

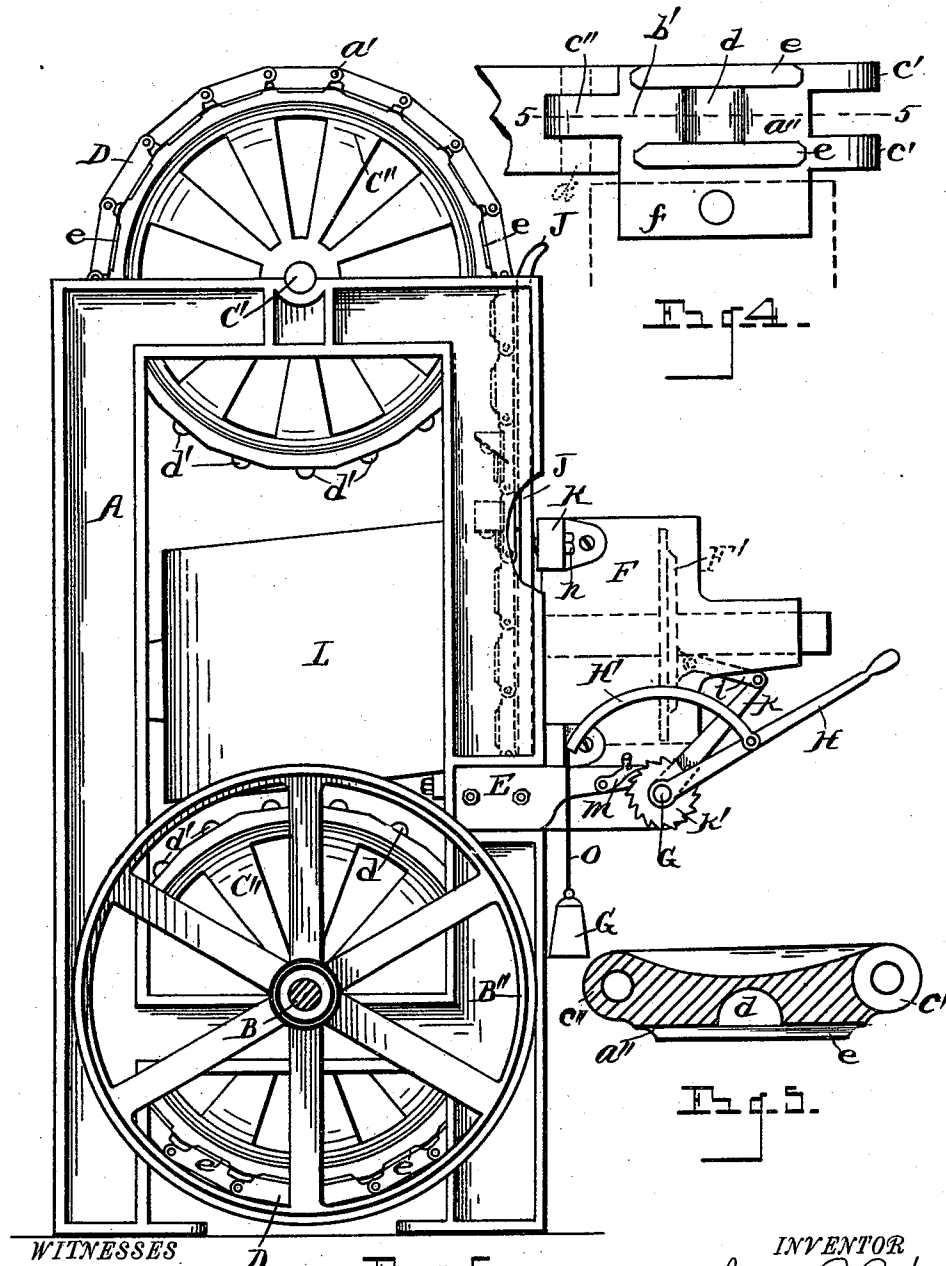
(No Model.)

3 Sheets—Sheet 1.

J. R. BATE.
MACHINE FOR CUTTING EXCELSIOR.

No. 583,884.

Patented June 8, 1897.



WITNESSES
Horace A. Wheeler,
Edward A. Stricker

INVENTOR
James R. Bate,
By his Attorneys R. B. Wheeler & Co.

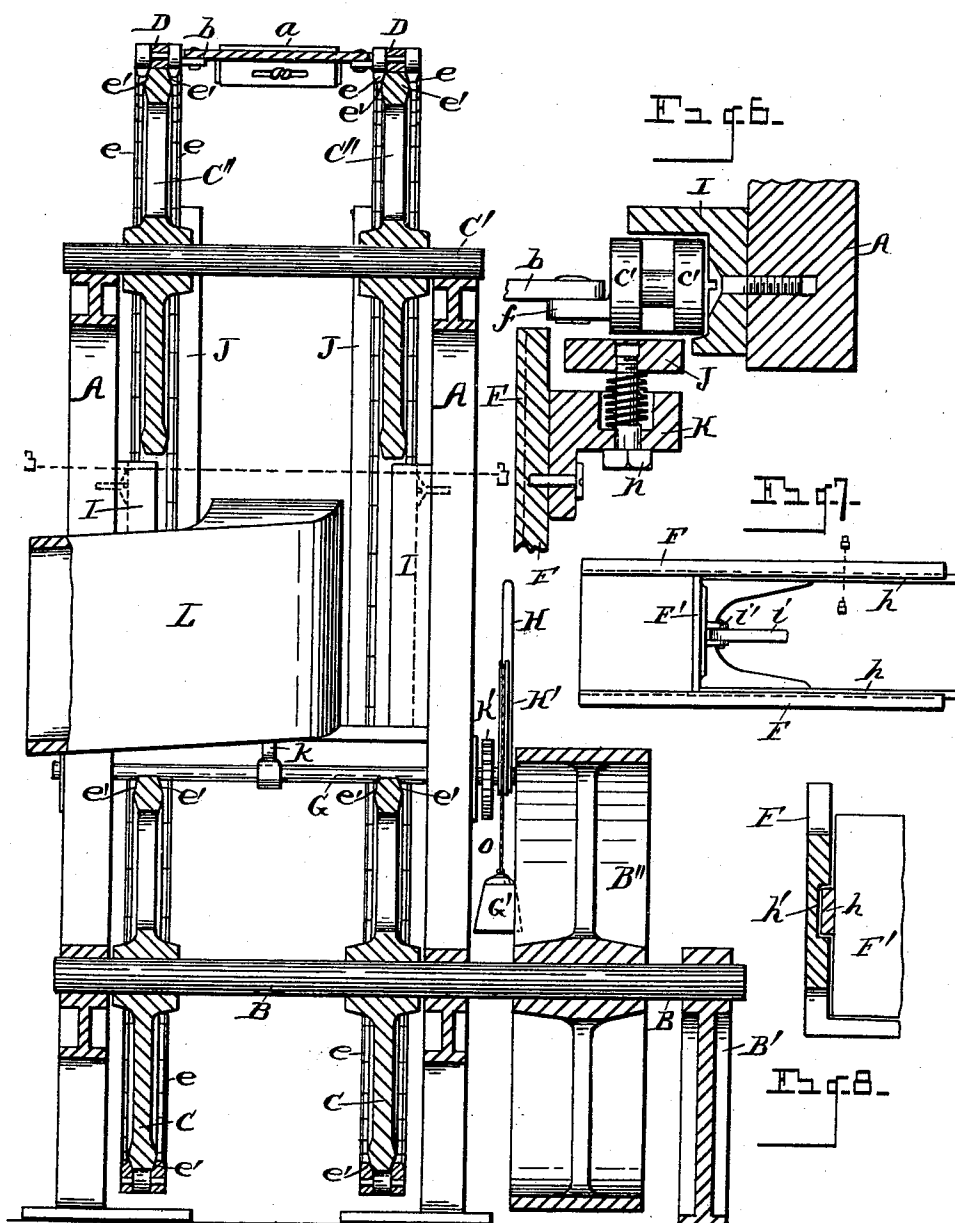
(No Model.)

3 Sheets—Sheet 2.

J. R. BATE.
MACHINE FOR CUTTING EXCELSIOR.

No. 583,884.

Patented June 8, 1897.



WITNESSES

Horace R. Wheeler,
Edward A. Stricker

INVENTOR

James R. Bate,

By his Attorneys R. B. Wheeler & Co.

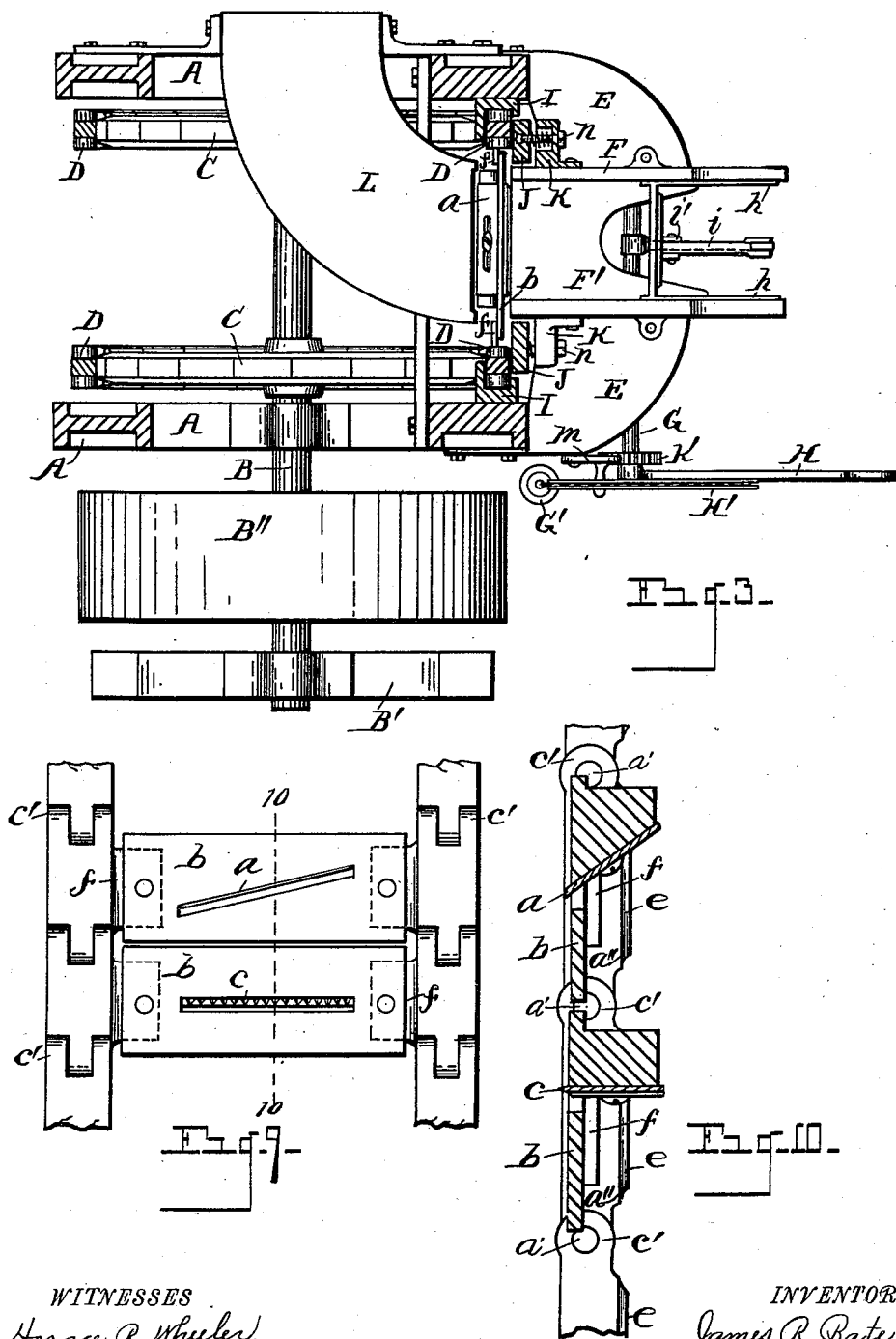
(No Model.)

3 Sheets—Sheet 3.

J. R. BATE.
MACHINE FOR CUTTING EXCELSIOR.

No. 583,884.

Patented June 8, 1897.



WITNESSES
Horace R. Wheeler,
Edward A. Stricker

INVENTOR
James R. Bate,
By his Attorneys R. B. Wheeler & Co.

UNITED STATES PATENT OFFICE.

JAMES R. BATE, OF CINCINNATI, OHIO.

MACHINE FOR CUTTING EXCELSIOR.

SPECIFICATION forming part of Letters Patent No. 583,884, dated June 8, 1897.

Application filed June 20, 1895. Serial No. 553,395. (No model.)

To all whom it may concern:

Be it known that I, JAMES R. BATE, a citizen of the United States, residing at Cincinnati, in the county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Machines for Cutting Excelsior; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in machines for cutting excelsior; and it consists in a certain construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide a machine of this class which shall stand in a vertical position and in which the scoring-spurs and cutting-knives are mounted upon an endless chain or carrier, so that said scorers when crossing the blocks of wood shall travel straight with the grain thereof, producing straight and tough strands of excelsior when removed from the block by the knives, which object is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a central vertical transverse section through the frame and journal-bearings of the sprocket-wheels carrying the endless chain in which the spurs and knives are mounted. Fig. 3 is a horizontal section through the machine on line 3 3 of Fig. 2. Fig. 4 is an enlarged inverted plan view of one of the links of the chain. Fig. 5 is an enlarged cross-section through one of said links, as on dotted line 5 5 of Fig. 4. Fig. 6 is an enlarged detail, partly in horizontal section, showing the slides mounted on the frame in which the links of the chain travel when the knives carried thereby are in the operation of cutting, also showing the spring which bears upon the outer face of said links and prevents the chain from jumping when the knives are cutting the block. Fig. 7 is a plan view of the feed-box. Fig. 8 is an en-

larged detail on line 8 8 of Fig. 7, showing the way formed in the inner face of the side of the feed-box which serves to guide the follower in its reciprocal movement therein. Fig. 9 is an enlarged plan of a section of the chain, showing the plates mounted thereon and carrying the scorers and cutting-knife; and Fig. 10 is an enlarged section, on line 10 10 of Fig. 9, through the plates carrying the knives and spurs.

Referring to the letters of reference, A designates the frame of the machine, which is composed of two adjacent parallel plates which are oblong and substantially rectangular in form and stand in a vertical position and may be secured together by means of suitable bolts passing between them. Journalled in the lower portion of said frame is the drive-shaft B, one end of which extends beyond the frame and is supported by a pillow-block B', upon which extended end is mounted the drive-wheel B". Also mounted upon the drive-shaft are the opposed lower sprocket-wheels C. Journalled in the upper portion of said frame is a counter-shaft C', secured in bearings and carrying the upper opposed sprocket-wheels C". These upper and lower sets of sprocket-wheels are arranged in vertical alinement and are adapted to carry the sprocket-chain or endless carrier D, upon which the scoring-spurs of the cutter-knives are mounted. This endless carrier consists of separate chains running upon their respective series of sprocket-wheels and connected by cross-plates b, in which the knives a and scoring-spurs c are mounted. The links b' of said chain are hinged together by means of a pintle a', passing through the opposed ears c' of one link and the entering-knuckle c'' of the opposite link, as clearly shown in Fig. 4. These links, as will be seen, are solid and the under face thereof where they bear upon the wheel is flat, as at a". In the center of this flat portion is a depression or concavity d, which receives the tooth d' on the sprocket-wheel, the surface of which on each side of said tooth corresponding to the flat surface a" of said link. Formed upon each side of the central depression d of the link and extending the distance of the flat surface a" thereof are two opposed parallel V-shaped flanges e, which engage the opposite

beveled faces *e'* of the sprocket-wheels and serve to retain the chain in proper position thereon, as clearly shown in Fig. 2. The cross-plates *b*, extending between the chains and carrying the scorers and cutter-knives, are secured at each end to lateral brackets *f*, formed integral with the links, by means of a bolt passing through said plate and bracket, said plates being held in perfect alinement by the teeth upon the opposed sprocket-wheels, which are so set as to cause their teeth to register. The arrangement of the parts is such that the operation of cutting shall occur upon the side of the chain moving downward. Therefore the scoring-spurs *c* are set in the plate in advance of the cutter-knife *a*, said spurs being securely retained in place by a screw and made adjustable at will. The knives *a* are set at an angle, so as to effect a drawing cut, being held by a screw and made readily removable when desired.

Mounted on each side of the frame is a bracket *E*, upon which the feed-box *F* is supported, said box consisting of two parallel sides between which the follower *F'* is adapted to slide, the inner end of said box being open and standing adjacent to the vertical plane of the knife-carrying chain. The follower *F'* is adapted to reciprocate horizontally within said feed-box, having slides *h* extending therefrom, which are adapted to travel in ways *h'*, formed in the opposed inner faces of the sides of said box, as clearly shown in Fig. 8, whereby said follower is steadied in its reciprocal movement.

In the operation of the machine the blocks of wood from which the excelsior is cut are placed within the feed-box in advance of said follower and are carried by said follower against the spurs and cutter-knives mounted in the endless chain or carrier, which, being driven at a suitable rate of speed through the medium of the drive-pulley *B''* and the lower sprocket-wheels *C*, causes said knives to cut the strands of excelsior from the block as they are fed thereto.

It is desirable that the feeding of the blocks to the cutter-knives in the chain shall be automatic, and it is also desirable that the operation of feeding shall not be of such a positive nature as to crowd the blocks unduly against the cutter-knives. To attain these desired objects, I journal to the brackets *E* of the feed-box a transverse shaft *G*, to which is secured near its central portion an arm *k*, which extends obliquely upward, its outer end being pivoted to a link *i*, which is in turn pivoted at its opposite end between suitable ears *i'*, extending from the outer face of the follower *F'*. Mounted upon the outer end of the shaft *G* is a lever *H*, to which is attached a circle-bar *H'*, having a groove in its upper edge adapted to receive a rope *o*, which lies therein and depends some distance therefrom, a weight *G'* being attached to the lower end of said rope, by which arrangement the follower may be drawn outward in the feed-box by de-

pressing or throwing downward the outer end of said lever, at the same time raising the weight *G'*, whereby when the feed-box is filled the power of said weight is exerted through the lever *H* and arm *k* to force the follower inward and carry the blocks against the knives, the action of the weight being such that the blocks are fed forward only so fast as they are properly cut away by the knives in the traveling chain.

To provide for locking the follower when thrown outward to the position shown by dotted lines in Fig. 1, so as to enable the feed-box to be filled, there is employed a ratchet-wheel *k'*, which is mounted on the shaft *G* and which is adapted to be engaged and locked from rotation by a pawl *m*, said pawl being disengaged when it is desired that the weight shall actuate the follower to feed the blocks.

Owing to the flexibility of the cutter-carrying chain, it is necessary that it shall have support at the point where the blocks are fed to the knives therein to prevent said chain from receding or springing inward by the pressure exerted by the follower *F'*. This I accomplish by providing a movable way *I*, which is adjustably secured to the inner opposite faces of the side plates of the frame and is provided with a right angle in the face thereof, which receives the links of the chain and against which they bear when passing downward adjacent to the feed-box, as more clearly shown in Fig. 6, whereby the knives in the chain are held closely to their work.

To prevent the chain from jumping or springing outward when the knives come in contact with the block, there is employed a vertical spring *J* on each side of the feed-box, which bears against the outer face of the links and holds them securely within the way *I*, said spring being mounted upon an adjustable screw *n*, supported in a holder *K*, secured to the side of the feed-box, whereby the knives mounted in the chain are carried through the blocks without vibration.

To provide for conveying away the strands of excelsior removed by the cutting-knives, there is employed a spout *L*, the mouth of which is located adjacent to the inner face of the chain opposite the feed-box in position to receive the strands of excelsior, and, curving outward through the side plate of the frame, its outer end discharges the excelsior strands outside of the machine.

In this case I have shown the drive-shafts located at the base of the frame, but in some instances it may be found desirable to drive the machine from the upper shaft, and while the machine is shown in a vertical position it may be made to operate in a horizontal position, if desired.

From the drawings and the foregoing description it will now be understood that in the operation of this machine the scoring-spurs and cutter-knives are carried across the face of the blocks fed thereto in a line straight with the grain thereof, thereby pro-

ducing long and tough strands of excelsior when cut from said blocks, making a product of superior quality.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine for cutting excelsior; the combination with the opposed sets of sprocket-wheels, the endless carrier passing over said wheels, said carrier consisting of two separate chains running upon their respective sets of sprocket-wheels and consisting of a series of solid links hinged together and having a flat under surface provided with a depression in the center thereof to receive a sprocket-tooth, said links also having the lateral brackets extending from the inner side thereof and the beveled ribs or flanges located on opposite sides of said central depression, the plates extending between and connected to said lateral brackets making a transverse connection between the separate chains, the knives mounted in said plates, the right-angled guideways which receive the links of said chains, and the spring-actuated guides engaging the outer face of said links to hold them in said ways, and the feed-box located centrally between the two separate chains of the carrier in line with the knives carried by the plates extending between said chains.

2. In a machine for cutting excelsior, the

combination of the opposed sets of sprocket-wheels, the separate chains traveling over said wheels, the transverse plates connecting the links of said separate chains, the cutting-knives mounted in said plates, the right-angled guideways embracing the links of said chains, the spring-actuated guide holding said links in contact with said ways, the feed-box located intermediate said chains and in the path of the cross-plates carried thereby, and means for feeding the blocks to the knives in said plates.

3. In a machine for cutting excelsior, the combination with the side frames carrying the series of opposed sprocket-wheels, the chains passing over said wheels, the cross-plates connecting said chains and carrying the cutting-knives, the feed-box intermediate the wheels, and means for feeding the blocks to the knives in the cross-plates connecting said chains, a spout for conveying away the strands of excelsior, the mouth of which is located adjacent to the inner face of the cross-plates carrying the knives opposite the feed-box, said spout discharging through the side plate of the frame.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES R. BATE.

Witnesses:

W. J. DAVIDSON,
JOHN J. SHAW.