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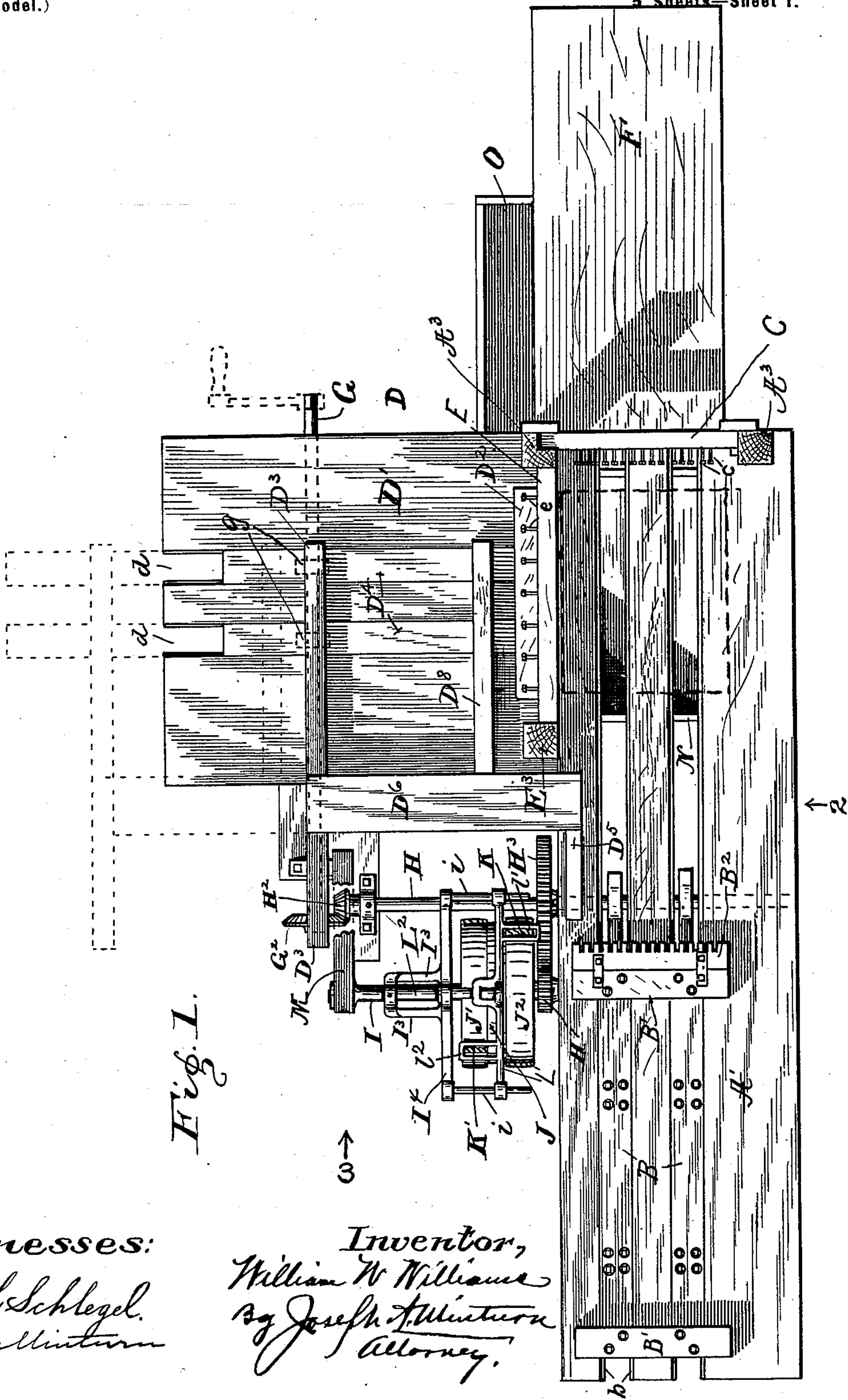
Patented July 11, 1899.

W. W. WILLIAMS.
SOAP CUTTING MACHINE.

(Application filed May 13, 1898.)

(No Model.)

5 Sheets—Sheet 1.



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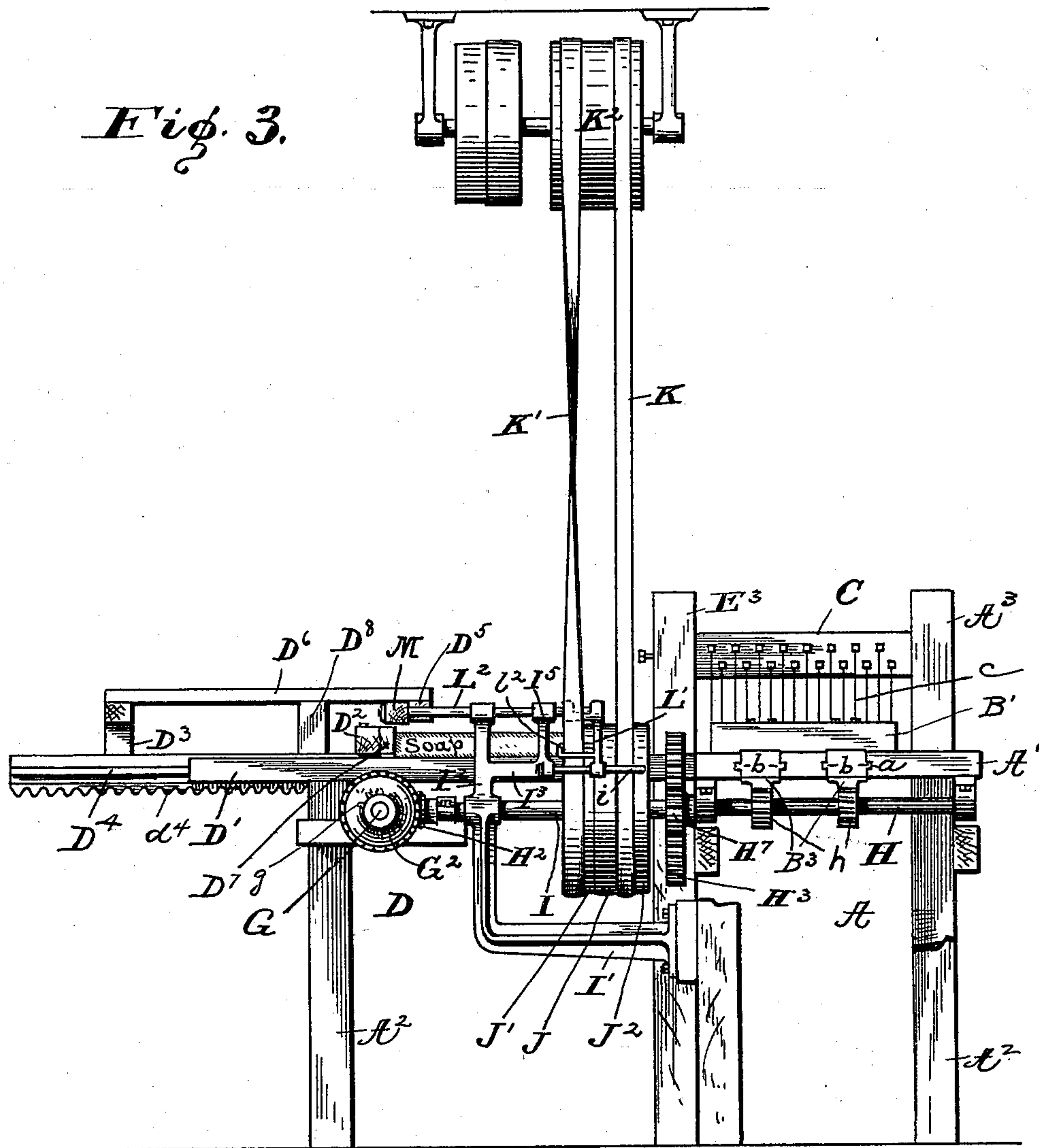
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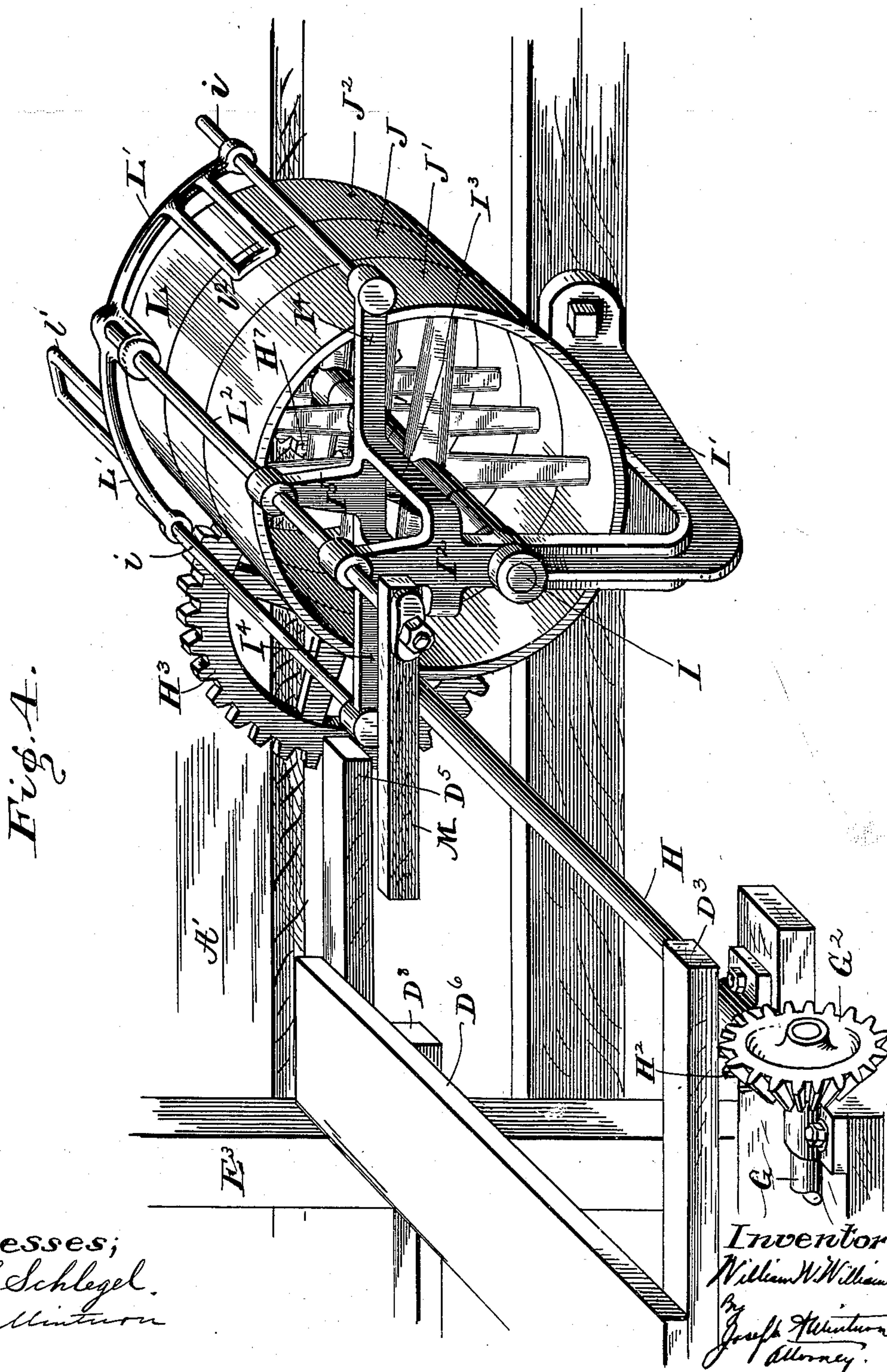
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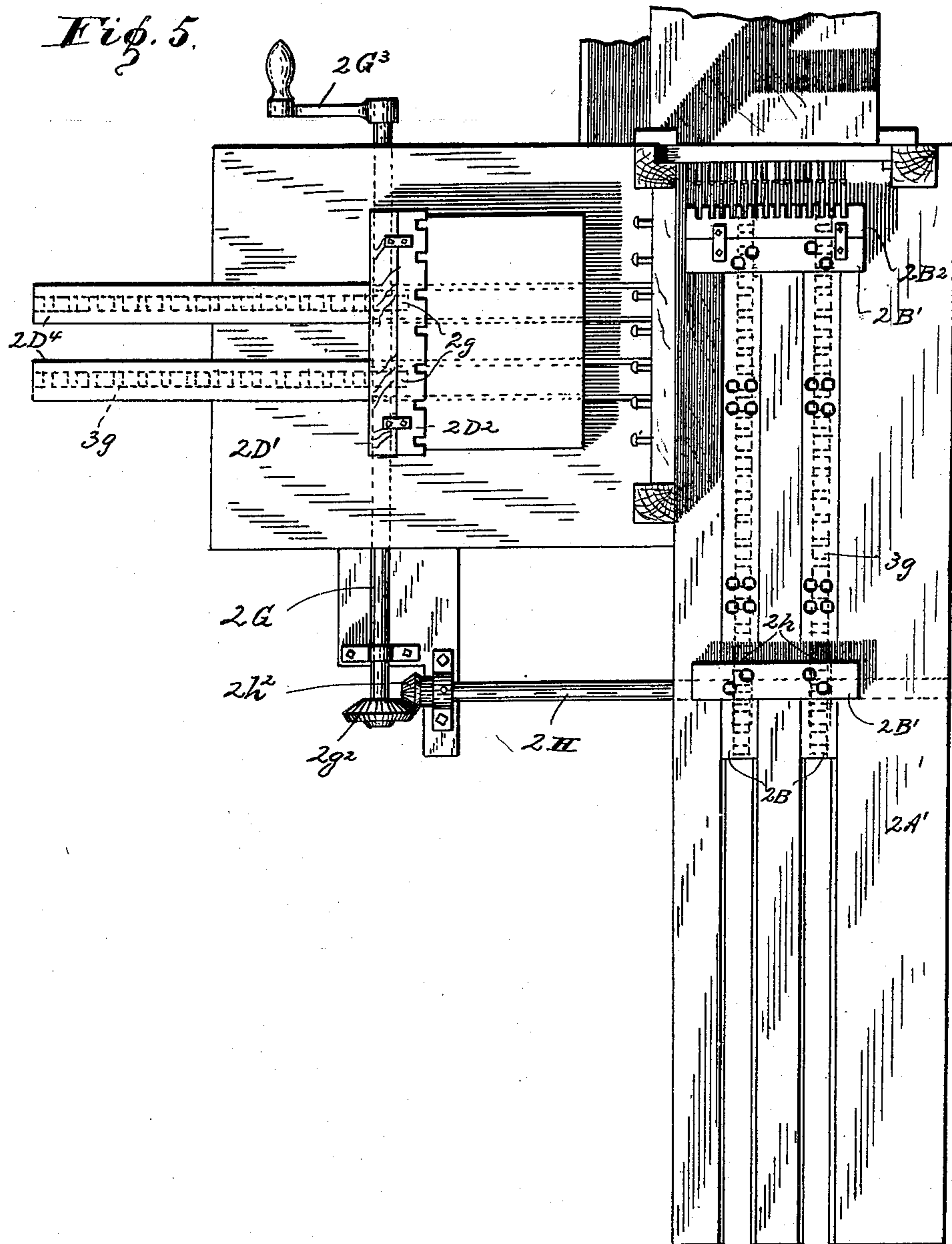
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5 Sheets—Sheet 5.



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UNITED STATES PATENT OFFICE.

WILLIAM W. WILLIAMS, OF INDIANAPOLIS, INDIANA.

SOAP-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 328,507, dated July 11, 1899.

Application filed May 13, 1898. Serial No. 680,558. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. WILLIAMS, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Soap-Cutting Machines, of which the following is a specification.

This invention relates to an improved machine for cutting slabs of soap first into bars and then into cakes and for depositing the cakes from the machine onto a table, from which they can be removed while the machine is cutting up the next slab.

The object of the invention is to provide a machine by which the several operations can be performed under the control of a single attendant and without undue effort on his part.

Another object of the invention is to provide new and improved means whereby when a starting and stopping lever is actuated a slab of soap placed on the machine is caused to advance against a series of cutting-wires for cutting the slab into bars and is then automatically stopped in its progress in that direction and caused to move at right angles against a second series of wires, which cut the bars into cakes, which operations will be successively repeated until the machine is disconnected by the stopping-lever from the driving mechanism.

To accomplish these objects, my invention involves the features of construction, the combination or arrangement of parts, and the principles of operation hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of my machine with the movable portions in the positions assumed by them at the end of the operation of cutting the slab of soap into bars and previous to cutting it into cakes. Fig. 2 is a side elevation looking in the direction of the arrow 2 in Fig. 1. Fig. 3 is an end elevation looking in the direction of the arrow 3 in Fig. 1. Fig. 4 is a detail in perspective of the driving-pulleys and belt-shifting mechanism employed in operating my machine. Fig. 5 is a plan view of a modified machine in which the soap-pushers are moved by crank-operated shafts.

Similar letters and figures of reference indicate corresponding parts.

Referring to the drawings, A represents the

main frame of my improved soap-cutting machine, comprising a horizontal table A' and the vertical posts or supports A². The table A' has two longitudinal slots with inside grooves α , which form ways for a pair of longitudinally-reciprocating beams B, with tongues b to fit into the grooves. The beams are framed together by the transverse pieces B', to the inner one of which a pusher-bar B² is removably secured.

B³ are rack-bars, which are bolted to the under sides of the beams B.

The two posts at one end of the table have the upper extensions A³, which form supports for the removable frame C, which frame has a plurality of equidistant vertical wires c stretched from one side to the other in the usual manner to form cutters for dividing the slab of soap when the latter is pressed against them by the pusher B² in the manner as hereinafter more fully described.

At the same end of the frame A which has the projected post-tops A³ is arranged at right angles thereto an auxiliary frame D, which has the slotted table D' on the same level as the table A', the said slots shown at d being longitudinally of the table and at right angles to table A'. They are grooved in the same manner as those in the table A' to receive a pair of tongued slides D⁴. These slides are framed together by the transverse bars D² and D³, and to the inner bar D² a pusher-bar D⁷ is removably secured in the same manner as described for the bar B². The slides D⁴ have the under side rack-bars d^4 .

At the junction of the inner edge of the table D' with the table A' is a post E³, and between it and the post extension A³ is a removably-secured frame E, having a plurality of vertical wires e , which form soap-cutters to cut the slab of soap which will be pushed against them by the pusher-bar D⁷. In practice the slab of soap to be cut is placed on the table D' and is cut into bars by being pushed through the wires by the pusher D⁷. The bars of soap are deposited on the table A' in the path of the pusher B², which now moves up and pushes the bars of soap at right angles through the wires in the frame C, thereby cutting the bars into cakes of soap and depositing the cakes on a receiving-table extension F, or, if preferred, a detachable rack or

truck or a belt-conveyer may be placed in the position occupied by the table extension F to facilitate removal without handling the cakes of soap.

5 I will now describe the mechanism by which the pushers B² and D⁷ are made to operate on the soap at the required intervals.

G is a shaft mounted on suitable hangers below the table D'. It has the cog-wheels g, 10 which engage the teeth of the rack-bars d⁴. The shaft G is transverse to the table D'. H is a shaft which is transverse to the table A' and is supported by hangers from the under side of the table in the position shown in the 15 drawings. This shaft H has the cogged wheels h, the teeth of which engage the teeth of the rack-bars B³. The shaft H has the small miter-gear H², the teeth of which mesh with the teeth of a larger miter gear-wheel G² on the 20 adjacent end of the shaft G. By this means the rotation of either shaft G or H will cause both of the shafts to rotate, and their relative speeds are adjusted by means of the varying sizes of the miter or bevel wheels G² and H² 25 to cause the pusher B² to begin its work after the pusher D⁷ has finished and move back out of the way before the next lot of soap is ready to be pushed through the cutting-wires onto the table A' by the pusher D⁷. The shaft 30 H has the large spur gear-wheel H³.

I is a short shaft parallel with the shaft H, one end of which is supported in a box secured to the frame A and the other or outer 35 end by a bracket I', as shown in Figs. 3 and 4. A pinion H⁷ is mounted on the shaft I and engages the cogs of the wheel H³. Mounted on the shaft also is the live pulley J, and on each side of it are "dead" or loose pulleys J' and J². These pulleys are connected by a 40 straight belt K and a crossed belt K' with a pulley K², here shown as being located above the shaft I, but which obviously might be located below. This pulley K² is driven from any suitable source of power. (Not shown.)

45 L is a belt-shifter consisting of a longitudinally-reciprocating rod parallel with the shaft I, having the transverse arms L' at its inner end between the straight and crossed belts, the said arms having the shifter-loops 50 l' and l², the former to engage the straight belt and the latter to engage the crossed belt. Projected above the shaft I from the outer end of the bracket I' is the standard I², which has the arms I³, intermediate of its length, 55 projected laterally toward the pulleys. These arms terminate with the cross-bar I⁴, the ends of which extend out past the rim of the pulleys and are provided with the lateral integral round bars i, which form slides for the 60 arms L' of the belt-shifter, the ends of the arms L' having eyes through which the bars i are projected. Projected up from the bar I⁴ at a suitable distance from the standard I² is a second standard I⁵. The standards I² 65 and I⁵ have openings to receive the reciprocating shifter-rod L² and guide it in its movements. The outer end of the reciprocating

rod L² has the lateral horizontal arm M, which lies in the path of and is between the two 70 arms D³ and D⁵. The two bars are in the same horizontal plane and are fastened to and move back and forth with the slides D⁴. The arm D³ is a continuation of the framing-bar D³, but the arm D⁵ is set in advance of 75 any part of the slides D⁴ by means of the plate D⁶ and the arm D⁸ in the manner as shown. Other means for supporting the two arms D³ and D⁵ from the slides D⁴ in position to shift 80 the arm M may be provided without departing from the spirit of this invention.

The operation of my improved soap-cutting machine is as follows: The machine being in the position shown in Fig. 3 with the pusher D⁷ at the outer end of its travel is supplied 85 with a slab of soap, which is placed by the attendant on the table in front of the pusher. The machine is started by the attendant and the pusher moves in, pushing the slab of soap ahead of it, and cuts the slab into bars by 90 pushing it through the row of wires in its path. The pusher is notched to enable it to follow the soap past the wires and push it off onto the table A'. At the beginning of the operation just described the pusher B² was 95 next to the frame C, but begins to move back at twice the speed of the approaching pusher D⁷ and is at its extreme outer position when the slab cut into bars is delivered on the table A'. As the pusher D⁷ approaches its maxi- 100 mum inward position the attached arm D³ contacts with the arm M and moves the belt-shifter in a direction to shift the belts and reverse the direction of movement of the pulley-shaft I. The direction of movement of the whole mechanism of the machine is thus 105 automatically reversed. The pusher D⁷ moves out to its first position, while the pusher B² advances rapidly toward the soap bars and pushes them through the frame C, whereby they are cut into cakes by the wires c and are 110 deposited onto the outside table. At the proper moment in this last movement the arm D⁵ contacts with the belt-shifter arm M, reversing the movement and causing the mechanism to begin over again the movement as 115 first described.

The above-described operation of the machine is automatic and continuous and only requires an attendant to supply the slabs of soap and to remove the cut product. The 120 removal can be accomplished by means of a belt, if desired, onto which the cut soap will be deposited.

The dimensions of the slab of soap in length should be approximately equal to half of the 125 length of the travel of the longer traveling pusher-bar and in width approximately equal to half of the length of the travel of the shorter traveling pusher-bar to allow time for the pusher-bars to get out of each other's way. 130

In the modification shown in Fig. 5 the machine is driven by a single crank by hand where the amount of work done does not justify the use of steam or other power. In this

modified form, 2^{A'} represents the long table having the longitudinally - reciprocating beams 2^B, connected by the transverse bars 2^{B'}, and having the pusher-bar 2^{B2}, as described for the machine in the other drawings. 2^{D'} is the table transverse to the table 2^{A'}. It has the longitudinally - reciprocating beams 2^{D4}, carrying the pusher-bar 2^{D2}. These beams 2^{D4} and also the beams 2^B have under side rack-bars 3^g. 2^G is a shaft mounted underneath the beams 2^{D4} and transversely to them and having the cog-wheels 2^g, (shown in dotted lines,) which engage the teeth of the rack-bars. Mounted under and transversely to the beams 2^B is the shaft 2^H, having the cog-wheels 2^h, which engage the teeth of the rack-bars under the beams 2^B. The shafts 2^G and 2^H are connected by the miter-gears 2^{g2} and 2^{h2}, the latter being one-half the diameter of the former, as described for the machine shown in the other drawings. The shaft 2^G has the crank 2^{g3}, by which operative power is applied to the mechanism above described.

N and O represent guideways to direct the waste particles which are trimmed off of the slab.

I claim—

1. In a soap-cutting machine, a pair of tables at right angles to each other, sliding beams having longitudinally-reciprocating movement at right angles to each other and having under side rack-bars, pusher-bars secured to the upper sides of the sliding beams, a pair of transverse shafts one under each table each having cogged wheels which engage the rack-bars, bevel-gears on the adjacent ends of the shafts whereby the shafts are geared together, one of said gear-wheels being twice the diameter of the other or over and means for revolvably moving one of the shafts and for reversing the direction of its movement substantially as described and specified, and wires for cutting the soap.

2. In a soap-cutting machine, a table on which the slab of soap is placed and cut, a pair of reciprocating pushers traveling in paths at right angles to each other and connected with rack-bars, a pair of shafts transverse to the rack-bars and having cogged

wheels to engage the teeth on said bars, bevel gear-wheels on adjacent ends of said shafts whereby the shafts are geared together, means for rotating one of the shafts and for automatically reversing the direction of rotation when the pushers are at the ends of their strokes and vertical wires fixed in series across the paths of the pushers to cut the soap which is pushed against them, all substantially as described and specified.

3. In a soap-cutting machine, the combination with a pair of tables placed with the end of one against the side of the other, a frame provided with vertical cutter-wires placed at the meeting line between the two tables, a slidable pusher guided over the first table and movable toward and from the cutter-frame, a second cutter-frame having vertical wires and arranged at the end of the second table adjacent to and at right angles to the first cutter-frame and a second slidable pusher guided to play longitudinally of the second table toward and from the second cutter-frame, means for connecting the two slidable pushers whereby the movement of either toward its cutter-frame will cause the other pusher to move away from its cutter-frame and vice versa, said means consisting of rack-bars secured to the under side of each pusher-frame, a pair of shafts mounted at right angles to each other below the rack-bars and having cogged wheels to engage said rack-bars, the adjacent ends of the said shafts being geared together, of a driving-belt connected with one of the above-mentioned shafts, and automatic belt-shifting mechanism to reverse the direction of movement of the machine and prevent breaking the cutting-wires by contact therewith of the slidable pushers, substantially as described and for the purposes specified.

In witness whereof I have hereunto set my hand and seal at Indianapolis, Indiana, this 9th day of May, A. D. 1898.

WILLIAM W. WILLIAMS. [L.S.]

Witnesses:

JOSEPH A. MINTURN,
CARL SCHLEGEL.