Oct. 9, 1951 W. N. POWELL 2,570,980

HAND PLANE HAVING ADJUSTABLE MOUTH

Filed June 28, 1949 2 Sheets-Sheet 1

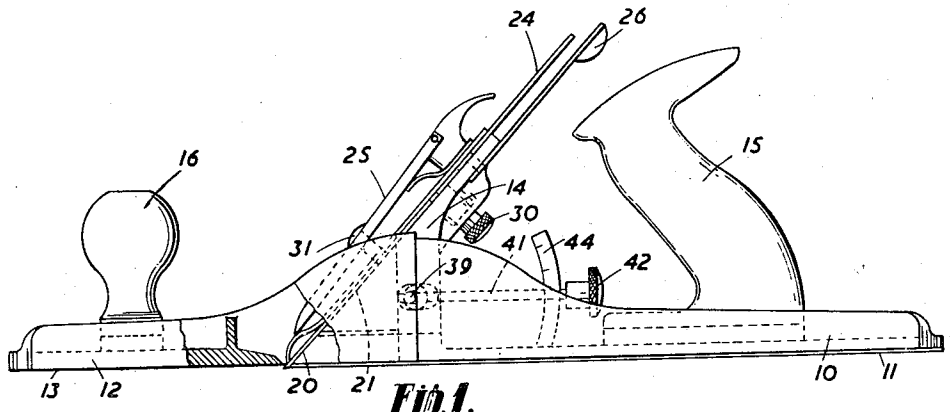


Fig. 1.

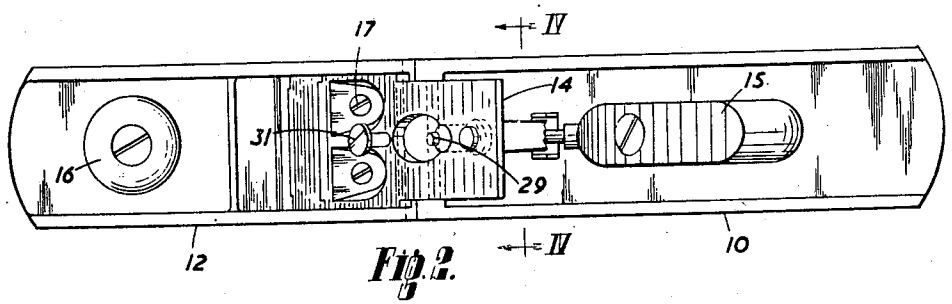


Fig. 2.

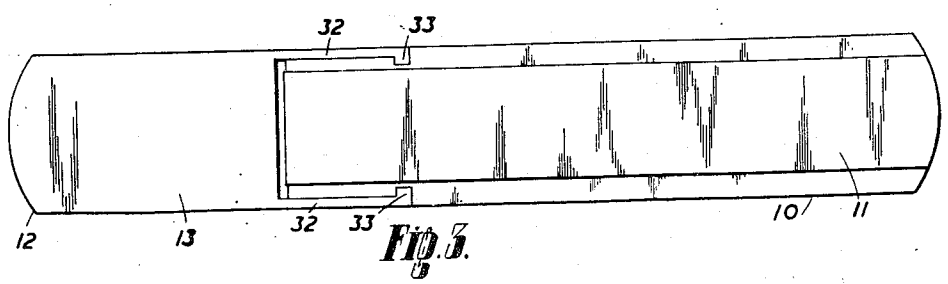


Fig. 3.

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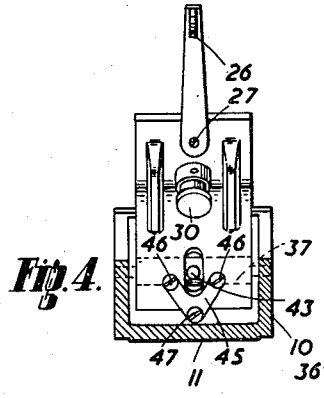


Fig. 4.

Fig. 5.

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HAND PLANE HAVING ADJUSTABLE MOUTH

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The present invention concerns improvements in planes for use in shaping wood and the like.

According to the present invention a hand plane for shaping wood and the like has flat bottomed relatively adjustable front and rear body members the flat bottomed faces of which join at the blade.

According to a further feature of the invention a hand plane for shaping wood and the like has flat bottomed front and rear body members which are relatively adjustable in an upward and downward direction and the flat bottomed faces of which join at the blade.

Preferably the flat bottomed faces are maintained parallel or substantially parallel with one another at all positions of adjustment, the front body member being movable in an upward and downward direction relative to the rear body member to form a step between the flat bottoms thereof to suit the desired depth of cut.

Preferably the position of the cutting blade is adjustable relatively to said rear body member.

The cutting edge of the cutting blade is normally adjusted to be substantially level with the flat work contacting surface of the rear body member and thus the depth of cut made by the plane is substantially the perpendicular distance between the two planes containing the flat work contacting surfaces of the front and rear body members respectively. The depth of cut can be regulated by altering the distance between these two planes.

In a preferred embodiment the front body member is provided with two inwardly projecting slides disposed at right angles to the flat work contacting surfaces. Two grooves are provided on the rear body portion normal to the flat work contacting surface thereof and these grooves are adapted to receive the slides of the front body member. Two eccentrics mounted upon a shaft rotatably mounted upon the rear body member cooperate with two holes or slots disposed in the slides of the front body member. Rotation of this shaft by means of a lever attached thereto enables the position of said front body member to be adjusted relatively to the rear body member.

The rear body member may comprise a substantially flat base portion upon which is mounted a wedge-shaped element at its front end. The sides of the grooves in which the slides of the front body member are contained can be formed, the one on the base portion and the other on the wedge element.

The invention will be described further, by

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way of example, with reference to the accompanying drawings in which:

Fig. 1 is a side elevation partly in section of a plane embodying the present invention,

Fig. 2 is a plan view with certain parts omitted for the sake of clarity,

Fig. 3 is an underside plan view of the plane shown in Fig. 1,

Fig. 4 is a section along the line IV—IV of Fig. 2, and

Fig. 5 is an exploded perspective view of a portion of the plane to a larger scale.

The plane comprises a front body member 12 having a substantially flat bottom face 13, a rear body member formed of a lower flat body member 10 having a substantially flat bottom face 11, and an upper wedge-shaped rear body member 14. The lower rear body member carries a rear handle 15 and the front body member carries a front handle 16 in a known manner. The wedge-shaped member 14 is secured to the front end of the lower rear body member 10 by means of screws 17 which pass through slotted holes 18 in the wedge-shaped member and are inserted in the holes 19 in the lower rear body member 10. The front face 20 of the lower rear body member 10 is inclined at substantially the same angle as the upper face 21 of the wedge element 14. Upstanding shoulders 22 on the lower rear body member co-operate with corresponding cut-away portions 23 of the wedge-shaped member 14 so as to prevent rotation of the latter relative thereto.

The wedge-shaped member 14 is adapted to receive a blade 24 and retainer 25 in a known manner. Lever 26 is pivotally mounted in the wedge-shaped member by means of shaft 27 which carries at its other end an eccentric 28 which co-operates with a slot in the blade 24 for the purpose of straightening it. The blade can be fed (in or out) along the front surface 21 of the wedge-shaped member 14 by means of pin 29 eccentrically mounted on the inner end of a knurled knob 30 which is pivotally mounted in the wedge-shaped member. The pin 29 is received in a transverse slot (not shown) in the blade. Pin 31 outstanding from the wedge-shaped element co-operates with a keyhole-shaped slot (not shown) on the retainer 25.

Two rearwardly extending arms 32 on the front body member 12 carry at their rear ends inwardly projecting slides 33 disposed substantially at right angles to the bottom face 13. The slides 33 co-operate with a groove 34 formed by the rear body member partly alone and partly in conjunction

with the wedge-shaped member 14. The front ends of the sides of the rear body member have vertical faces 35 substantially at right angles to the bottom face and constitute the rear surface of the groove 34. The sides of the wedge-shaped member 14 are, at each side, cut away at 36 to form a stepped portion and provide the upper portion of the front and inner faces of the grooves 34. A rod 37 which is pivotally mounted in slots 38 in the wedge-shaped member 14 carries at the outer ends eccentrically mounted pins 39 which co-operate with grooves 40 provided in the inwardly projecting slides 33 on the front body member. Rotation of the rod 37 is effected by movement of the rod 41 which carries at its outer end a knurled knob 42. The inner end of rod 41 is threaded and passes through an internally threaded hole 43 in the centre of the rod 37. Rotation of the rod 37 brings about movement of the front body member relative to the rear body member in a direction substantially at right angles in the work contacting surfaces and the rod 37 may be locked in position by rotation of the rod 41 by means of the knob 42, whereby the inner end of rod 41 is brought into friction-tight contact with the inner surface of the slot 38.

Thus each setting of the rod 41 corresponds to a particular value of the perpendicular distance between the plane of the bottom face of the front body member and the plane of the bottom face of the rear body member. In normal operation the plane iron is fed into the position where its lower front cutting edge is at the same level as the front edge of the bottom face of the rear body member and thus the depth of the cut which is made by a stroke with the plane is more or less equal to the perpendicular distance between the bottom faces. A scale 44 adjacent the rod 41 serves to indicate the approximate depth of the cut.

It will be seen that the groove containing the slides 33 on the front body member is formed jointly in its upper region by the cut-away portion 36 of the wedge-shaped member 14 and the front vertical surface 35 of the lower rear body member. A dependent U-shaped member 45 is secured by means of screws 46 to the lower surface of the wedge-shaped member 14 (see Fig. 4) and carries at its lower end a forwardly projecting screw 47. Screw 47 co-operates with a step 48 on the lower rear body member and serves to limit the maximum forward displacement of the wedge-shaped member and thus prevent enlargement of the groove to such an extent as to permit wobbling of the front body member.

The plane of the present invention permits the lead-in and lead-out of a cut to be more easily controlled. When approaching the edge of a piece of material in starting a cut in the flat work contacting surface of the front body member is kept in contact with the top surface of the material to be cut. During the cut the work contacting surface of the front body member is kept in contact with the uncut surface of the material and the work contacting surface of the rear body member is kept in contact with the cut surface of the material. At the end of the cut the work contacting surface of the rear body member is kept in contact with the cut surface of the material. A flat plane surface can readily be obtained.

I claim:

1. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, means for adjusting said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said front body member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member.

2. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, means for adjusting said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said front body member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member and to maintain said flat bottoms of said front and lower rear body members substantially parallel with one another at all positions of adjustment.

3. In a hand plane for shaping wood and the like a flat bottomed rear body member, a flat bottomed front body member, a blade whose lower end lies between the adjacent ends of flat bottoms of said body members, said front body member having on each side at the rear end thereof an upwardly extending inwardly projecting slide, said rear body member having on each side thereof adjacent the forward end thereof an upwardly inwardly extending guide slot to receive the upwardly inwardly projecting slide of the front body member, a shaft rotatably mounted transversely of and in said rear body member, eccentric members disposed at opposite ends of said shaft, slots formed in said slides to receive said eccentric members and means to angularly displace said eccentric carrying shaft to adjust said body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof.

4. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said upper wedge-shaped member having,

on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member, a shaft rotatably mounted in said wedge-shaped rear body member, eccentrics at opposite ends of said shaft, slots formed in said inwardly projecting slides to receive said eccentric members, and means to angularly displace said eccentric carrying shaft to adjust said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof.

5. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said upper wedge-shaped member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member and to maintain said flat bottoms of said front and lower rear body members substantially parallel with one another, a shaft rotatably mounted in said wedge-shaped rear body member, eccentrics at opposite ends of said shaft, slots in said inwardly projecting slides to receive said eccentrics, and means to angularly displace said eccentric carrying shaft to adjust said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof.

6. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, means for adjusting said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said upper wedge-shaped member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member, and means for adjusting said upper wedge-shaped rear body member longitudinally relative to said flat bottomed lower rear body member to increase or decrease the width of said grooves.

7. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said upper wedge-shaped member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member, a transverse bore in said wedge-shaped rear body member, a shaft rotatably mounted in said bore, eccentrics at opposite ends of said shaft, slots formed in said inwardly projecting slides to receive said eccentrics, and means to angularly displace said eccentric carrying shaft to adjust said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, and means for locking said eccentric carrying shaft in any desired position.

8. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said upper wedge-shaped member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member, a transverse bore in said wedge-shaped rear body member, a shaft rotatably mounted in said bore, eccentrics at opposite ends of said shaft, slots formed in said inwardly projecting slides to receive said eccentrics, a rearwardly extending lever, a transverse bore through said eccentric carrying shaft to receive said rearwardly extending lever in threaded engagement therewith, means to angularly displace said eccentric carrying shaft to adjust said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, and means to bring the end of said lever into or out of fric-

tional engagement with the eccentric carrying shaft receiving bore to lock said shaft in any position of angular adjustment.

9. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, a blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, said upper wedge-shaped member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member, a transverse bore in said wedge-shaped rear body member, a shaft rotatably mounted in said bore, eccentrics at opposite ends of said shaft, slots formed in said inwardly projecting slides to receive said eccentrics, means to angularly displace said eccentric carrying shaft to adjust said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, means for locking said eccentric carrying shaft in any desired position, and a scale member upstanding from said lower rear body member to give visual indication of the distance between said flat bottoms of said front and rear body members at the blade.

10. In a hand plane for shaping wood and the like a flat bottomed lower rear body member, an upper wedge-shaped rear body member, a flat bottomed front body member, a forwardly and downwardly inclined blade whose lower end lies between the adjacent ends of the flat bottoms of said lower rear and front body members, means to retain said blade on said upper wedge-shaped

rear body member, means to adjust said blade in an upward and downward direction relative to said upper wedge-shaped rear body member, means to adjust said blade laterally of said upper wedge-shaped rear body member, said upper wedge-shaped member having, on each side at the rear end thereof, an upwardly extending inwardly projecting slide, the lower rear body member having adjacent the forward end thereof an upwardly extending and forwardly facing step at each side thereof whilst the upper wedge-shaped rear body member has, on each side thereof, an upwardly extending and rearwardly facing step such that when said rear body members are assembled said steps of the lower and upper rear body members will face one another in longitudinally spaced relationship to form a guide slot on each side of the combined rear body member adapted to receive the upwardly inwardly projecting slide of the front body member, a transverse bore in said wedge-shaped rear body member, a shaft rotatably mounted in said bore, eccentrics at opposite ends of said shaft, slots formed in said inwardly projecting slides to receive said eccentrics, a rearwardly extending lever, a transverse bore through said eccentric carrying shaft to receive said rearwardly extending lever in threaded engagement therewith, means to angularly displace said eccentric carrying shaft to adjust said lower rear and front body members relatively to one another in an upward and downward direction to form a step between the flat bottoms thereof, and means to bring the end of said lever into or out of frictional engagement with the eccentric carrying shaft receiving bore to lock said shaft in any position of angular adjustment.

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