

No. 15,572.

PATENTED AUG. 19, 1856.

J. POTTER.
TENONING MACHINE.

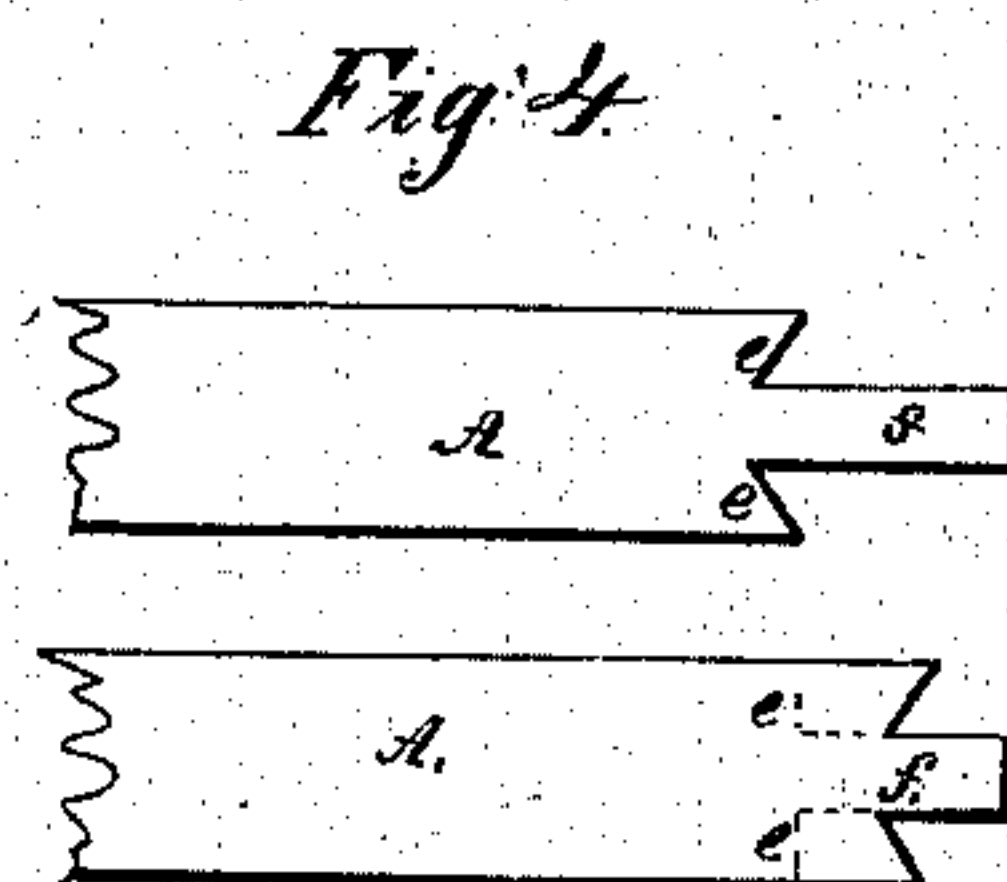
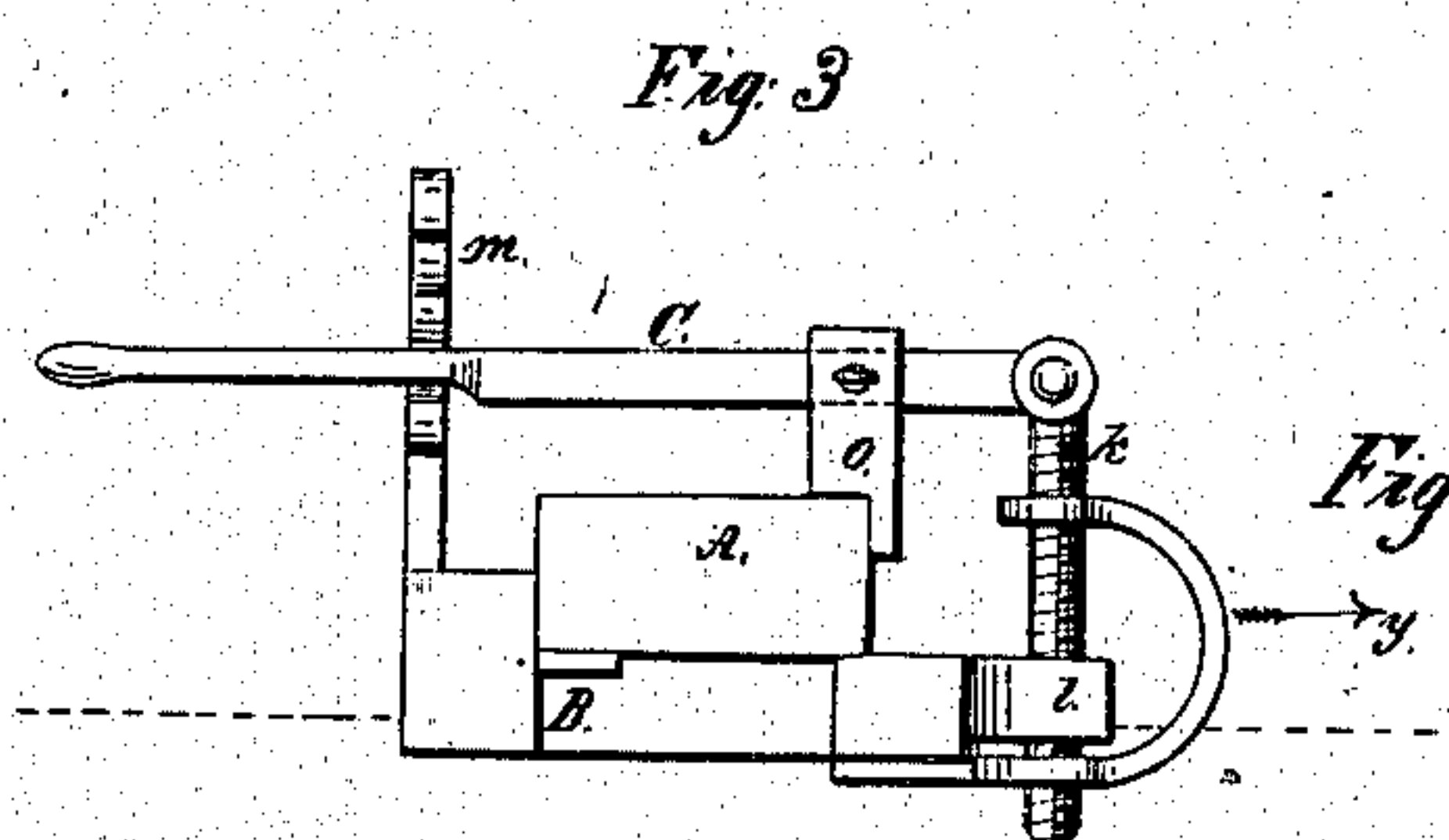
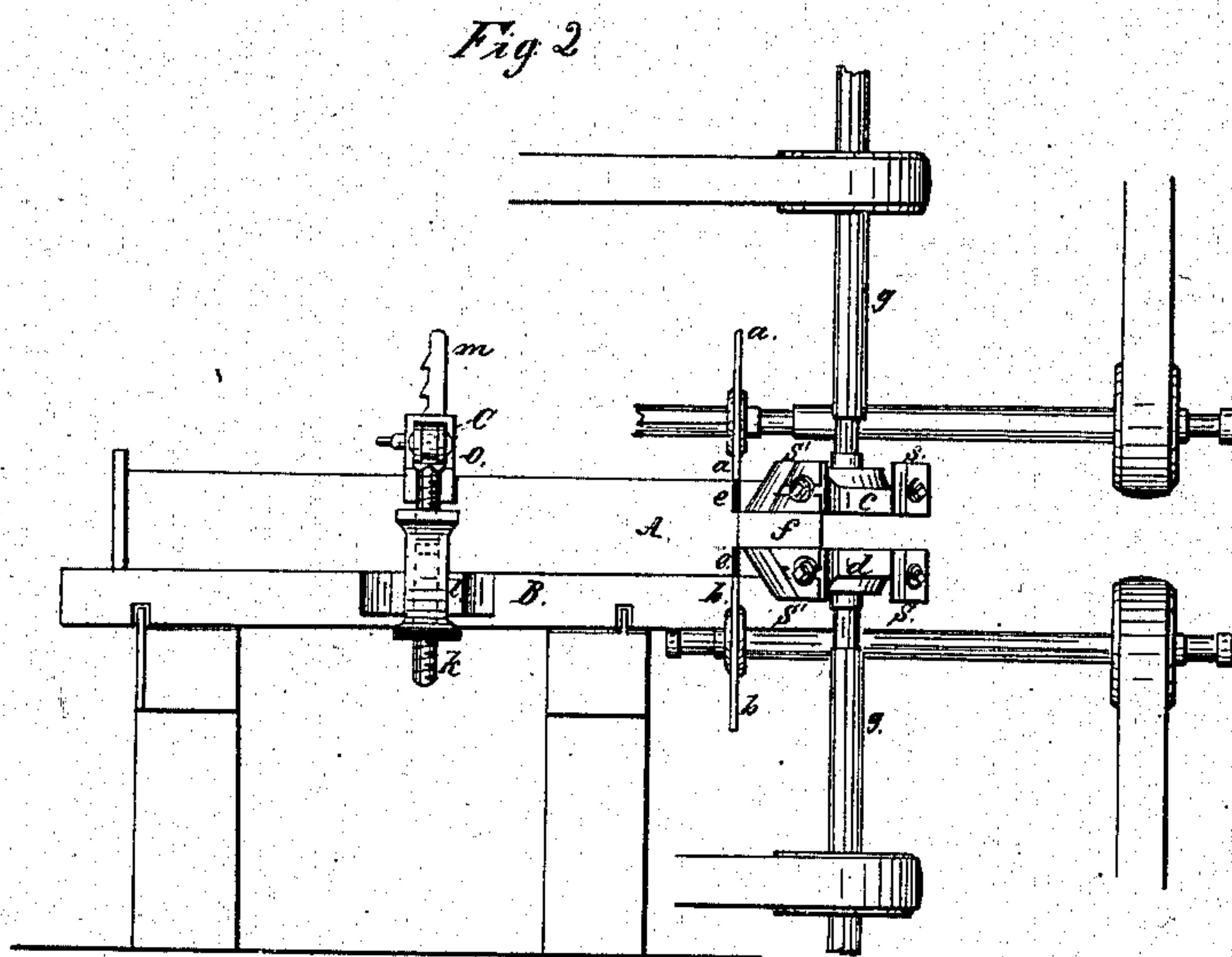
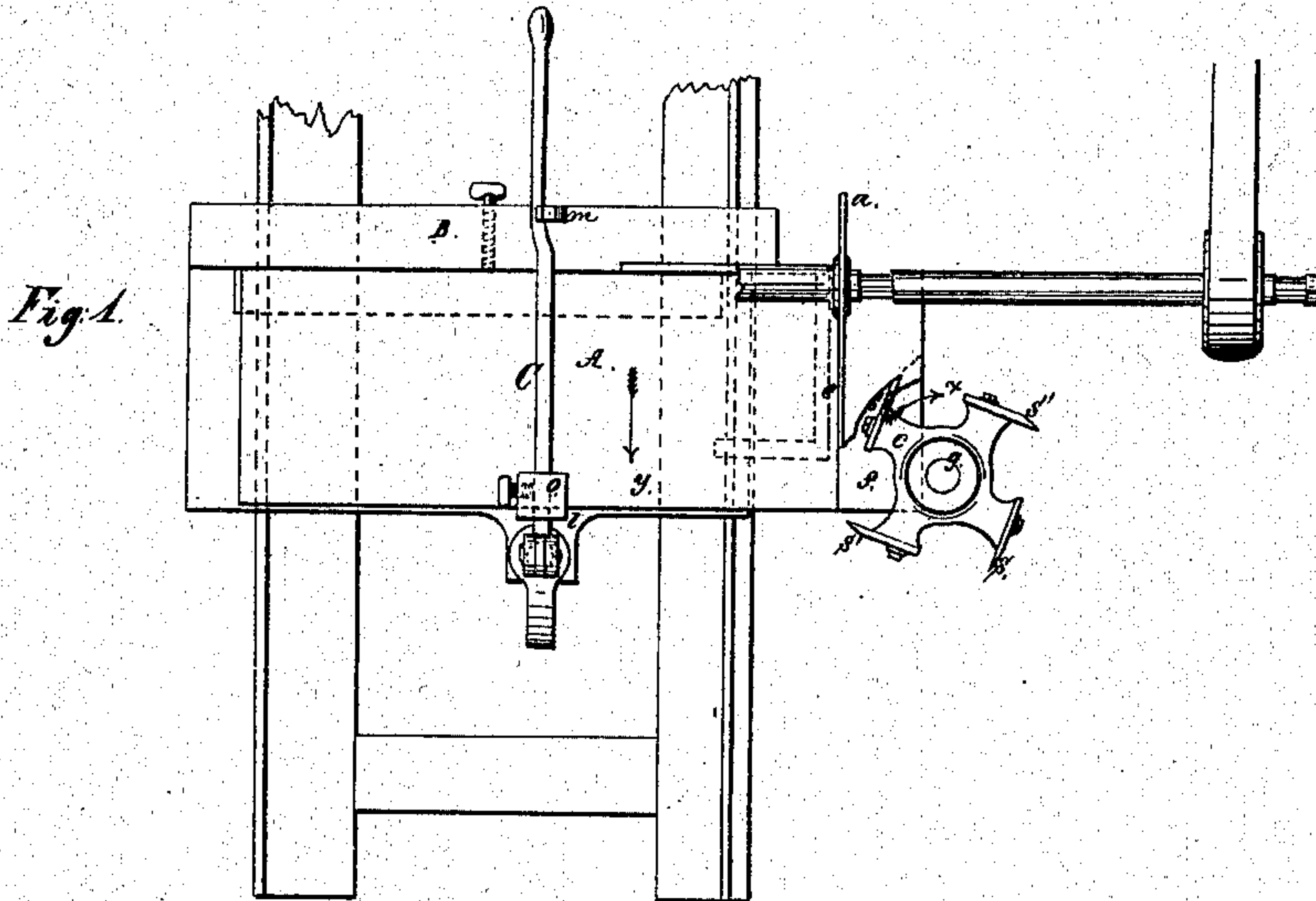


Fig 5



UNITED STATES PATENT OFFICE.

JOHN POTTER, OF ELLICOTTSVILLE, NEW YORK.

TENONING-MACHINE.

Specification of Letters Patent No. 15,572, dated August 19, 1856.

To all whom it may concern:

Be it known that I, JOHN POTTER, of Ellicottsville, in the county of Cattaraugus and State of New York, have invented a certain new and useful Improvement in Tenoning-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a plan or top view of the main working parts of the machine in the act of cutting a tenon; Fig. 2 a vertical front view of the same; Fig. 3 a side view of the clamp arrangement which holds the stuff on the carriage, detached; and Figs. 4 and 5 diagrams in illustration of the operation of the cutters on the wood.

It is well known that circular saws and revolving knife cutters have been used in connection both for cutting tenons on the ends of rails and for various kinds of work, but the relative arrangement and action of these in combination for cutting tenons have been for the most part grossly defective. It is also well known that one or more sets or heads of revolving knife cutters for scooping out the work as it is pushed past them have been used for certain kinds of work connected with the planing or reduction of wood and, as mere devices, such are old, as, of themselves also, are revolving circular saws arranged in pairs opposite each other to cut into the work on opposite sides as it is pushed past them. But as before stated much or all depends in certain descriptions of work upon relative arrangement and operation together of devices which in themselves are old.

In some tenoning machines, a pair of revolving circular saws are used, arranged vertically and opposite each other at a suitable distance apart to nick or cut the shoulder of the tenon on either side, while knives or chisels secured radially or tangentially on the one side or face of said saws chip away the wood to the required depth between the shoulder and point of the tenon to form the tenon as the rail is pushed along and past or through and between this combination of knife and saw cutters. But this action is bad. The knives on the two saws not digging into and leaving the wood exactly at the same time, or, accordingly as they are sharp or blunt, cutting with differ-

ent degrees of force on opposite sides of the rail, cause the rail however tightly held to keep up a continuous tremble at the tenon point or end so that a waved or jagged surface is produced which makes the tenons fit badly, and it is impossible with cutters so arranged and operating to cut a good long or rather broad tenon at all, in consequence of the spring and so forth, while such arrangement and action of the knives, in relation to the saws, has no tendency to relieve the "bind" of the saws in the wood, and, as tenons are ordinarily arranged, these knives do not cut at all with the fiber but across it; nor can such a combination of knives with the saws cut a bevel shoulder to the tenon as is commonly required in the construction of bevel doors, paneling, and so forth.

In some other tenoning machines, circular saws altogether are used, one pair arranged vertically, as the saws (*a* and *b*) are in the accompanying drawing, to cut the shoulder of the tenon on either side, and another pair of saws arranged horizontally or at right angles to the first pair, to cut the two sides or faces of the tenons. But this arrangement or combination of circular saws is almost if not quite as objectionable as the arrangement of knives and saws before described and has many of the defects in common with it, and the horizontal saws in particular operate badly, they binding too greatly in the wood to effect an easy cut even where the tenon is a narrow one, and to cut a deep or broad one by saws thus acting is out of the question, they also by reason of their thinness and elasticity "sag" and so shake or tremble as seldom to cut in a straight path, especially where the wood is knotty, and which gives an untrue face to the tenon; and again, such an arrangement of saws does not admit of a tenon being cut so deep or broad as to pass the centers of the horizontal saws as the axes or shafts of said saws would necessarily intercept the tenon or remnant being cut on either side to form the tenon, the saws not chipping away the wood as knives do, but the binding of the saws would, in a general way, prevent anything like so deep a tenon being cut.

In the arrangement represented in the accompanying drawing all these defects are avoided and a perfectly true tenon of any required depth or breadth and with square or bevel shoulder may be cut with ease.

The stuff or rail being worked (A), is fed or pushed forward as indicated by the arrow *y* and has the square shoulder (*e*) of the tenon (*f*) cut, by its end or edge at the required distance passing in between and through as it were the revolving circular saws (*a* and *b*) as in the machines before described. A little in advance of these circular saws (*a*, *b*) are a pair of horizontal cutter heads (*c* and *d*) which revolve as indicated by the arrow *x* in Fig. 1, and which are so arranged in relation to the saws as to cut the sides or faces of the tenons, cutting the wood (where it is a rail designed to have a tenon on the end) mainly in part direction of the fiber and so as to relieve the "binding" of the saws (*a*, *b*), by the knives bearing on the wood in their cut to free it from pressure on the outer sides of the saws in front, the knives cutting from the shoulder to the point of the tenon and where a spring has been formed by the incisions of the shoulders, saws and the reduction of surplus wood by the knives. Thus the cut of both knives and saws is made easy and light, and there is no irregular up or down pressure of the knives to produce trembling of the tenon, and a tenon of any breadth may be cut with ease to the cutters, the cutter heads (*c* and *d*) having their vertical driving shafts (*g*) projecting exclusively from their outer faces so that the tenon, if a broad one, may pass the centers of said cutter heads as much or as little as required, and the inside faces of the cutter heads will serve as bed surfaces or guides to keep the tenon steady, the heads being sufficiently stiff for that purpose. (For these effects and operations see Figs. 1 and 2 of the drawing.)

The knives or cutters (*s*, *s'*) of the cutter heads (*c*, *d*) may be either square or bevel nosed at their ends. In the drawing they are shown as alternately square and bevel whereby the cut is made lighter, the bevel nosed knives (*s'*) first reducing the wood as shown by black outline of the shoulder (*e*) in Fig. 5 and the square or straight nosed knives (*s*) following up to cut off the angle so formed till the shoulder is finally finished as represented by red lines in Fig. 5, if the shoulder is required to be a square one; but if the shoulder is required to be a bevel one, as represented in Fig. 4 of the drawing, then the bevel nosed knives (*s'*) are set radially in advance or excess of the square knives, or bevel nosed knives alto-

gether used and these, operating in combination with the saws, finish the shoulders.

The adjustability of the knives on the cutter heads, and the adjustability of the cutter heads, also of the saws, to vary the length, breadth, depth or size of the cut and so forth, according to the shaped tenon required—its thickness and breadth—may be effected in any suitable manner, and to avoid complication the hanging of the saws and cutter heads in adjustable sliding frames for this purpose has not been shown in the drawing, such arrangements being common and well known.

The timber under operation is firmly held on the sliding carriage (B) by a hinged clamp (C) that is jointed or hinged at its one end to a screw swivel pin (*k*) the thread of which fits a female thread in a screw box projection (*l*) through which the pin (*k*) passes, so that by unhooking the lever or clamp (C) at its opposite end from bite into any of the teeth of the catch (*m*), and the clamp or lever being raised, it may be raised or lowered at its hinged end by turning it and its screwed swivel pin (*k*) in the suitable direction so as to bring the clamping slide (*o*) to its true or required level to bite a thicker or thinner piece of stuff as required. The mere raising of the front end of the clamping lever, or lowering it, would not do this.

What I here claim as new and useful in cutting tenons, and desire to secure by Letters Patent, is—

1. The combination of the revolving knife cutter heads (*c*, *d*) and rotating saws (*a*, *b*), when these devices are arranged in relation to each other and for operation together as shown and described, causing the knives of the cutter heads to relieve the saws from binding and insuring many other advantages in the cutting of the tenon as specified.

2. Further, I claim the alternate arrangement on the cutter heads (*c*, *d*), when operating in specified relation to and connection with the saws, of the square and bevel nosed knives or cutters (*s*, *s'*), for action with each other and the saws in the formation of the shoulder as set forth.

In testimony whereof, I have hereunto subscribed my name.

JOHN POTTER.

Witnesses:

WM. M. SMITH,
A. GREGORY.