(No Model.) 2 Sheets—Sheet 1.

F. HASENAU.

GROOVING AND SCRATCHING APPARATUS FOR MILLBOARDS.

No. 459,095. Patented Sept. 8, 1891.

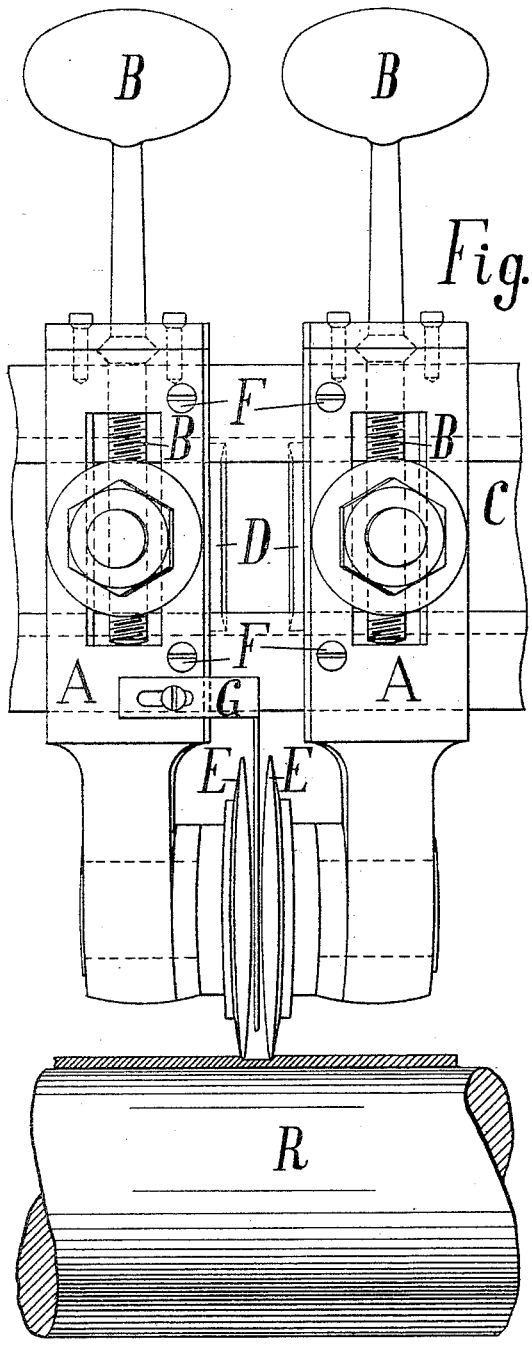

Fig. 1.

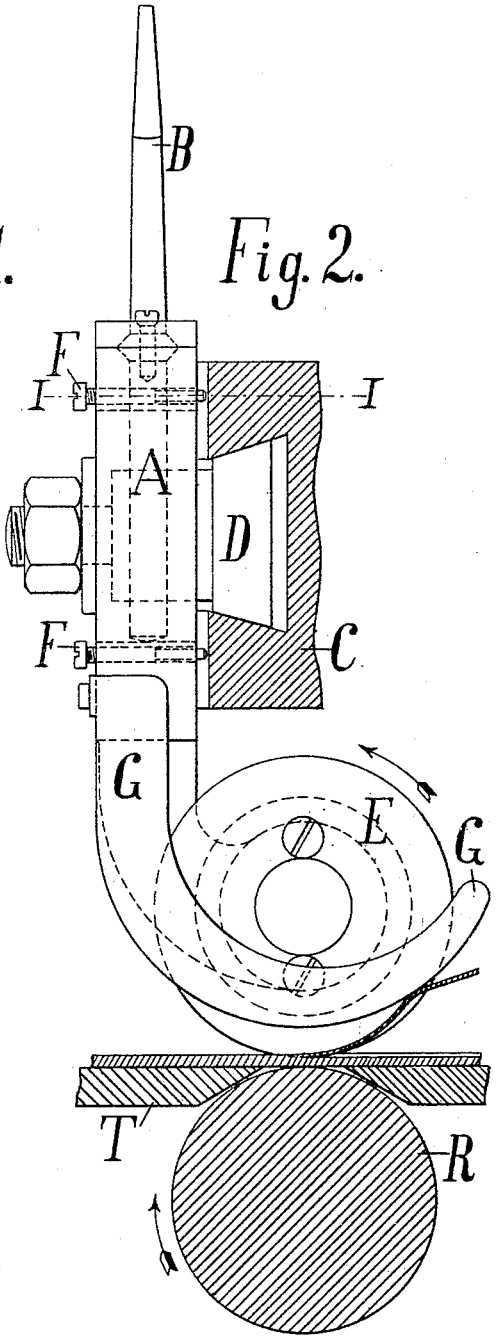

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

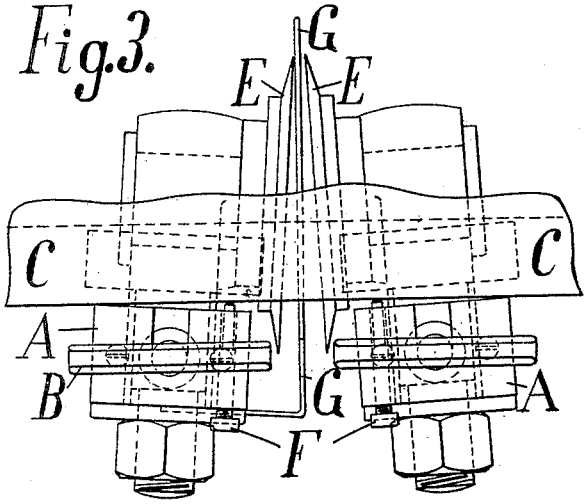


Fig. 4.

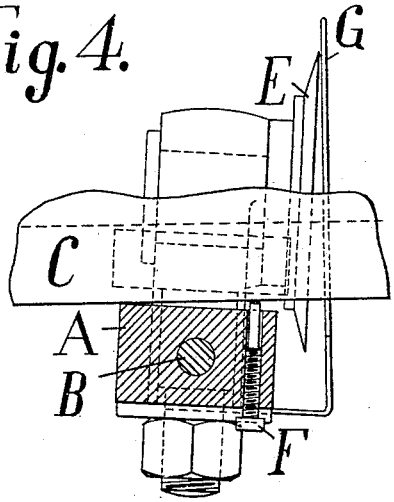


Fig. 6.

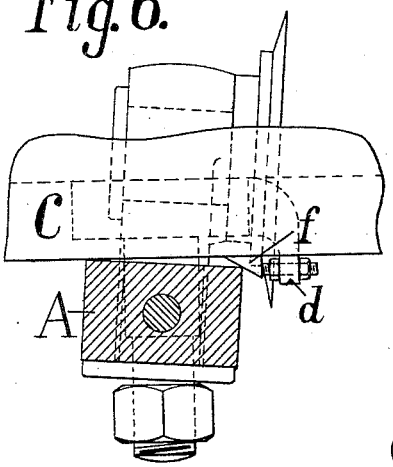


Fig. 5.

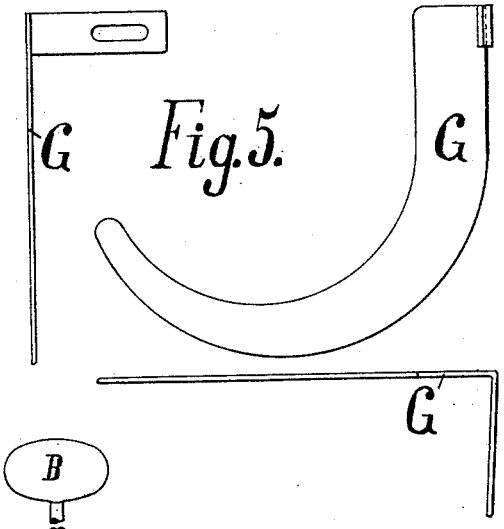
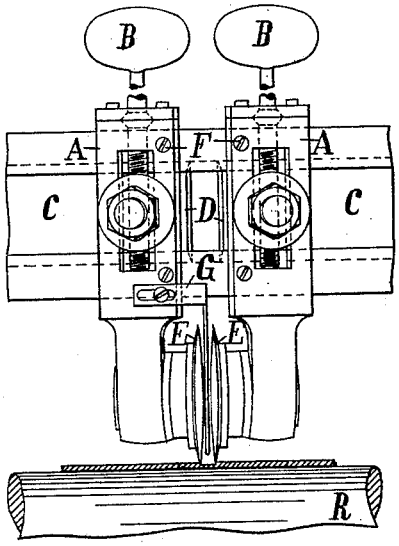


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANZ HASENAU, OF LENNEP, GERMANY.

GROOVING AND SCRATCHING APPARATUS FOR MILL-BOARDS.

SPECIFICATION forming part of Letters Patent No. 459,095, dated September 8, 1891.

Application filed October 29, 1890. Serial No. 369,705. (No model.) Patented in Germany February 3, 1890, No. 9,728; in France July 7, 1890, No. 193,669, and in England July 24, 1890, No. 11,617.

To all whom it may concern:

Be it known that I, FRANZ HASENAU, a subject of His Majesty the Emperor of Germany, residing at Lennep, in the Province of Rhenish Prussia, Germany, have invented certain new and useful Improvements in Grooving and Scratching Apparatus for Mill-Boards, (for which I have received Letters Patent in Germany, dated February 3, 1890, No. 9,728; in France, dated July 7, 1890, No. 193,669, and in England, dated July 24, 1890, No. 11,617,) of which the following is a specification.

In order to be better able to fold the card-boards or mill-boards in making boxes and other similar work, the boards are scratched with a racing-iron along the folding-lines when the mill-board is not thick, and they are grooved when the board reaches a certain thickness. This is generally done by the use of a circular cutter or a racing-iron, which is pressed upon the board while it is moved below it by the action of a friction-roller mounted below the table of the grooving-machine. For making grooves two such scratches or cuts are made into the mill-board, and the material between them is taken out by a special tool, a sort of a plane-iron.

The apparatus invented by me serves for making scratches as well as grooves of any width without the use of any other tool by merely putting two properly-set rotary cutters at the right distance from each other.

In the accompanying drawings my improved apparatus is shown in different views and sections.

Figure 1 is a front view of the apparatus in working order. Fig. 2 is a vertical section between the two cutters. Fig. 3 is a top view of Fig. 1. Fig. 4 is a section along line I I of Fig. 2. Fig. 5 are details. Fig. 6 shows a similar view to Fig. 4 of a somewhat modified construction. Fig. 7 is a small-sized drawing for the *Gazette*.

The cutter-holder which I use is of similar construction as those generally employed for the purpose. It consists in the cast piece A, which can be adjusted in a vertical direction by the thumb-screw B in the dovetail slide-piece D, which itself can be shifted lengthwise in the corresponding groove of the bridge-piece C of an ordinary grooving-machine, so as to fit the depth and width of a groove to be made, two such pieces A being used side by side.

I mount the cutter E on the piece A in such a manner that it is quite free on one side and that it can turn on a pin fixed therein. The sliding piece D is so arranged that it can be set at an angle to the bridge-piece C in the horizontal plane, or, what comes to the same, that the cutter E rotates in a vertical plane standing at an angle to the direction in which the mill-board to be cut moves. This is the essential part of my invention. I regulate the proper angle at which the piece A or the cutters E respectively have to stand obliquely by means of two set-screws F F or equivalent means, which press against the bridge-piece C, and thus raise the piece A at one side, as shown in Figs. 3 and 4. The same effect is obtained by the use of a little wedge *f*, which may be held in a projecting part *d* of the slide-piece D by a screw and nut, as shown by Fig. 6, or by equivalent means, as they are familiar to any experienced mechanic.

For scratching, one knife may be used, which may be put straight or oblique; but two may be used, and they are then approached to each other so much that the cutters touch. If, however, grooves are to be made, two knives must be used, and they must be mounted, as shown by Figs. 1 and 3, so as to form an acute angle having its point in the direction in which the card-board is moved. Both cutters acting so together form, properly speaking, but one instrument, making the groove and raising the chip out of the board in a continuous strip without the use of any other means, as shown by Fig. 2.

The piece G, Fig. 5, serves as a deflector to prevent the chip being taken round by the cutters.

The grooving without a plane-iron, (as formerly used,) now done by the angular position in the horizontal plane of the two cutters, is based on the following: The two cutters being so arranged that their distance where they touch the mill-board is equal to the desired width, they are screwed down to the depth of

the groove to be made into the board, thus ripping the latter between themselves and the roller R underneath, projecting just a little over the table T and rotating in the direction indicated. The circumferences of the circular cutters therefore converge in that direction up to the horizontal plane placed through their center, and they therefore also nip the chip between themselves and so raise it or pull it out of the mill-board. It will therefore be understood that grooves of any width and depth can be made, the acute angle of the knives having to be increased slightly for making deeper and wider grooves.

I am aware that prior to my invention grooving and scratching apparatus have been made with cutters rotating on a spindle. I therefore do not claim such apparatus broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The pair of rotary cutters E, set perpendicularly with their peripheries converging in the direction of the movement of the mill-board up to the horizontal plane placed through their center, then diverging again and acting together to make grooves with vertical side edges and a broad bottom and to pull out the chip at the same time, substantially as set forth.

2. The combination of the cutter-holders A with the set-screws F and the slide-piece D for setting the knives E at an angle in the horizontal direction, as set forth.

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Witnesses:

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