

(No Model.)

2 Sheets—Sheet 1.

J. T. GRZYBOWSKI.

CUTTER HEAD FOR GROOVING MACHINES.

No. 388,410.

Patented Aug. 28, 1888.

Fig. 1.

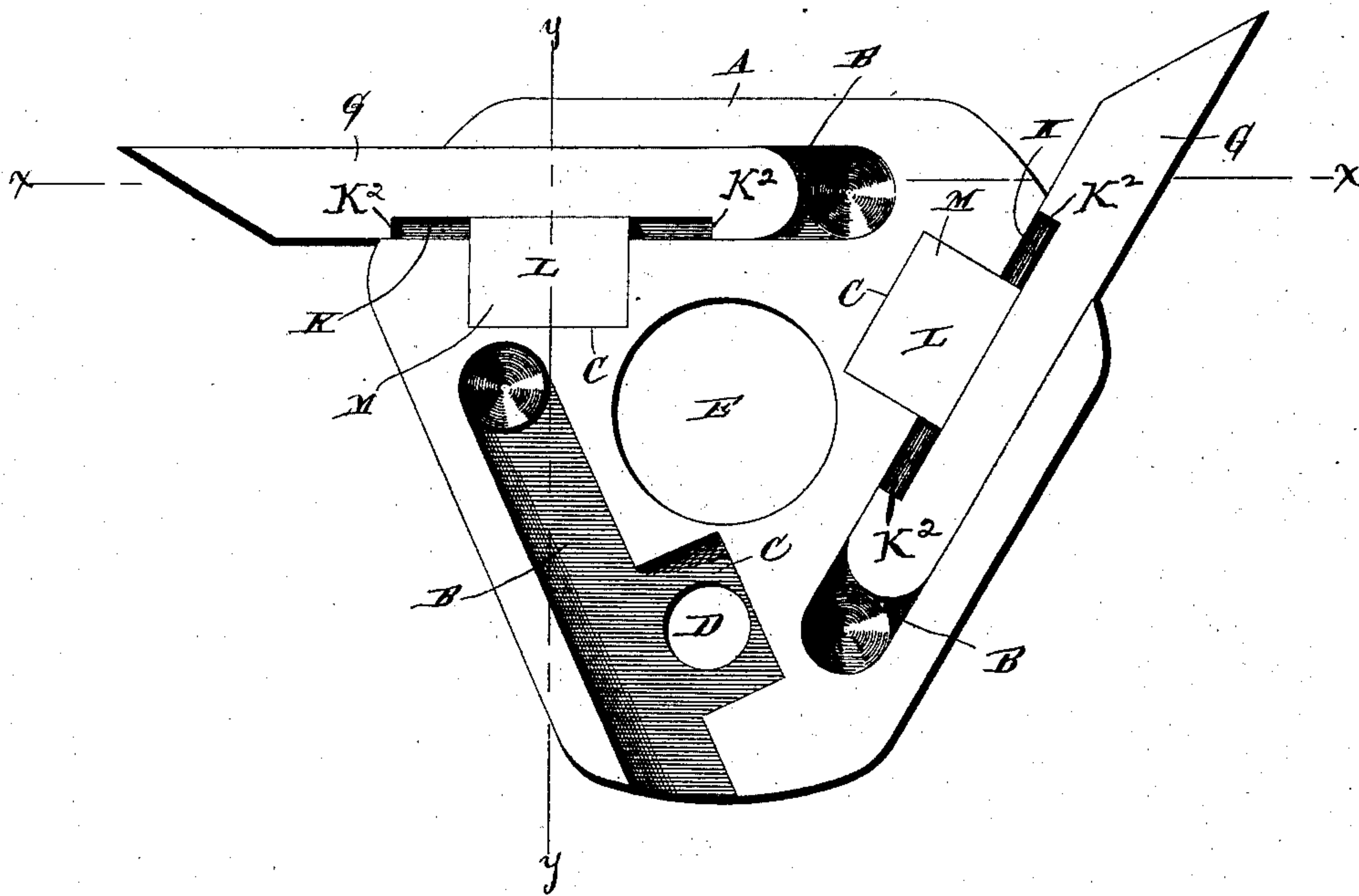
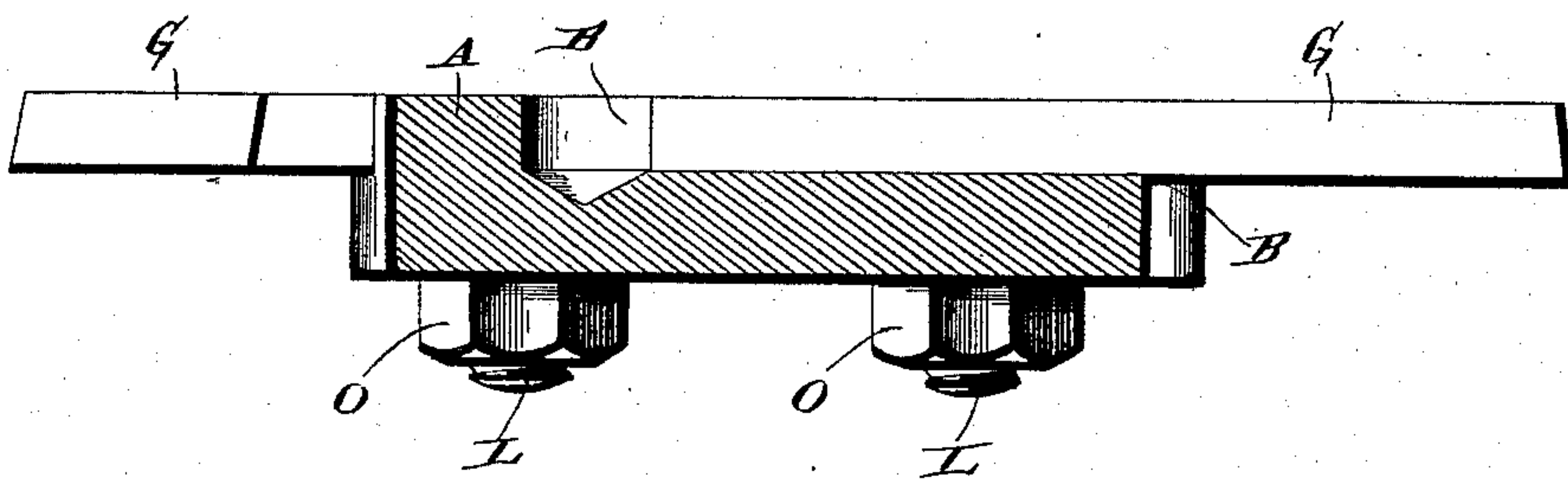


Fig. 2.



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(No Model.)

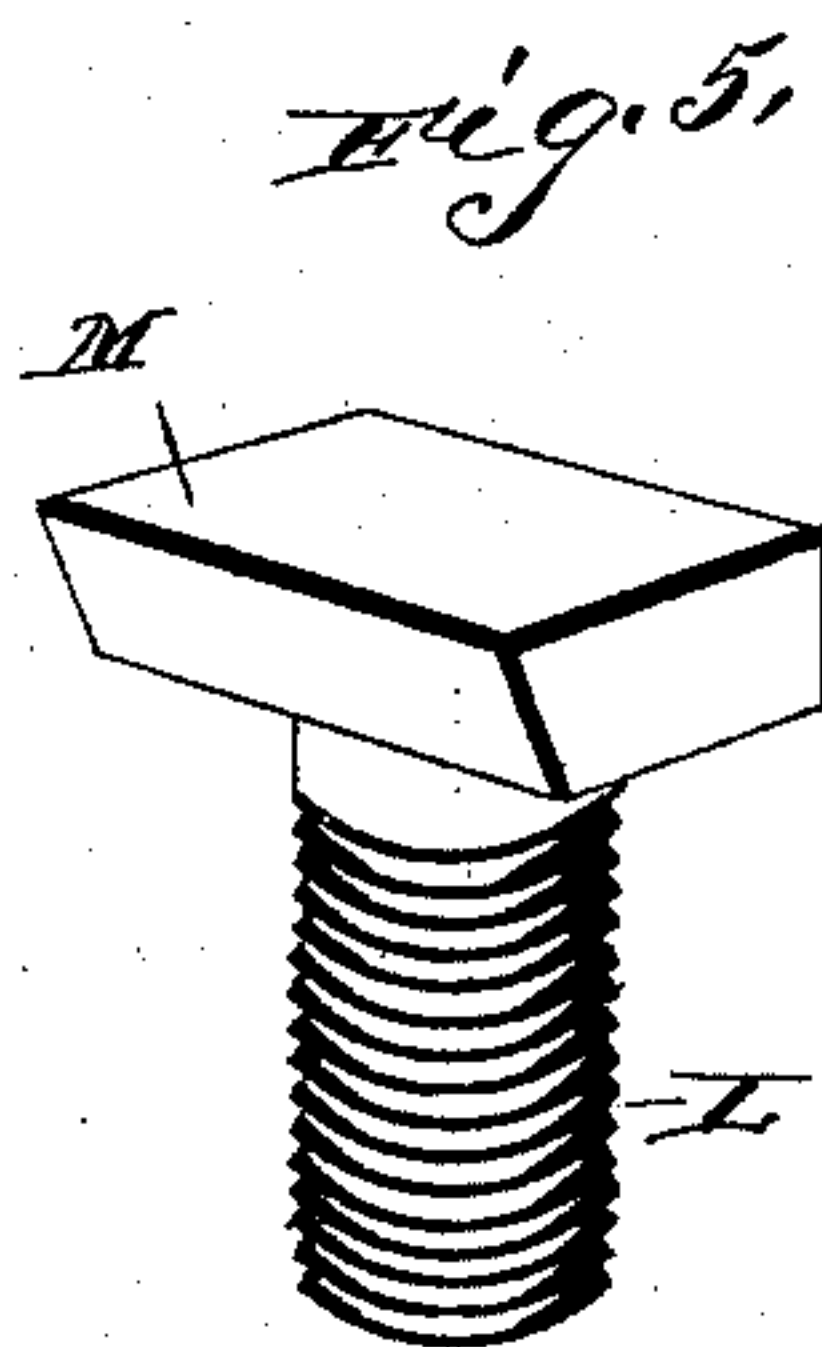
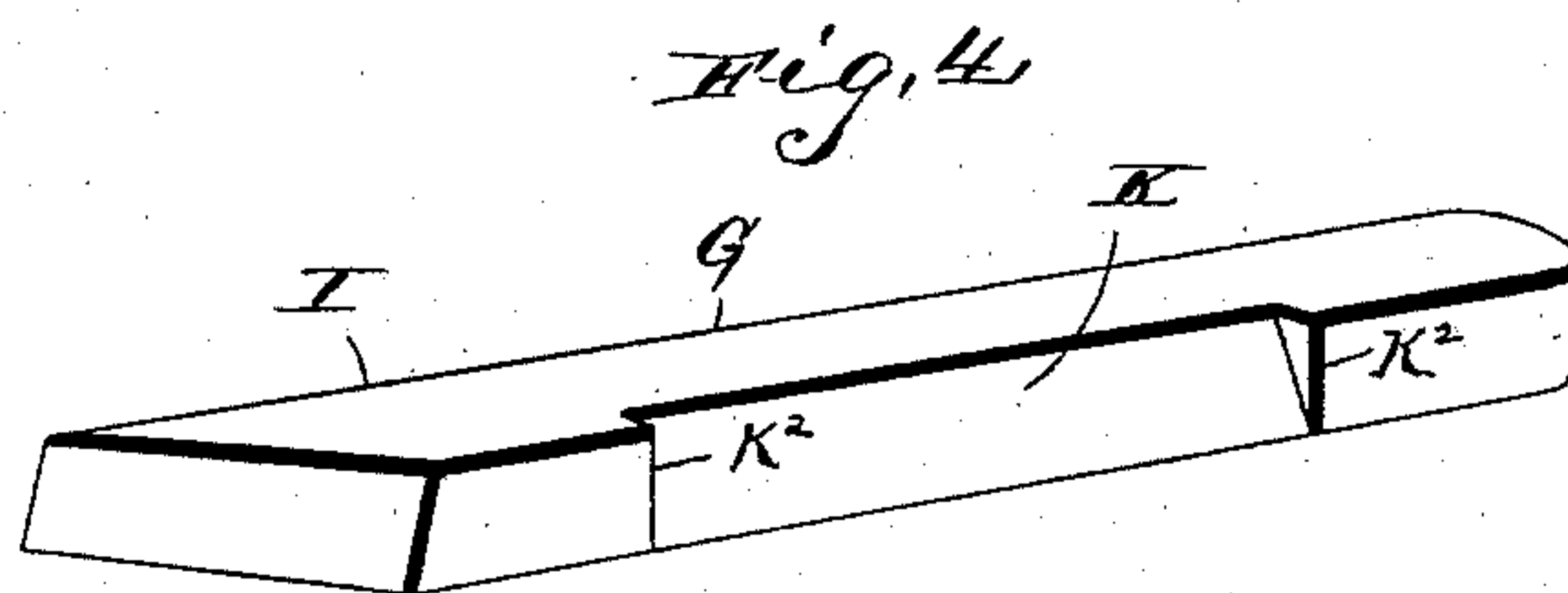
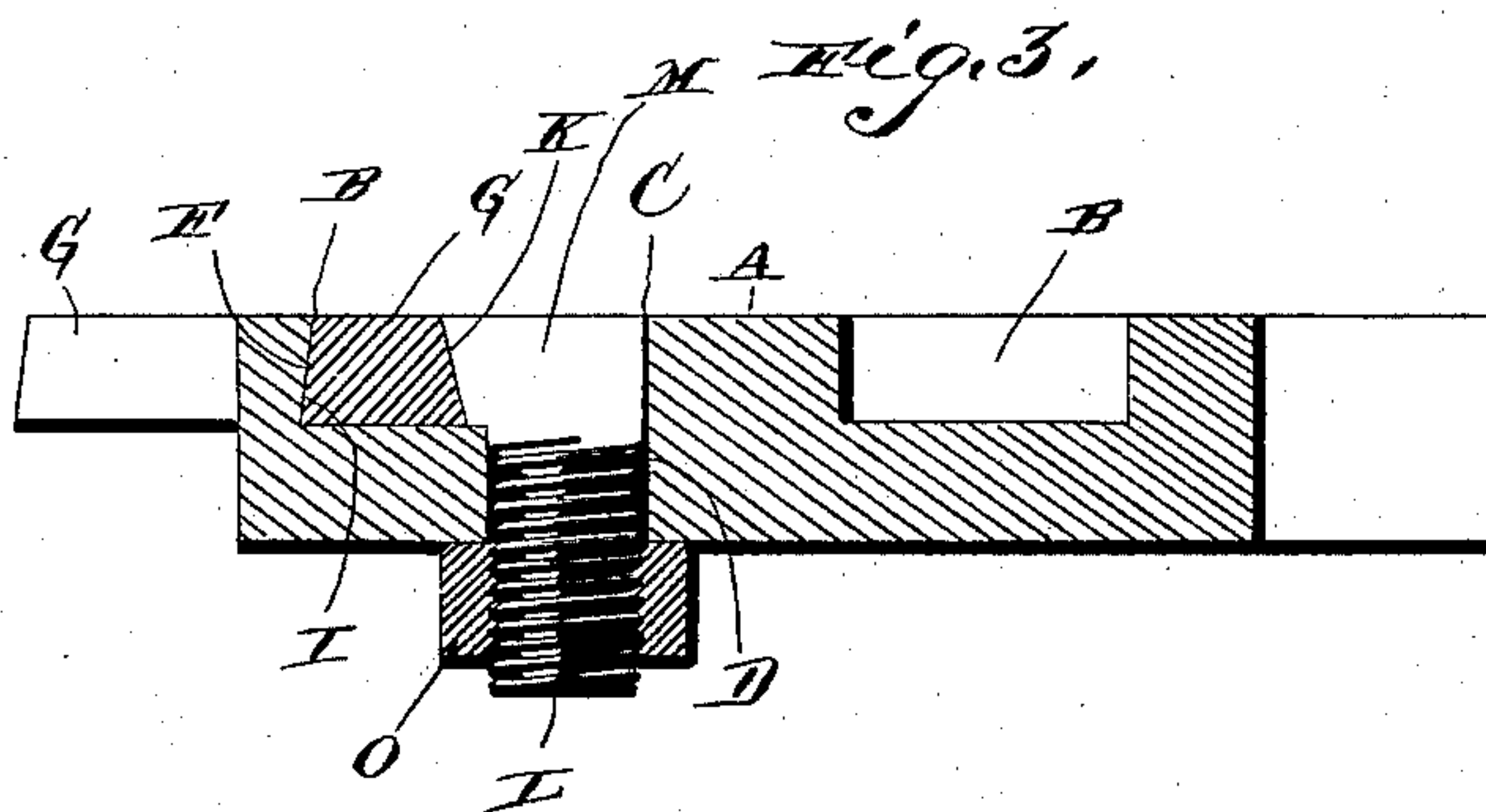
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UNITED STATES PATENT OFFICE.

JULIAN T. GRZYBOWSKI, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO R. E. BUTTERWORTH AND JAMES LOWE, OF SAME PLACE.

CUTTER-HEAD FOR GROOVING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 388,410, dated August 28, 1888.

Application filed November 1, 1887. Serial No. 253,990. (No model.)

To all whom it may concern:

Be it known that I, JULIAN T. GRZYBOWSKI, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Cutter-Heads for Grooving-Machines, of which the following is a specification.

My invention relates to improvements in cutter-heads for grooving-machines; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation of a cutter-head embodying my improvements, one of the cutters being removed. Fig. 2 is a sectional view of the same taken on the line *xx* of Fig. 1. Fig. 3 is a similar view taken on the line *yy* of Fig. 1. Fig. 4 is a detached perspective view of one of the cutters. Fig. 5 is a similar view of one of the bolts for securing the cutters in place.

This cutter-head is adapted to be used in connection with a grooving-machine, such as described in my application for Letters Patent of the United States for an improvement in grooving-machines, filed this day, a series of the cutter-heads being secured to shafts to which rotary motion is imparted, and the boards to be grooved being run under the cutter-heads, and thereby causing the cutters to form grooves in the boards.

A represents the cutter-head, which is preferably made of cast metal and is triangular in form, as shown, its corners being rounded. In one face of the cutter-head is a series of grooves, B, which forms a triangle, the inner ends of the said grooves being closed and the outer ends thereof being open. As here shown, the cutter-head is provided with three of these grooves; but I do not wish to limit myself in this particular, as any desired number of grooves may be formed in the cutter-head, according to the number of cutters it may be found desirable to employ.

On the inner side of each groove B, and near the open end thereof, is formed a recess, C. An opening, D, communicates with the center of the said recess and extends through the cutter-head. In the center of the cutter-

head is made an opening, E, of suitable size to receive the rotating shaft on which the cutter-head is adapted to be secured. The grooves B have their inner sides formed at right angles to their bases or lower sides; but the outer sides of the said grooves are inclined, as at F, thereby making the said grooves wider at their bases than they are at their outer sides. (See Fig. 3.)

G represents a series of cutters which are of the form shown, and are adapted to have their shanks fitted in the grooves B. The said shanks have their inner sides made at right angles to their base and top faces, and have their outer sides inclined, as at I, the shape of the said shanks in cross-section being similar to the cross-section of the grooves B, and the said shanks being thereby adapted to fit into the said grooves. The inclined sides of the grooves of the shanks of the cutters prevent the latter from falling out of the grooves when the clamping-bolts work loose. The inner side of the shank of each cutter is provided with a longitudinal recess, K, the inner side of which is inclined in the opposite direction from the side I. These recesses extend a limited distance along the side of the shank of each cutter and terminate abruptly in vertical shoulders K².

L represents a series of clamping-bolts, which are provided with enlarged heads M, adapted to fit in the recesses C, and have their outer sides inclined, and thereby adapted to fit against the inclined sides of the recesses K in the shanks of the cutters. The stems of the said bolts extend through the openings D, and clamping-nuts O are screwed onto the threaded extremities of the bolts and bear against the reverse face of the cutter, and serve to clamp the bolt-heads so tightly against the inner sides of the cutters as to retain the latter firmly in the grooves B and thus secure them rigidly to the cutter-head.

It will be observed by reference to Fig. 1 that the cutters are arranged tangentially in the cutter-head, and that the recesses K in the shanks of the cutters enable the same to be adjusted longitudinally in the grooves B, so that their cutting-edges may be projected to any desired distance from the center of the cutter-heads.

As shown in the accompanying drawings, the recesses C and the heads of the bolts are rectangular in shape; but I do not limit myself to this form of the recesses and bolt-heads, 5 as the same may be modified without departing from the spirit of my invention.

The essential feature of this invention pertains to the recesses K, having the shoulders K². By this arrangement, should the nuts come off 10 during the rotation of the cutter-heads, the bolts gradually loosen by the subsequent operation of the machine. As the bolts loosen, their hold on the cutter-shanks relaxes and the shanks are caused to play longitudinally 15 in the recesses B by the revolution of the machine, the recesses K permitting this limited longitudinal movement. As the cutter-shanks work longitudinally, the shoulders K² come in contact with the heads of the bolts and cause 20 a sharp "click." As the cutter-head in practice revolves at a rate of four hundred revolutions per minute, the successive clicking sound will produce an alarm and attract the attention of the operator and cause him to 25 stop the machine, tighten the bolt, and put on the nut. Heretofore no provision has been made for this purpose in cutter-heads, for as soon as the bolts became loose the cutter-shanks would immediately slip out.

30 The dangerous result attending the flying out of the cutter-shanks when the machine is in operation is too well known to require repetition here.

It is essential to provide limiting-shoulders 35 to prevent the cutter-shanks from flying out during their longitudinal movement. Any form of stops would answer this purpose.

Having thus described my invention, I claim—

1. The cutter-head having the grooves B, 40 the cutters having their shanks fitted in the grooves, the clamping-bolts having their heads locking the shanks, and the limiting shoulders or stops K² on the shanks on each side of the 45 bolt-heads, the distance between the shoulders or stops being greater than the size of the bolt-heads, so as to allow a limited longitudinal play of the shanks of the cutters, as set forth.

2. The combination of the cutter-head having in the grooves B, the cutters having the shanks 50 fitted in the said grooves and provided with the longitudinal recesses K, the stops or shoulders K² at the ends of the recesses, and the clamping-bolts having the heads bearing against the recessed portions of the sides of 55 the cutters, the recesses being longer than the heads of the bolts, whereby the latter may be adjusted longitudinally, substantially as described.

3. The combination of the cutter-head having 60 the grooves B, and the recesses C, communicating with the said grooves, the cutters having their shanks fitted in the grooves B and provided with the longitudinal recesses K, the 65 sides of which are inclined, the stops or shoulders K² at the ends of the recesses, the clamping-bolts having their heads fitted in the grooves C and bearing against the sides of 70 the recesses K, and the clamping-nuts screwed to the threaded ends of the bolts, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JULIAN T. GRZYBOWSKI.

Witnesses:

EDWARD LOWE,
HARVEY JOSLIN.