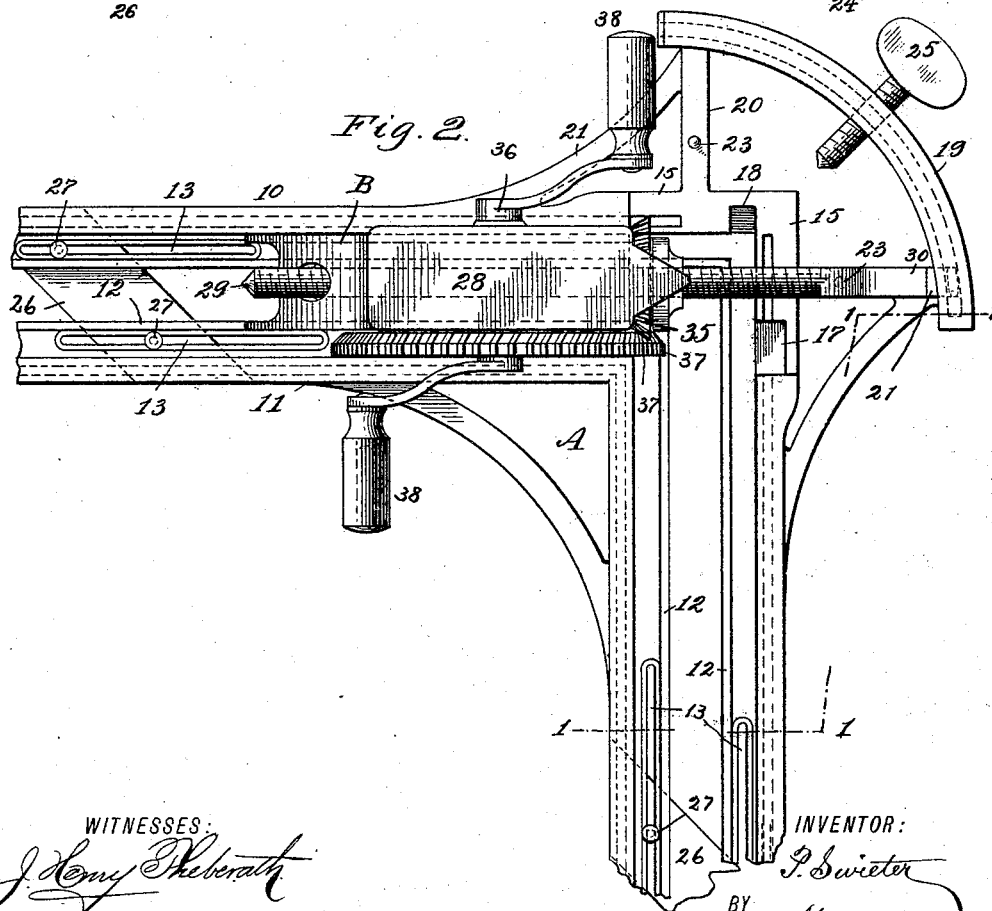
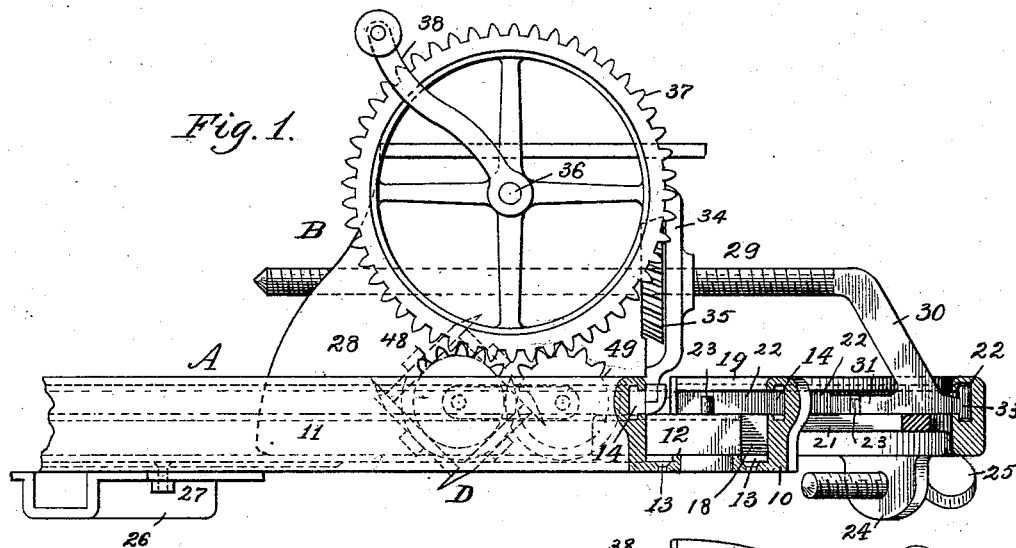


P. SWIETER.
MORTISING MACHINE.

No. 455,646.

Patented July 7, 1891.



WITNESSES:

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C. Sedgwick

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(No Model.)

2. Sheets—Sheet 2.

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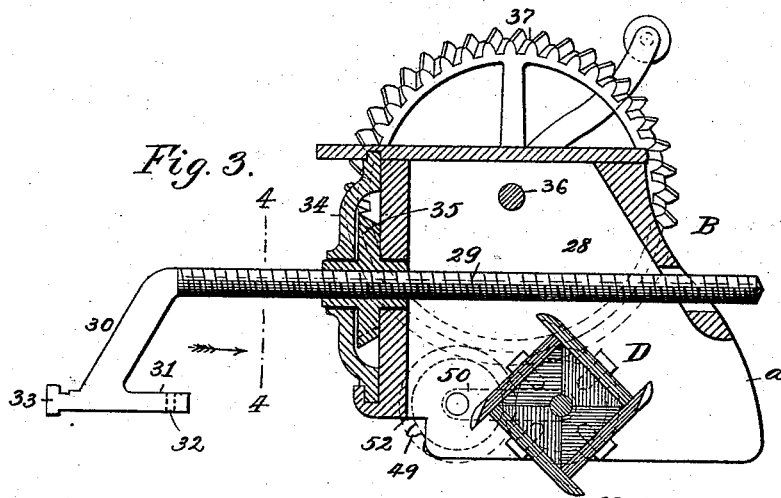


Fig. 5.

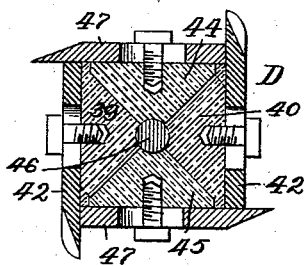


Fig. 4.

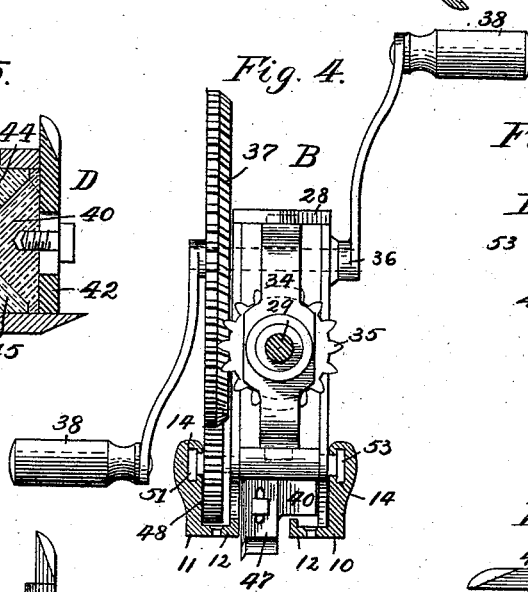


Fig. 6.

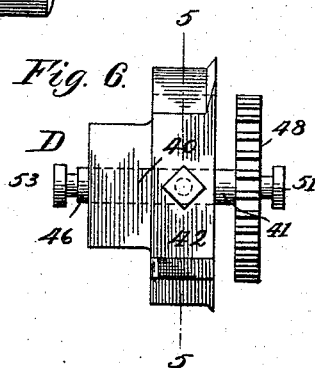


Fig. 7.

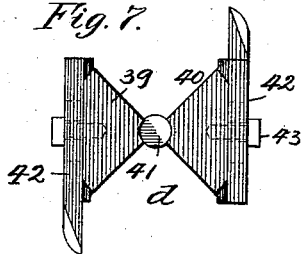


Fig. 8.

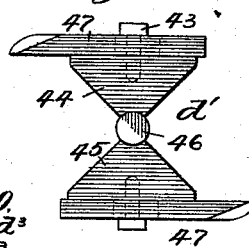


Fig. 9.

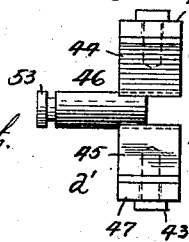
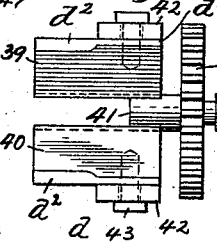


Fig. 10.



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UNITED STATES PATENT OFFICE.

PAUL SWIETER, OF ALLEGHENY, PENNSYLVANIA.

MORTISING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 455,646, dated July 7, 1891.

Application filed July 11, 1890. Serial No. 358,390. (No model.)

To all whom it may concern:

Be it known that I, PAUL SWIETER, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Mortising-Machine, of which the following is a full, clear, and exact description.

My invention relates to an improvement in mortising-machines especially adapted for mortising wall-strings to receive the risers and treads of steps, and has for its object to provide a portable machine of simple and durable construction and capable of convenient and expeditious application and manipulation.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the machine, partially in section, the section being taken on the line 1 1 of Fig. 2. Fig. 2 is a plan view of the machine with the members of the base broken away. Fig. 3 is a central vertical section through the carriage thereof. Fig. 4 is an end view of the carriage in position, the base of the machine being in section. Fig. 5 is an enlarged central vertical section through the cutters located in the carriage, the section being taken on the line 5 5 of Fig. 6. Fig. 6 is a side elevation of the cutters detached. Fig. 7 is a side elevation of the stationary section of the cutters. Fig. 8 is a side elevation of the adjustable cutter-section, and Figs. 9 and 10 are edge views of the two sections disconnected.

The base A of the machine consists of two parallel angular sections 10 and 11, the members of which are at a right angle one to the other. Each section is provided upon its inner face at the lower edge with a horizontal flange 12, the said flanges being adapted to constitute slideways, and in the flange of each member of each section, at or near the center thereof, a longitudinal slot 13 is produced. Near the upper edge of the inner face of each member of each section a longitudinal under-

cut or T-shaped recess 14 is formed. The outer or larger section in its upper face at the junction of its members is provided with a horizontal recess 15, and in the recessed surface 15 two downwardly-extending cavities 17 and 18 are produced. Opposite the recessed portion 15 of the larger section 10 of the base a segmental plate 19 is secured, preferably by means of radial arms 20 and 21. The segmental plate upon its inner face is provided with a horizontal or T-shaped undercut recess 22, and each of the arms 20 21 is provided with an upwardly-extending attached pin 23. The segmental plate is also provided with a downwardly-extending central lug 24, through which a set or binding screw 25 passes.

The members of the two sections 10 and 11 of the base are united by essentially U-shaped connecting-plates 26, which plates are diagonally located, as illustrated best in Fig. 2, and the members of the said connecting-plates are horizontally and outwardly flanged, the sections 10 and 11 resting upon the said flanges. The connecting-plates are united to the sections by means of bolts 27, extending upward through the flanges of the plates into the grooves 13 of the base-sections, the said bolts being provided beneath the flange of the connecting-plates with suitable adjusting or tightening nuts. By this construction the members may be adjusted to regulate the width of the space therebetween.

A carriage B is adapted to travel in the space between the base-sections 10 and 11 upon the flanges 12 of the members of said sections. The carriage consists of a box-like casing 28 of sufficient width to travel freely between the base-sections, the lower end or bottom of the casing being open and also a portion of one end, as illustrated at *a* in Fig. 3.

Through the casing, at about the central portion thereof, a screw 29 is passed, extending through both ends, one extremity of which screw is provided with a downward and outward extension 30, terminating at its extremity in a horizontal foot 31. The foot is provided near one extremity with an aperture 32, and upon the opposite extremity a button 33 is formed.

At one end of the casing a vertical bracket 34 is secured, and in the bracket and an ap-

erture in the end of the casing the hub of a pinion 35 is capable of revolving. The bore of the hub of the pinion is threaded and the said pinion is mounted to turn upon the screw 29.

In the inside of the casing near the top a shaft 36 is journaled, and upon one end of the shaft a crown-wheel 37 is secured, which wheel meshes with the pinion 35. The shaft 36 at each extremity is provided with a crank-arm 38, whereby it is rotated. The cutters D are held to revolve between the sides of the casing at the lower open face thereof. The cutter-head is made in two sections d and d' . The section d consists of two triangular blocks 39 and 40, placed with their base facing outward, the apex or sharp angular portion of the blocks being attached at one end to opposite sides of a spindle 41, and the opposed inner surfaces of the blocks 39 and 40 are longitudinally grooved. The outer faces of the blocks at their side edges are preferably slightly chamfered, as shown at d^2 in Fig. 10, and provided also with a slight flange d^3 . The cutting-blades 42 are made to face in opposite directions and are secured to the outer faces of the blocks, preferably by means of bolts 43, which pass through slots in the blades, whereby the said blades are rendered adjustable. The blades of the section d of the cutter-head are firmly bound to the blocks and are located near one end, preferably at the end having the flanges d^3 attached, over which flanges the blades project. The section d' of the cutter-head is constructed in practically the same manner as the section d , and comprises two triangular opposed blocks 44 and 45, secured at or near one end of a spindle 46. The blocks 44 and 45 are, however, much narrower than the blocks of the section d . In fact, the blocks of the section d' correspond in thickness to the width of the cutting-blades 47, secured to their outer faces, the cutting-blades being attached in a similar manner to the cutting-blades 42.

The complete cutter-head is formed by causing the blocks 44 and 45 to enter the side spaces intervening the blocks 39 and 40 of the section d , as illustrated in Fig. 5, the flanges d^3 of the section d preventing any lateral movement of the blocks of the section d' . When the cutter-head is formed, the cutting-edges of the cutting-blades of one section extend over and beyond the heel of the cutting-blades of the other section, as is likewise best shown in Fig. 5. The section d I denominate a "fixed" section, as the spindle thereof passes through and is journaled in the side of the casing 28, at which side the crown-wheel 37 is located, and the projecting end of the spindle has secured thereto a gear-wheel 48, which meshes with a similar wheel 49, journaled upon a spud-axle attached to the casing, the latter gear-wheel being adapted to mesh with spur-teeth on the periphery of the crown-wheel. Upon the outer extremity

of the spud-axle of the wheel 49 and the spindle of the wheel 48 the ends of a horizontal guide-bar 50 are loosely attached, the guide-bar being prevented from slipping from the axle and spindle, preferably, by buttons 51, formed upon them, preferably, by an annular groove.

In operation the base is attached to the wall-string by causing the set-screw 25 to engage with one side edge of the string-piece and the connecting-plates 26 to engage with the opposite side face of the string-piece. The set-screw is then adjusted so that the string-piece will be clamped firmly between it and the connecting-plates. The carriage B is then placed, for instance, at the outer end of the upper channel in the base, and the button 33 of the foot of the feed-screw 28 is made to enter the undercut recess of the segmental plate 19, and the pin 23 opposite the channel in which the carriage is located is made to enter the aperture 32 in the foot of the feed-screw, as is best shown in Figs. 1 and 2. By turning the crank-arms 38 the carriage is made to travel in the direction of the foot of the feed-screw, crossing the other channel in the base. The revolution of the shaft 36 by means of the crank-arms revolves the cutter-head and causes the blades carried by the head to cut a mortise channel or groove in the string-piece corresponding to the location of the channel over which the carriage is traveling, and the carriage is gradually fed forward as the cut is made by the crown-wheel 37 acting upon the pinion 35, which causes the said pinion to travel upon the screw in the direction of its foot. When one mortise groove or channel has been completed, the position of the carriage is reversed—that is, the carriage is placed at the end of the other channel of the base—and the foot of the feed-screw is connected with the pin 23 facing that channel. Before locating the carriage the second time the crank-arms 38 are moved in a direction to cause the carriage to travel upon the screw to its extreme outer end or near the same.

The recess 15 is formed in the base in order to admit of the forward end of the carriage passing over the upper portion of the base-section 10 at the junction of its members, the forward lower end of the carriage having an angular recess 52 formed therein, whereby a shoulder is formed, limiting the forward movement of the carriage.

The spindle of the movable section of the cutter-head passes through the side of the carriage and is provided with an attached or integral button 53, and when the carriage is placed in position to travel in either of the channels of the base the button 53 of the movable cutter-head section is made to enter one groove 14 of one of the base-sections, and the guide-bar 50 at the opposite side of the carriage is made to enter the opposed groove in the opposite section. By this means the carriage is effectually guided in its forward

movement and prevented from having movement laterally.

It will be observed that by constructing the cutter-head in two sections, one of which is nominally fixed and the other held to slide thereon, by drawing the movable section outward, which is accomplished through the medium of its spindle 46, the blades carried by said section may be drawn any desired distance out of alignment with the blades upon the fixed section, thus producing a mortise cut of any desired width or a cut, if desired, the full width of the thickness of the complete cutter-head. The movable blades are never adjusted to completely leave the fixed blades, as the cutting-edge of the latter blades must in every instance partially cover the heels of the movable blades. The adjustment of the cutters is made by adjustment of the sections of the base to or from each other.

Whenever it is desired to cut a mortise wider at one end the sections 10 11 are adjusted farther apart at the outer ends of the parts on which the carriage is to travel, so that as the carriage B travels inward with the button 53 engaging the groove 14 the cutter-section d' will be moved inward upon the section d , thus bringing the cutters 47 gradually nearer the blades 42. It will be noticed that the blocks 39 40 extend from side to side of the casing 28, and that the blocks 44 45 are only about half that length, with their spindle 46 passing through the side of the casing. Of course the section d' of the cutter will therefore be automatically slid on the section d , according to the inclination of the grooved section engaged by the button 53. If the two sections 10 11 are parallel, the two cutter-sections will not change their relative positions with respect to each other; but any divergence from parallelism on the part of the sections will be followed by a correspondingly-cut groove on the part of the cutter, whose section d' will be moved in or out, as the case may be. I would remark here that the purpose of cutting a groove wider at one end than the other is to permit of the ends of the stair-treads being inserted in said grooves and being firmly wedged therein by wedges driven between the treads and the wider ends of the grooves.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A cutter-head comprising two sections sliding one upon the other and provided with oppositely-projecting spindles having buttons on their outer ends, substantially as set forth.

2. The combination, with a carriage having a box-like casing, of an expansible cutter-head mounted therein and consisting in two sections of different lengths, the shorter section sliding upon the longer, and each section having an independent short spindle projecting through the sides of the casing, substantially as set forth.

3. In a sectional cutter-head, the combina-

tion, with a section consisting of connected and spaced triangular blocks and cutting-blades attached to the blocks and having their cutting-edges projecting in opposite directions, of a section also constructed of spaced and connected angular blocks of less width than the blocks of the first section, the said blocks being also provided with attached cutting-blades, the cutting-edges whereof extend in opposite directions, the smaller section being laterally adjustable upon the larger section, substantially as shown and described.

4. A sectional cutter-head consisting of two sets of triangular blocks oppositely arranged upon the inner ends of independent spindles having buttons on their outer ends, said blocks being adapted to interlock and to carry cutting-blades, substantially as and for the purpose specified.

5. In a mortising-machine, a base provided with a right-angled channel, inwardly-extending base-flanges defining the width of the channel, an offset at the junction of the members of the base, a clamping device carried by the offset, and clamping devices attached to the members of the base, substantially as and for the purpose specified.

6. In a mortising-machine, a base consisting of two right-angled sections provided with inwardly-extending base-flanges and adjustably connected to provide for varying the width of the space between said sections, substantially as described.

7. In a mortising-machine, a base consisting of two parallel right-angled sections, adjustable clamping-plates spacing the members of the sections, a clamping device connected with one section at the junction of its members, both sections being provided with inwardly-extending flanges, and channels above the said flanges, substantially as and for the purpose specified.

8. In a mortising-machine, a base consisting of two parallel right-angled sections, adjustable clamping-plates spacing the members of the sections, a clamping device connected with one section at the junction of its members, both sections being provided with inwardly-extending flanges, and T-shaped channels above said flanges, substantially as and for the purpose specified.

9. The combination, with a base provided with a right-angled channel and clamping devices attached to the base, of a carriage held to travel in the channel, provided with rotary cutters, and a feed-screw connected with the base, as and for the purpose specified.

10. The combination, with a base provided with a right-angled channel and clamping devices attached to the base, of a carriage held to travel in the channel, provided with rotary cutters, a feed-screw connected with the base, a threaded pinion engaging the feed-screw, and a driving mechanism, substantially as and for the purpose set forth.

11. The combination, with a base provided

with a right-angled channel and clamping devices connected with the base, of a carriage held to travel in the channel of the base, a cutter located in the carriage, a pinion provided with an interiorly-threaded hub, a drive-
5 shaft, a gear connection between the drive-shaft, the cutter, and pinion, and a feed-screw passed through the carriage and the hub of the pinion, the said screw having detachable
10 connection with the base, substantially as shown and described, and for the purpose set forth.

12. The combination, with a base consisting of two right-angled sections adjustably held
15 together to form a space between them and provided with T-shaped channels, of a carriage adapted to travel in said space, a cutter journaled in said carriage, made in two sections, the axles of which have buttons on
20 their outer ends adapted to engage the T-

shaped channels of the base-sections, substantially as and for the purpose specified.

13. The combination, with a base consisting of two right-angled sections adjustably held together to form a space between them and
25 provided with T-shaped channels, of a carriage adapted to travel in said space, a cutter journaled in said carriage, made in two sections, the axles of which have buttons on their outer ends adapted to engage the T-
30 shaped channels of the base-sections; a feed-screw removably attached to the base and engaging the carriage, and a mechanism for revolving the cutter and feed-screw, substantially as and for the purpose specified.

PAUL SWIETER.

Witnesses:

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PETER LIPPERT.