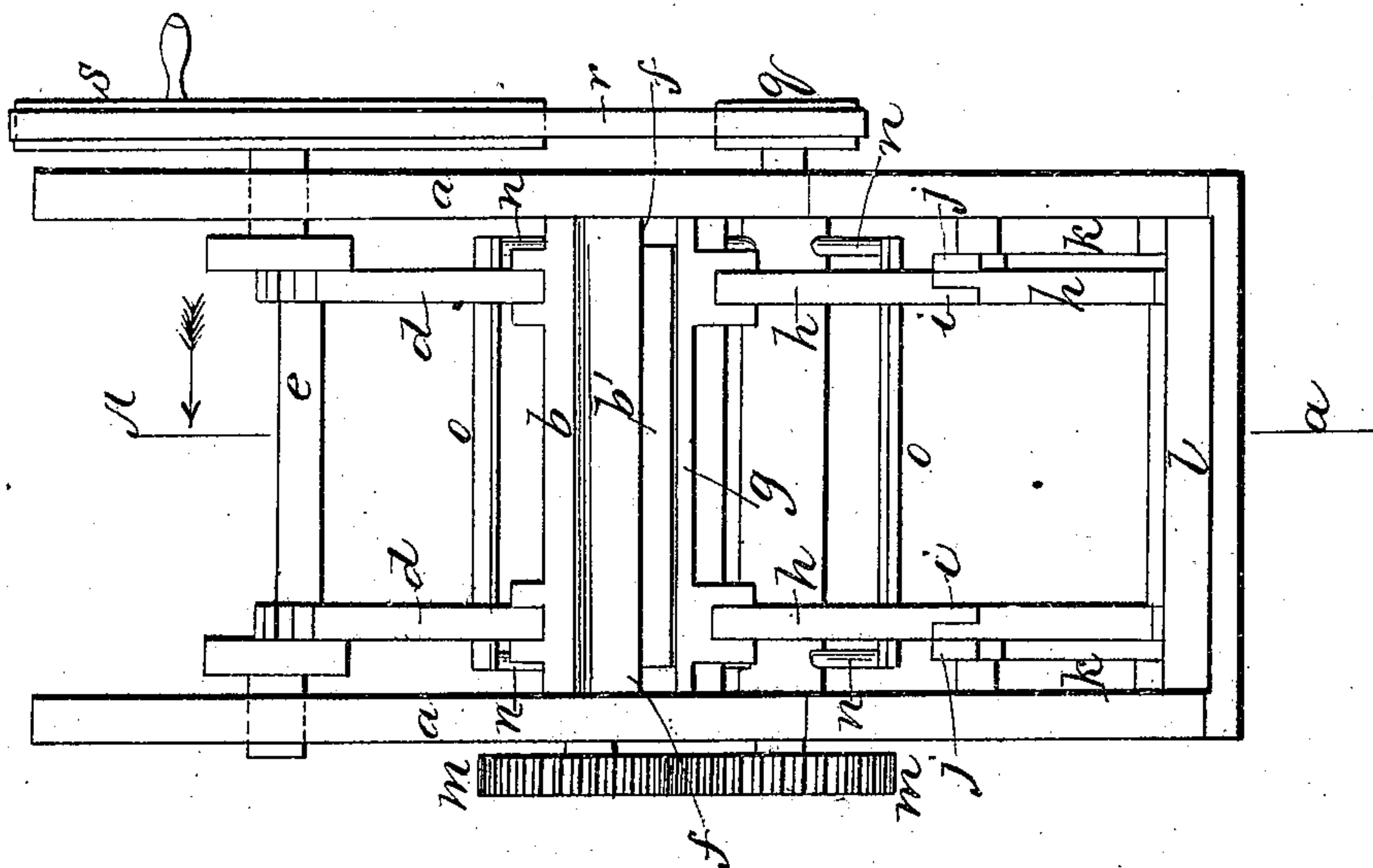
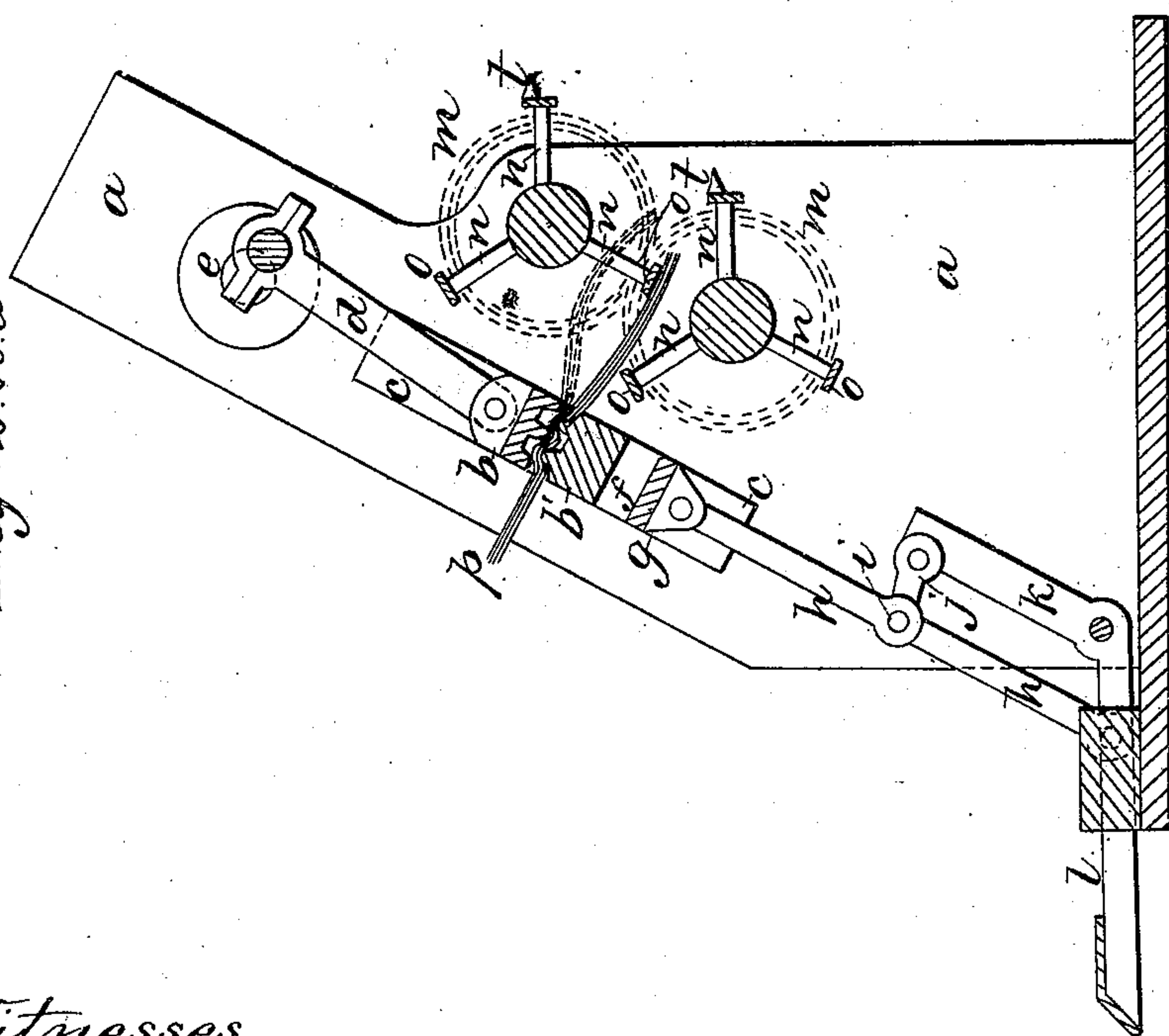


Fig. 2. A. a



Witnesses.
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINERY FOR BREAKING AND CLEANING HEMP OR FLAX.

Specification forming part of Letters Patent No. 34,698, dated March 18, 1862.

To all whom it may concern:

Be it known that we, GELSTON SANFORD and JAMES E. MALLORY, of the city, county, and State of New York, have invented certain new and useful Improvements in Machines for Breaking, Scutching, or Cleaning Flax, Hemp, and other like Fiber-Producing Plants; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a front elevation, and Fig. 2 a vertical section taken at the line A a of Fig. 1.

The same letters indicate like parts in both the figures.

The object of our said invention is to break and scutch or clean out the woody particles from the fibers of flax, hemp, or other like fiber-yielding plants with less injury to the fibers than by any other known machine.

In the accompanying drawings, *a* represents a suitable frame, and *b b'* two parallel breaking-bars, fluted on their contiguous faces so as to fit into each other. The ends of these bars are fitted to slide in ways *c* in the sides of the frame, and the upper bar, *b*, is connected by connecting-rods *d d* with a double crank on the main shaft *e*, by which a rapid motion toward and from the other bar, *b'*, is given to it, the said shaft being driven by any suitable motor. The ends of the lower bar, *b'*, are also fitted to slide in ways in the sides of the frame, and it rests on springs *f f*, which may be made of vulcanized india-rubber or other suitable material, so that the said bar can yield to the concussions of the beating or breaking action of the upper bar. The said springs *f f* rest on a movable bed, *g*, the ends of which are also adapted to slide in the before-named ways in the sides of the frame, and this bed is hinged to one end of a pair of toggle-joint levers, *h h*, the opposite or lower ends of which are suitably-hinged to the bottom of the frame. The middle joints, *i i*, of the said toggle-levers are connected by links *j j* with two arms, *k k*, of a lever-treadle, *l*, so that when the said treadle is borne down by the foot of the attendant the toggle-levers are brought in a straight line, and the bed of the lower breaker-bar carried up to its highest and proper position for breaking; but when the treadle is raised the toggle-levers are bent, which has

the effect of drawing down the lower breaking-bar, *b'*, so far from the upper breaking-bar, *b*, that the attendant can pass his hand between them while the upper brake continues to move, so that he is enabled to feed the whole broken portion of the flax to the scutching operation beyond. Beyond the breaking-bars there are two parallel shafts, geared by cog-wheels *m m* to turn in opposite directions and with equal velocity. Each shaft within the frame carries two sets of radial arms, *n n*, of equal length—one set at each end—and to the outer ends of these arms are secured scutching-bars *o o*, of any of the usual or suitable forms. The two shafts are at such distance and so geared that the scutching-bars on each shaft shall, in the rotation, pass near to the other shaft, and in the middle of the spaces between the others, as represented, the two sets alternately beating against the bunch of flax *p* on opposite sides, and bending it in opposite segments of circles, as represented by full and by dotted red lines. One of the shafts is provided with a pulley, *q*, to which motion is communicated by a belt, *r*, from the hand-wheel *s*.

If desired, the outer faces of the scutching-bars, or some of them, may be armed with radial scutching-teeth, as at *t*, to pass between the fibers.

The flax or other plant, in suitable bunches, is introduced between the breaking-bars while the one, *b'*, is in the position nearest to the other or reciprocating one, *b*, and it is there broken by the fluted surfaces of the two bars by the rapid vibration of the upper, the lower bar resting on springs yielding to the blows whenever the flax or other plant presents at first too much resistance to the blows, or when the thickness of the bunch is too great. In this way the woody part of the plants gradually yields to the breaking action without violence to the fibers.

We have discovered that in separating the woody and other frangible parts of flax and other like fiber-plants from the fibers that the operation of breaking the frangible parts does not of itself loosen the broken fragments from the fibers, and that unless such fragments be effectually separated from the fibers the after operation of scutching to effect the separation is seriously injurious to and often breaks the fibers; and we have also discov-

ered that after the woody part of the plant has been broken into fragments they can be readily loosened from and without serious injury to the fibers by a pounding action between opposing surfaces, provided the blows be not so violent as to overcome the texture of the fibers. This desirable result we have accomplished by breaking and pounding the flax or other plant between two opposing fluted surfaces, the edges of which break or snap the woody parts, while the surfaces pound them to detach them from the fibers; but as the pounding action, performed by a positive reciprocating motion, operating on necessarily variable thicknesses of material, would be at times insufficient and at others too great, one or both of the said fluted surfaces must yield by a spring-like action, not only to ease off and thus avoid the violence of the blows, but also to render the fluted surfaces self-adapting to the varying thickness of the material operated upon. As the breaking action progresses, the attendant advances the bunch between the bars, and as fast as it is broken it passes between the two series of scutching-bars, by which the broken fragments of wood are scutched out. When a sufficient portion of the length has been broken, the attendant draws down the bar *b'* by the treadle and feeds the residue of the broken portion of the length to the scutchers, and when sufficiently cleaned the bunch is drawn out, reversed, and the other end subjected to the like operations.

We are aware that in machines for breaking flax by means of two series of slats, the one series working opposite to and in the spaces

of the other series, one of the said series has been made yielding by means of springs placed behind them; but in this machine the compound operation of breaking and pounding is not performed; and we are also aware that in a machine for pounding the flax between two opposing flat surfaces one of the said surfaces is made self-adapting by springs behind it; but this machine does not perform the compound operation of breaking by snapping the woody parts of the plant and then pounding the fragments. We do not therefore claim, broadly, the use of springs to render self-adapting the instruments employed either for breaking alone or for pounding alone; but

What we do claim as our invention, and desire to secure by Letters Patent, is—

1. Combining the fluted bars substantially as herein described, for performing the compound operation of breaking and pounding flax or other like plants, with springs, substantially as herein described, to render such compound breaking and pounding surfaces yielding and self-adapting, substantially as and for the purpose specified.

2. In combination with the fluted breaking-bar reciprocating by a positive motion, the making of the other or opposite breaking-bar movable and connected with the frame by toggle-joint levers and treadle, or their equivalent, substantially as and for the purpose specified.

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