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T. T. TVEDT.
PLANE.
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Fig. 1.

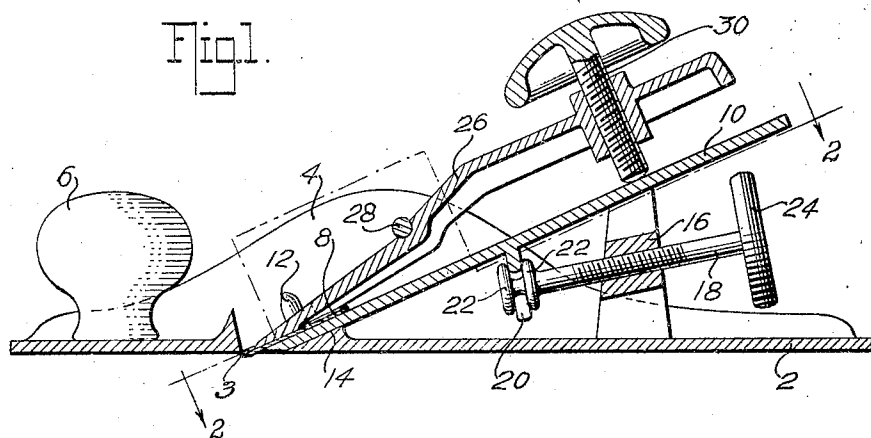


Fig. 2.

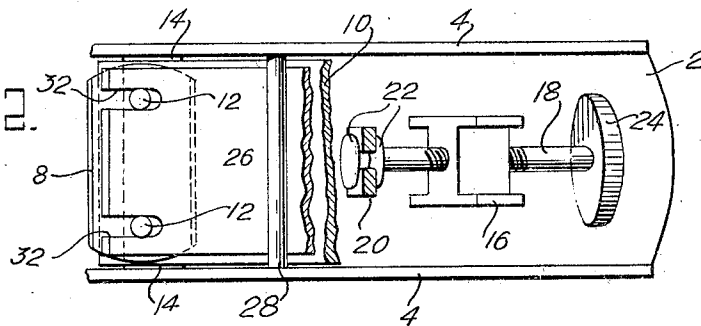


Fig. 3.

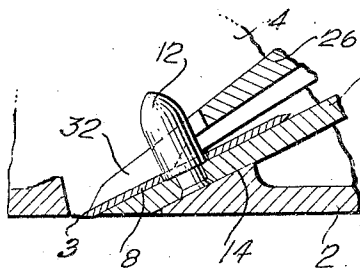
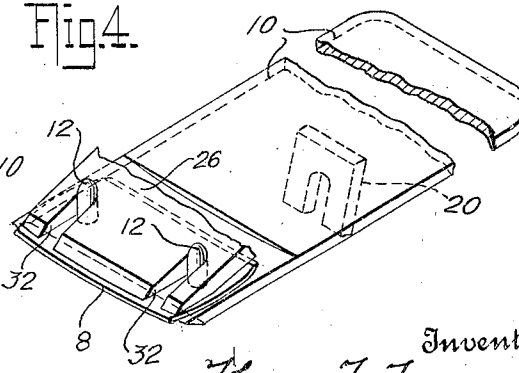


Fig. 4.



Inventor
Thomas T. Tvedt
By his Attorneys
Newell & Spencer

UNITED STATES PATENT OFFICE.

THOMAS T. TVEDT, OF BROOKLYN, NEW YORK.

PLANE.

Application filed November 22, 1921. Serial No. 516,908.

To all whom it may concern:

Be it known that I, THOMAS T. TVEDT, a citizen of the United States, residing at 533 57th Street, Brooklyn, New York, have invented certain new and useful Improvements in Planes, of which the following is a clear, full, and exact description.

This invention relates to planes.

One of the principal objects of the present invention is to improve the construction of planes and to produce a plane adapted for use of blades which may be made at comparatively small expense so that the blades may be discarded when they become dull.

Another object of the invention is to produce an improved plane construction in which inexpensive blades having two or more cutting edges adapted to be readily located interchangeably in operating position, may be employed.

Another object of the invention is to produce a plane adapted for the use of thin flexible blades of the general character employed in certain classes of safety razors.

With these and other objects in view, the invention comprises the features, constructions and combinations of parts hereinafter described and particularly pointed out in the claims, the advantages of which will be readily understood and appreciated by those skilled in the art.

The invention is illustrated in the present application as embodied in a plane construction adapted for the use of thin flexible doubled-edged blades having holes therein for the reception of holding pins such as are used in the well known Gillette safety razor. In the broader aspects of the invention, however, it is not limited to a construction for the use of this particular form of blade, but certain features may be embodied in constructions in which others forms of blades are employed.

The invention will be readily understood from the accompanying drawings illustrating the invention in its preferred form and the following detailed description of the constructions therein shown.

In the drawings—

Figure 1 is a view in central vertical section of a plane embodying the invention.

Fig. 2 is a sectional view of the plane taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is a detail view in vertical section taken substantially through the axis of one of the blade-holding pins, and

Fig. 4 is a perspective view of the iron.

The plane construction illustrated in the drawing comprises a stock indicated at 2, having an opening 3 through which the blade of the plane is projected beyond the lower surface of the stock. The stock is provided with side walls or flanges 4 between which the blade, iron and blade-clamping device are located and with the usual knob or handle 6 at the forward end thereof to be gripped in operating the plane.

In the illustrated embodiment of the invention, the planing blade indicated at 8 is a thin, flexible, double-edged blade of the same construction as the blades employed in the Gillette safety razor. This blade is removably mounted upon an iron 10 which is provided with pins 12 for insertion in the openings in the blade to hold the blade in position with relation to the iron, the blade being clamped on the upper surface of the iron with the pins passing through the openings in the blade, as shown in Fig. 3.

The iron is adjustable longitudinally to regulate the extent to which the forward edge of the blade projects below the lower surface of the stock. To this end the iron is mounted to slide on an inclined surface 14 formed on the stock at the rear of the opening 3 and upon correspondingly inclined surfaces formed at the upper ends of spaced portions of a lug 16 projecting upwardly from the base of the stock. The iron is adjusted longitudinally by means of an adjusting screw 18 threaded into the lug 16, the forward end of which is connected with the iron by the engagement of a slotted projection 20 on the iron between two flanges 22 on the adjusting screw. The rear end of the adjusting screw is provided with a hand wheel 24 by which the screw may be rotated manually.

In the present embodiment of the invention, a clamp is provided which operates both to clamp the blade 8 securely to the iron 10 and also to hold the iron securely in any position in which it may be adjusted. This clamp is indicated at 26 and is suitably shaped to engage between the side flanges 4 on the stock, the forward end of the clamp engaging the blade 8 preferably in advance of the pins 12, as clearly shown in Fig. 3. The clamp 26 engages beneath and has a pivotal bearing on a cross rod 28 mounted in the side flanges 4 on the stock, and the rear end of the clamp is adjusted toward and

from the iron 10 to release and clamp the iron and blade. As shown in the drawing, an adjusting screw 30 is threaded into the rear end of the clamp and arranged to engage the iron 10, as shown in Fig. 1, the screw being turned in a direction to screw the same into the clamp to clamp the iron and blade in position and being turned in the opposite direction to release the iron and blade. This construction is comparatively simple and enables the blade to be clamped and unclamped with relation to the iron, and the iron to be clamped in position with relation to the stock and to be unclamped by very simple, easy operations. It will also be noted that the blade is held on one side by the clamp and on the other by the iron close to its operating edge, so that it is not liable to become bent or broken while in operation. The clamp 26 is provided with slots 32 for the reception of the pins 12 on the iron, these slots allowing the pins to vary their positions with relation to the clamp as the iron is adjusted.

When a flat blade of flexible character such as that shown in the drawing of this application is employed in a plane, the corners of the blade at the opposite ends of its cutting edge are liable to dig into the wood, thereby causing a great deal of trouble. To avoid this difficulty, the blade is preferably flexed when clamped in position on the iron so that its cutting edge is convex with relation to the lower surface of the stock, or so that the corners at the opposite ends of the cutting edge lie above or within the central portion of said edge. By thus flexing the blade, the corners of the blade at the opposite end of its cutting edge may be located above the lower surface of the stock so that these corners will not dig into the work. In the present construction, in order to flex the blade in this manner, the surface of the forward end of the clamp 26 which engages the blade is made slightly convex and the blade-engaging surface of the iron 2 is made correspondingly concave.

The iron 10 and the clamp 26 securely clamp the blades between them from its center close up to its cutting edge and prevent the bending of a blade during a planing operation. The use of a blade of the character described enables a sharp blade readily to be supplied at any time and inasmuch as blades of this kind can be secured at comparatively small expense, the grinding and sharpening of the blades which, in the usual construction take a great deal of labor and time, may be dispensed with. The blades, however, may be readily removed for sharpening and the provision of a blade with a double edge enables the blades to be used double the usual time before they become dull. It is obvious that

blades having more than two cutting edges may be employed in a plane of this character if it is desired to increase still further the length of time which a blade may be used.

It is to be understood that the invention is not limited to the particular construction and arrangement of parts of the illustrated embodiment of the invention, but that the invention may be embodied in other forms within the scope of the claims.

Having explained the nature and object of the invention and having specifically described the construction embodying the invention in its preferred form what is claimed is:

1. A plane having, in combination, a stock, an adjustable iron, a flexible blade having at least two cutting edges removably mounted on the iron, so that it may be shifted to place any one of said cutting edges interchangeably in cutting position, means for supporting the blade adjacent the cutting edge which is in cutting position, and means for securing the blade in position on the iron.

2. A plane having, in combination, a stock, an iron having a plate form, a relatively small planing blade removably mounted on one face of the iron and a clamp arranged both to secure the blade in position against the face of the iron and to hold the iron in adjusted position.

3. A plane having, in combination, a stock, having an opening, an adjustable iron, pins mounted in fixed positions on the iron, a thin blade smaller than the iron arranged to be removably and non-adjustably mounted on a supporting face of the iron so as to project through the opening in the stock and having holes to receive the pins to locate the blade accurately in a predetermined and definite operating position with relation to the iron, the blade being supported substantially throughout its width by the iron, and means for securing the blade to the iron.

4. A plane having, in combination, a stock, an iron mounted on the stock, pins projecting from the iron, a blade arranged to be removably mounted on the iron and having holes to receive the pins, and a clamp arranged both to secure the blade in position on the iron and to hold the iron in adjusted position.

5. A plane having, in combination, a stock, an adjustable iron mounted on the stock, a flexible blade removably mounted on the iron, and means for securing the blade to the iron in flexed condition so that the ends of the cutting edge thereof are located above the central part of said edge.

6. A plane having, in combination, a stock, an iron adjustably mounted on the stock and having a concave upper face at the forward end thereof, a flexible blade mounted on the iron and arranged to engage the concave face

thereof, and a clamp having a convex face for engagement with the blade to clamp the same against the convex face of the iron, thereby flexing the blade to locate the ends of the cutting edge above the central portion of the said edge.

7. A plane having, in combination, a stock, an iron adjustably mounted on the stock, a relatively small blade removably mounted on and entirely supported by the forward end of the iron, a clamp having a pivotal bearing carried by the stock and arranged with its forward end engaging the blade, and means for adjusting the rear end of the clamp about its pivotal bearing to cause the forward end of the clamp to clamp the blade against the forward end of the iron or to unclamp the blade from the forward end of the iron.

8. A plane having, in combination, a stock having an opening, a blade supporting structure carried by the stock in position to hold a blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin blade, requiring support adjacent its cutting edge, removably mounted on said structure so that the blade is supported adjacent its cutting edge by said structure, and means for accurately locating the blade with its cutting edge in a predetermined and definite operating position with relation to the blade edge supporting part of said structure.

9. A plane having, in combination, a stock having an opening, a blade-carrying iron mounted on the stock in position to hold the blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin blade, requiring support adjacent its cutting edge, removably mounted on the lower end of the iron and engaged on one face by the iron so that the blade is supported adjacent its cutting edge by the iron, a clamping plate for clamping the blade to the iron engaging the opposite face of the blade and also supporting the blade adjacent its cutting edge, and means for locating accurately the cutting edge of the blade in a predetermined and definite position with relation to the supporting portion of the iron.

10. A plane having, in combination, a stock having an opening, a blade supporting structure carried by the stock in position to hold a blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin blade having at least two cutting edges, requiring support adjacent its operative cutting edge and mounted on said structure so that it is supported adjacent its operative edge by said structure and so that it may be shifted to place any one of its cutting edges in operative position with relation to said structure, means for securing the blade to

said structure with any one of its cutting edges interchangeably in operating position and means for accurately locating the blade with its operative cutting edge in a predetermined and definite operating position with relation to the blade edge supporting part of said structure.

11. A plane having, in combination, a stock having an opening, a blade-carrying iron mounted on the stock in position to hold the blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin blade having at least two cutting edges, requiring support adjacent its operative cutting edge, and mounted on the iron so that it is supported adjacent its operative cutting edge by the iron and so that it may be shifted to place any one of its cutting edges in operating position with relation to the iron, and clamping devices for clamping the blade to the iron with any one of its cutting edges interchangeably in operating position.

12. A plane having, in combination, a stock having an opening, a blade-carrying iron mounted on the stock in position to hold a blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin blade, requiring support adjacent its cutting edge, removably mounted on the iron so that the blade is supported adjacent its cutting edge by the iron and having blade locating openings and blade locating pins mounted on the iron and arranged to fit in said openings in the blade to locate the blade accurately with its cutting edge in a predetermined and definite operating position with relation to the blade supporting part of the iron.

13. A plane having, in combination, a stock having an opening, a blade-carrying iron mounted on the stock in position to hold a blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin blade, requiring support adjacent its cutting edge, removably mounted on the lower end of the iron so that it is supported adjacent its cutting edge by the iron and having blade locating openings therein, pins mounted on the iron arranged to fit in the openings in the blade to locate the blade accurately with its cutting edge in a predetermined and definite position with relation to the supporting portion of the iron, and a clamping plate for clamping the blade to the iron also arranged to support the blade adjacent its cutting edge.

14. A plane having, in combination, a stock having an opening, a blade-carrying iron mounted on the stock in position to hold a blade so that the blade projects through said opening below the lower surface of the stock, a relatively small thin

blade, requiring support adjacent its cutting edge, removably mounted on the iron so that the blade is supported adjacent its cutting edge by the iron, blade locating means carried by the iron, and locating means on the blade for engagement with said locating means on the iron to locate the blade accurately with its cutting edge in a predetermined and definite operating position with relation to the blade supporting portion of the iron.

15. In a plane, the combination of a plate-like iron having its face adjacent one end formed to receive a relatively small thin blade and to support the blade by contact with a lateral face thereof, a relatively small thin blade, requiring support adjacent its cutting edge, removably mounted on the iron so that it is supported adjacent its cutting edge by the iron, and means for locating the blade accurately with its cutting edge in a predetermined and definite position with relation to the supporting part of the iron.

16. In a plane, a plate-like iron having its lateral face adjacent one end formed to receive a relatively small thin blade and to support the blade by contact with a lateral face of the blade, a relatively small thin blade, requiring support adjacent its cutting edge, removably mounted on the iron so that it is supported adjacent its cutting edge by the iron, a clamping plate for engaging the opposite lateral face of the blade to clamp the blade to the iron, and means for locating the blade accurately with its cutting edge in a predetermined and definite position with relation to the supporting part of the iron.

17. In a plane, a plate-like iron having its lateral face adjacent one end thereof formed to receive a relatively small thin blade and to support the blade by contact

with a lateral face of the blade, a relatively small thin blade, requiring support adjacent its cutting edge and removably mounted on the iron so that it is supported adjacent its cutting edge by the iron, blade locating means carried by the iron, and means on the blade for engaging said blade locating means to locate the blade accurately with its edge in a predetermined and definite position with relation to the supporting part of the iron.

18. In a plane, the combination of a plate-like iron having its lateral face adjacent one end thereof formed to receive a relatively small thin blade and to support the blade by contact with a lateral face thereof, a relatively small thin blade having at least two cutting edges, requiring support adjacent its operative cutting edge and removably mounted on the iron so that it is supported adjacent its operative cutting edge by the iron, and means for accurately locating the blade with relation to the iron to place its cutting edges interchangeably in predetermined and definite operative positions with relation to the supporting portion of the iron.

19. In a plane, the combination of an iron, a blade having at least two cutting edges removably mounted on the iron so that it may be shifted to place any one of said cutting edges in operating position with relation to the iron, and means for locating accurately the blade with relation to the iron to place said cutting edges interchangeably in operating position with relation to the iron.

Signed at New York, N. Y., this 20th day of November, 1921.

THOMAS T. TVEDT.

Witnesses:

JESSIE R. VOSS,
NORMAN ANDERSON.