

E. A. HOUCHIN.
 SOAP CUTTING AND SEPARATING MACHINE.
 APPLICATION FILED DEC. 20, 1911.

1,166,459.

Patented Jan. 4, 1916.
 5 SHEETS—SHEET 1.

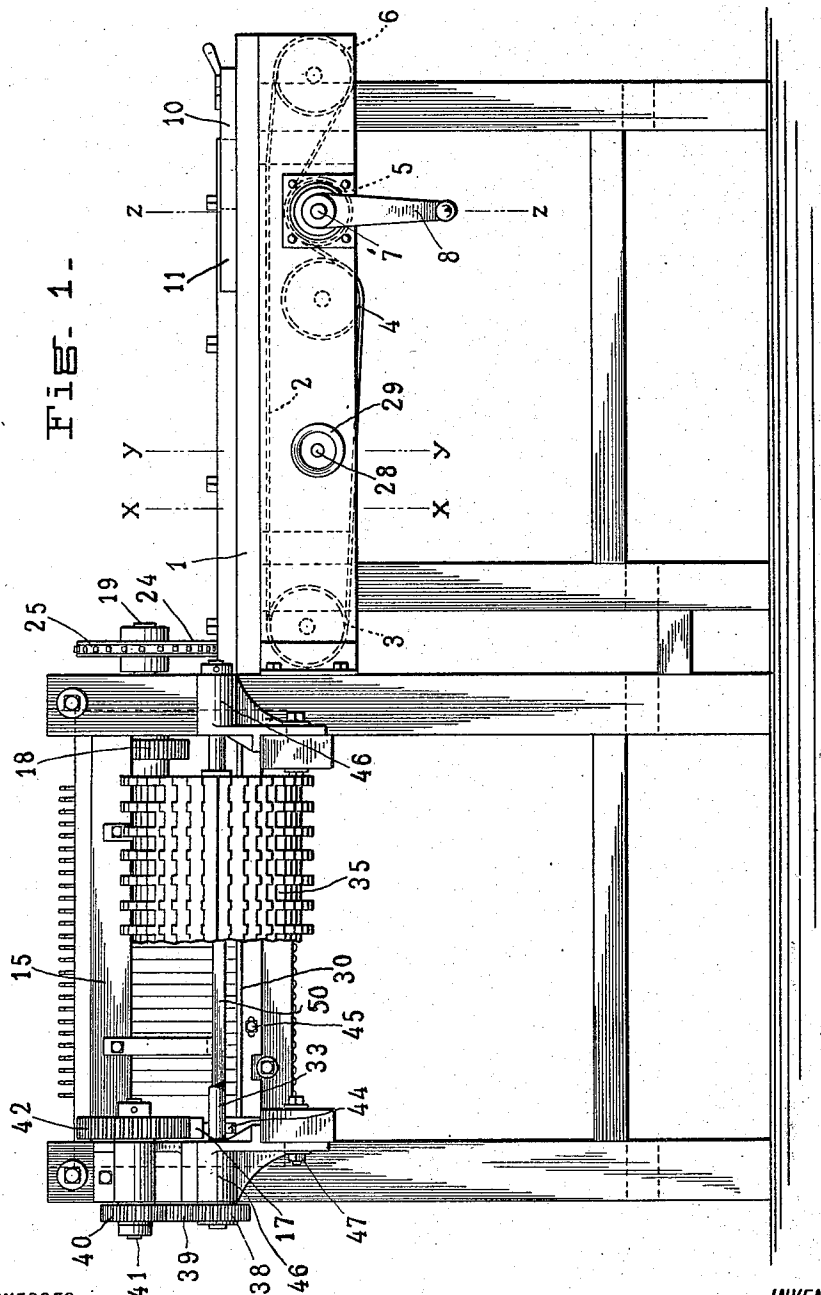


FIG. 1-

WITNESSES

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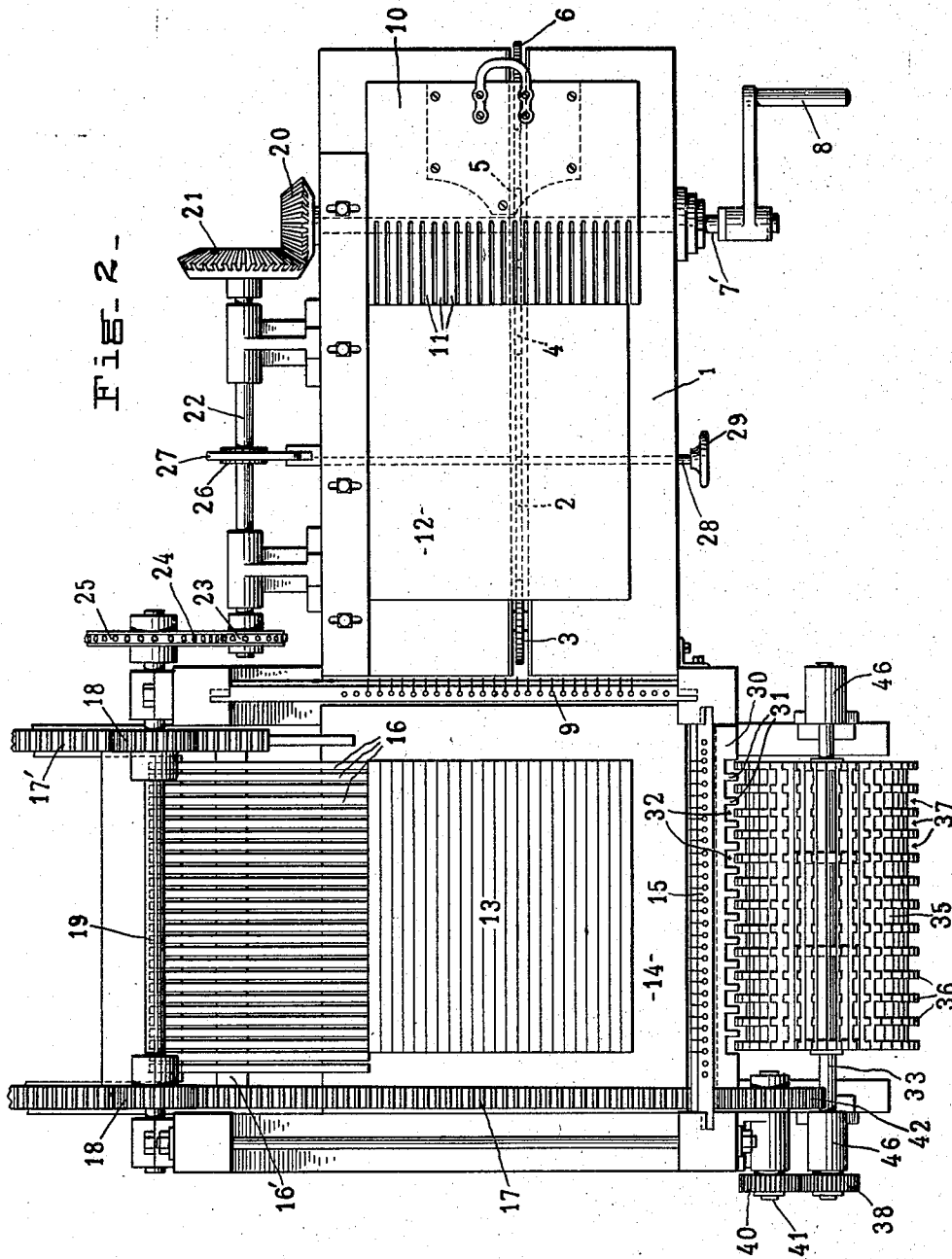
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FIG- 3-

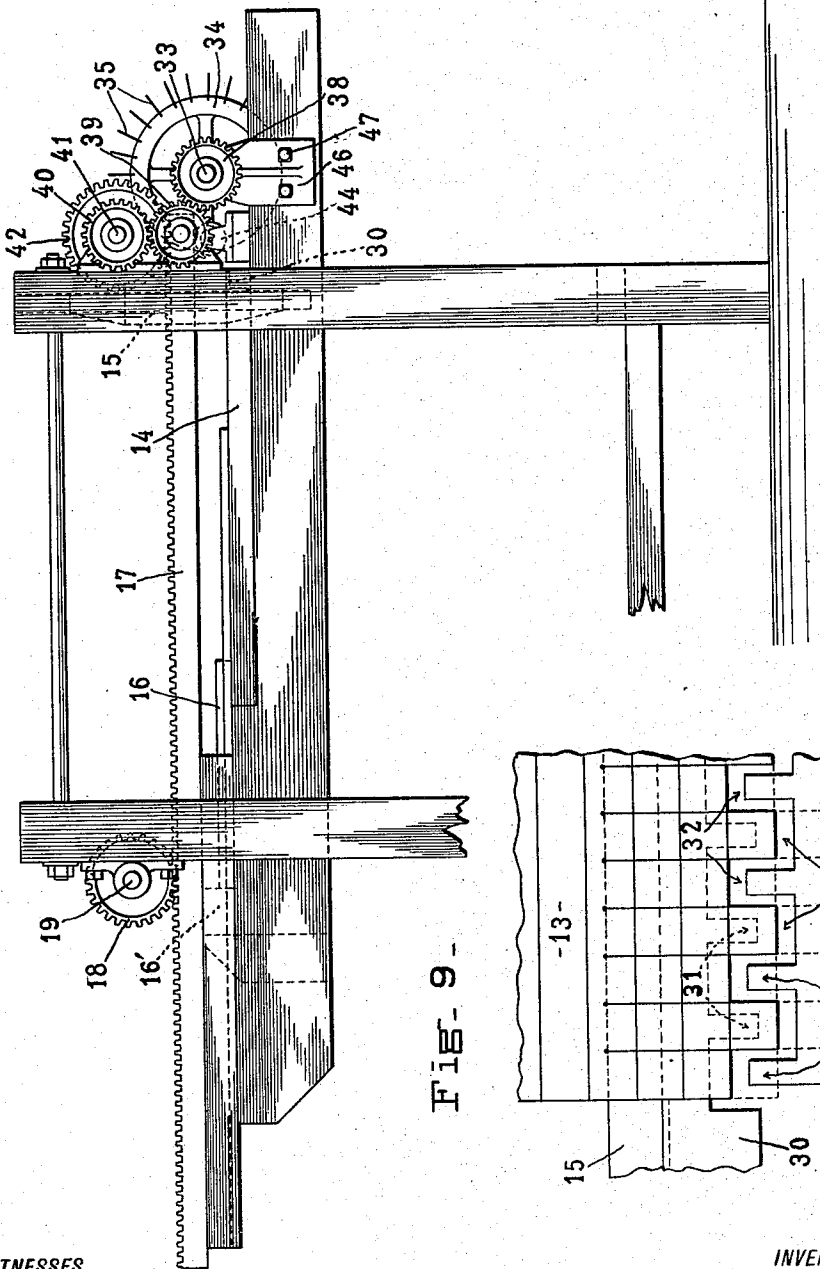
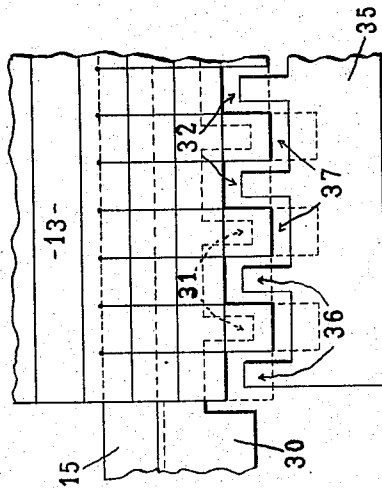


FIG- 9 -



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5 SHEETS—SHEET 4.

FIG. 4.

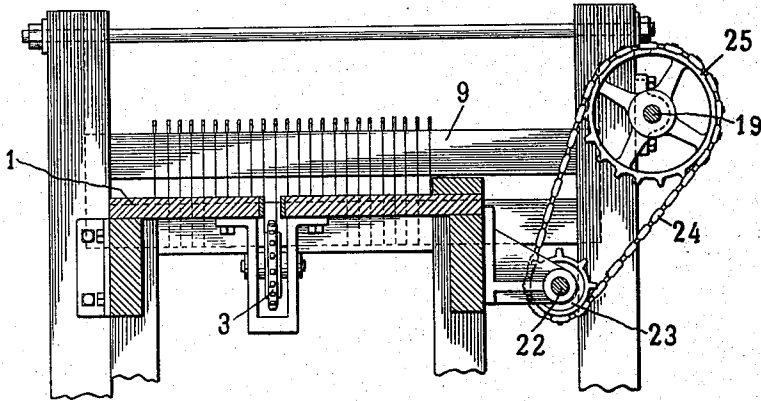


FIG. 5.

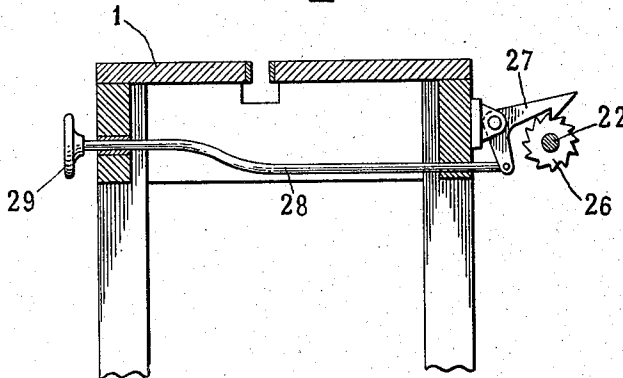
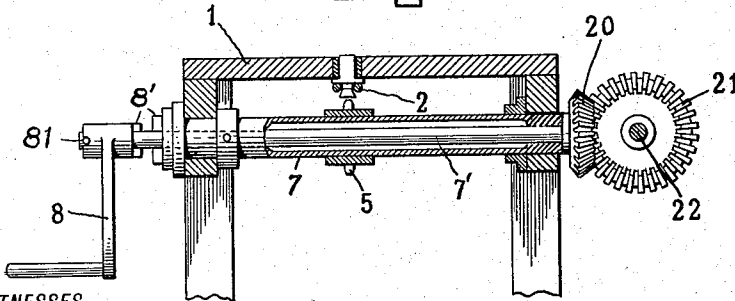


FIG. 6.



WITNESSES

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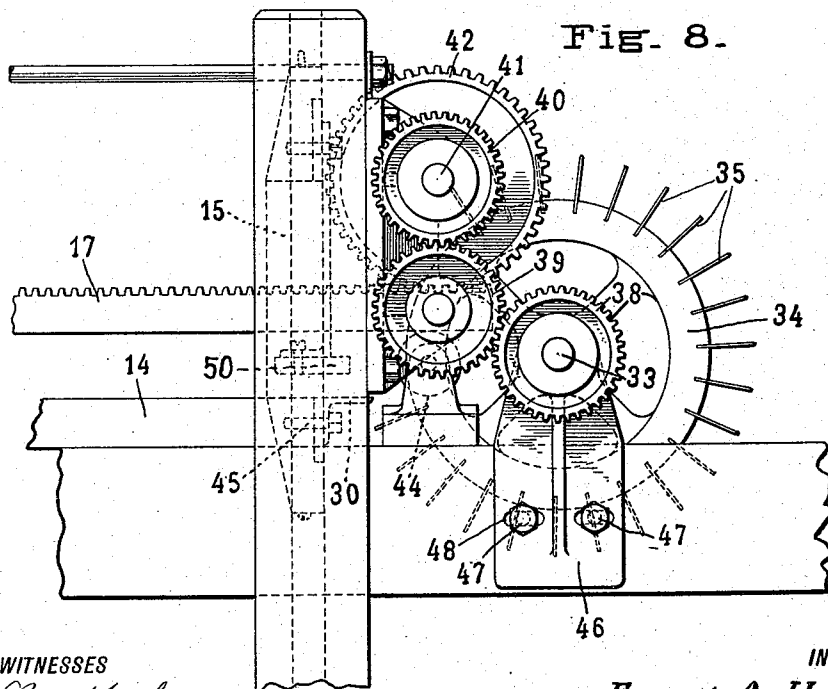
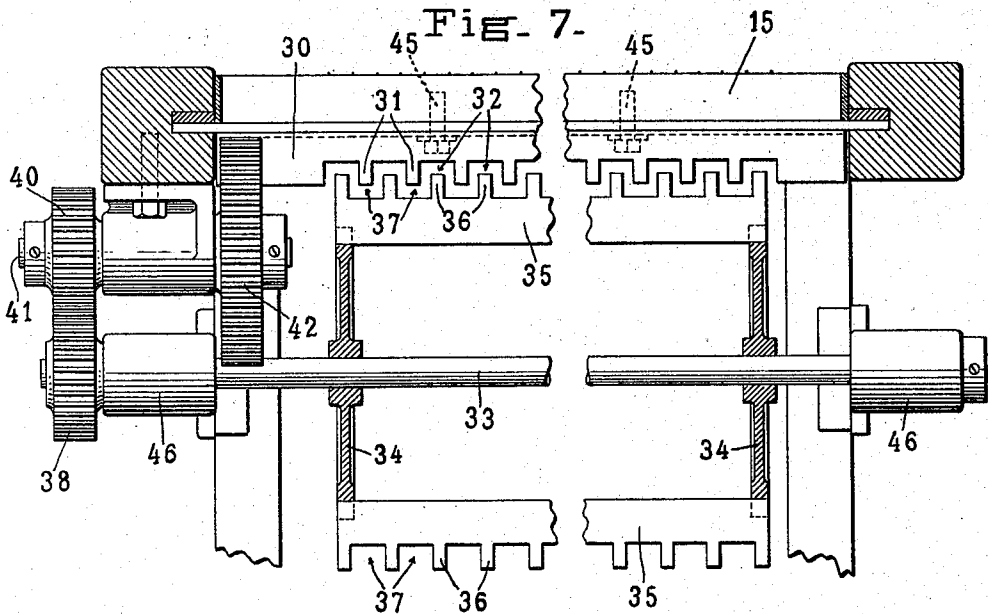
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UNITED STATES PATENT OFFICE.

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SOAP CUTTING AND SEPARATING MACHINE.

1,166,459.

Specification of Letters Patent.

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Application filed December 20, 1911. Serial No. 666,996.

To all whom it may concern:

Be it known that I, ERNEST A. HOUCHEIN, a citizen of the United States, and resident of New York, in the county of Kings and State of New York, have invented certain new and useful Improvements in Soap Cutting and Separating Machines, of which the following is a specification.

My invention relates to a machine for cutting up slabs of a pastic material such as soap into small sections, pieces or cakes.

The particular object of the invention is to cut up such a slab into smaller cakes such for instance, as small cubes, say three-quarters of an inch on each side, and separate the cubes from each other automatically.

It has been customary to cut up soap into cakes or smaller sections by means of wires, the slab being first pushed in one direction through a set of wires so as to cut the slab into strips and then pushing the slab through a set of wires in a direction at right angles so that the strips are cut up into smaller sections. On account of the character of the material however, the smaller sections after being cut cohere to each other very strongly so that they have to be separated. This has heretofore been done by hand and is a slow, tedious and unsatisfactory process.

By my invention I propose to cut up a slab into strips by forcing it through wires in one direction and then cutting up the strips into cubes by forcing them through another set of wires in a direction at right angles to the first. After the cut slab emerges from the second set of cutting wires it passes over the edge of a support where a series of fingers are provided which in conjunction with a rotating set of spaced fingers serve to separate the distinct pieces and throw them into a suitable receptacle beneath the machine.

One form of the invention is illustrated in the accompanying five sheets of drawings, but it will be understood that the dimensions and details may be varied and that the invention is not limited to the formation of exact cubes and that the machine may be used for cutting up any other substances having physical characteristics similar to that of soap and separating the cakes in the manner hereinafter set forth. The word cake will be used hereinafter in referring to the small sections or pieces cut from the slab.

Figure 1, is a side elevation of a machine embodying the improvements of my invention. Fig. 2, is a plan view of the same. Fig. 3, is a vertical projection of the machine taken from the left of the positions of Figs. 1 and 2. Fig. 4, is a vertical section on the plane of the line X X of Fig. 1. Fig. 5, is a vertical section on the plane of the line Y Y of Fig. 1. Fig. 6, is a vertical section on the plane of the line Z Z of Fig. 1. Fig. 7 is a plan view and horizontal section showing the separating mechanism. Fig. 8, is an end view of the separating mechanism. Fig. 9, is an enlarged detail view showing the separation of the sections of the slab.

A table 1 of suitable character is provided on which the slab is supported before the first cutting operation. Beneath the table 1 is arranged a feed chain 2 which passes around sprockets 3, 4, 5 and 6. The sprocket 5 is mounted on a hollow shaft 7 and the shaft, sprocket and chain are rotated by means for instance, of a hand crank 8 when the clutch members 8' are interengaged. At the left hand end of the table 1 is located a frame 9 having the usual cutting wires arranged vertically at intervals depending upon the width of the strips to be cut. A pusher 10 having fingers 11, 11 is adapted to be driven by the chain 2 so as to push the slab 12 through the wire frame 9 and cut it up into strips as shown at 13 in Fig. 2 where the strips are supported on the table 14. Another set of vertical cutting wires is carried by the frame 15, the wires being spaced apart so as to cut up the strips 13 into the sized cakes required. Fingers 16, 16 carried by a cross piece 16' are provided for pushing the strips through the wire frame 15. The member 16' is secured to racks 17, 17' which are driven by pinions 18, 18 on shaft 19. Shaft 19 is driven from shaft 7' through the medium of the bevel pinion 20, bevel gear 21, shaft 22 sprocket 23, chain 24 and sprocket 25 as shown in Fig. 2. The feeding of the uncut slab 12 through the wire frame 9 is accomplished by rotating the handle 8 clockwise as viewed in Figs. 1 and 2 with the clutch 8' interlocked and the feeding of the slab cut into strips 13 toward wire frame 15 is also effected by the continuation of the same movement of rotation of the handle 8 when the handle hub engages the pin 81. The accidental feeding of slab 13 may however,

be checked by the construction shown in Figs 1, 2 and 5. The shaft 22 carries a toothed wheel or ratchet 26. A two-armed pawl 27 is adapted to engage the teeth of the ratchet 26. This pawl may be engaged and disengaged with and from the ratchet 26 by means of a rod 28 and handle 29 so as to check the rotation of the shaft 22 or release it as desired.

Immediately in front of the wire cutting frame 15 I have provided a plate 30 having fingers 31, 31 arranged at intervals along its edge so as to afford spaces 32, 32 between the fingers. The width of these fingers as viewed from right to left in Fig. 7 is less than the width of the cut cakes and the width of the spaces 32, is slightly greater. On the shaft 33 I have mounted a number of disks or wheels such as 34 which carry a series of plates such as 35 in notches in the periphery. Each of these plates 35, has a series of fingers 36, 36 with spaces between them 37, 37. These fingers and spaces are similar to the fingers and spaces 31, 32 but are arranged so as to lap by one another as shown in Fig. 7. The width of the fingers 36 is slightly less than the width of the cut cakes and the width of the spaces 37 is slightly greater than the width of the cut cakes. The clearance between the fingers 36 and the rear edges of the spaces 32 and the clearance between the ends of the fingers and the backs of the spaces 37 is less than the length of the cakes as determined by the spacing of the wires in the frame 9. The shaft 33 has a pinion 38 meshing with gear 39. Gear 39 meshes with gear 40 on the shaft 41 which also carries the gear wheel 42. This latter is driven by the rack 17. The front end of the rack 17 is supported beneath the gear wheel 42 by means of a roller 44.

The operation is substantially as follows:—A slab 12 is placed on the table 1 and forced forward to the left (Fig. 2) through wire frame 9 on to the table 14, the slab being cut into strips 13 by the wire frame. The strips generally cohere on account of the physical characteristics of a soap slab. The strips therefor still have the general characteristics of a slab weakened along the lines where the material has been cut. The cut slab is then forced through the wire frame 15 by means of which the strips 13 are cut up into smaller cakes. These cakes still cohere as they pass over the edge of the plate 30. Alternate cakes are supported by the fingers 31, 31 and the intervening cakes project over the spaces 32, 32. As the shaft 33 and finger plate 35 rotate, the fingers 36, 36 engage the unsupported cakes and knock them down so that they may fall into a suitable receptacle (not shown). As the shaft and finger plates continue to rotate and the cut slab is forced

forwardly, the cakes which have been supported by the fingers 31, 31 are engaged by the plate 35 at the back of the recesses 37, 37 and knocked off. As the cut slab is fed forwardly the separating action is substantially continuous. The arrangement of the fingers 31, and 36 insures the complete separation of all the cakes not only from the succeeding cakes but from each other.

It will be obvious that any spacing desired may be given to the wires in the frames 9 and 15 as is customary. To accommodate different sizes of sections, different sizes of plates 30 and 35 may be employed. I have also mounted the plate 30 so that it is adjustable longitudinally to bring the fingers and spaces in proper alinement with the wires of the cutting frame. This adjustment may be accomplished by means of moving the plate 30 to one side or the other by loosening the clamp screw 45. The wheels 34, 34 and knock-out plates 35, 35 together with the shaft 33 constitute what may be termed the separating drum. This is mounted so as to be adjustable toward and from the plate 30. For this purpose the shaft 33 is supported in brackets 46, 46 which are clamped to the frame for instance, by means of bolts 47, 47 passing through slots such as 48.

Just above the edge of the table 14 in front of the cutting wires and adjacent the finger plate 30 I provide a bar 50 for holding the cakes down on the table and to prevent them from tilting up when the movable fingers are knocking off the outer rows. This plate will be adjusted to leave a clearance beneath it to allow for the thickness of the cakes.

What I claim is:—

1. In combination, a table, a holding bar above the table for holding a slab of longitudinally and transversely subdivided material down on the table, means for separating the slab into sections including supporting fingers projecting beyond the end of the table, slab engaging separating fingers beyond the said holding bar and independent therefrom and means for operating said separating fingers down past the supporting fingers at the end of the table.

2. In a separating machine, means for supporting alternate sections of a row of slab sections, means for separating the unsupported sections of said row of sections from the other sections, means for then feeding the remaining sections of said row and means for separating the said remaining sections of said row of sections from the succeeding row of sections.

3. In a separating machine, spaced apart supporting fingers engaging and supporting the alternate sections of a row of slab sections, movable separating fingers spaced apart to engage the unsupported slab sec-

tions and means for operating the separating fingers in a plane at an angle to the plane of the supporting fingers.

4. In a separating machine, the combination of a table for supporting a slab of material divided longitudinally and transversely into rows of slab sections, means at the end of said table for supporting diagonally adjoining slab sections in two adjacent transverse rows of the sections, movable separating fingers arranged to engage the diagonally adjoining slab sections adjoining the said supported slab sections, and means for operating said separating fingers down past the end of the table whereby to engage and shift the said diagonally adjoining unsupported slab sections.

5. In a separating machine, the combination with relatively stationary spaced fingers arranged to support alternate slab sections of a sub-divided slab of material, of a series of movable separating fingers disposed opposite the supporting fingers and a second series of separating fingers disposed to pass between said supporting fingers and means operating said separating fingers to carry the respective fingers down past the ends of the supporting fingers and in the spaces between the supporting fingers to thereby strip off the slab sections which are in advance of the sections supported on the spaced supporting fingers and the slab sections lying in between the sections so supported on the spaced supporting fingers.

6. In a separating machine, supporting means including spaced projecting fingers, and a plurality of sets of spaced fingers movable past the said spaced projecting supporting fingers in a plane substantially at right angles to the plane of the supporting fingers whereby to carry with them the material protruding past the edge of the supporting means.

7. In a separating machine, a set of substantially horizontally disposed relatively stationary spaced supporting fingers and a series of relatively rotatable spaced separating fingers rotatable between the stationary supporting fingers.

8. In a machine of the character set forth, the combination of a supporting table, spaced supporting fingers mounted at the end of the supporting table, a series of spaced separating fingers movable down past the supporting fingers and arranged to co-

operate with the supporting fingers and means for adjusting the relation of the supporting fingers and separating fingers whereby to bring the two sets of spaced fingers into alternating relation.

9. In combination, a table, a holding bar above the table, a stationary finger plate on the end of the table and adjacent the holding bar, and a series of movable fingers cooperating with said plate for separating cakes from material supported on the table.

10. In a separating machine, the combination of a table for the support of a divided slab of material separated into sections substantially regular in size, supporting fingers at the end of the table spaced apart a greater distance than the width of the slab sections, means for feeding the slab sections out onto the supporting fingers and separating fingers moving downwardly past the end of the table and spaced apart a greater distance than the width of the slab sections, the said separating fingers being disposed substantially in line with the spaces between the supporting teeth whereby to strip off the projecting slab sections in line with the spaces between the supporting fingers and the separating fingers respectively.

11. In a machine of the character set forth, the combination of a supporting table, spaced supporting fingers at the end of the supporting table, downwardly moving separating fingers cooperating with the supporting fingers, means for adjusting the supporting fingers laterally with respect to the separating fingers and means for adjusting the separating fingers toward and away from the supporting fingers.

12. In a machine of the character set forth, the combination of a supporting table, spaced supporting fingers mounted at the end of the supporting table, a rotating carrier journaled adjacent the end of the supporting table and adjustable with respect thereto, a series of spaced separating fingers carried by the rotating carrier and arranged to cooperate with the supporting fingers and means for adjusting the supporting fingers in relation to the separating fingers whereby to bring the two sets of spaced fingers into alternating relation.

ERNEST A. HOUCHIN.

Witnesses:

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