March 19, 1929. W. H. HANNAH 1,706,157

POWER DRIVEN PLANE

Filed May 13, 1927 2 Sheets-Sheet 1

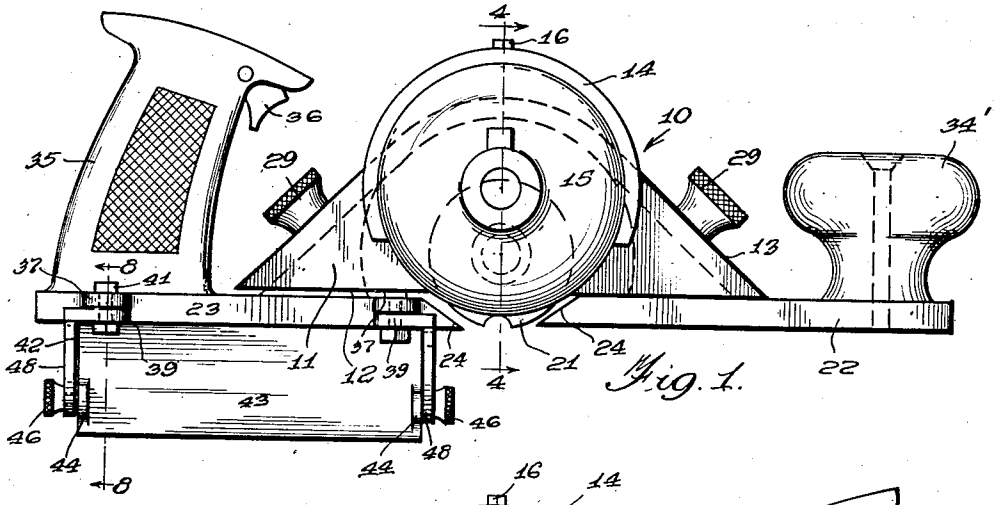


Fig. 1.

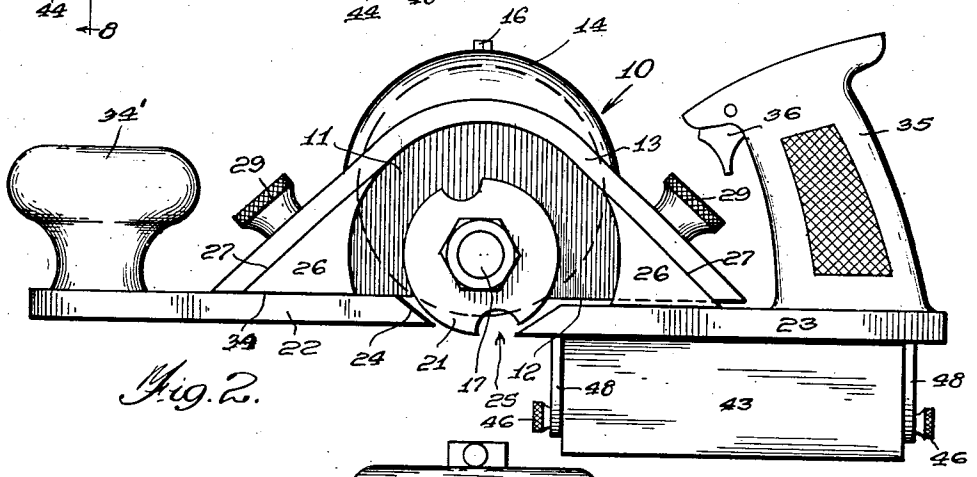


Fig. 2.

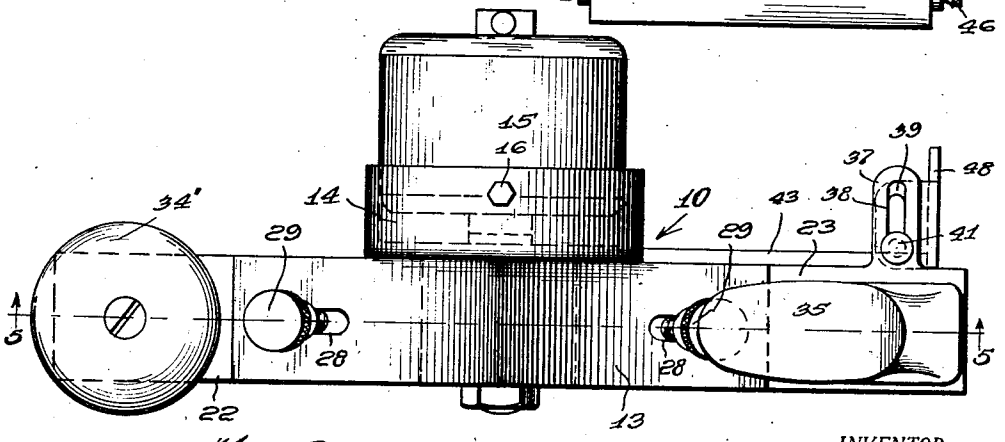


Fig. 3.

INVENTOR.
Walter H. Hannah,
BY
ATTORNEY.

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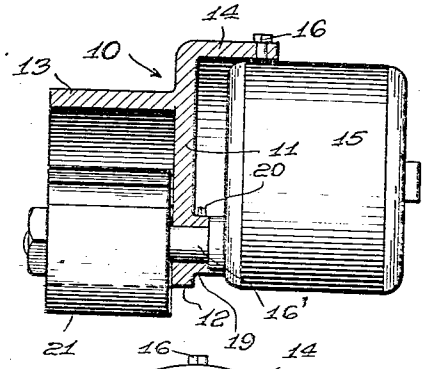


Fig. 4

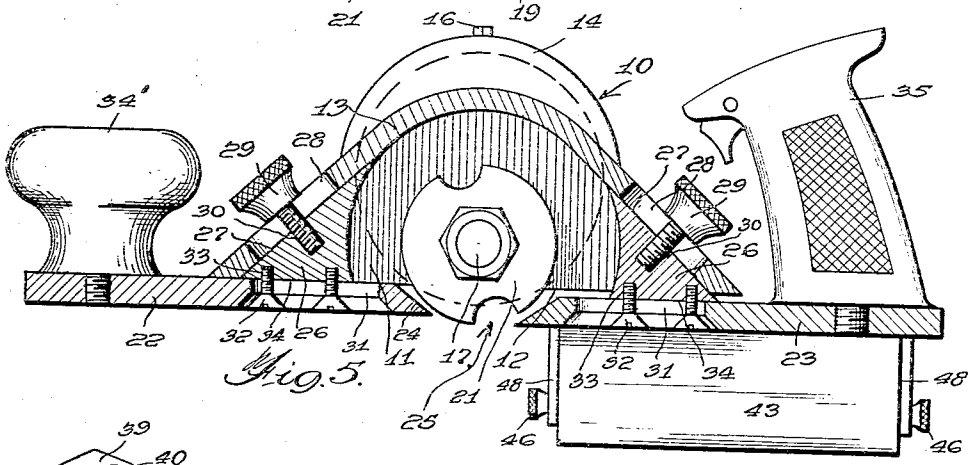


Fig. 5.

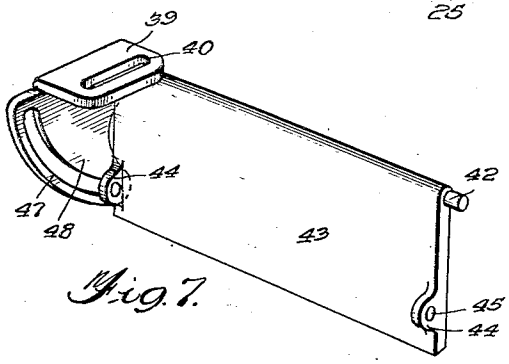


Fig. 7.

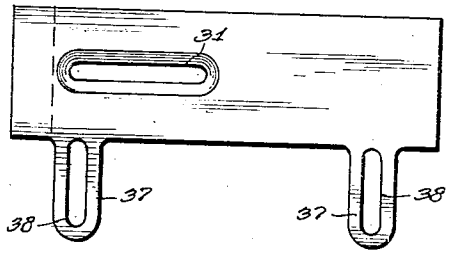


Fig. 6.

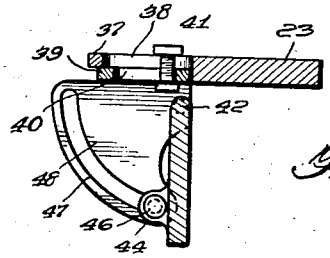


Fig. 8.

INVENTOR.

Walter H. Hannah,

BY

ATTORNEY.

Patented Mar. 19, 1929. 1,706,157

UNITED STATES PATENT OFFICE.

WALTER H. HANNAH, OF PORTSMOUTH, OHIO.

POWER-DRIVEN PLANE.

Application filed May 13, 1927. Serial No. 191,210.

My invention relates to a power driven plane for performing various operations, such as planing surfaces, joining, grooving, gaining, beveling, molding and various other operations.

In accordance with my invention, I provide a power driven plane which is portable and is shifted longitudinally of the work. The plane embodies a body portion or support, upon which is mounted a motor. The rotary planing element or cutter is connected with the motor and driven thereby. The body portion is mounted upon shoes and means are provided whereby these shoes are independently vertically adjustable to different elevations, with respect to the body portion, or may be arranged in the same elevation, and may be also adjusted longitudinally or horizontally, with relation to the body portion, depending upon the various planing operations to be performed. I also provide a guide or gage, which is transversely adjustable with relation to the body portion or shoes, and may also be angularly adjustable, when it is desired to plane bevels.

The device is characterized by extreme simplicity, cheapness, and is highly convenient and reliable in operation.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of the plane, from the motor side,

Figure 2 is a similar view from the cutter side,

Figure 3 is a plan view of the plane,

Figure 4 is a transverse section taken on line 4—4 of Figure 1,

Figure 5 is a longitudinal section taken on line 5—5 of Figure 3,

Figure 6 is a bottom plan view of the rear shoe,

Figure 7 is a perspective view of an adjustable guide or gage,

Figure 8 is a transverse section through the rear shoe and guide, taken on line 8—8 of Figure 1.

In the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 10 designates the body portion or stock of the plane. This body portion is preferably in the form of a casting, and includes a vertical plate 11, having a lower straight edge 12. The upper edge of the plate 11 is in the form of a curve, and is integral with an arch shaped or inverted approximately, V-shaped flange or strip 13, extending to the left or the cutter side of the plane. The plate 11, near the apex of the flange or strip 13, projects above the same, as shown, and is formed integral with a laterally projecting circularly curved flange or strip 14, projecting upon the right or motor side of the plane. The flange 14 extends downwardly beyond its horizontal diameter, but terminates at an elevation above the lower edge 12 of the plate 11, as shown.

The flange or strip 14 is adapted for receiving and holding the casing 15, of an electric motor, which casing is preferably circular in cross section. The flange 14 may be rigidly clamped to the motor casing 15 by set screws 16 or the like. The motor has an armature shaft 16′, concentric with its casing 15 and this armature shaft drives a rotable tool carrying shaft 17, which is arranged eccentric to the armature shaft and at a lower elevation, and driven by the armature shaft through the medium of suitable gearing within the motor casing 15. The shaft 17 is journaled through a tubular bearing formed by a sleeve 19, formed upon the plate 11. It is thus seen that the motor is rigidly mounted up the body portion 10, and the shaft 17 extends centrally within the arched strip or flange 13.

The shaft 17 carries the rotatable cutter, designated by the numeral 21. This cutter is detachably clamped upon the shaft, to be rotated thereby, and is removable from the shaft. I contemplate the employment of a number of different types of rotary cutters, depending upon the type of work to be performed. The flange or strip 13 also functions as a guard for the rotary cutter.

The numerals 22 and 23 designate forward and rear shoes, respectively, which are preferably in the form of flat plates. These shoes are arranged beneath the ends of the flange or strip 13 and beneath the lower edge 12 of the plate 11. At their inner ends, the shoes 22 are beveled, as indicated at 24, affording a throat 25, for the rotary cutter.

Means are provided whereby these shoes are independently vertically adjustable, with respect to the body portion 10, so that they may

assume different elevations with relation thereto, and also so that they may be longitudinally adjusted, with relation thereto, to vary the area of the throat 25, as may be found necessary in the use of the tools of different diameters. This means is preferably in the form of tapered clocks 26, having upper inclined faces 27, arranged beneath and contacting with the inclined ends of the arched flange or strip 13. This strip or flange is provided with longitudinally extending slots 28, for receiving headed clamping screws 29, the inner ends of which have screw-threaded engagement within screw-threaded openings 30, formed through the upper inclined faces 27 of the tapered blocks. It is thus seen that by manipulation of the screws 29, the blocks may be shifted longitudinally of the ends of the strip or flange 13, and locked in a selected adjusted position, whereby the blocks will be raised or lowered with respect to the body portion 10 and rotary cutter. The blocks are vertically adjustable independently of each other.

The blocks 26 carry the shoes 22 and 23 and the vertical adjustment of the blocks, effects the vertical adjustment of the shoes. The shoes 22 and 23 are provided in their inner portions with longitudinal slots 31, receiving clamping screws 32, the heads of which are counter-sunk within the walls of these slots. These clamping screws have screw-threaded engagement within screw-threaded openings 33, formed in the lower horizontal faces 34 of the blocks. By manipulation of the screws 32, the shoes 22 and 23 may be adjusted horizontally toward and away from each other, to vary the area of the throat 25.

The forward shoe 22 is equipped with a knob 34′, rigidly attached thereto, while the rear shoe 23 carries an upwardly projecting handle 35, rigidly secured thereto. This handle is provided with a trigger 36, included in a switch device, for regulating current supply to the motor. The trigger 36 is spring pressed to move to the outer portion, Figure 1, but when the operator grasps the handle 35, this trigger is depressed and the switch device closed and currents applied to the motor. Any well known or preferred type of switch device may be employed, and any well known or preferred type of circuit may be used in connection with the motor and source of current, and it is thought to be unnecessary to describe the same here.

The rear shoe 23 is provided upon the edge thereof adjacent to the motor with laterally extending ears 37, provided with elongated slots 38. Arranged beneath the ears 37 are co-acting ears 39, also having elongated slots 40. The slots 38 and 40 receive clamping bolts 41. It is thus seen that the lower ears 39 are longiudinally adjustable with respect to the ears 37, by virtue of the co-acting slots 38 and 39. Hinged to the ends of the ears 39 adjacent to the motor, at 42, is a guide or gage 43. The guide 43 is provided upon the side thereof remote from the work with segmental ears 44, having openings 45, receiving clamping bolts 46 extending through elongated slots 47, formed in segmental ears 48, which are rigidly attached to the ears 39, at the ends thereof, remote from the pivots 42. It is thus seen that the guide 43 may be angularly adjusted to assume various inclined positions, and this guide is also bodily laterally adjustable, as explained.

The guide is also bodily detachable from the rear shoe.

I will now explain the operation of the plane, when planing a flat surface. The guide 43 may be removed from the rear shoe 23, and this would be done, if the surface to be planed was of a width in excess of the range of adjustment of the guide. Of course, if the surface to be planed was narrow and could be covered by the range of adjustment of the guide, it would be unnecessary to remove the guide. The drawings show the rotary cutter 21 in the form of a planer head. If it is desired to plane a sixteenth of an inch from the flat surface, the forward shoe 22 is adjusted upwardly, so that it is at an elevation of a sixteenth of an inch above the radius of the blades of the planer head. The rear shoe 23 would be adjusted so that its lower surface would be substantially flush with the outer ends of the blades of the rotary planer head. The forward shoe is, therefore, at an elevation above that of the rear shoe, and the elevation of the forward shoe determines the depth of the cut, while the elevation of the lower shoe enables the same to support the planer upon the previously planed surface. The forward shoe 22 is now placed upon the end of the surface to be planed and the planer is moved forwardly manually over the surface, and the rotary planer head will act upon this surface to plane the same, as is obvious.

If it should be desired to form a groove in a board or surface, of a substantial depth, such as one-half of an inch, the planer head would be removed and a rotary head carrying a groove forming blade or blades placed upon the shaft or arbor 17. The rear shoe 23 will not enter this groove, and in order that the groove may be cut evenly both shoes 22 and 23 are adjusted to the same elevation. In order that the blades of the groove forming head may not contact with the ends of the shoes, the shoes 22 and 23 are adjusted outwardly horizontally, to properly increase the length of the throat 25.

It is obvious that various different types of implements may be mounted upon the shaft or arbor 17, such as cutter heads for forming molding, rabbets or the like. A grinding wheel, such as a sand paper drum may be mounted upon the shaft or arbor 17. The va-

rious cutting heads may be of different widths, and in order that they may be properly clamped upon the rotary shaft or arbor, I contemplate using any suitable number of filler washers. Any suitable means may be employed to clamp the cutter heads upon the shaft or arbor.

While I prefer to use means including the tapered blocks 26, to effect the adjustments of the shoes, yet the invention is in no sense restricted to this precise construction, as other means may be employed.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention, or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. In a power operated portable plane, a body portion embodying an arched member having upwardly converging inclined sides, a rotary cutter carried by the body portion and arranged between the inclined sides, a motor mounted upon the body portion for driving the cutter, tapered blocks arranged within the arched member and slidably engaging said inclined sides, to be adjusted longitudinally thereof, adjustable means to clamp the blocks to the inclined sides, and forward and rear shoes carried by said blocks.

2. In a power operated portable plane, a body portion embodying an arched member having upwardly converging inclined sides, a rotary cutter carried by the body portion and arranged between the inclined sides, a motor mounted upon the body portion for driving the cutter, tapered blocks arranged within the arched member and slidably engaging said inclined sides, to be adjusted longitudinally thereof, adjustable means to clamp the blocks to the inclined sides, forward and rear shoes arranged beneath the blocks, and means whereby the shoes may be adjusted horizontally with relation to the blocks.

3. In a power operated portable plane, a substantially vertical plate having an opening formed therein and provided with a laterally extending holding flange extending beyond one side thereof, a motor held within said flange and having an armature shaft extending through said opening and projecting beyond the opposite side of said plate, an arched member rigidly secured to said plate and projecting beyond the opposite side of the same, said arched member embodying upwardly converging inclined sides having longitudinal slots, a rotary cutter mounted upon the armature shaft and arranged beneath the arched member, blocks arranged beneath said inclined sides and having upper inclined walls and lower horizontal walls, clamping screws carried by said blocks and extending through the longitudinal slots and projecting above said inclined sides, forward and rear shoes engaging the lower horizontal walls of said blocks and having longitudinal slots, clamping screws engaging said blocks and extending through the longitudinal slots in said shoes and accessible from the bottom of said shoes, and handle means for the plane.

4. In a power operated portable plane, a substantially vertical plate having an opening formed therein and provided with a laterally extending holding flange extending beyond one side thereof, a motor held within said flange and having an armature shaft extending through said opening and projecting beyond the opposite side of said plate, an arched member rigidly secured to said plate and projecting beyond the opposite side of the same, said arched member embodying upwardly converging inclined sides having longitudinal slots, a rotary cutter mounted upon the armature shaft and arranged beneath the arched member, blocks arranged beneath said inclined sides and having upper inclined walls and lower horizontal walls, clamping screws carried by said blocks and extending through the longitudinal slots and projecting above said inclined sides, forward and rear shoes engaging the lower horizontal walls of said blocks and having longitudinal slots, clamping screws engaging said blocks and extending through the longitudinal slots in said shoes and accessible from the bottom of said shoes, a knob arranged above the forward shoe and attached thereto, and a handle arranged above the lower shoe and attached thereto.

In testimony whereof I affix my signature.

WALTER H. HANNAH.