Sheet 1-3 Sheets.

S. U. King,

Bending Wood,

No. 50,601, Patented Oct. 24, 1865.

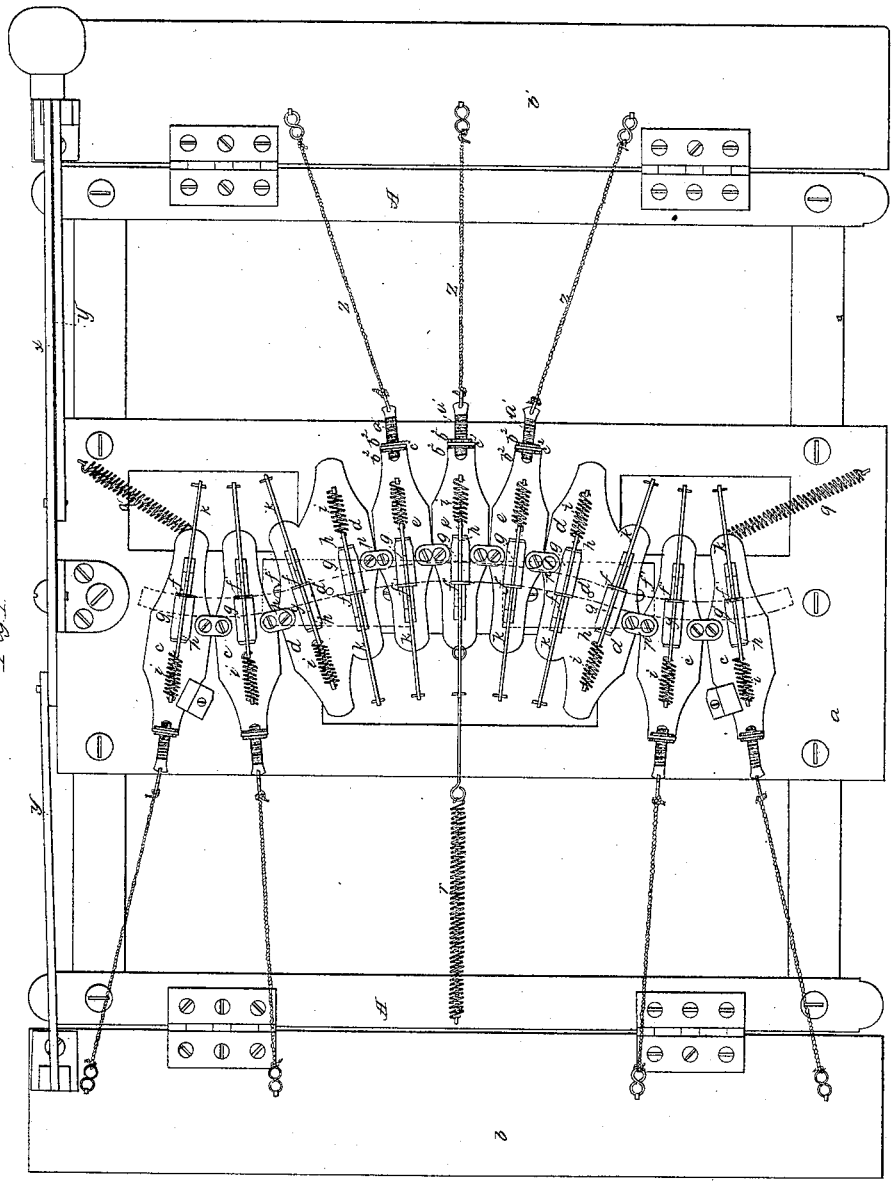


Fig. 1.

Witnesses
W. P. Hale Jr.
H. E. Fisher.

Inventor
Sam.l U. King
by his attorney
R. H. Eddy.

Sheet 2 · 3 Sheets.

S. U. King,

Bending Wood,

No. 50,601, Patented Oct. 24, 1865.

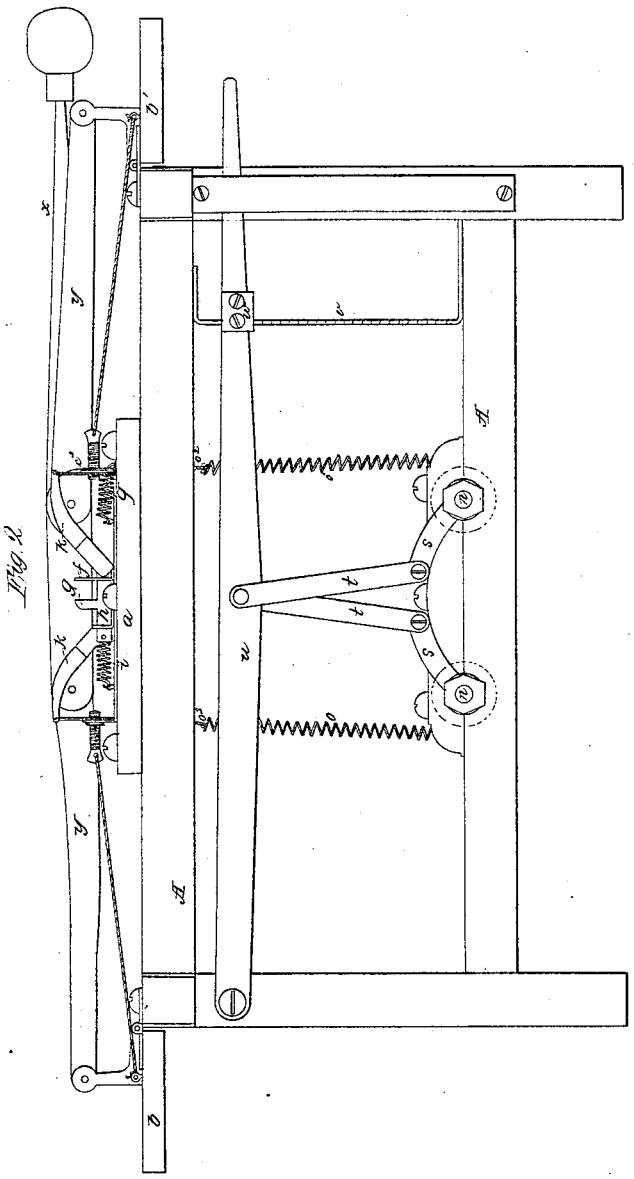


Fig. 2.

Witnesses
J. W. Hale Jr.
H. E. Fisher

Inventor.
Sam.l U. King.
By his attorney
R. H. Eddy

Sheet 3 - 3 Sheets.

S. U. King,

Bending Wood,

No. 50,601, Patented Oct. 24, 1865.

Fig. 5.

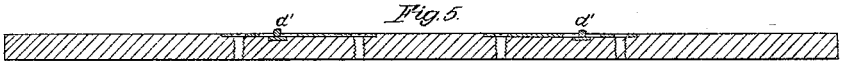


Fig. 4.

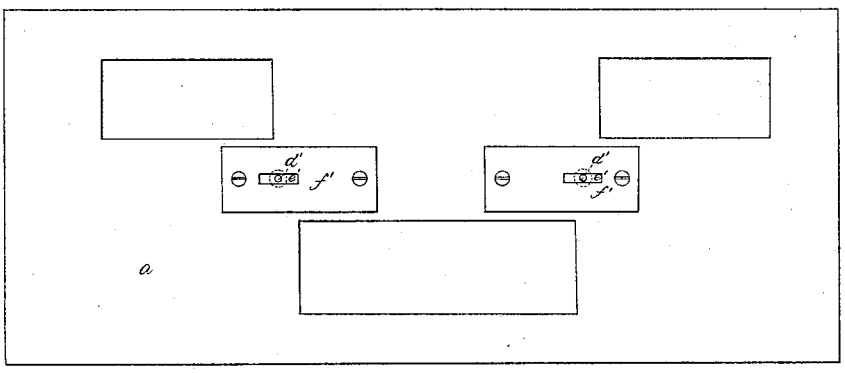
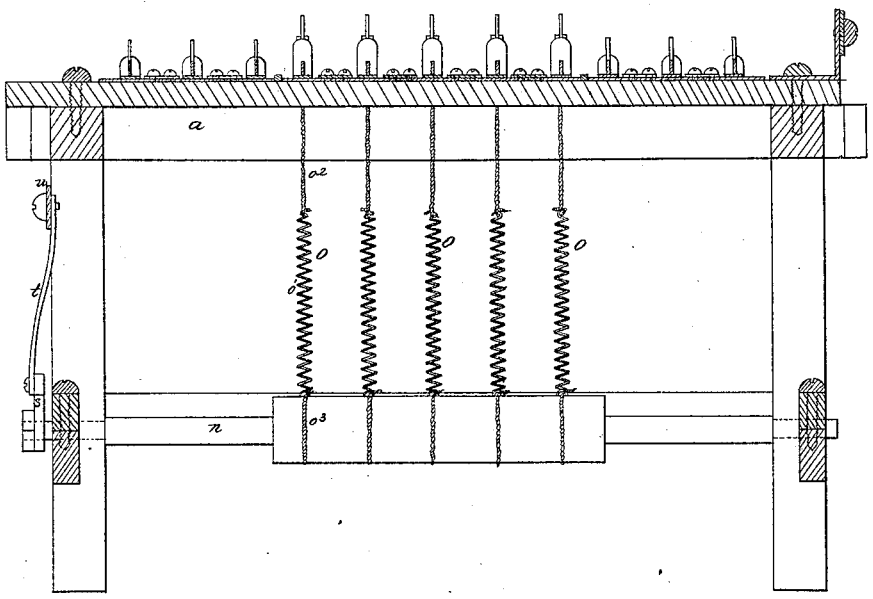


Fig. 3.



Witnesses
H. P. Hale Jr.
H. E. Fisher.

Inventor
Sam'l U. King
by his attorney
R. H. Eddy.

UNITED STATES PATENT OFFICE.

SAMUEL U. KING, OF WINDSOR, VERMONT.

IMPROVEMENT IN MACHINES FOR BENDING WOOD.

Specification forming part of Letters Patent No. **50,601**, dated October 24, 1865.

To all whom it may concern:

Be it known that I, SAMUEL U. KING, of the town and county of Windsor, and State of Vermont, have invented a new and useful Machine for Bending Scythe-Snaths or various other Articles; and I do hereby declare the same to be fully described in the following specification and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a side elevation, and Fig. 3 a transverse section, of it.

In the said drawings, A denotes the frame of the machine, on the top of which there is a board or platform, *a*, and there are also two other boards, *b b'*, which are hinged to opposite sides of the frame and arranged relatively to the board *a* in manner as exhibited in such drawings.

There is arranged on the upper surface of the board *a* a series of jaw carriers or carriages, *c c*, *d d*, *e e*, *d d*, and *c c*, each of which supports a stationary jaw, *f*, and a movable jaw, *g*, which are arranged as seen in Figs. 1, 2, and 3. Each movable jaw extends upward from a slide-bar, *h*, which slides through the fixed jaw, and at one end is connected to a spring, *i*, attached to the carrier. The other end of the said slide-bar is jointed to a cammed lever, *k*, so arranged as to bear against the outer surface of the fixed jaw, and so made that when pulled downward it will cause the movable jaw to be moved toward the fixed jaw. The upper end of each of the said several cammed levers *k k* of the jaw-carriers *c c d d c c* is jointed with one of two rocker-shafts, *m n*, by means of an elastic connection, *o*, composed of a spring, *o'*, and two cords, o^2 o^3, extending from opposite extremities of the spring. In the same manner each of the levers *k* of the other carriers *d e e e d* is united with the other rocker-shaft, the two rocker-shafts extending across the frame and being arranged in manner as shown in Figs. 2 and 3. Furthermore, the two pairs of carriers *d d* are joined together, and they are connected with those next adjacent to them by links *p p p p*. In the same manner each of the other carriers is united to that or those next to it, such links being arranged relatively to the jaws in the manner as exhibited in Fig. 1. Furthermore, retracting-springs *q q* and *r* are applied to the conjoined series of carriers, the board *a*, and the top of the frame, and arranged as shown in Fig. 1. There projects from each of the rocker-shafts an arm, *s*, and these two arms *s s* are connected with a lever, *u*, by means of two rods or links, *t t*, the said levers, arms, and rods being disposed in manner as represented in Fig. 2. A vertical rack, *v*, applied to the frame A, answers to hold the lever at any desirable position, there being a projection, *u*, from the lever to co-operate with the rock in upholding the lever. The two boards *b b'* are also connected to a lever, *x*, by two bars, *y y*, jointed both to the lever and the boards, and arranged as shown in Figs. 1 and 2. One of these boards is also connected by cords *z z z* to the three middle carriers *e e e*, the connection of each with the carrier being by means of an adjustment consisting of a screw, *a'*, and two nuts, b^2 b^2. The screw goes through a projection, c^2, from the carrier, and the nuts are screwed on the screw and placed on opposite sides of the projection. The two external pairs of carriers *c c c c*, are similarly connected to the other of the said boards *b b*. Furthermore, into the lower surface and at the middle of each pair of conjoined levers *d d*, as crew, *d'*, is screwed, such screw extending upward through a slot, *e'*, made in a plate, *f'*, fastened to the board *a*.

Fig. 4 denotes a top view of the board *a* with the plates *f' f'*; and Fig. 5 is a longitudinal section of such board, and the screw *d'* and the plate *f'*, in the slot of which such screw is situated.

It is intended for each of the screws to be directly underneath the conjunction of two opposite bends of the snath when it is in the machine. It is also intended that the several links *p* shall be arranged about in the line of the inner faces of the several movable jaws—that is, each link is to be so placed that while the snath may be in the act of being bent the two jaw-carriers connected by such link shall be made to so move laterally, as well as longitudinally, as to cause their two pairs of jaws to so move with respect to each other as to counteract any tendency of the fibers of the snath to become stretched or elongated. The object is to bend the snath, and at the same time to put upon any portion of it that may be between any two next-adjacent jaws such a contractile force as

may effectually prevent elongation and breakage of the fibers of the wood.

In bending wood it has been customary to contract the piece by pressure made at its two ends only. This causes compression of the fibers to take place at that part of the stick where it has the least area of cross-section, the compression or contraction not being uniform throughout the stick; but with my machine the compression in rendered for all practical purposes alike throughout its entire length, and thus the strength of the stick will not be impaired in any one part by the process of bending it.

In operating with the machine the lever should first be raised upward so as to elevate the two boards *b b'* and slacken the cords extending therefrom. Next, the snath stick or blank, after having been properly steamed, should be laid between the jaws of the several pairs of the carriers. The lever should next be raised so as to cause the jaws to firmly grasp the stick, after which the lever *x* should be depressed until the boards *b b'* may have been forced down into horizontal positions or thereabout. This will cause the jaw-carriers to be so moved as to effect the bending of the snath or stick in the manner required.

Were the connection *o o*, extending from the several cammed levers *k* to the rocker-shafts, non-elastic, it might frequently happen that, by reason no two snath-blanks are exactly alike or of the same size, some of the jaws would firmly grasp a blank, while others would not do so, during the act of revolving the rocker-shafts; but by having the connection *o o* elastic, as described, we insure the thorough grasping of the snath by each pair of jaws.

By means of each of the adjusting-screws *a'* and its two nuts b^2 b^2 the adjustment of their jaw-carriers may be effected in a manner to cause more or less variation of the curves to be given to the snath.

The above-explained machine operates to great advantage in bending a snath. It may also be employed for bending wood for the manufacture of various other objects.

What I claim as my invention is—

1. The machine substantially as described, and for the purpose specified, it consisting of the several series of jaw-carriers *c*, *d*, *c*, connected together and with their supporting-frame by means as described, the stationary and movable jaws *f g* of such carriers, the mechanism for simultaneously operating the movable jaws relatively to the fixed jaws in manner as described, and, finally, the mechanism for simultaneously actuating the jaw-carriers in manner as explained, the whole being arranged so as to operate on a snath and bend it with a uniform longitudinal compression or contraction, and in other respects as hereinbefore specified.

2. The combination of the adjusting-screws *a'* and the nuts b^2 b^2 with the jaw-carriers to which they are applied, and with the mechanism for actuating the jaw-carriers so as to effect the bending of a snath in manner as described, the purpose of such screws and nuts, or the object to be effected by them, being hereinbefore explained.

S. U. KING.

Witnesses:
R. H. EDDY,
F. P. HALE, Jr.