

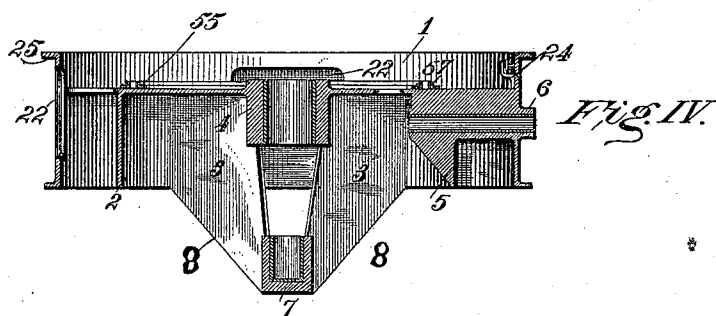
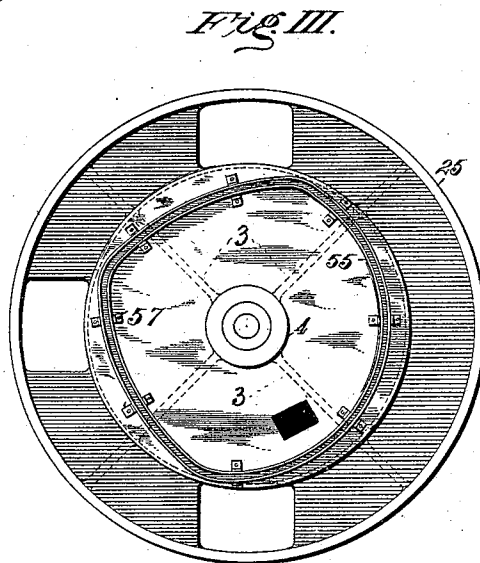
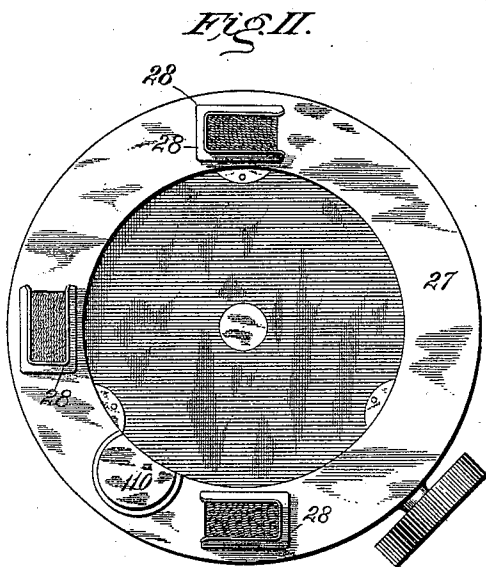
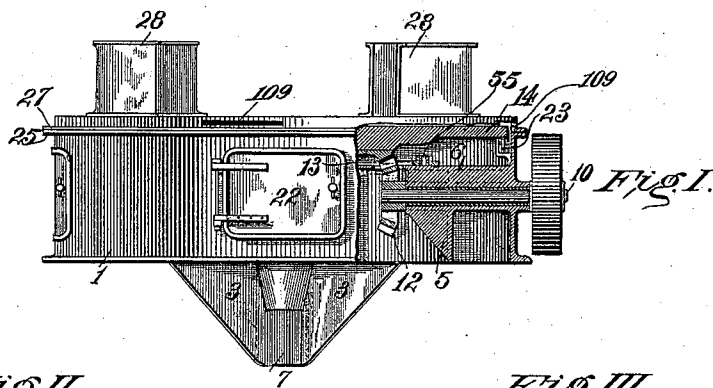
(No Model.)

4 Sheets—Sheet 1.

L. P. KING.
EXCELSIOR MACHINE.

No. 574,613.

Patented Jan. 5, 1897.



Witnesses
Louis G. Juhn
M. A. Ketch

Inventor,
Leicester P. King,
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Attorney.

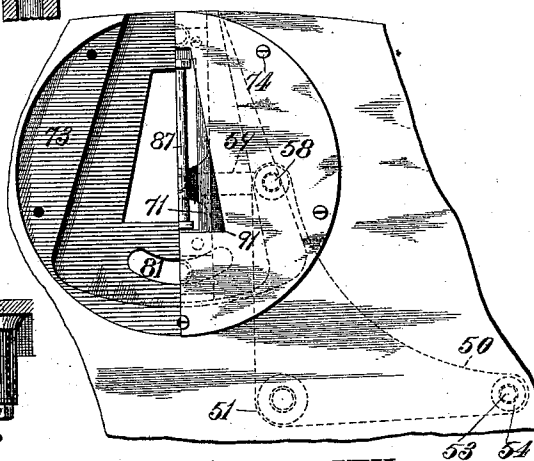
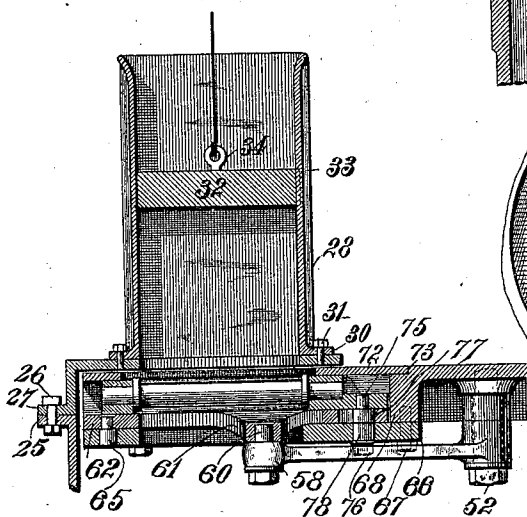
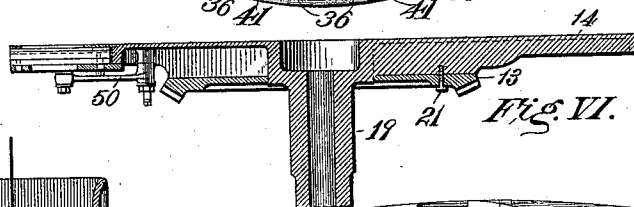
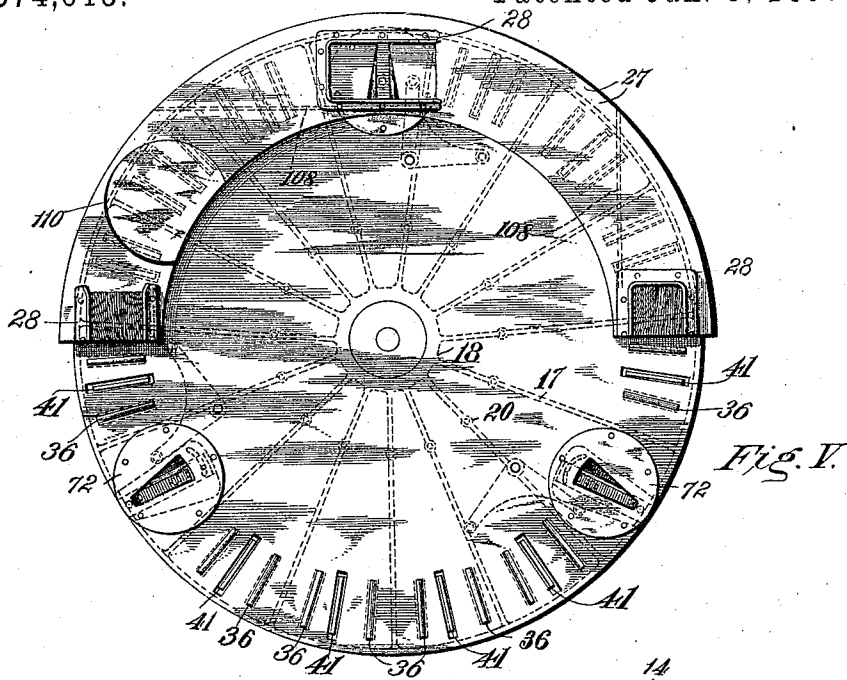
(No Model.)

4 Sheets—Sheet 2.

L. P. KING.
EXCELSIOR MACHINE.

No. 574,613.

Patented Jan. 5, 1897.



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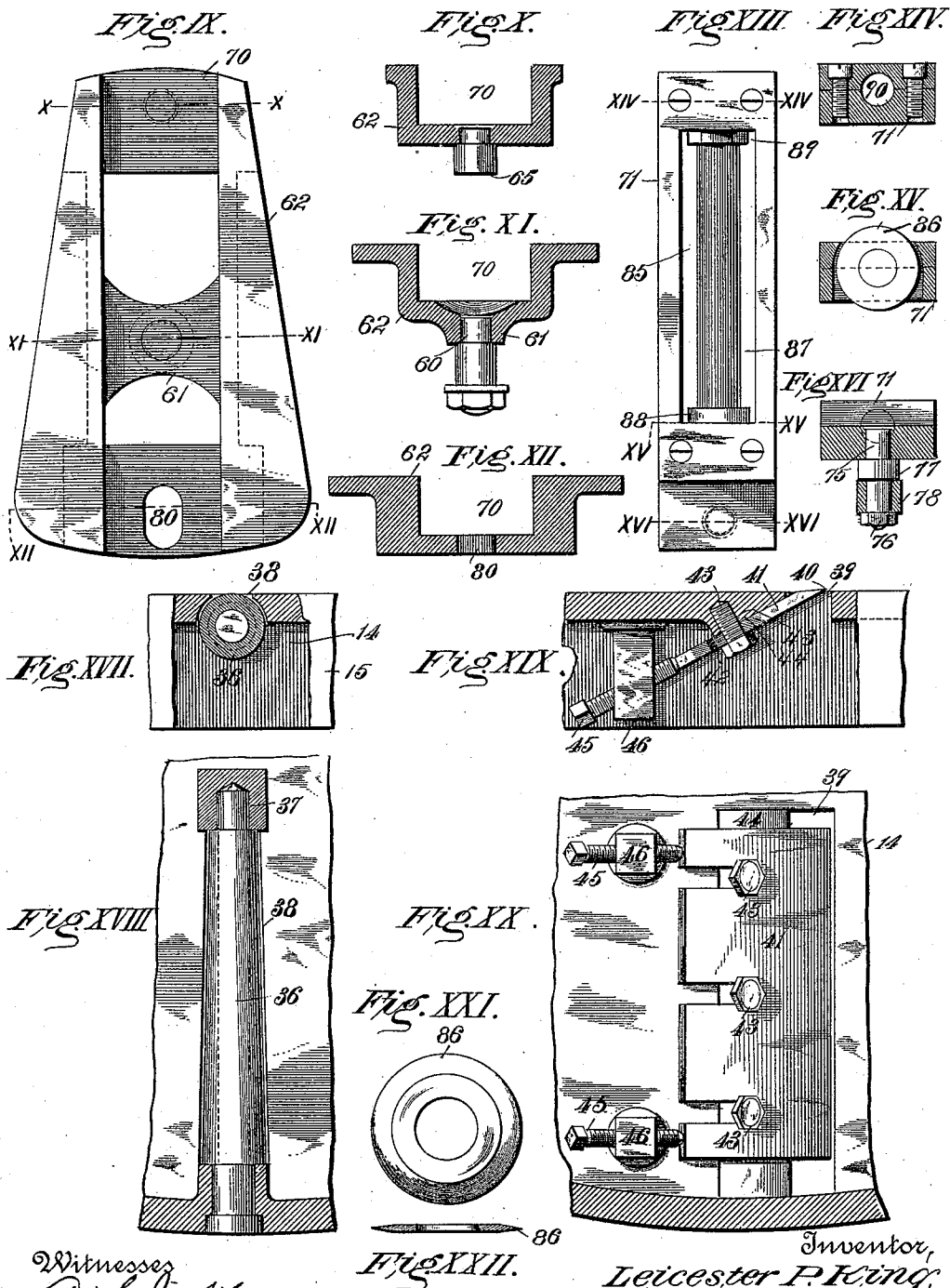
(No Model.)

4 Sheets—Sheet 3.

L. P. KING.
EXCELSIOR MACHINE.

No. 574,613.

Patented Jan. 5, 1897.



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Fig. XXII. Inventor,
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(No Model.)

4 Sheets—Sheet 4.

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EXCELSIOR MACHINE.

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FIG. XXIII.

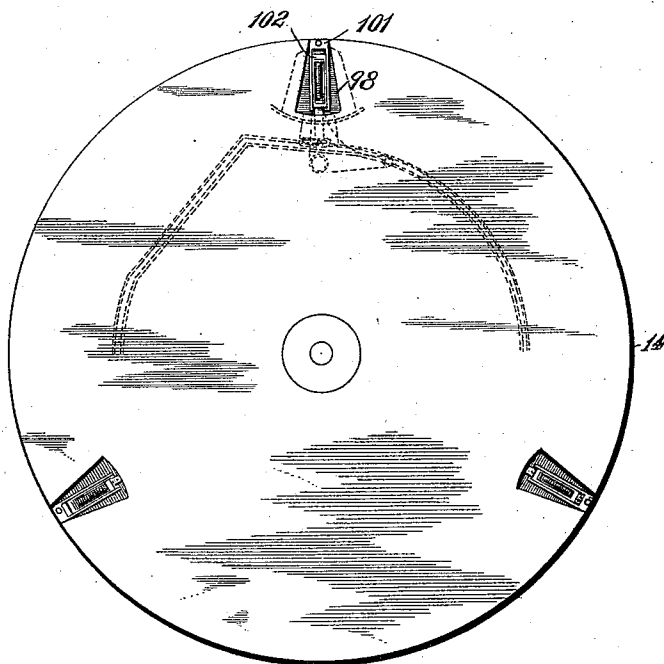


FIG. XXIV.

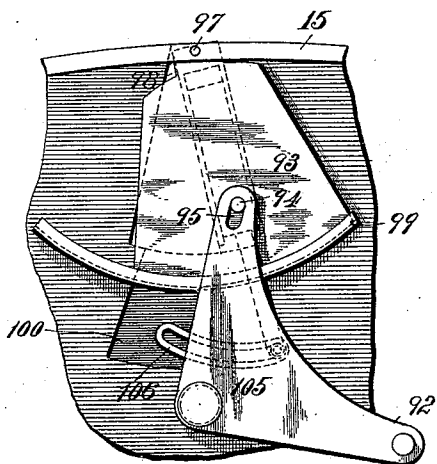
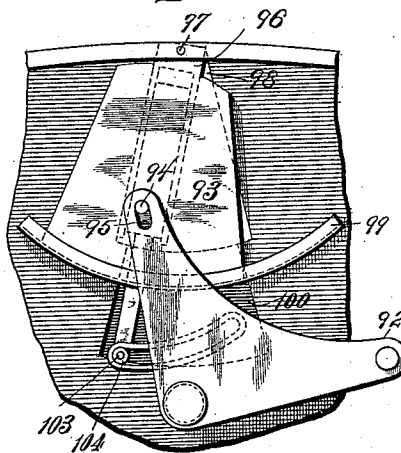


FIG. XXV.



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UNITED STATES PATENT OFFICE.

LEICESTER P. KING, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO
ISAAC STURM, OF SAME PLACE.

EXCELSIOR-MACHINE.

SPECIFICATION forming part of Letters Patent No. 574,613, dated January 5, 1897.

Application filed August 17, 1896. Serial No. 603,005. (No model.)

To all whom it may concern:

Be it known that I, LEICESTER P. KING, of Cincinnati, in the county of Hamilton, State of Ohio, have invented certain new and useful Improvements in Excelsior-Machines, of which the following is a complete specification, reference being had to the accompanying drawings.

Among the objects of my invention one is to produce an improved circular machine for cutting excelsior in which provision is made for improving the speed obtainable in such machines without interfering with the proper action of the cutting mechanism and without disproportionately shortening the lives of the cutters.

Another object is to materially reduce the load of the machine, and consequently the power necessary to operate it.

Another object is to promote the discharge of waste from the machine as rapidly as it accumulates and to protect all working parts of the machine from the accumulation of dust or the like calculated to produce heat and to set fire to the extremely inflammable product of the machine.

In the accompanying drawings, Figure I is a side elevation of my complete machine, partly in section. Fig. II is a plan view of the same. Fig. III is a similar view with the rotatory table removed. Fig. IV is a diametrical vertical section of the frame of my machine with the parts thereof detached. Fig. V is a plan view of the rotatory table complete, showing half of it obscured by the annular plate which surmounts it in the assembled machine. Fig. VI is a diametrical section of the rotatory table, taken through one of the slitters. Fig. VII is a sectional view showing the slitter mechanism, feed-boxes, and portions of the frame and of the rotatory table. Fig. VIII is a top plan view, on an enlarged scale, of one form of slitter mechanism, showing one-half of the covering-plate cut away. Fig. IX is a view of the shuttle detached. Fig. X is a section on the line X X of Fig. IX. Fig. XI is a section on the line XI XI of Fig. IX. Fig. XII is a section on the line XII XII of Fig. IX. Fig. XIII is a plan view of one of the slitter-shafts and frame. Fig. XIV is a section on the line XIV XIV of Fig. XIII.

Fig. XV is a section on the line XV XV of Fig. XIII. Fig. XVI is a section on the line XVI XVI of Fig. XIII. Fig. XVII is a sectional view of one of the block-rollers. Fig. XVIII is a top plan view of the same. Fig. XIX is a sectional view of a portion of the rotatory table, illustrative of one of the shaving-knives. Fig. XX is a reverse plan view of the same. Fig. XXI is a side elevation of one of the slitter-disks detached. Fig. XXII is a diametrical section of the same. Fig. XXIII is a top plan view of the rotatory table, showing in dotted lines a modified form of slitting mechanism and its appropriate form of actuating-groove. Fig. XXIV is a bottom plan view of a portion of the same, showing the slitter-actuating lever at one of its limits of movement. Fig. XXV is a similar view showing it at the opposite limit of movement.

Referring to the figures on the drawings, 1 indicates an outer cylinder, and 2 an inner cylinder.

3 indicates radial arms which unite the inner and outer cylinder to support a central bearing-collar 4. (Consult also Fig. III.)

The parts above enumerated consist, preferably, of a single casting and constitute the frame of my machine, within which also is preferably incorporated a web 5, which supports a radially-disposed elongated box 6.

7 indicates a step hung as upon supports 8, which consist of extensions of the arms 3. The box 6 (see Fig. I) carries a driving-shaft 10, whose entire length is completely inclosed within it and nowhere exposed, being provided upon its outer end with a belt-pulley (illustrated as one mode of driving the shaft) and upon its inner end with a gear 12, that meshes with a large driving-gear 13, that is secured, as by screws, to the bottom of a rotatory table 14. (See also Fig. VI.) The table is preferably provided with a peripheral flange 14 and flanges 17, which radiate from a hub 18. (See Figs. I, V, and VI.) The hub is provided with a trunnion 19, which works in the collar 4 and step 7. Each of the flanges 17 is enlarged, as indicated at 20, for the reception of the screw-bolts 21, that secure the wheel 13 to the rotatory table.

The outer cylinder 1 is preferably provided with hinged doors 22 for gaining access to the

interior of the frame for the purpose of oiling and cleaning the machinery, for example.

Rollers 23, supported, as in brackets 24, upon the inner wall of the cylinder 1, are located in the path of the flange 16 and assist the trunnion 19 and its bearing in holding the table 14 firmly and rigidly in its proper relations, the bottom of the table being preferably made flush with the top of the cylinder 1. The latter is provided with an upper annular flange 25, to which is secured, as by a crown of bolts 26, an annular plate 27. (See Figs. I, II, V, and VII.)

The plate 27 supports such a number of feed-boxes 28 as may be desired and as the size and character of the machine and the work it is designed to perform may justify.

The boxes 28 are preferably three-sided, (see Fig. V,) being open on one side and at the top for the introduction of a block of wood. They are provided upon their lower edges with a flange 30, by means of which, through the aid of the screw-bolts 31, screwing into the face of the plate 27, they are secured in place. Each box is provided with a weight 32, whose lugs 33 work in grooves in the side of the box, the length of the grooves, through the interposition of the lugs, serving to limit the downward movement of the weight. The weight is preferably provided with an eyebolt 34 for manipulating it. The boxes 28 are carried upon the plate 27 above the face of the table 14 and are intended to present to suitable cutters carried upon the table 14 blocks of wood which are designed to be reduced by the operation of my machine to that material which is commercially known as "excelsior."

The means which I provide for reducing the blocks of wood to excelsior consists of mechanism adapted to score or slit the surface of the block parallel to the grain of the wood and mechanism adapted to take from the previously scored or slitted surface a shaving of required thickness. In order, however, that the constant pressure of the wooden blocks upon their weights upon the surface of the table 14 may be as much as possible relieved, in order to avoid unnecessary strain upon the machine and the danger of heating, I prefer to provide at such close intervals as will prevent the blocks from at any time touching the surface of the table a series of antifriction-rollers 36, mounted, as, for example, in the manner illustrated in Fig. XIV of the drawings, within the respective concavities 37 of suitable slots 38, formed in the table 14.

At suitable intervals, preferably between each alternate pair of rollers, as illustrated, I prefer to provide a knife-slot 39, through which projects the beveled edge 40 of a knife 41. Each knife is adjustably secured within its slot 39, for which purpose I prefer to provide it with transverse slots 42, which receive screw-bolts 43, that secure it to the beveled shoulder 44, formed upon the bottom of the ta-

ble 14. The screws 43 serve to hold the knives adjustably in place, the required adjustment being obtained through abutment-screws 45, working, respectively, in obliquely internally-screw-threaded lugs 46 upon the bottom of the table 14 at opposite ends of each knife. The knives 41 constitute the cutters of the shaving mechanism. Slitting or scoring mechanism to operate successfully must cause its knives to work at all times, without deviation, in lines parallel to the grain of the wood which they cut. To accomplish this object, I employ mechanism for producing in the scoring or slitting knife frame both swinging and endwise motion, thereby avoiding any twisting, however slight, of the scoring-knives in the wood and providing for the employment of disk cutters, preferably rotatory, in place of the pointed knives heretofore employed in circular machines of this class.

I am aware that it is not new in machines of this class to employ a movable scorer-frame, but the object of my invention in this regard is to produce practicable and efficient means for actuating the scorer-frame in place of the, so far as I am aware, hitherto impracticable, unsuccessful efforts made to accomplish that result.

I exhibit two forms of embodiment of mechanism for accomplishing said object, both forms including as an operative element an intermediate lever between the scorer-frame-actuating mechanism and the actuating cam-groove, whereby the employment of a cam-groove of gentle and regular curves may be substituted for one of abrupt and irregular curves otherwise essential to the operation of such mechanism. The employment of abruptly-operative actuating mechanism in this connection not only tends practically to prohibit a desirable rate of speed, but it produces such motion in the scorer-frame as necessitates the employment of spur-knives in place of the disk cutters, such as I propose to employ.

The preferred form of scorer-frame-actuating mechanism is shown in Figs. V and VI of the drawings and in detail in Figs. VII, VIII, IX, and X thereof, in which 50 indicates a bell-crank lever pivoted in its corner, as indicated at 51, to the bottom of the table 14, as by means of a bolt 52. (See Fig. VII.) At one end the lever 50 carries upon a bolt 53 an antifriction-roller 54, which works in an actuating-groove or cam-groove 55, carried upon the upper surface of the inner cylinder 2 and arms 3, as by means of angular brackets 57 secured thereto, respectively. (See Figs. I, II, and III.) The other end of the lever 50 is pivoted, as indicated at 58, to a link 59, which is pivoted to a bolt 60, that is secured to a depending bridge 61 in the bottom of a shuttle 62. (Compare Figs. VII, IX, and X.) The shuttle is pivotally secured, as by a pin 65, to the face of a supporting-plate 66, that is secured, as by screw-bolts 67, to projections

68, extending from the bottom of the table 14. The plate 66 is provided with a somewhat triangular aperture 69 for accommodating the movement of the bolt 60 and the parts which it unites. The shuttle 62 (see Fig. X) is provided with an oblong rectangular channel 70, within which fits the scorer-frame 71. A cap-plate 72, fitting within a suitable recess 73 in the face of the table 14, and secured, as by screws 74, holds the scorer-frame in place within its channel 70, and it in turn serves to hold the pin 65 in place.

75 indicates a bolt provided with a nut 76, which holds in place antifriction-rollers 77 and 78. The former works in a longitudinal slot 80 in the shuttle 62 and the latter in a curved slot 81 in the plate 66.

From the foregoing description it will appear that the lever 50, actuated by its cam-groove, will impart, in conformity to the shape of the cam, predetermined swinging movement to the shuttle 62 upon its pivot-pin 65. which movement, through the relations between the slot 81 and the bolt 75 included therein, will impart the required lateral motion to the scorer-frame 72.

The scorer-frame is provided with a longitudinally-disposed oblong recess 85, within which is mounted a series of disk cutters 86, assembled upon an axle 87, provided on one end with a fixed retaining-flange 88 and at the other end with a nut 89, which performs the office of an adjustable flange for holding the cutters in place. The axle is journaled at its opposite ends in suitable ordinary bearings 90, provided for it in the frame 71.

The edges of the disk cutters 86 upon their axle 87 project above the face of the table 14, so as to reach the wood which they are to cut through an aperture 91 in the plate 72, said aperture being preferably somewhat triangular to permit the swinging movement of the shuttle 62, which carries the scorer-frame.

The other form of scorer-actuating mechanism is illustrated in Figs. XVII to XIX of the drawings, in which appears a bell-crank lever 92, corresponding in all respects to the lever 50, previously described, except that it is loosely connected directly to a shuttle 93.

I prefer to provide as a means of connecting the lever 92 to the shuttle 93 a pin 94, projecting from the shuttle and working in a slot 95 in the lever, although, of course, the relative location of the slot and pin might be reversed. The shuttle is provided with a neck 96, which is pivoted, as by a bolt 97, within a triangular aperture 98, the small end of which extends through the flange 16 in the table 14. The shuttle is supported by a flange-arc 99, secured to the bottom of the table 14 and spanning a triangular recess 100 therein.

To the face of the shuttle 93 is secured a guide-frame 101, within which works a scorer-frame 102, corresponding to the frame 71, previously described. The plate 72 in this form of embodiment of my invention also

serves to hold the scorer-frame 102 in place in the same manner as it holds the frame 71 in place.

Upon its extremity the scorer-frame is provided with a bolt 103, which carries an anti-friction-roller 104, that works in a curved slot 105 in a slot-frame 106, secured to the arm of the lever 92. The movement of the lever 92 operates, through the mechanism just described, to produce a motion of the scorer-frame corresponding to that produced by the mechanism operated through the lever 50, previously described.

During the operation of the machine the blocks supplied to the boxes 28 will be eventually reduced to such thinness as to allow them to slip between the plate 27 and the face of the table 14, from which position they must be discharged to permit the continued operation of the machine. For that purpose I provide upon the bottom of the plate 27, underneath each of the boxes 28 and in line parallel to its inner edge, a rib 108. (See Fig. V.) Adjacent to it and in alinement with it I provide an opening 109 in the wall of the plate 27. Whenever, therefore, a block is ready to be discharged, it is passed between the plate 27 (See Figs. I and V) and the face of the table 14, and, meeting the rib 108, is, through the continued rotation of the table, discharged through the opening 109. I prefer to provide at a suitable part of the plate 27 a screw-secured lid 110, through which access may be gained to the knives 14, the rollers 36, or the scorer mechanism, as required, without taking the machine apart.

By way of explanation of the operation of my machine, in addition to what has been said, it will suffice to add that the machine being set in motion, the wooden blocks of suitable shape and dimensions having been supplied to the boxes 28 and the weight 32 properly manipulated, the under surface of the respective blocks is presented to the scorers and shaving-knives, which, acting successively, discharge the product of the machine through the opening defined between the outer and inner cylinders 1 and 2, where it drops away from the machine.

From time to time the waste-blocks, impelled by the rotation of the table and the resistance of the ribs 108, are shot out from the machine through the openings 109 provided for them.

What I claim is—

1. In an excelsior-machine, the combination with inner and outer cylinders united to constitute a frame, of a rotatory table mounted thereon, a gear upon the bottom of the table, a second gear meshing therewith, a shaft, a box in the frame completely inclosing the shaft, and a driving-pulley upon the outer end of the shaft, substantially as set forth.

2. The combination with a frame composed of inner and outer cylinders, collar and step, of a table and trunnion thereon mounted in the collar and step, movable cutters upon the

table, an actuating-groove on the surface of the inner cylinder operatively connected with the movable cutters, antifriction-rollers upon the side walls of the outer cylinder supporting the table, and table-driving mechanism, substantially as set forth.

3. In an excelsior-machine, the combination with a frame and rotatory table, of a swinging cutter-frame upon the table, a bell-crank lever pivoted to the table, connected at one end to the cutter, and at the other end to a cam-groove said cam-groove being defined upon the frame, substantially as set forth.

4. In an excelsior-machine, the combination with a frame and rotatory table, of lugs upon the bottom of the table, a plate secured to the lugs, a recess and transverse slot in the plate, a shuttle pivoted to the plate, a longitudinal slot therein, a cutter-frame working in the shuttle, a bolt passing through the same, and the slots in the shuttle and in the plate, respectively, a bell-crank lever pivoted to the table, and the shuttle-driving mechanism and lever-actuating mechanism, substantially as set forth.

5. In an excelsior-machine, the combination with a frame, rotatory table, cutters thereon, and feed-boxes above the same, of a waste-discharging member supported above

the table in a line with the box and disposed transversely of the path of the cutters, substantially as set forth.

6. In an excelsior-machine, the combination with a frame, and annular plate thereon, of a rotatory table carried on the frame underneath the plate, a feed-box upon the plate, knives upon the table, an aperture in the side wall of the plate, a rib between the plate, and the table, in line with the feed-boxes, for causing discharge of waste blocks through the aperture in the side wall of the plate, substantially as and for the purpose specified.

7. In an excelsior-machine, the combination with a frame, rotatory table, and driving mechanism, of a swinging cutter-frame upon the table, disk cutters mounted in the cutter-frame, a bell-crank lever pivoted to the table and connected at one end to the cutter-frame, and at the other end to a cam-groove defined upon the main frame, substantially as set forth.

In testimony of all which I have hereunto subscribed my name.

LEICESTER P. KING.

Witnesses:

MAX SILBERBERG,
STE. BERGER.