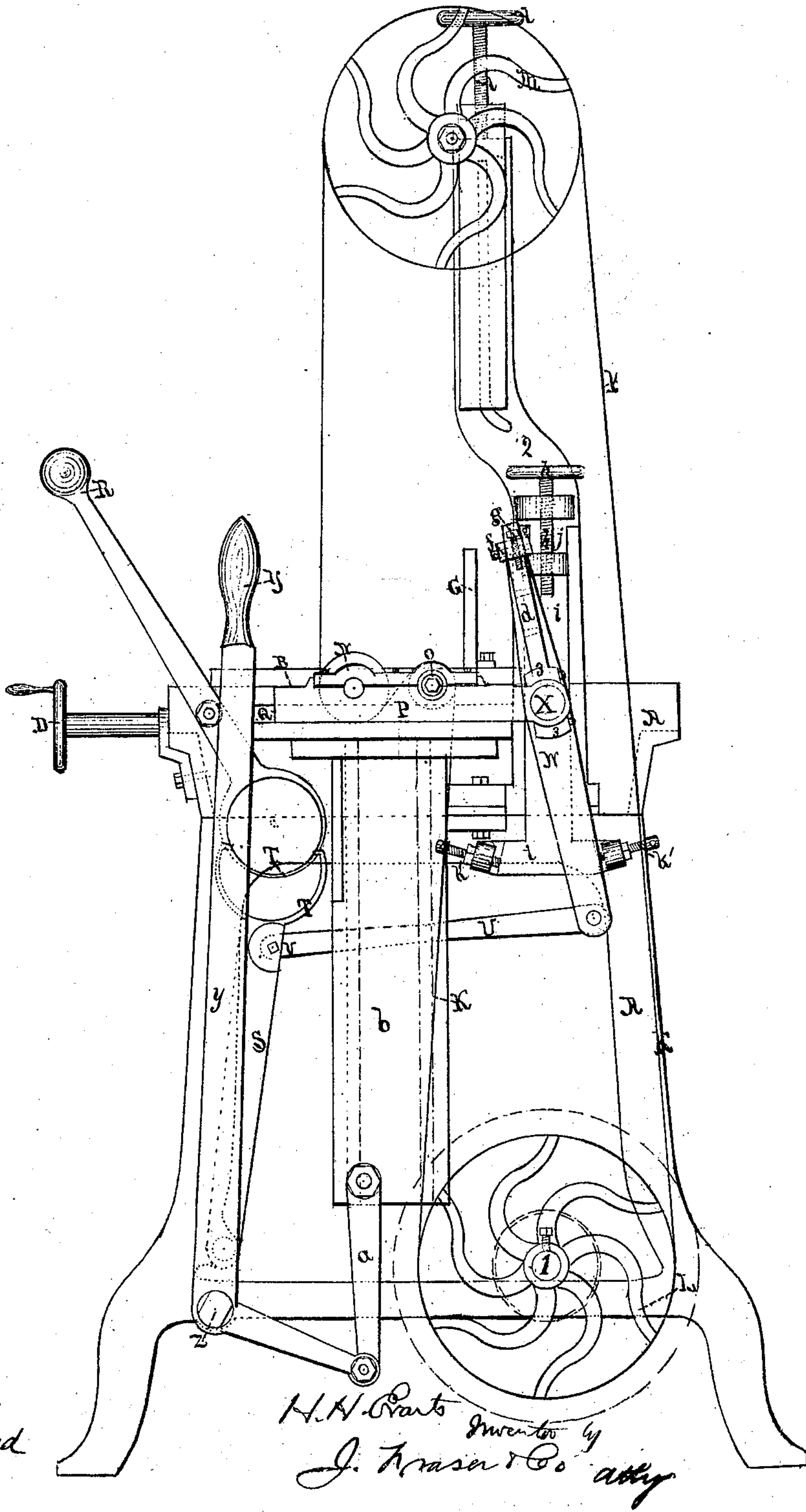


3. Streets, Street. 1.

Dovetailing Machine.

No. 104,001.

Patented June 7. 1870.



Witnesses,
A. B. Davis
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H. H. Parts Invented by
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H. H. Evans,

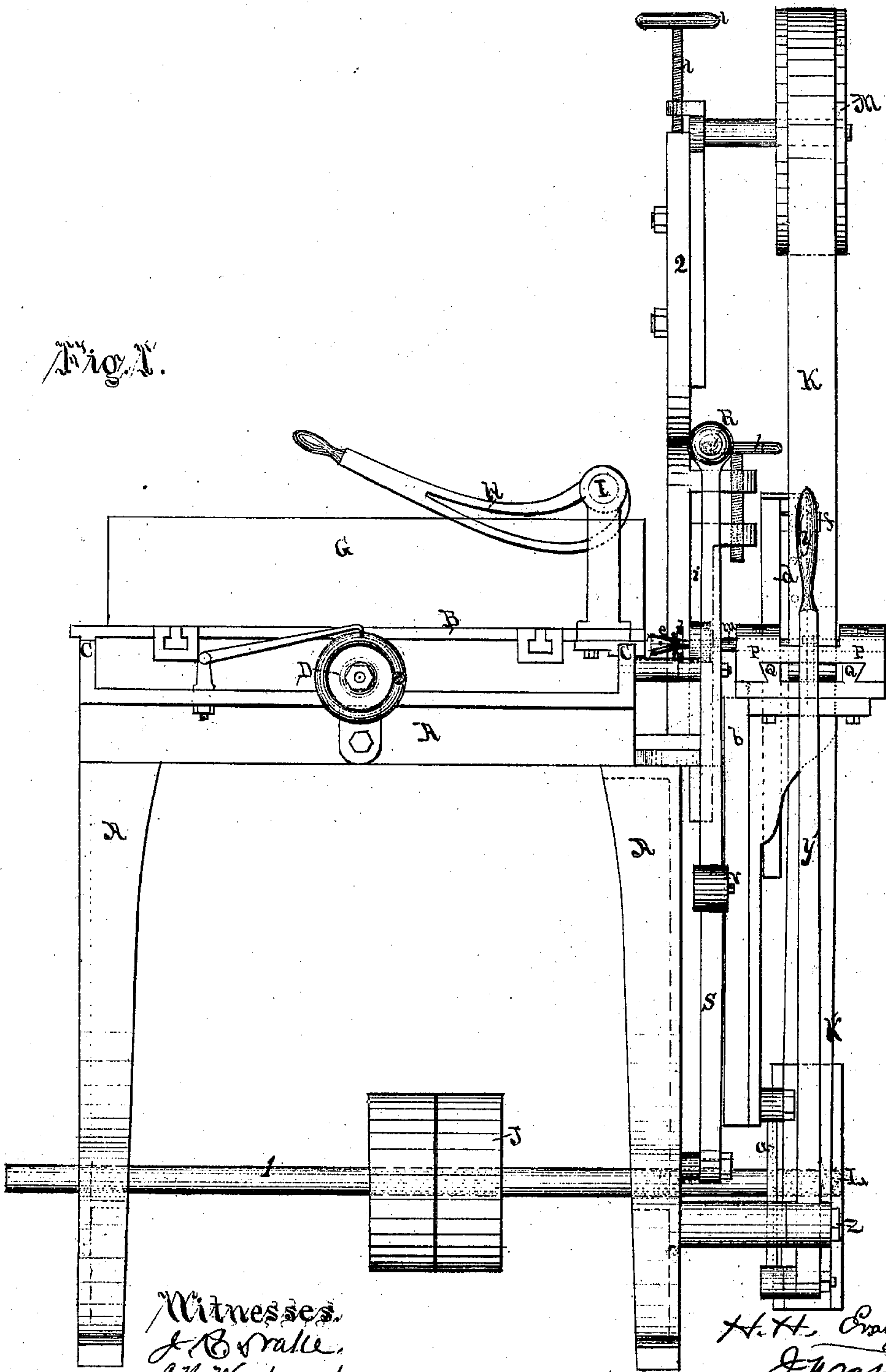
3. Sheets. Sheet 2

Dovetailing Machine.

No. 104,001.

Patented June 7, 1870.

Fig. 1.



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Dovetailing Machine.

No. 104,001.

Patented June 7, 1870.

Fig. 3.

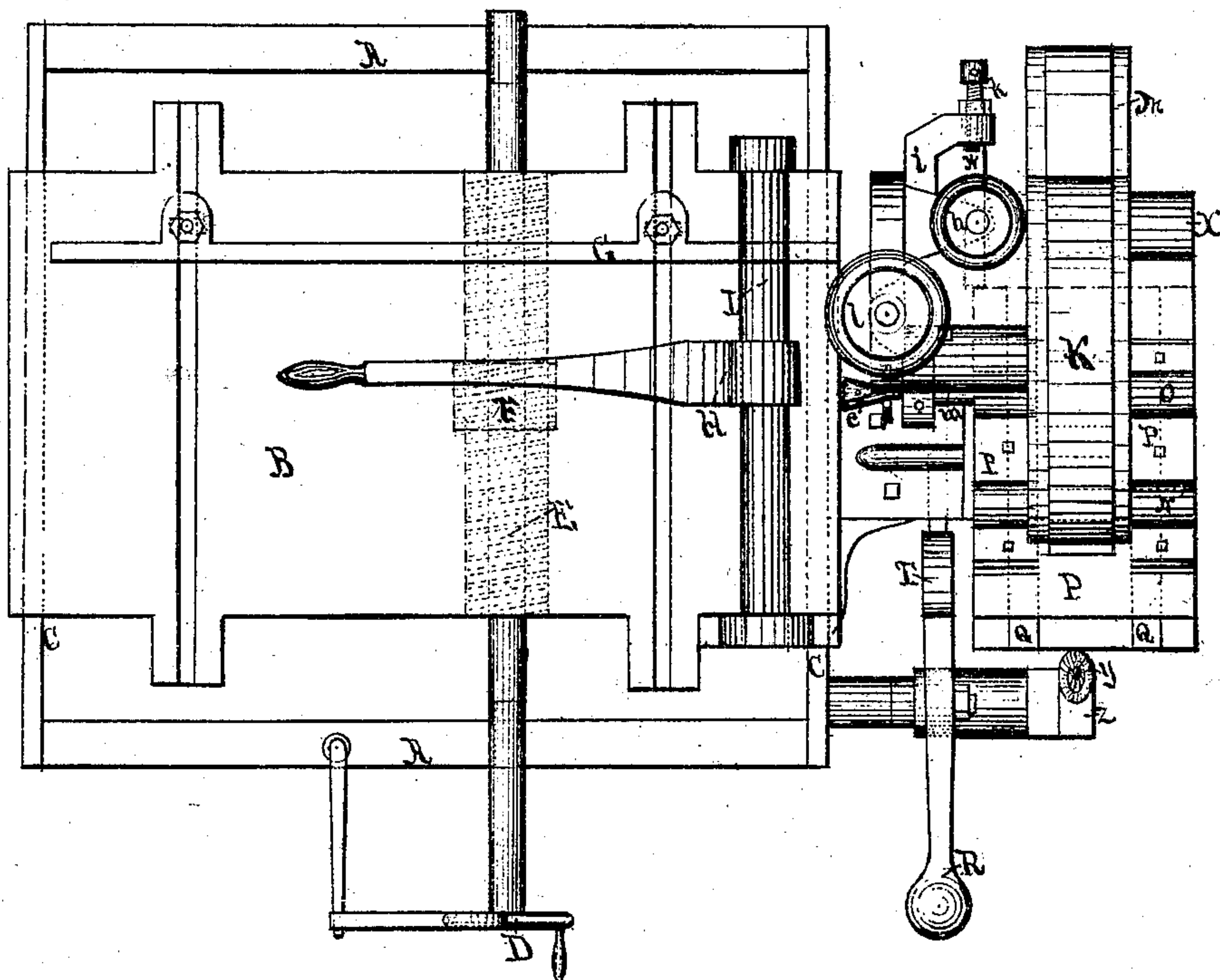


Fig. 5.

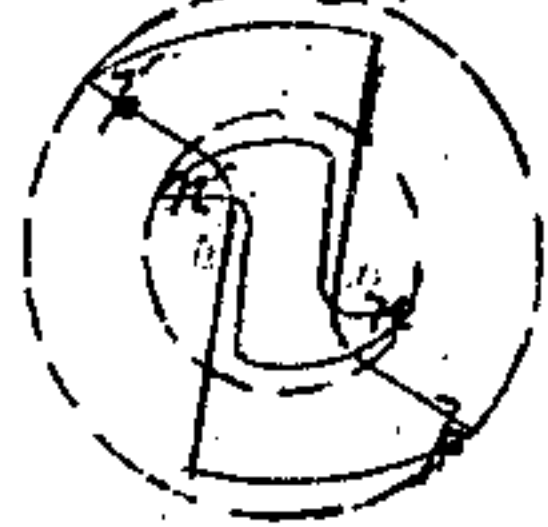
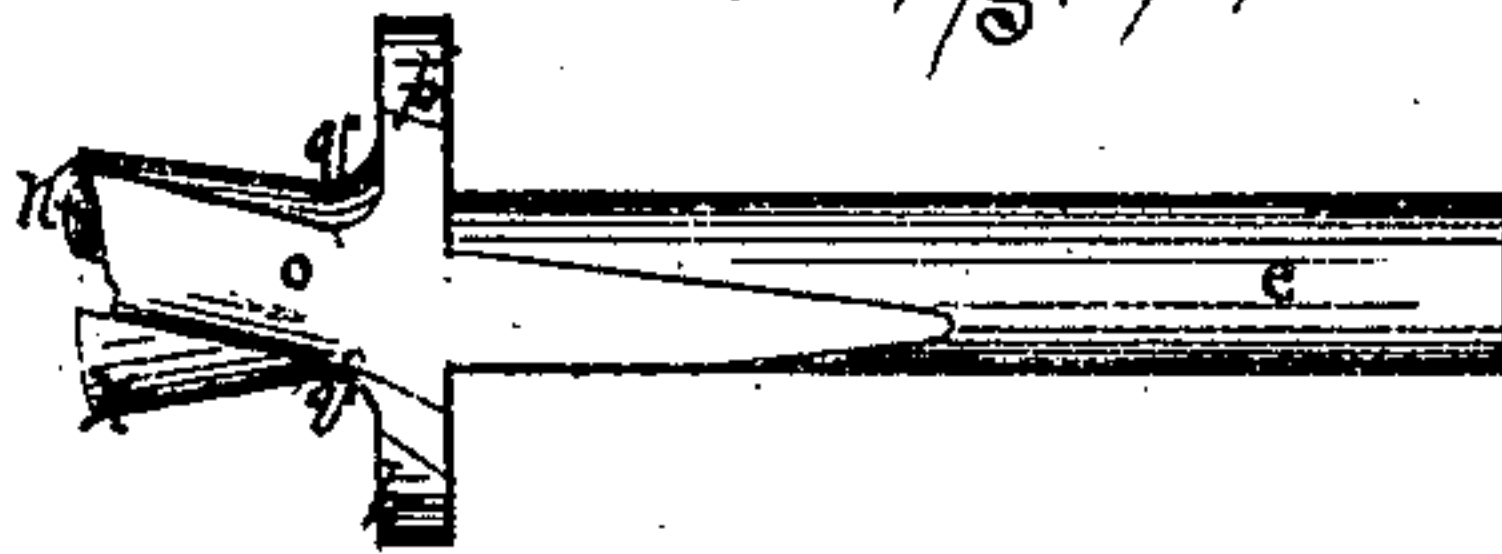


Fig. 4.



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UNITED STATES PATENT OFFICE.

HARRY HUBBARD EVARTS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN DOVETAILING-MACHINE.

Specification forming part of Letters Patent No. **104,001**, dated June 7, 1870.

To all whom it may concern:

Be it known that I, HARRY HUBBARD EVARTS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Dovetailing, of which the following is a specification:

Nature of the Invention.

The invention consists in imparting to the rotary cutters, or cutters of a dovetailing-machine, such motion as will produce perfect dovetailing without involving hand-labor in the operation.

It further consists in providing the machine with a peculiar cutter for forming dovetails and rounding the corners of the same, as hereinafter described.

General Description.

In the accompanying drawing, Figure 1 is a side elevation of the whole machine; Fig. 2, an end elevation; Fig. 3, a plan; Fig. 4, the winged cutter; Fig. 5, a diagram of the cutting end of the same.

A represents the frame, on which is placed the table B, mounted on slides C C, upon which it is moved backward and forward by means of a hand-wheel, D, attached to a worm, E, under the table, working in rack F. (See Fig. 3.) The wood to be dovetailed is set on this table with its edge against the gage G, and is there held tightly down by a cam-lever, H, on shaft I. The gage is adjustable for wide or narrow stuff.

Underneath the table is situated the main shaft 1, on which is a pulley, j, which drives the machine. On the end of this shaft is a pulley, L, around which a belt, K, passes, which continues up and over another pulley, M, running in an upright post, 2. The belt then passes down and over small pulleys, N O, both running in line of the table B in a frame, P. The shaft m of the pulley O is the cutter-shaft, in the end of which is inserted the cutter e, to be further described. This frame P has two important motions—first, a lateral one on slides Q Q, and operated by cam-lever R, working in a cam-joint, T T, the lower half attached to lever S, whose lower end is pivoted to frame A. A rod, U, connected at V with the upper part of lever S, transmits

motion to a vibrating bar, W, and which aids in moving the frame P back and forth by means of a connection at X. Second, the vertical motion is produced by means of a long lever, Y, bent and pivoted at Z to the lower part of frame A, with a connecting-rod, a, attached to it and to the lower end of a vertical flat plate, b. The frame P, with the slides Q Q before mentioned, is rigidly attached to the upper end of this plate b. The plate itself is retained in and works in a vertical position by dovetailed slides attached to frame A. It would seem that the lateral and vertical motion of this frame P would affect the belt K; but such is not the case, owing to its arrangement with the pulleys N and O.

By means of a hand-wheel and screw t at the top of the upright post 2 the pulley M is raised or lowered to regulate the tension of the belt.

The vibrating bar W has a slide, d, on its upper face, along which the gibs 3 in the connection X move when frame P is raised by lever Y, and when this vibrating bar is inclined, by moving the handle of cam-lever R, it will be seen that as frame P is raised by means of the lever Y the gibs 3 will follow up or down on slide d, and consequently move the frame laterally on the slides Q Q simultaneously with the upward movement, thus by these two motions—upward and lateral—giving an oblique movement to the cutter on shaft m of pulley O in frame P. This is an important double effect that I believe has never before been produced in a dovetailing-machine. On the top of this slide d is placed a stop, f, to arrest the frame P at any desired point; and to adjust the stopping-point closely, I arrange a set-screw, g, in the stop.

To regulate at will the amount of movement forward and back or vibration of the bar W, (the said bar vibrating on a pin fastened near the center to the upright bar of a gage, i,) I arrange set-screws k k, one on each side of the bottom of gage i. This widens or narrows its movement, and has necessarily a corresponding effect on the angle of the dovetails. The lower the frame P is set, and the more acute the angle of the vibrating bar, the wider the dovetails, and the higher it is set, the narrower.

The gage i slides up and down in way j, and

is adjusted by means of hand-wheel screw *h*, for the purpose of changing the width of the dovetail.

The cutter *e* has been mentioned in connection with the shaft which runs it. This is another important part of my invention, and performs what is called "blind dovetailing," as well as rounding the corners of dovetails—the operation hereinafter described. This cutter has two diagonally-spreading cutting-edges, *n n*, having two coves or grooves, *o o*.

A short distance from the cutting end two cutting-wings, *p p*, project at right angles to the shaft, the cutting-edges *p' p'* continuing to the extreme ends of the wings *p p*. The face of these wings is perfectly flat; but as it approaches the inside edge of the cutters *n n* it rounds a little, as shown at *q*, which forms or cuts the round edges of the dovetails—an effect I believe never before produced. A cutting-edge is thus produced from *n* to *p'*, which forms the side of the angular dovetail.

For plain dovetailing, or for plain dovetail-pins, different cutters are used; but these I do not claim.

Operation of the Machine.

The operation of the machine is as follows: For plain dovetailing, one or more of the pieces to be dovetailed are placed on the table *B*, squarely, with their ends projecting over the cutter *e* a distance equal to the length of the required dovetail, and secured by means of the cam *H*. The vibrating bar *W* is placed in a vertical position, and the stop *f* either placed high up or removed entirely. Motion is given to the machine, and the frame *P*, which carries with it the cutter *e*, is raised, and the cutter *e* cuts up through, forming one side of a dovetail in each piece. The cutter is then either returned through the space just cut, and the table *B* moved along a distance equal to the width of the required dovetail, and another space cut up through, completing the dovetails already begun, and making one side of another set, or the cutter *e* may be retained above the work after cutting the space up, while the table is moved along, as before, the width of the required dovetail, and then the cutter may be allowed to descend through the pieces, finishing those dovetails already begun, and cutting the side of another set, as before.

To make the dovetail-pins on the ends of other pieces to match and fill the spaces of those just cut out between the dovetails, I remove the plain dovetail-cutter and replace it with the ordinary twist-drill, then place a single piece upon the table and secure it. The gage *i* is set so that the end of the bar *W*, when thrown against the set-screws *k k*, assumes the angle of the dovetailing-tool just removed. The bar *W* is then thrown over as far as it will go by the lever *R*, and the cutter raised, as before, cutting obliquely upward through the piece. The cutter is allowed to descend

through the space just cut, and the bar *W* thrown either partly or entirely over to the opposite side of the gage *i*, and another cut made up through the piece, oblique in a direction opposite to the first cut made. If the bar *W* was thrown only part way over for this cut, it should be thrown entirely over the next time, and a cut made for the purpose of removing all the wood between the pins.

The "blind dovetailing" is done in a similar manner to making the plain dovetails described above. A different cutter is, however, used, being shown in Figs. 4 and 5, which rounds the corners of the dovetails.

To make the blind dovetail-pins on the ends of other pieces to match and fill the spaces between the blind dovetails, a single piece is operated on at a time, and the process similar to that pursued in making the plain dovetail-pins, except that the stop *f* is placed upon the slide *d* in such a position as to stop the cutter when it has cut upward a distance equal to the length of the dovetails already made, which are shorter than the thickness of the stuff used for "blind pins."

When the cutter is at its highest point the handle *R* is thrown over, which passes the cutter horizontally along, making the third side of the space. The cutter used is the same as that used for the plain dovetail-pins.

The principal advantages of the machine are obvious at a glance. It is simply constructed, is easily and readily worked, and does the work quicker and better than by hand, which is the usual method of making dovetails.

Claims.

1. The oscillating plate *W*, with its lever *R*, and the frame *P*, with its lever *Y*, the whole constructed, combined, and operating together in the manner and for the purpose substantially as herein shown and described.

2. The vertically-sliding plate *b*, in combination with and actuated by the lever *Y* and its connecting-rod *a*, the frame *P*, slides *Q Q*, pulleys *N O*, and holding cutter-shaft *m*, by which means the cutter is carried up through the wood worked upon, to form dovetails, as herein fully described.

3. The laterally-sliding mandrel-frame *P*, slides *Q Q*, plate *b* and its connections, and levers *R S*, cam-joints *T T*, connecting-rod *U*, vibrating bar *W* and its connections, all arranged as specified, so as to produce the diagonal cutting necessary to form the dovetail-pins, as herein set forth.

4. The vibrating bar *W*, having slide *d*, on which run gibs *3*, the gage *f*, and screw *g*, in combination with the frame *P*, levers and their connections *R S T*, *T*, and *U*, arranged and operating in the manner and for the purpose herein specified.

5. The plate *i*, with which the vibrating center of the bar *W* is connected, having the set-screws *k k*, which govern and determine the

inclination of said bar, in combination with the adjusting-screw *h*, by which the plate *i* is raised or lowered, to produce greater or lesser breadth for cutting, as herein clearly set forth.

6. The cutter consisting of the two diagonally-spreading edges *n n* and the cutting-wings *p p*, projecting at or about right angles to the shaft *e*, with the cutting-edges being continuations of each other in curved form,

with coves *o o*, when the same is constructed as herein shown and described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

HARRY HUBBARD EVARTS.

Witnesses:

J. R. DRAKE,

ALBERT HAIGHT.