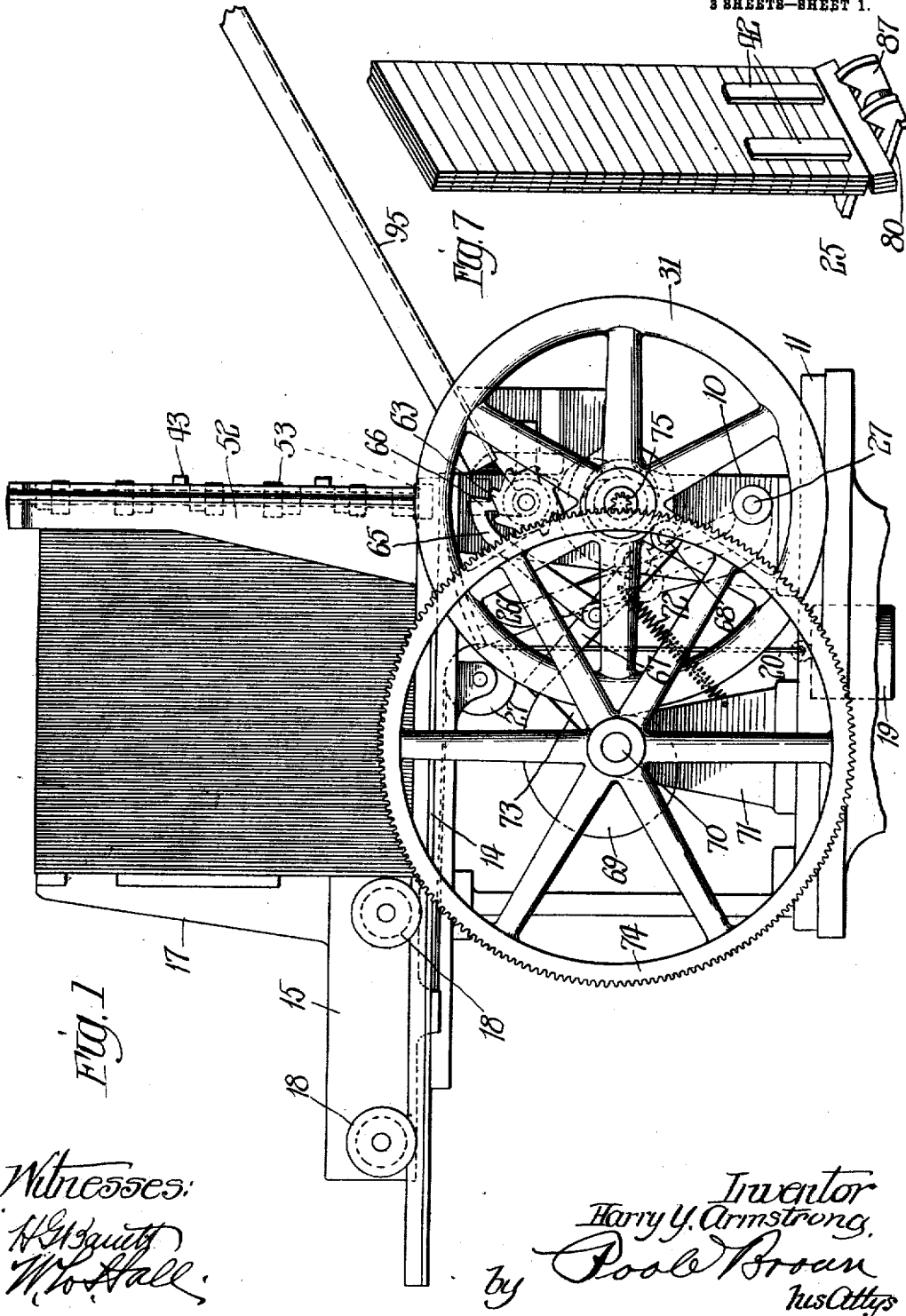


H. Y. ARMSTRONG.
MACHINE FOR BREAKING SLABS OF GUM INTO STICKS.
APPLICATION FILED MAY 28, 1908.

924,955.

Patented June 15, 1909.

3 SHEETS—SHEET 1.



Witnesses:
H. G. Smith
W. H. Hall

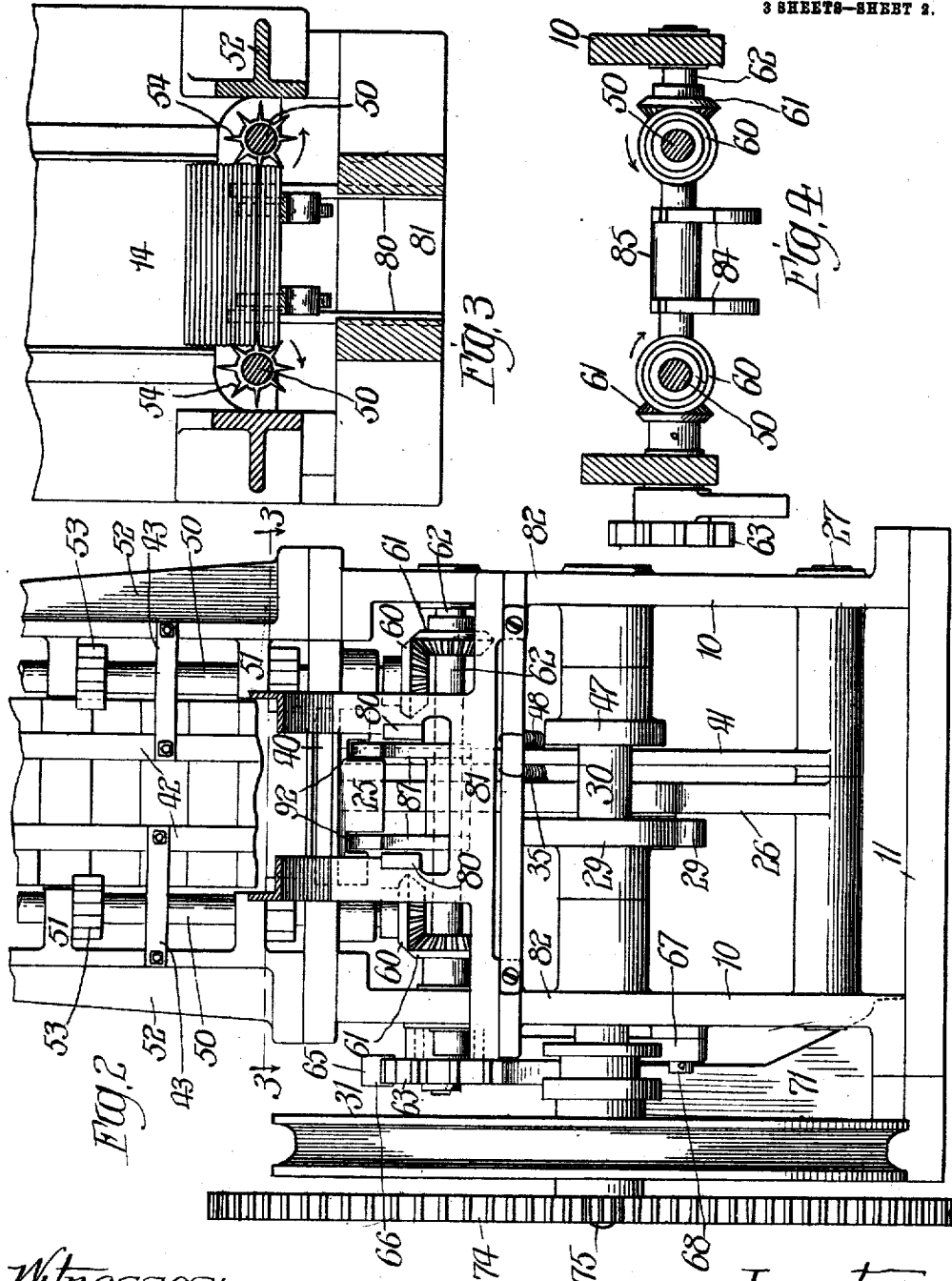
Inventor
Harry Y. Armstrong.
by Pool Brown
his Attys

H. Y. ARMSTRONG.
MACHINE FOR BREAKING SLABS OF GUM INTO STICKS.
APPLICATION FILED MAY 26, 1908.

924,955.

Patented June 15, 1909.

3 SHEETS—SHEET 2.



Witnesses:
H. B. Quinn
W. H. Hall

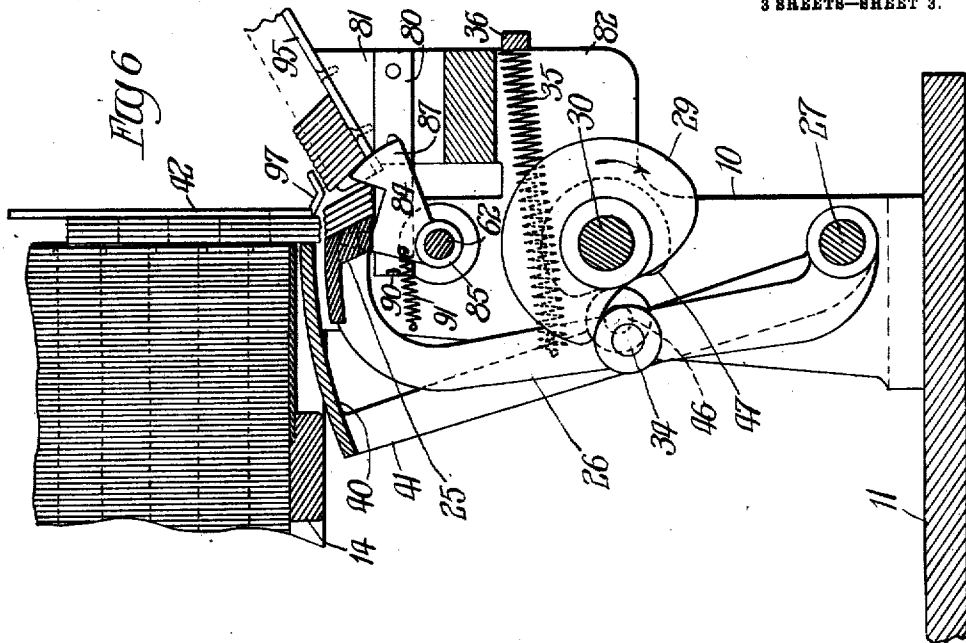
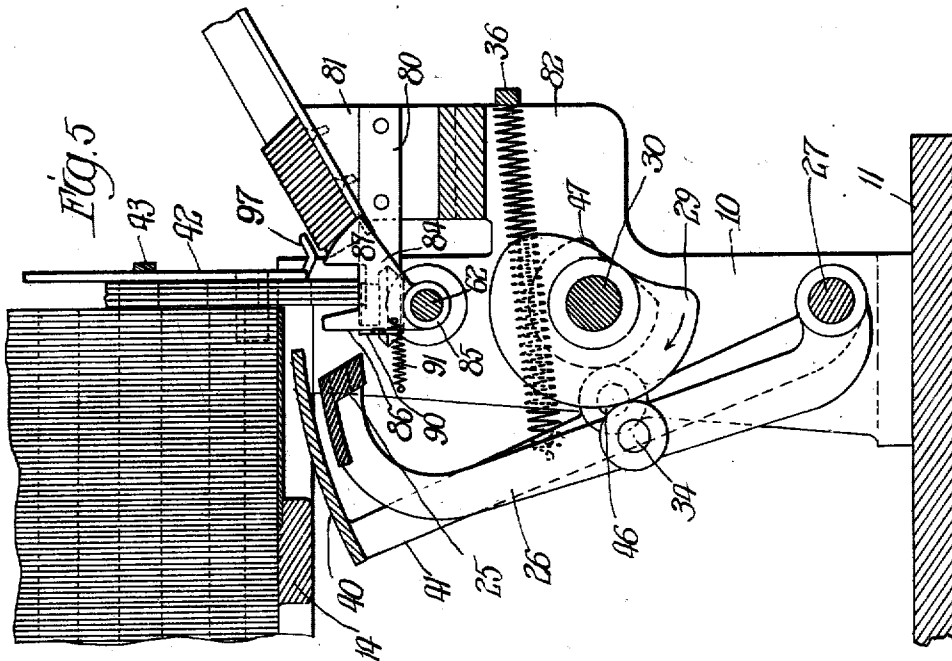
Inventor:
Harry Y. Armstrong
by Robert Brown
his Attys

H. Y. ARMSTRONG.
MACHINE FOR BREAKING SLABS OF GUM INTO STICKS.
APPLICATION FILED MAY 28, 1908.

924,955.

Patented June 15, 1909.

3 SHEETS—SHEET 3.



Witnesses:
H. B. Bayliss
W. W. Hall

Inventor:
Harry Y. Armstrong
by Pool & Brown
attorneys

UNITED STATES PATENT OFFICE.

HARRY YARRINGTON ARMSTRONG, OF ELGIN, ILLINOIS.

MACHINE FOR BREAKING SLABS OF GUM INTO STICKS.

No. 924,955.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed May 26, 1908. Serial No. 435,109.

To all whom it may concern:

Be it known that I, HARRY Y. ARMSTRONG, a citizen of the United States, and a resident of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Machines for Breaking Slabs of Gum into Sticks; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

This invention relates to a machine for breaking scored slabs of chewing gum and the like into sticks preparatory to wrapping or otherwise disposing of the same, and the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

Among the objects of the invention is to provide a machine for automatically breaking sticks of gum from previously scored slabs of material, so constructed and arranged that one or more slabs of the scored material is successively segregated from a group of slabs and fed in a step-by-step manner to a breaking device which operates to break off successive sticks or sections from the advance margin of said slab or slabs and to discharge the sticks so broken from the slabs in an orderly manner from the machine, and in a like manner the remaining slabs are successively segregated and fed to the breaking mechanism until all the slabs are thus reduced or broken into sticks and discharged from the machine.

As shown in the drawings:—Figure 1 is a side elevation of a machine made in accordance with my invention. Fig. 2 is a front elevation thereof, with parts in section. Fig. 3 is a horizontal section taken on line 3—3 of Fig. 2. Fig. 4 is a horizontal, sectional view illustrating a portion of the mechanism for operating the devices for segregating the slabs from the group in the magazine in which the group of slabs are confined. Fig. 5 is a vertical section taken through the magazine, the breaking mechanism and the mechanism for operating the same. Fig. 6 is a similar section, with the parts shown in changed positions. Fig. 7 illustrates a segregated group of scored slabs, from the lower ends of which the sticks or sections are broken.

As shown in the drawings, 10, 10 designate

the side members of the machine frame, and 11, 11 a base plate on which said side members are supported. The scored slabs *a* of the gum material are confined on edge in a group in a magazine at the upper side of the machine. The said slabs rest on the bottom 14 of the magazine and are confined between a follower 15 supported on the rear end of the magazine bottom and a feed device, hereinafter to be described, which operates to segregate the slabs from the group and deliver them to the breaking mechanism and to support the forwardmost slabs. The follower 15 is herein shown as provided with an upright extension 17 which bears against the rearmost slab of the group of gums. It is mounted on wheels or rollers 18 and is pressed forwardly against the group of gums by a weight 19 which is connected by a cable 20 with said follower, said cable being trained over a guide pulley 21 mounted on the frame of the magazine bottom.

25 designates a breaking hammer which is located beneath the forward end of the magazine. It is carried by the upper end of a vertically swinging lever 26 which is pivotally mounted on a shaft 27 extending between and fixed at its ends to the side members 10 of the frame. The said hammer lever is operated by a cam 29 fixed to the main driving shaft 30 of the machine, which latter is mounted in the side frame members 10 and provided at one end exterior to the frame with a driving pulley 31. The hammer lever is provided between its ends with a roller bearing stud 34 which is acted on by the cam 29. The hammer is drawn forwardly to its breaking position and the roller is held engaged with the periphery of the cam by means of a spiral contractile spring 35 which is attached at one end to said lever and at its other end to a bar 36 extending across the rear end of the machine frame.

40 designates a clamping device located between said hammer and the bottom of the magazine. It is carried by the upper end of a vertically swinging lever 41 that is pivoted at its lower end to the shaft 27 at one side of the hammer lever. The clamping device is adapted to engage a slab or group of slabs which is being fed in front of the hammer and to clamp or confine the same at a point above the lowermost section next to be broken, between the same and a pair of bars 42, 42 arranged vertically in front of the magazine

and attached to the frame by rigid arms 43, 43, as shown in Fig. 1. The said clamping device lever is provided between its ends with a roller bearing stud 46 which is acted upon 5 by a cam 47 fixed on the shaft 30 at one side of the cam 29. Said clamping device lever is drawn forwardly to hold the roller of its bearing stud in engagement with the cam by means of a spiral contractile spring 48 which 10 is attached at one end to said lever and at its other end to the bar 36 to which the hammer lever spring 35 is attached.

The means for segregating one or more slabs from the group at the rear end of the 15 magazine, while holding the remaining slabs in place are made as follows: 50, 50 designate two upright shafts located one at each side of the magazine at the rear thereof and mounted in bearing lugs 51, 51 extending 20 inwardly from standards 52, 52 rising from the frame. Fixed to said shafts 50 are a plurality of vertically separated toothed wheels 53 which are arranged so close to the sides of the group of slabs in the magazine 25 that the teeth 54 thereof, when the wheels are rotated forwardly, are adapted to enter between adjacent slabs of the group in a manner to segregate the slab or slabs in front of the entering teeth from the group 30 and force the same forwardly past the front edge of the magazine bottom to permit the segregated slab or slabs to fall by gravity in front of the breaking hammer. Said teeth of the star wheels are located at such distance 35 apart that the slab or slabs thus segregated are guided in their descent between two adjacent teeth of each wheel, as clearly shown in Fig. 3. In the event that said slab or slabs should escape rearwardly from the rear guide teeth, said slab or slabs would 40 still be held upright by the vertical bars 42, when said bars are employed. It will be also observed from an inspection of Fig. 3 that the unsegregated slabs, or those in front of the teeth which have just advanced a slab or slabs, are held from forward movement 45 by said teeth; said teeth serving as stops between which and the follower at the front of the group the slabs are confined. The said segregating wheels are rotated in a step-by-step fashion by mechanism operating in timing relation to the breaking hammer operating mechanism, the said 50 wheels being rotated one step during the time required to break all the sticks or scored sections from a segregated slab or slabs. In the present instance each slab is scored to form twenty-four sticks, so that the segregating wheels rotate one step during 60 each twenty-four striking operations of the hammer.

The mechanism for intermittently rotating the segregating wheels is made as follows: The shafts of said wheels are provided 65 at their lower ends with beveled pinions 60,

(Figs. 2 and 4) which mesh with beveled pinions 61, 61 fixed to a horizontal shaft 62 that is rotatively mounted in the frame members 10. Said shaft is provided at one end outside of the frame with a ratchet 70 wheel 63 (Figs. 1 and 2). 65 designates a gravity pawl, the tooth 66 at the upper end of which engages said ratchet. Said pawl 65 is pivoted at its other end to a vertically swinging lever 67, which latter is pivoted at 75 one end on a stud 68 extending laterally from the adjacent frame member 10. Said lever rides at its other end on the periphery of a snail cam 69 which is fixed to a rotative shaft 70 that is rotatively mounted in a vertical standard 71 rising from the base plate 80 11 laterally outside the adjacent frame member 10. The free end of said lever is held pressed against the periphery of said cam by a spiral contractile spring 72. The 85 cam is provided with a relatively deep abrupt drop 73 into which the free end of the lever 57 drops once during each rotation of said cam; the said free end of the lever gradually rising during the remaining portion 90 of the rotation of said cam until it reaches the highest portion of the cam to again drop to the lowest portion thereof, as before. At each drop of the lever 67 carrying the pawl 65 the pawl is drawn downwardly and acts on the ratchet wheel, and through the gearing described, to rotate the segregating wheels one step, as above stated. The rotative shaft 70 is provided with a large gear wheel 74 which meshes with a 100 small gear pinion 75 carried by the driving shaft 30. The ratio of the gear of said pinion and gear wheel is such that the shaft 70 and its cam 69 are rotated once during as many rotations of the main drive shaft as is 105 required to break all the sticks or scored sections from a full slab of gum. In the present instance said slabs contain twenty-four scored sections and the ratio of the gearing of said pinion and gear wheel is 24 110 to 1.

The operation of the segregating wheels occurs just after the last stick or group of sticks of a segregated slab or slabs have been discharged from the breaking mechanism, and serves to segregate another slab 115 or group of slabs from the group in the magazine and bring the same into position to be fed in a step-by-step manner in front of the breaking hammer as the lower sticks or sections are broken therefrom. The said segregated slabs drop in front of the breaking hammer upon a support consisting of two horizontal bars 80, 80 which are attached to 120 the inner side faces of upwardly extending, laterally separated members 81 of a casting that is supported in brackets 82 formed on the rear margins of the frame members 10 (Figs. 2, 5 and 6). Located between said supporting bars 80 are two laterally sepa- 125 130

rated rocking guides 84, 84 which are formed on a hub 85 that is loosely mounted on the shaft 62 carrying the beveled pinions which operate the segregating wheel shaft, as before stated. Said rocking guides are provided with front and rear guide members 86 and 87 between which are formed upwardly opening recesses to receive the lower ends of the segregated group of slabs which are delivered thereto from the magazine. The said rocking guides are provided to prevent the sticks of gums from falling on their sides during the breaking and discharging operations. The said rocking guides are normally held against a stop shoulder 90 on one of the supporting bars 80 by means of a spiral contractile spring 91, this position of the guides holding the receiving recess between the guide members 86 and 87 upwardly in position to receive a segregated group of slabs, as shown in Fig. 5. The hammer is provided in line with the guide members 86 of the rocking guides with downwardly opening recesses or notches 92 to receive said guide members when the hammer is in its forward position, as shown in Figs. 2 and 6. Said notches or recesses divide the hammer into a central and two side portions (Fig. 2) the central portion of which operates between the slab supporting bars 80 and the side portions of which pass over said bars in the forward throw of the hammer. Said side portions are shortened so as to clear the supporting bars in the extreme forward throw of the hammer.

A discharge chute 95 is arranged in rear of the hammer with its receiving end in position to receive the sticks or sections of gums as they are broken off from the lower end of the slabs. Said chute is of channel form and is shown as attached to the members 81 of the frame. It may be extended to any suitable place for the delivery of the sticks of gum. The bars 42 are provided at their lower ends with rearwardly turned portions 97 arranged over the chute to prevent the gums from rising when delivered into the receiving end of the chute.

In the operation of the device described one or more slabs is segregated from the forward side of the group of slabs in the magazine by the toothed or star wheels 53, and said segregated slab or slabs drop downwardly upon the supporting bars 80 and into the notches or recesses of the rocking guides 84. Thereafter the clamping device lever 41 is swung rearwardly under the control of its cam 47 and spring 48 to bring the clamping device 40 into position to clamp or confine the lower end of the slab or slabs between the same and the lower ends of the bars 42. Thereafter the hammer is advanced under the action of its spring 35 and the control of the cam 29 to break off the lower scored section of the slab or slabs. The said hammer

is advanced by its operating mechanism beyond its breaking position, as indicated in Fig. 6, and forces the detached or broken sticks into the receiving end of the discharge chute 95. The said rocking guide members 84 swing rearwardly and downwardly during the time the gums are transferred to the receiving end of the chute far enough to permit the sticks of gum to pass thereover into the chute. When the sticks of gum have been thus delivered into the chute and the hammer is retracted, said rocking guides swing backwardly into their normal positions to bring the rearmost members 84 into position to act as stops to prevent the gums falling backwardly out of the chute, as clearly shown in Fig. 5. When the hammer and clamping devices have been retracted the slab or slabs fall to bring the next scored section in front of the hammer and the operation of the breaking device is repeated. Said operations of the breaking mechanism are repeated until all of the sections of a segregated slab or slabs have been broken and delivered into the chute. When the last section of a slab or slabs has been delivered into the chute the actuating cam 69 of the segregating mechanism is in position to permit the swinging pawl bearing lever 67 to drop from the highest to the lowest part of the cam, whereupon the segregating wheels are rotated one step to segregate another slab or slabs from the group in the magazine in position to be delivered to the breaking mechanism.

I claim as my invention:—

1. In a gum breaking machine, a breaking device and means whereby a slab or slabs of gum may be fed by gravity to intermittently bring the advance end thereof to the breaking device as the sections are successively broken from said advance end, and a clamping device arranged to intermittently clamp the slab or slabs near the breaking device during the breaking operation thereof.

2. A gum breaking machine comprising a breaking hammer, a guide through which a slab of gum may be fed step by step in front of the hammer, and a clamping device arranged to act on the slab in rear of the hammer during the breaking operation of the hammer and to intermittently release the slab to permit its step by step feed to the hammer.

3. A gum breaking machine comprising a breaking device, an intermittently acting clamping device arranged to engage the slab of scored gum while the breaking device is breaking sticks or sections from the advance end thereof and to release the slab to permit it to be fed in front of the breaking device.

4. A gum breaking machine comprising a breaking hammer, a guide through which a slab of scored gum may be fed step by step in front of the hammer and a discharge chute so

arranged relatively to the hammer that the hammer delivers the broken sticks or sections into the receiving end of said chute.

5. A gum breaking machine, comprising a breaking hammer, a discharge chute so arranged relatively to the hammer that the hammer delivers the broken sticks or sections into the receiving end of said chute, and a stop arranged at the receiving end of the chute to prevent the sticks or sections falling backwardly from the chute while permitting the sticks or sections to be delivered thereover into the chute.

6. A gum breaking machine comprising a breaking hammer, means whereby a slab of scored gum is fed step-by-step in front of the hammer as the scored sections are broken from the advance end of the slab, and a discharge chute through which the gums are discharged from the machine, said hammer delivering the sticks or sections of gums into the receiving end of the chute and discharging them therethrough.

7. A gum breaking machine comprising a breaking hammer, means whereby a slab of scored gum is fed step-by-step in front of the hammer as the scored sections are broken from the advance end of the slab, a discharge chute through which the gums are discharged from the machine, said hammer delivering the sticks or sections of gums into the receiving end of the chute and discharging them therethrough, and a rocking stop at the rear end of the chute over which the gums are delivered to the chute and arranged to prevent the gums from falling backwardly out of the chute.

8. A machine for breaking gum comprising means for holding scored slabs of gum in a group, a breaking hammer, means for segregating a slab or slabs from said group and feeding the same to the breaking hammer, which latter operates to successively break the scored sections from the advance end of the slab or slabs, and an intermittently acting clamping device arranged to hold the slab or slabs while the hammer is acting thereon and to release the same to permit them to be fed to the hammer.

9. A machine for breaking gum comprising means for holding scored slabs of gum in a group, a breaking hammer, means for segregating a slab or slabs from said group and feeding the same to the breaking hammer, which latter operates to successively break the scored sections from the advance end of the slab or slabs, and means for holding said slab or slabs stationary while the breaking device acts thereon, arranged to release them to permit them to be intermittently fed to the hammer.

10. A machine for breaking gum comprising means for holding slabs of gum in a group, a breaking device, means for feeding the slabs from said group to the breaking de-

vice, and a pressure device for holding the group of gums up against the feeding means.

11. A gum breaking machine comprising means for holding or confining a group of scored gum slabs, a breaking device, means for segregating a slab or slabs therefrom and guiding the same to the breaking device, said breaking device acting on the advance end of the slab or slabs to successively break the scored sections therefrom, means whereby broken sticks of gum are discharged from the machine in an orderly manner, and an intermittently acting clamping device acting to hold said slab or slabs stationary during the action of the breaking device thereon.

12. A gum breaking machine comprising a magazine in which a group of scored gum slabs are confined, a breaking device beneath the magazine, and means for segregating a slab or slabs from the group and arranged to guide the same to the breaking device, said breaking device operating to successively break the scored sections from the advance end of the slab or slabs as the latter are fed step-by-step thereto.

13. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, a breaking hammer arranged beneath one end of the magazine, means above the hammer for segregating a slab or slabs from one end of the group and permitting the same to drop in front of the hammer, said hammer operating to successively break the lowermost sections from the slabs, and means whereby the broken sections are discharged from the machine, said slab or slabs intermittently dropping in front of the hammer, as the broken sections or sticks are discharged from the machine, to present another section or sections to the action of the breaking hammer.

14. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, a breaking hammer arranged beneath the end of said magazine, means for segregating a slab or slabs from the end of the group to permit them to drop in front of the hammer, the hammer operating to successively break the lower scored sections from said slab or slabs, clamping means between said hammer and the magazine arranged to engage and hold the slab or slabs while the breaking hammer operates thereon, and means whereby the broken sections are discharged from the machine, said clamping means acting to release the slab or slabs after each operation of the hammer thereon to permit them to drop to present the lowermost section thereof to the action of the hammer.

15. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, means for segregating a slab or slabs from the rear end of the group, a horizontal support below the rear end of the

magazine on which the segregated slab or slabs drop as they are segregated from said group, and a hammer below the magazine for successively breaking the lower sections from said slab or slabs.

16. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, a breaking device beneath one end of said magazine, and means for segregating a slab or slabs from said group to present the same to said breaking device, said segregating means being constructed to provide a stop to hold the unsegregated slabs of the group in the magazine.

17. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, intermittently rotative devices at the sides of the magazine arranged to engage the margins of the slabs to segregate a slab or slabs from said group at predetermined periods, and a breaking device beneath the magazine for successively breaking gum sections from the advance end of the slab or slabs.

18. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, intermittently rotative toothed wheels arranged at the sides of the magazine, the teeth of which are adapted to engage the margins of the slabs to segregate at predetermined periods a slab or slabs from the group, and a breaking device beneath said magazine to which the segregated slabs are delivered.

19. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, intermittently rotative toothed wheels arranged at the sides of the magazine, the teeth of which are adapted to engage the margins of the slabs to segregate at predetermined periods a slab or slabs from the group, and a breaking device beneath said magazine to which the segregated slabs are delivered, the teeth of the segregating wheels constituting guides to guide the slab or slabs to the breaking mechanism.

20. A gum breaking machine comprising

a magazine for confining a group of scored gum slabs, intermittently rotative toothed wheels arranged at the sides of the magazine, the teeth of which are adapted to engage the margins of the slabs to segregate at predetermined periods a slab or slabs from the group, and a breaking device beneath said magazine to which the segregated slabs are delivered, the teeth of the segregating wheels being arranged to constitute stops to hold the unsegregated slabs in place in said group.

21. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, means for segregating a slab or slabs from one end of said group, a breaking hammer to which the segregated slab or slabs are delivered and by which the lower scored sections are successively broken therefrom, a rocking guide for holding the broken sections or sticks upright, and means whereby the gums are discharged from the machine.

22. A gum breaking machine comprising a magazine for confining a group of scored gum slabs, means for segregating a slab or slabs from one end of said group, a breaking hammer to which the segregated slab or slabs are delivered and by which the lower scored sections are successively broken therefrom, a rocking guide for holding the broken sections or sticks upright, a discharge chute through which the broken sections or sticks are discharged from the machine, and a rocking guide at the receiving end of said discharge chute for holding the broken sections or sticks upright and arranged to serve as a stop to prevent said sections or sticks from falling backwardly from said chute.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 29th day of April A. D. 1908.

HARRY YARRINGTON ARMSTRONG.

Witnesses:

W. L. HALL,
G. P. WILKINS.