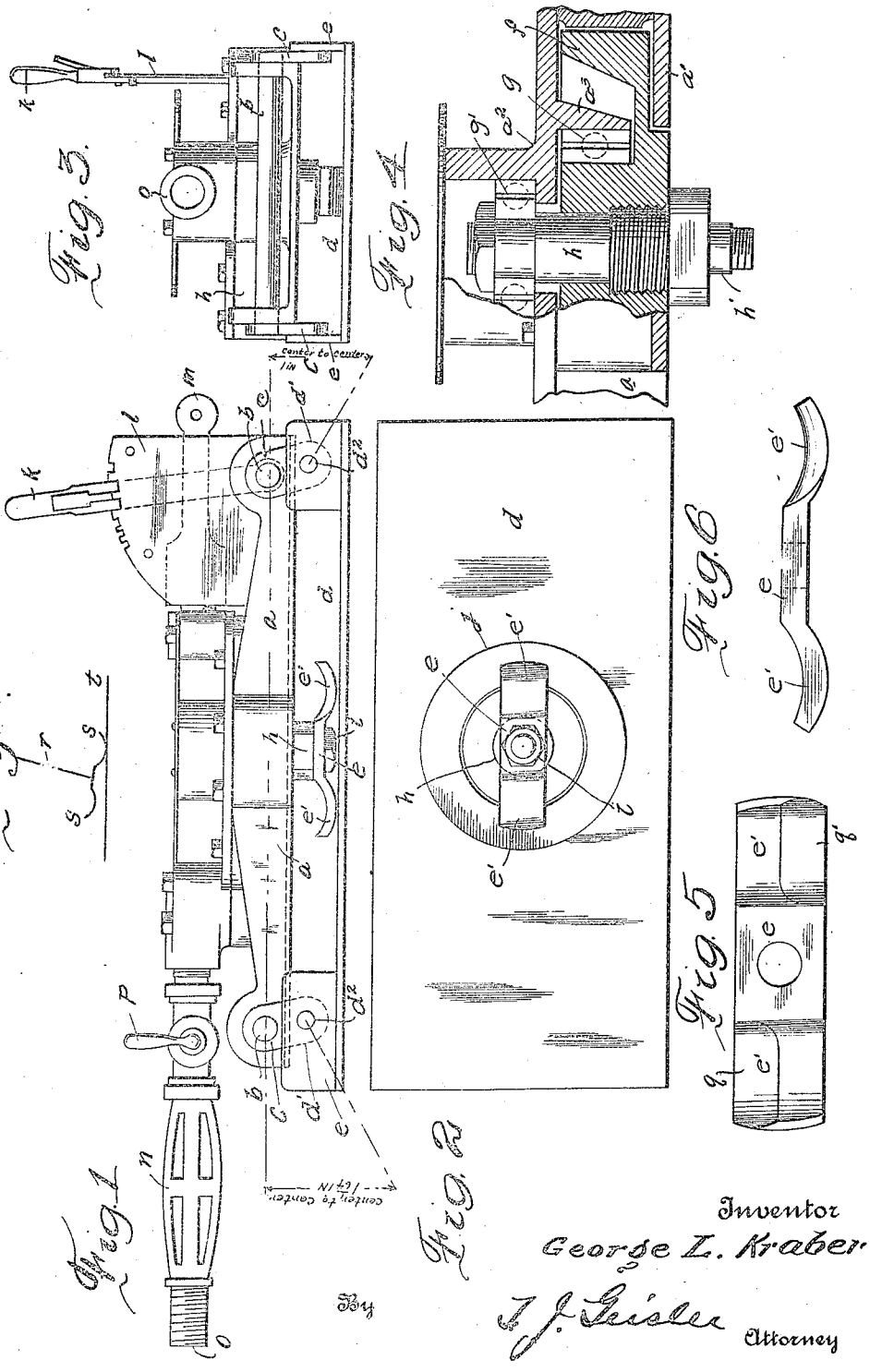
Dec. 25, 1923. 1,478,569

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PORTABLE PLANER

Filed Oct. 7, 1918



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UNITED STATES PATENT OFFICE.

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PORTABLE PLANER.

Application filed October 7, 1918. Serial No. 257,254.

To all whom it may concern:

Be it known that I, GEORGE L. KRABER, a citizen of the United States, and a resident of Portland, county of Multnomah, State of Oregon, have invented a certain new and useful Improvement in Portable Planers, of which the following is a specification.

My invention relates to cutter-heads to be driven at a very high speed, and which, in order to do certain kinds of work, require the employment of a knife-element adapted to cut in a plane in parallelism with a face of the surface to be planed.

It has heretofore been attempted to employ a knife comprising two oppositely disposed cutting members or blades, projecting in a plane in parallelism with said surface; but practice developed the fact that there was a tendency of the knife-blades to become overheated in work, and, in this way, lose their temper and effective state in too brief a time.

I have, however, discovered that the overheating may be eliminated by slightly tilting the axis of rotation of the knife out of the perpendicular with respect to the surface being planed, so that the plane of rotation of the knife-blades will be at a slight angle to said surface. When so arranged the knife-blades or cutting members of the knife will be alternately imposed upon, and cut said surface, or be slightly spaced therefrom for a brief interval, which practice has demonstrated as effective for causing a sufficient drop in temperature of the knife-blade not cutting for the time, to prevent the overheating of the knife-blades.

Another object of my invention is to adapt the knife-element to produce a slightly concaved surface, as desirable in the shipbuilding art. In short, in planing the abutting surfaces of timbers and planks it is desirable that the edges of the surfaces project a trifle, and that the intermediate surface be slightly concaved so as to insure a proper fit of the surface planed with the surface against which it is laid. For example, the abutting edge-faces of the planking should be slightly concaved so as to form a pocket, as it were, between them, in which to hold the caulking material; for if there were a convexity at these surfaces the caulking material might be pushed through.

I attain my object by the devices illustrated in the accompanying drawings, in which:

Fig. 1 is a side elevation of my portable planer;

Fig. 2 is a bottom view of my planer;

Fig. 3 is an end view of my planer;

Fig. 4 is a sectional detail of the motor, and the shaft carried thereby on which the knife-element is affixed;

Figs. 5 and 6 show respectively, in the order numbered, a top view, and a side elevation of the type of knife used by me; and

Fig. 7 diagrammatically illustrates the operation of my planer.

Referring to the illustrative mechanism, the portable planer there shown will be seen to comprise a frame, or body *a* provided at each end with a transverse shaft *b*, on which are mounted arms *c*, connecting the ends of the sole-plate *d* to the body; the sole-plate being made with flanges *d'*, to which the lower ends of the arms *c* are pivoted, as as at d^2.

Since relative dimensions are of some importance in the successful construction of my planer, I have given dimensions on Fig. 1 to serve as a guide. Said dimensions give a distance of 12½ inches between the centers of the shafts *b*, *b*, on which the arms *c* are mounted; and the relative distance between the centers of the shafts *b* and the pivots d^2 fastening the lower ends of the arms *c* to the flanges *d'* of the sole plate *d* should be unequal, as, for example, said distance at one end of my planer being 1 inch and that at the opposite end 1 1/64 inch. The purpose of this construction is to cause the sole-plate *d* to be held at a slight angle to the base of the body *a*, so that thereby the axis of rotation of the knife *e* will be tilted slightly out of the perpendicular with respect to the sole-plate *d*, with the result that the plane of rotation of the cutting members *e'* of the knife will be at a slight angle to that of the surface being planed. Such arrangement causes said cutting members of the knife to be alternately imposed upon, for operating upon the surface being planed, or to be slightly spaced therefrom. In other words, each cutting member during each revolution of the knife will be at work part of the time and idle the remain-

ing time, and so be given an opportunity of slightly cooling, and, in this way, preventing the overheating and loss of temper of the cutting members of the knife, and prolonging the effective life of the latter.

The knife is driven by a motor *f*, revolving on ball-bearings *g*. The motor should preferably be of a suitable air-driven turbine engine type; for example such as described in U. S. Letters Patent No. 1,283,423 to Thomas W. Paxton, dated Oct. 25, 1918. In said motor *f*, is affixed a shaft *h* having a projecting end *h'*, on which the knife *e* is secured by a nut *i*. The sole-plate *d* has a circular portion *j* cut away, under the motor, through which the knife *e* is projected onto the work.

The body *a*, as shown in Fig. 4, preferably comprises a base member *a'* and a top member a^2, said base member being formed with a circular chamber into which depends a circular flange a^3, formed on the under side of said top member. The motor *f* lies in such circular chamber between the outer wall thereof and said flange a^3, and the ball bearings *g*, on which it revolves, are interposed between the hub of said motor and said flange. In addition ball bearings *g'*, in the top member a^2 proper, are provided, wherein the upper end of shaft or spindle *h* is journaled.

The sole-plate *d* is moved from and towards the base of the body *a* by means of a lever *k*, co-operating with a notched quadrant *l*. Handles *m* and *n* at the opposite ends of the planer are provided for convenience of manipulation, the air pipe being connected to the nipple *o*, and the admission of the air to the motor being controlled by the valve *p*.

The knife *e* has two oppositely disposed, laterally projecting blade or cutting members, *e'*, *e'*, as mentioned, the lower faces of which are convexed, as more clearly shown in Figs. 1 and 6. The upper faces of said cutting members are concaved and each is provided with a cutting edge, as shown at *q* and *q'*.

By making the lower faces of said cutting members convex, and by relatively tilting the axis of rotation of the knife, my planer will be given a tendency to make a slightly concaved cut, which is desirable in certain classes of work, as mentioned, in order to insure that the edges of the surface being planed will project a trifle above the intermediate surface.

The action of the knife of my planer is diagrammatically represented in Fig. 7, in which *r* represents the axis of rotation of the knife, *s*, *s*, the laterally projecting cutting members and *t* the surface being operated upon.

I claim:

1. In a tool of the character described, the combination of a body, a motor, carried thereby, rotating on a vertical axis, the shaft of said motor extending below the base of the body, a knife on said extending shaft end, a sole-plate, and means connecting the ends of the sole-plate to said body the base of the latter, adapted to position the sole-plate at a slight angle to said base, thereby causing a relative incline of the axis of rotation of said shaft, for the purpose specified; said sole-plate having a part cut away under said motor.

2. In a tool of the character described, the combination of a body, a motor, carried thereby, rotating on a vertical axis, tne shaft of said motor extending below the base of the body, a knife on said extending shaft-end, a sole-plate, and pivoted arms connecting the ends of the sole-plate to said body in approximate parallelism with the base of the latter, said arms being adapted to position the sole-plate at a slight angle to said base, thereby causing a relative incline of the axis of rotation of said shaft, for the purpose specified; said sole-plate having a part cut away under said motor.

3. In a tool of the character described, the combination of a body, a motor, carried thereby, rotating on a vertical axis, the shaft of said motor extending below the base of the body, a knife on said extending shaft-end, said knife having opposite, lateral cutting members, a sole-plate, and pivoted arms connecting the ends of the sole-plate to said body in approximate parallelism with the base of the latter, said arms being adapted to position the sole-plate at a slight angle to said base, thereby causing a relative incline of the axis of rotation of said shaft, for the purpose specified; said sole-plate having a part cut away under said motor.

4. In a tool of the character described, the combination of a body, a motor, carried thereby, rotating on a vertical axis, the shaft of said motor extending below the base of the body, a knife on said extending shaft-end, said knife having opposite, lateral cutting members, the latter having their under faces convex, a sole-plate, and pivoted arms connecting the ends of the sole-plate to said body in approximate parallelism with the base of the latter, said arms being adapted to position the sole-plate at a slight angle to said base, thereby causing a relative incline of the axis of rotation of said shaft, for the purpose specified; said sole-plate having a part cut away under said motor.

Signed at Portland, Oregon, this 20th day of August, 1918.

GEORGE L. KRABER.