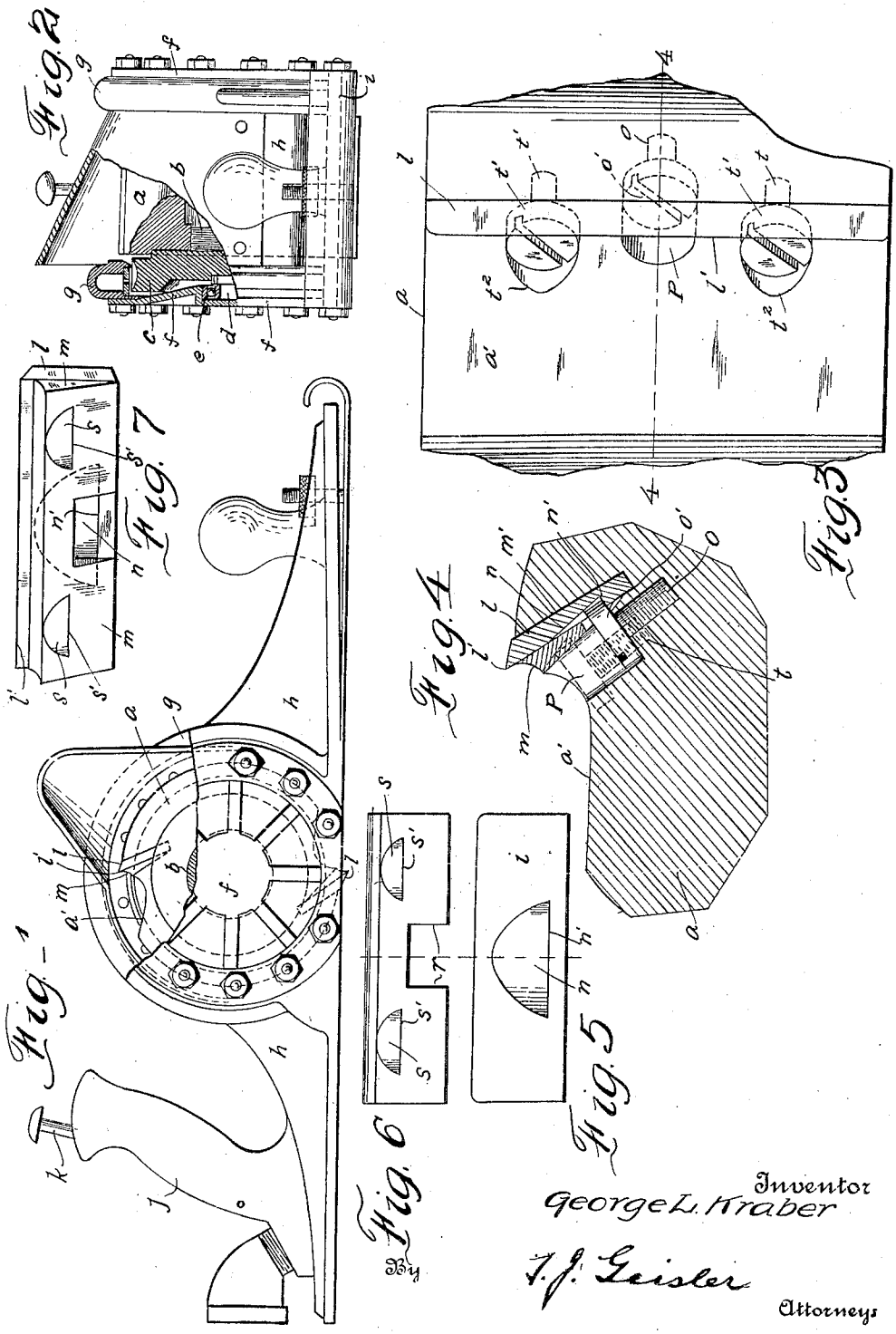
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KNIFE SECURING MEANS FOR CUTTER HEADS.

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1,346,215. Patented July 13, 1920.



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UNITED STATES PATENT OFFICE.

GEORGE L. KRABER, OF PORTLAND, OREGON, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE TURBINE AIR TOOL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

KNIFE-SECURING MEANS FOR CUTTER-HEADS.

1,346,215. Specification of Letters Patent. Patented July 13, 1920.

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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 Knife-Securing Means for Cutter-Heads, of which the following is a specification.

My invention relates to cutter-heads to be driven at high speed, and has for its object the providing of simple but efficient means for securely holding the knives in place.

The high centrifugal force developed by the high speed tends to dislodge the knives, hence the fastening of the latter must be of such character as not to permit them to become loose; for such would be a menace to the safety of the workmen.

I attain my object by securing each knife by two independent but coöperating fastening elements, which are so arranged that they must be removed one after the other, and are further so arranged that even if one of these fastening elements should become accidentally loose the other is sufficient to hold the knife against being thrown out by centrifugal force. In short, my knife-holding means are designed to render the accidental release of the knives practically impossible.

The construction and operation of my knife-fastening means are hereinafter described, having reference to the accompanying drawings, in which:

Figure 1 is a side elevation, partly in section, of a planing tool having a cutter-head containing my invention;

Fig. 2 is a front elevation thereof, partly in section;

Fig. 3 is a fragmental plan view of the cutter-head, showing one knife and illustrating the arrangement of the knife-securing means;

Fig. 4 is a section on the line 4—4 of Fig. 3;

Fig. 5 is a front elevation of one of the knives;

Fig. 6 is a front elevation of the knife-holding wedge; and

Fig. 7 is an isometric view of one of the knives and its holding wedge, illustrating their relation to each other.

My invention comprises a frame *h*, rotatably supporting a cutter-head *a*, cored out for lightness, and mounted between and on the threaded shoulders *b* of the inner sides of the two similar rotary turbine wheels *c* that constitute the motor, only one such wheel *c* appearing on the sectional view of the drawings (Figs. 1 and 2). On their outer sides the wheels thus constituting the sides of the motor are provided with stub shafts *d*, revolving in ball-bearing rings *e* in the central annular recesses, or boxes, of the side plates *f*. The chambers *g* of the frame *h* connect with the channel *i*, see Fig. 2, and provide a passage-way for the motive fluid from the inlet port to the peripheries of the respective wheels *c*.

The handle *j* is integral with the frame *h*, and is provided with a valve not shown having a projecting stem *k* for regulating the admission of the compressed air, which I use as the driving fluid, to such passage *i*.

The cutter-head is cut away, as at *a'*, and is provided with transverse slots *m'* for receiving the knife-blades *l*, and the knife-holding wedges *m*. The knife-blades are tapered to an edge, as at *l'*, and the bottom part thereof is made square. One face of each knife-blade has a cored out recess *n*, made with a shoulder *n'* at the bottom, upon which bears the head *o'* of the screw-bolts *o*, located in the cavities *p*, therefor provided in the cutter-head; said screw-bolts *o* being threaded into the latter.

The wedges *m* are V-shaped in cross sections, and have a part cut away at the middle, as at *r*, so that each may be placed astride of a screw bolt *o*. The latter constitutes one of the elements for holding the knife-blades in place. Each of the wedges is made with two recesses *s*, one located at each end, and provided with a shoulder *s'* at the bottom, upon which shoulders bear the heads *t'* of the screw-bolts *t* inserted in the cavities t^2 of the cutter-head, and threaded into the latter.

The wedges *m* serve to hold the knife-blades rigid at their cutting edges, also serve to strengthen the knife-blades by properly supporting the same; and also serve to break and eject the shavings cut by the knife-blades.

When inserting a knife-blade the screw-bolt *o* is screwed loosely into the cutter-

head, then the wedge *m* may be put in place and drawn up tight, by so doing causing these wedges to take a firm hold at the cutting-edges of the knife-blades; then the screw-bolts *o* are to be tightened up, and the knife will be held rigidly in place. The combined actions of the screw-bolts, *o* and *t*, besides holding the knife-blades *l* firmly in place and rendering them rigid, also distribute the holding strain on the knife-blades in such a manner as to prevent any breaking strain; and since the screw-bolts *o* cannot become unthreaded without the wedges *m* being first removed, the screw-bolts *o*, by bearing in the recesses *n* of the knife-blades *l*, hold them against being dislodged by centrifugal force.

I claim:

1. The combination of a cutter head provided with a slot for receiving a knife-blade, a knife-blade adapted for insertion in such slot, means directly coöperating with said blade to secure the same in place, a wedge-plate adapted for insertion in such slot in contact with said blade, and means for securing said plate in place, said plate being adapted to prevent removal of said first-named securing means.

2. The combination of a cutter head provided with a slot for receiving a knife-blade, a knife-blade adapted for insertion in such slot, a screw element directly engaging with said blade to secure the same in place, a wedge-plate adapted for insertion in such slot in contact with said blade, and a screw-element engaging with said plate to secure the latter in place, said plate being adapted to prevent removal of said first-named screw-element.

3. The combination of a cutter-head provided with a slot for receiving a knife-blade, a knife-blade provided with a recess terminating in a shoulder, a screw-bolt threaded into the cutter-head in front of said shouldered recess, and provided with a head adapted for bearing in the latter, a knife-wedging plate adapted for insertion in said slot of the cutter-head in front of the knife, over the head of said screw-bolt, and a screw-bolt element for securing said knife-wedging plate on the cutter-head.

4. The combination of a cutter-head provided with a slot for receiving a knife-blade, a knife-blade provided with a recess terminating in a shoulder, a screw-bolt threaded into the cutter-head in front of said shouldered recess, and provided with a head adapted for bearing in the latter, a knife-wedging plate adapted for insertion in said slot of the cutter-head in front of the knife, over the head of said screw-bolt, said knife-wedging plate being provided with shouldered recesses on either side of said screw-bolt, screw-bolts threaded into the cutter-head, having heads bearing in said recesses of the knife-wedging plate.

5. The combination of a cutter-head provided with a slot for receiving a knife-blade, a knife-blade provided with a recess having an inwardly sloping face, terminating in a shoulder, a screw-bolt threaded into the cutter-head in front of said shouldered recess, and provided with a head adapted for bearing in the latter, a knife-wedging plate adapted for insertion in said slot of the cutter-head in front of the knife, over the head of said screw-bolt, and a screw-bolt element for securing said knife-wedging plate on the cutter-head.

6. The combination of a cutter-head provided with a slot for receiving a knife-blade, a knife-blade provided with a recess having an inwardly sloping face, terminating in a shoulder, a screw-bolt threaded into the cutter-head in front of said shouldered recess, and provided with a head adapted for bearing in the latter, a knife-wedging plate adapted for insertion in said slot of the cutter-head in front of the knife, over the head of said screw-bolt, said knife-wedging plate being provided with shouldered recesses on either side of said screw-bolt, screw-bolts threaded into the cutter-head, having heads bearing in said recesses of the knife-wedging plate.

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

GEORGE. L. KRABER.