No. 631,542. Patented Aug. 22, 1899.

# J. IHLE.

## CUTTER HEAD FOR PLANING MACHINES.

(Application filed Dec. 20, 1898.)

(No Model.)

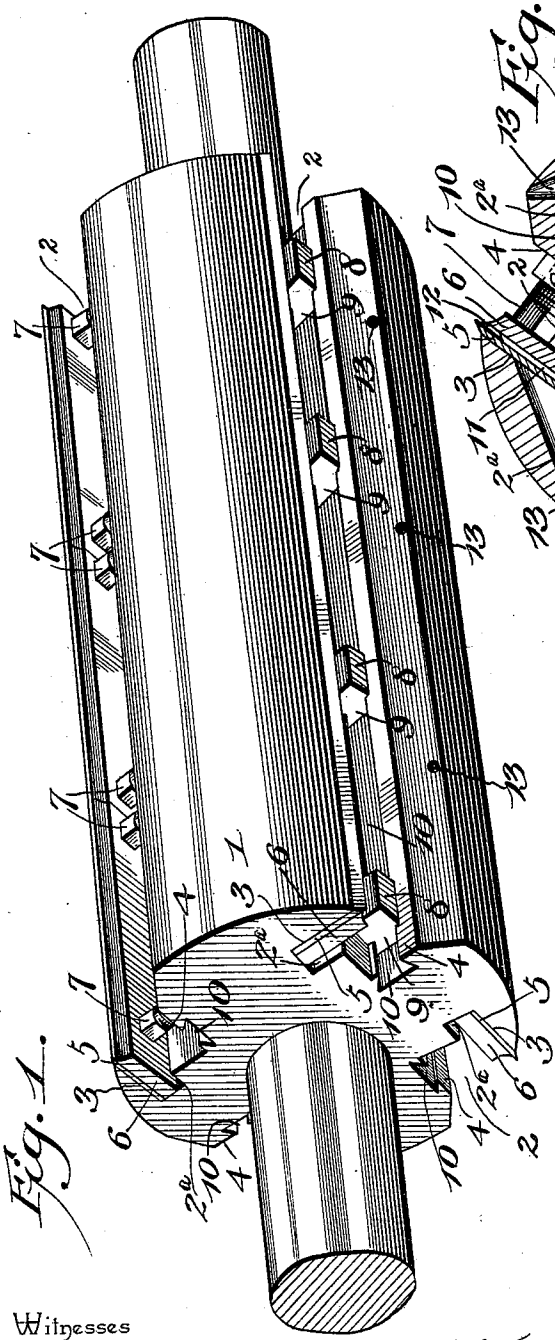


Fig. 1.

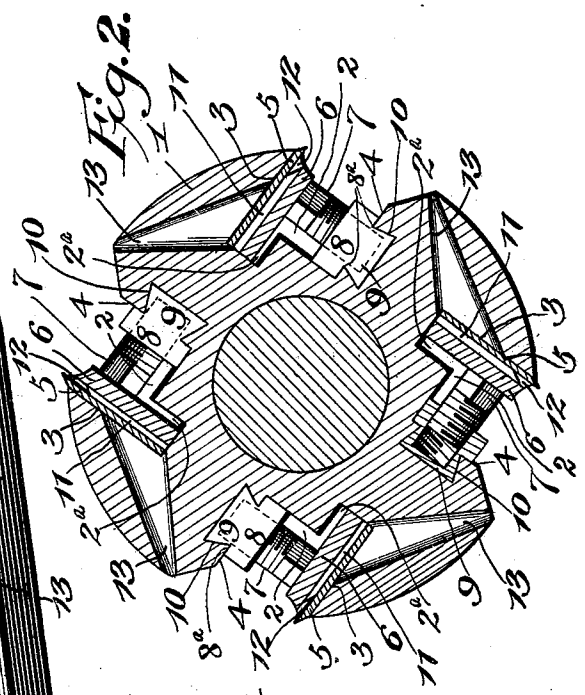


Fig. 2.



Fig. 3.

Witnesses

A. Roy Appleman

C. B. Hoyle

John Ihle, Inventor.

By his Attorneys,

C. A. Snow & Co.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

JOHN IHLE, OF CHIPPEWA FALLS, WISCONSIN.

## CUTTER-HEAD FOR PLANING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 631,542, dated August 22, 1899.

Application filed December 20, 1898. Serial No. 699,332. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN IHLE, a citizen of the United States, residing at Chippewa Falls, in the county of Chippewa and State of Wisconsin, have invented a new and useful Cutter-Head for Planing-Machines, of which the following is a specification.

My invention relates to cutter-heads for surface-planers and similar machines, and has for its object, primarily, to provide simple, inexpensive, and efficient means for securing the knives and bits in the cylinder of a cutter-head and also to provide such means as to adapt a machine of the class named to the use of knives consisting of flat plates, which may be readily and conveniently filed to take out notches or nicks without removal from the machine.

A further object of the invention is to provide means for securing in the cylinder of a cutter-head matching, drop-siding, and beading bits without necessitating the removal of the planer-knives, whereby the operation of grooving or beading may be accomplished simultaneously with the planing of the lumber and without reduction in the rapidity of feed of the machine, and, furthermore, to provide such means for securing the auxiliary bits as will enable the latter to be adjusted both angularly and linearly.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a cutter-head constructed in accordance with my invention, showing auxiliary bits arranged in operative position therein. Fig. 2 is a transverse section of the same, taken in the plane of a set of knife-setting drifts. Fig. 3 is a detail view in perspective of one member of a sectional holding-bar, showing molding or beading bits mounted thereon.

Similar reference characters indicate corresponding parts in all the figures of the drawings.

A cutter-head constructed in accordance with my invention may be provided with any desired number of coöperative knives, which may be varied to suit the diameter of the cylinder, the desired rapidity of feed, &c.; but for the purposes of illustration I have shown a head consisting of a cylinder 1, wherein four longitudinal grooves 2 are formed, said grooves extending inward from the periphery of the cylinder and being of sufficient width between their opposite side walls 3 and 4 to form clearance for the cuttings produced by the knives 5, which are cross-sectionally flat and consist of thin metallic plates arranged in contact with the walls 3. The grooves are prolonged or cut deeper at the end where the plates are disposed, forming knife-seats $2^a$. The means employed for securing these knives in the knife-seats and locking the same at the desired adjustment or with their cutting edges at the desired projection beyond the surface of the cylinder consist of holding-bars 6 of sectional or continuous construction, either or both of which may be included in the same cutter-head, as shown in Fig. 1, and strut-bolts 7 disposed perpendicularly to the planes of the holding-bars and knives, between the inner surfaces of said bars and the opposite side walls 4 of the grooves. The bars 6 are received in the knife-seats. The bolts 7 are provided with flat-faced bearing extremities for contact with the said inner surfaces of the holding-bars and are threaded in adjusting members 8, consisting of nuts, which preferably carry cross-sectionally-dovetailed extensions forming gibs 9, which operate in ways 10, consisting of channels formed in the walls 4 and extending continuously from one end of the cylinder to the other. At the point where the gibs join with the nuts there is formed a shoulder $8^a$, which overhangs the ways and prevents displacement. Obviously by turning the nuts 8 the bolts 7 are adjusted to cause greater or less pressure upon the holding-bars 6, and thus either clamp or loosen the knives 5; but the adjusting or clamping bolts are adjustable independently of the holding-bar, while held from displacement by the gibs 9, fitted in the ways 10, and thus said bolts may be arranged at such intervals and in such positions as to secure the knives at desirable points to prevent straining or displacement. This adjustment of the bolts is particularly advantageous in connection with the sectional form of holding-bar 6, in that it provides for the use of holding-bars having sections of different lengths; but it is

also desirable in connection with a single-piece holding-bar, in that it enables the operator to prevent bulging or springing of the knives in operation and to counteract the tendency to spring when the work which is being turned out by a planer indicates an irregularity in the operation of the knives. The holding-bars, however, perform a further function (in addition to that of securing the knives 5 in place) of supporting auxiliary bits 11, having any desired configuration of cutting edge, such use being either with or independently of the main cutting bits or knives 5, and for this purpose said holding-bars are provided with auxiliary bit-seats 12, formed transversely in those surfaces which are arranged adjacent to the planes of the main bits or knives 5, whereby when the holding-bars are clamped in place they are adapted to secure both the main and auxiliary bits in operative positions. This construction enables me to employ molding, beading, or drop-siding bits with the main planing bits or knives, whereby the beading of a board may be accomplished in the same operation with the planing thereof and without reducing the rate of feed of the lumber to suit the reduced number of planer-bits, as in the ordinary practice. When the auxiliary bits are not required, they may be adjusted inwardly or sheathed in their seats in the holding-bars and may be adjusted to cause their cutting edges to project beyond the main bits or knives 5 only when required. Thus when a cutter-head is to be used for simple planing and must subsequently be used for beading or to form moldings the parts may be set up with the auxiliary bits sheathed until the planing operation is completed, after which the auxiliary bits may be set up to the desired projection without loss of time to the operator and without necessitating a prolonged stoppage of the machinery. To accomplish this adjustment, it is simply necessary to slightly loosen the strut-bolts and advance the auxiliary bits by the application of pressure to their rear edges or backs, and to enable this operation of setting up to be accomplished with facility I provide the cylinder in communication with each knife-seat with a series of drifts 13, consisting of bores through which a tool may be inserted to advance either the main or the auxiliary bits without removing the latter from the seats provided therefor. Furthermore, in order to compensate for irregularity in the grinding of the cutting edges of the auxiliary bits I preferably construct the bit-seats 12 in the holding-bars 6 with rearwardly or inwardly divergent side walls, as shown clearly in Fig. 3, whereby a limited angular adjustment of the auxiliary bit may be accomplished. The frictional contact of the surfaces of the auxiliary bit with the opposing surfaces of the main bit or knife and the holding-bar serves to secure said bits at the desired adjustment. Furthermore, when the auxiliary bits are not in use I have found that the auxiliary bit-seats 12 in the holding-bars do not affect the efficiency of the holding-bars to lock the main bits or knives at the desired adjustment. The cut-away portions of the holding-bars are not of sufficient extent to allow of the warping or springing of the knives.

With the means of adjustment above described I am enabled to secure a uniform projection of the cutting edges of the main and auxiliary bits or such a relative adjustment thereof as to compensate for slight irregularities in the grinding of the cutting edges, and thus to attain an efficiency in the operation of cutter-heads which insures satisfactory results in the operation of the machine.

It will be understood that while I have shown and described holding-bars provided with auxiliary bit-seats this construction is desirable only when auxiliary bits are to be used, but that these channeled holding-bars may be substituted by plane-surfaced holding-bars when the auxiliary bits are not required or may be used in connection with a machine designed for planing purposes and not intended to be used at intervals for matching or beading.

In connection with setting up or adjusting the bits I preferably employ a suitable gage for securing uniformity of projection of the knives; but as such gage forms no part of my present invention I have deemed it unnecessary to illustrate the same in the drawings.

It will be understood, furthermore, that various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having described my invention, what I claim is—

1. A cutter-head having a cylinder provided with longitudinal grooves to receive the bits and their holding devices, said grooves being cut deeper or prolonged at one side wall to provide knife-seats $2^a$, the bits and their holding-bars both arranged in the knife-seats, and bar-adjusting devices having an interlocking sliding connection with the other side wall of the grooves, substantially as described.

2. A cutter-head having a cylinder provided with longitudinal grooves to receive the bits and their holding devices, the bits being arranged in contact with one side wall of the grooves, and the holding devices comprising a holding-bar, strut-bolts, and nuts having dovetailed extensions or gibs providing intermediate shoulders $8^a$, the opposite side walls of the grooves being formed with dovetailed ways which receive the corresponding extensions or gibs of the nuts, the shoulders $8^a$ overhanging the ways, for the purpose set forth.

3. A cutter-head having a cylinder provided with longitudinal parallel-walled grooves in contact with one side wall of each of which a bit is adapted to be arranged, and clamp-

ing devices consisting of a holding-bar for adjustment toward and from the plane of said side wall of the groove, and strut-bolts mounted upon and having an interlocking sliding connection with the other side wall of the groove, for adjustment parallel therewith, and having a terminal bearing against the inner surface of said holding-bar, substantially as specified.

4. A cutter-head having a cylinder provided with longitudinal parallel-walled grooves in contact with one side wall of each of which a bit is adapted to be arranged, and clamping devices consisting of a holding-bar for adjustment toward and from the plane of said side wall of the groove, dovetailed gibs mounted in ways parallel with the other wall of the groove, and adjusting-bolts carried by said gibs for terminal contact with the inner surface of said holding-bar, substantially as specified.

5. A cutter-head having a cylinder provided with longitudinal parallel-walled grooves in contact with one side wall of each of which a bit is adapted to be arranged, and clamping devices consisting of a holding-bar for adjustment toward and from the plane of said side wall of the groove, and an adjustable bolt arranged between the inner surface of the holding-bar and the opposite side wall of the groove, and having engaged therewith a nut provided with attached means mounted in an undercut way in said opposite side wall of the groove for adjustment parallel with the axis of the cylinder, substantially as specified.

6. A cutter-head having a cylinder provided with longitudinal parallel-walled grooves in contact with one side wall of each of which a bit is adapted to be arranged, and clamping devices consisting of a holding-bar for adjustment toward and from the plane of said side wall of the groove, adjusting-bolts bearing terminally against the inner surfaces of said holding-bars, and nuts engaged with said bolts and provided with dovetailed gibs mounted in ways in the opposite side wall of the groove, substantially as specified.

7. A cutter-head having a cylinder provided with longitudinal grooves in contact with one side wall of each of which a bit is adapted to be arranged, a holding-bar arranged in the groove for adjustment toward and from the plane of said side wall of the groove to hold the main bit in place, auxiliary bits disposed intermediately between the holding-bar and the main bit and connected with the inner face of the holding-bar, and devices for adjusting said holding-bar whereby the latter serves the double function of holding both the main bit and the auxiliary bits in place, substantially as described.

8. A cutter-bar having a cylinder provided with longitudinal grooves, in contact with one side wall of each of which is adapted to be arranged a main bit, a holding-bar arranged in the groove for adjustment toward and from the plane of said side wall of the groove, and provided with auxiliary bit-seats on the inner face of the holding-bar, auxiliary bits fitted in said auxiliary bit-seats in contact with the main bit, and adapted to have their cutting edges projected beyond the main bit, and adjusting devices for said holding-bar, whereby both the main bit and the auxiliary bits are held in place by the same holding means, substantially as specified.

9. A cutter-bar having a cylinder provided with longitudinal grooves, in contact with one side wall of each of which is adapted to be arranged a main bit, a holding-bar for the main bit arranged in the groove for adjustment toward and from the plane of said side wall of the groove, and provided on its inner face with auxiliary countersunk bit-seats having rearwardly-divergent side walls, the auxiliary bits fitted in the seats contiguous to the main bit and adjusting devices for said holding-bar to hold both the main bit and the auxiliary bits in place, substantially as specified.

10. A cutter-bar having a cylinder provided with longitudinal grooves, in contact with one side wall of which a main bit is adapted to be arranged, a holding-bar arranged in the groove for adjustment toward and from the plane of said main bit, auxiliary bits carried by said holding-bar on its inner face in contact with the adjacent surface of the main bit and countersunk in the holding-bar, and adjusting devices for the holding-bar, whereby the latter serves to clamp said main and auxiliary bits at the desired adjustment, substantially as specified.

11. A cutter-head having a cylinder provided with longitudinal grooves, in contact with one side wall of which a main bit is adapted to be arranged, a holding-bar arranged in the groove for adjustment toward and from the plane of said main bit, auxiliary bits countersunk in and mounted for angular adjustment upon the inner side of said holding-bar in contact with the main bit, and adjusting devices for the holding-bar, whereby the latter serves to clamp both the main and auxiliary bits at the desired adjustment, substantially as specified.

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

JOHN IHLE.

Witnesses:
JOHN P. WALL,
ED. EMERSON.