(No Model.) 2 Sheets—Sheet 1.

N. HENRY.

EXCELSIOR CUTTING MACHINE.

No. 439,007. Patented Oct. 21, 1890.

Fig. 1.

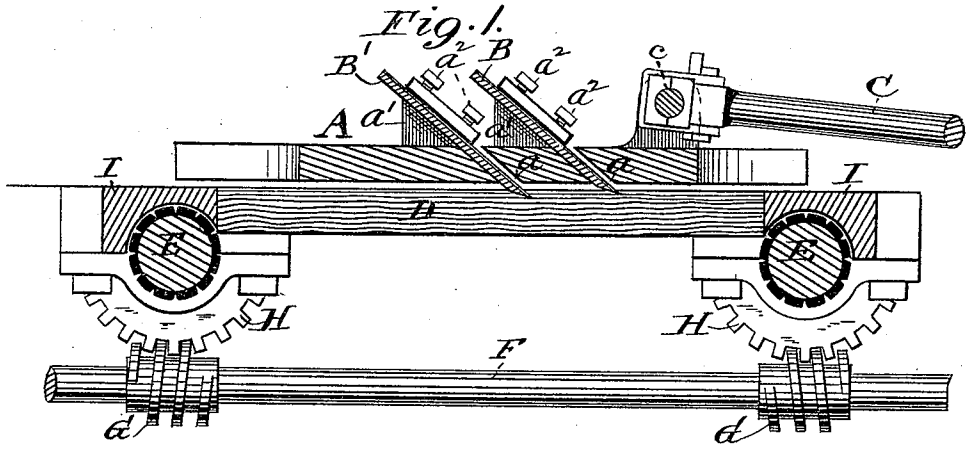


Fig. 2.

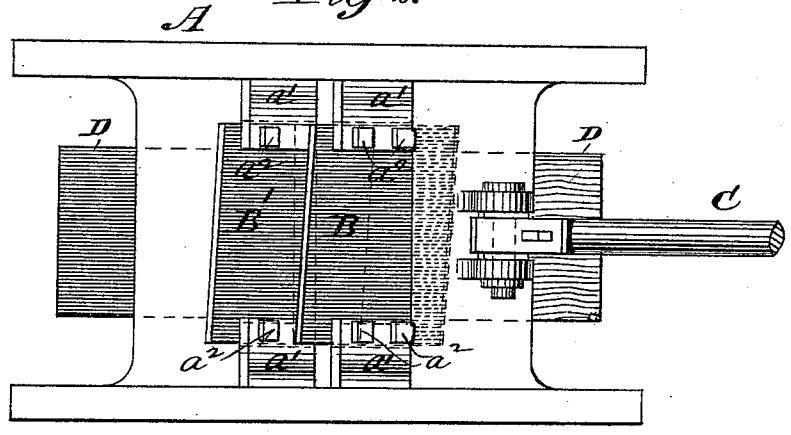
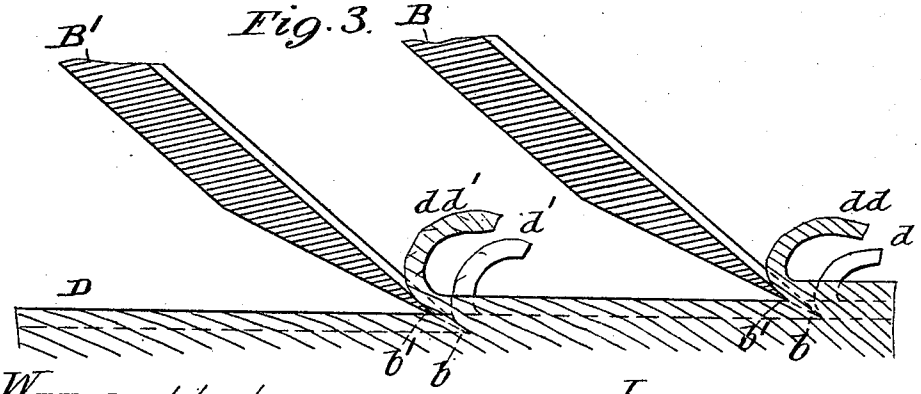


Fig. 3.



WITNESSES

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

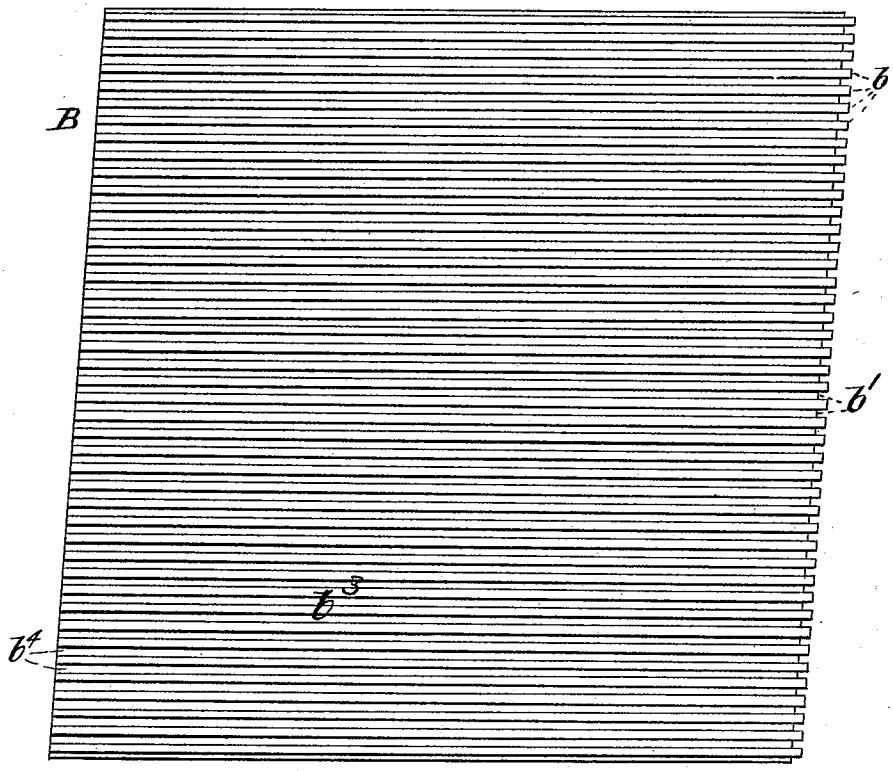


Fig. 5.

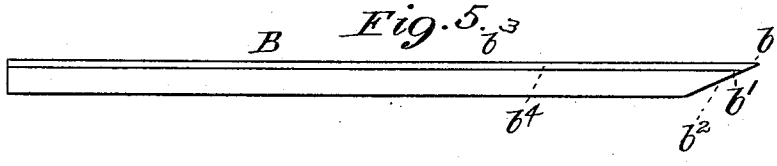
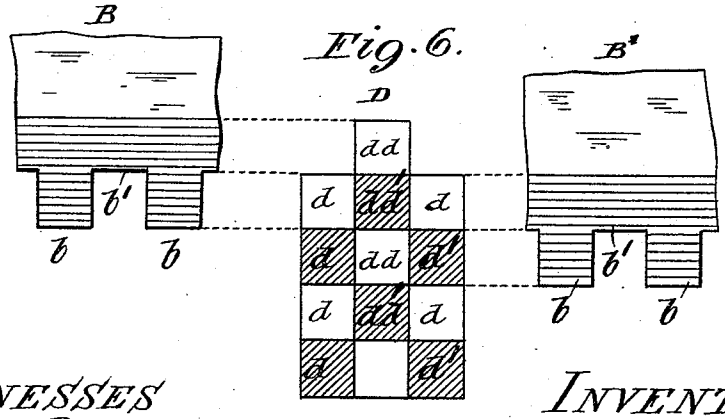


Fig. 6.



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UNITED STATES PATENT OFFICE.

NETTIE HENRY, OF ST. LOUIS, MISSOURI.

EXCELSIOR-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 439,007, dated October 21, 1890.

Application filed May 31, 1890. Serial No. 353,849. (No model.)

To all whom it may concern:

Be it known that I, NETTIE HENRY, of St. Louis, Missouri, have made a new and useful Improvement in Excelsior-Cutting Machines, of which the following is a full, clear, and exact description.

My improvement relates to that class of machines in which the cutting-knife is adapted to both score and plane; and it consists, mainly, in combining the knives, whereby at each forward stroke of the knife-head the knives co-operate to produce the excelsior, substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification, in which—

Figure 1 is a view showing the improved mechanism in longitudinal section; Fig. 2, a plan of the same not including the block-feeding mechanism; Fig. 3, a view illustrating the action of the knives, the knives and the block being in section; Fig. 4, a plan of one of the knives; Fig. 5, a side elevation of the knife; and Fig. 6, a view introduced to illustrate the mode in which the knives co-operate, portions, respectively, of the two knives being shown in rear elevation and at opposite sides, respectively, of a diagram representing that part of the block of wood which is acted upon by the said knife portions.

The views are not all upon the same scale.

The same letters of reference denote the same parts.

Only that portion of the excelsior-cutting machine is shown which is essential to an understanding of the improvement.

A represents the knife-head or part which carries the knives B B′ for cutting the excelsior.

C represents the pitman, which at *c* is joined to the knife-head A for the purpose of effecting the customary reciprocating movement of the knife-head past the block D, from which the excelsior is produced. The usual means—such as the feed-rolls E E—are employed to feed the block D toward the knives.

F represents a driving-shaft provided with the worm-gears G G, which engage, respectively, with the gears H H, which in turn are fastened, respectively, to the shafts of said feed-rolls. By this means a suitable motion is imparted to the feed-rolls and the block D thereby suitably fed. In Fig. 1 only the remnant of the block D is shown, and it is held between the bars I I in the customary manner.

The knives B B′ are similar. The cutting-edge of the knife consists of a series of projecting blades (which may be termed "spurs") *b b* and a series of blades termed "planers" *b′ b′*. The spurs, which may be made narrow to score simply, or wider to plow out a piece of excelsior, project beyond the planers. The spurs and planers are arranged alternately, and the under side b^2 of the cutting-edge of the knife, including the spur-edges and the planer-edges, is a continuous bevel, substantially as shown. To cause the spurs to project thus beyond the planers the front b^3 of the knife is grooved at b^4 b^4, the grooves being respectively in line with the planers and at the cutting-edge of the knife being sufficiently deep to cause the spurs to project the desired distance beyond the planers.

The improvement, as stated, does not relate to the special form of either of the knives, but in combining two or more such knives, substantially as described—that is, to carry out the improvement at least two knives B B′ must be employed, and in such employment the knives must be arranged relatively to each other and to the block of wood from which the excelsior is produced, substantially as is represented in the drawings. As there shown, the knives are arranged one behind the other and are held in the knife head or stock, so that the cutting-edge of the rear one of the knives is projected slightly farther out than is the cutting-edge of the forward one of the knives. The amount of such projection is equal to the thickness of one of the shavings cut from the block D. The knives are also so relatively arranged as to cause the spurs of the rear knife to be respectively in line with the spurs of the forward knife.

The operation of the improvement is as follows: In making the excelsior the knives are moved past the block of wood from which the excelsior is produced in the ordinary manner, saving that when two knives B B′ are employed, as in the present instance, the block is fed twice as far at each stroke of the knife-head as when but a single knife is employed. At the first forward stroke of the knife-head the spurs of the forward knife score or shave the block D in the ordinary manner. At that

same forward stroke the spurs of the rearward knife, and which, as stated, are respectively in line with the spurs of the forward knife, score still deeper into the block, and the planers of that rearward knife plane off the ridges upon the block which have been formed by the action of the spurs upon the forward knife. At the next forward stroke of the knife-head the spurs of the forward knife score the block and the planers of that knife plane off the ridges formed upon the block by the action of the spurs of the rearward knife at the previous stroke of the knife-head, and so on, the spurs of the two knives respectively scoring successively into the block, and the planers of the two knives respectively planing off the ridges which have been formed upon the block by the action of the spurs of the knives, respectively.

For a better understanding of the operation in question reference is made to Fig. 6 of the drawings. In this view the forward and rearward knives are represented at B and B′, respectively, and the diagram D represents the block from which the excelsior is being cut. The action of the forward knife B upon the block is represented by the unshaded portion *d dd d*, the spurs of the knife cutting off the portions *d d*, and the planers of the knife planing off the portion *dd*. The action of the rearward knife B′ upon the block is represented by the shaded portion *d′ dd′ d′*, the spurs of the knife scoring out the portions *d′ d′* and the planers of the knife planing off the portions *dd′*. At each stroke of the knife-head the block D is fed sufficiently to enable the two knives to again coact upon the block as before, for each of the knives supplements the action of the other upon the block, and the alternately-occurring unshaded and shaded portions of the diagram illustrate the combined action of the two knives. The knives are held in the knife-head substantially in the manner shown in Figs. 1 and 2—that is, the knife-head is slotted at *a a* to admit the knives, and each slot is also sufficiently wide to permit the shaving *dd′* cut by the knife to pass through it above the knife. The knives work through guides *a′ a′*, and they can be set to cut deeper or shallower, and when adjusted they are held in place by means of the set-screws a^2, working through the upper portion of the guides to bear upon the knives, substantially as is represented.

When the knife-head is provided with three knives, the block is fed at each stroke of the knife-head three times as far as when but a single knife is used, and the three knives are relatively adjusted to each other and to the block and co-operate in cutting the excelsior in a manner analogous to that in which two knives co-operate.

I claim—

In an excelsior-cutting machine, a knife-head having two or more similar knives, said knives each being notched to both score and plane, and both pointing forward and being relatively arranged and held to cause the cutting-edge of the rear one of the knives to project farther than the cutting-edge of the forward one of the knives, and the spurs of the rear knife to be respectively in line with the spurs of the forward knife, substantially as described.

Witness my hand this 26th day of May, 1890.

NETTIE HENRY.

Witnesses:
C. D. MOODY,
B. F. REX.