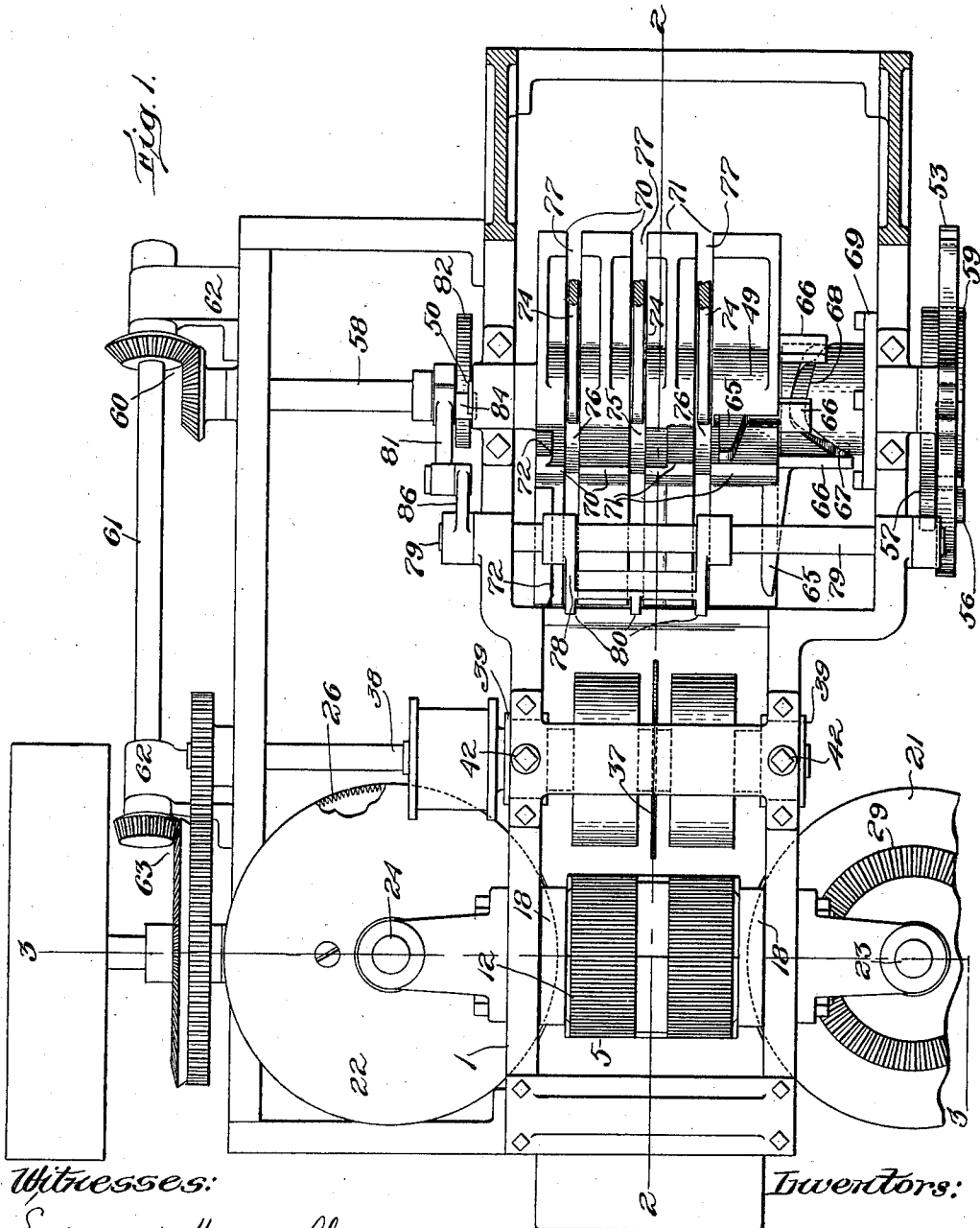


T. NIMMO & A. G. LIBBY.
MATCH MAKING MACHINE.
APPLICATION FILED MAY 8, 1911.

1,029,218.

Patented June 11, 1912.

4 SHEETS-SHEET 1.



Witnesses:

Edward Maxwell

C. L. Rogers.

Inventors:

Thomas Nimmo,
Almon G. Libby,

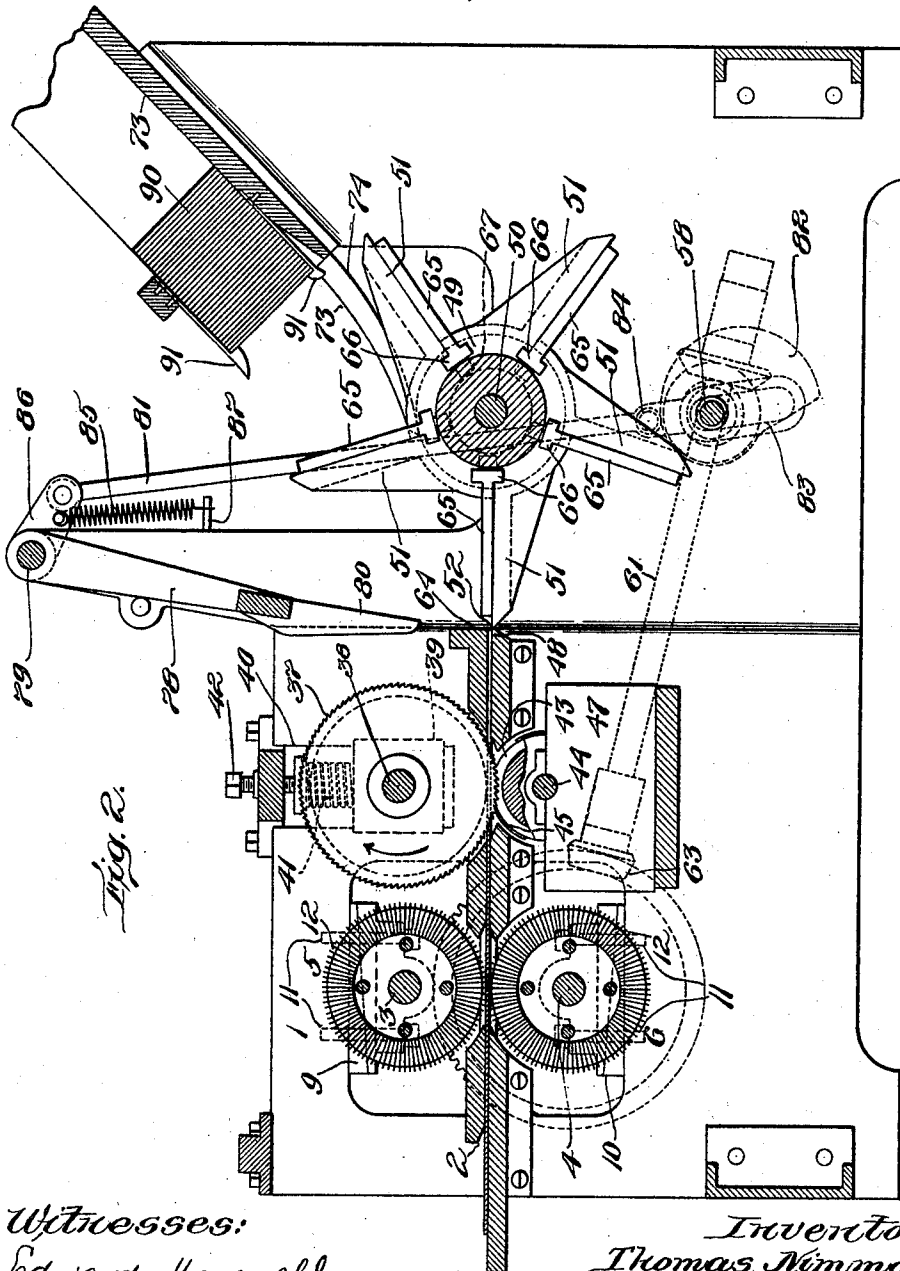
by Geo. H. Maxwell, atty.

T. NIMMO & A. G. LIBBY.
MATCH MAKING MACHINE.
APPLICATION FILED MAY 8, 1911.

1,029,218.

Patented June 11, 1912.

4 SHEETS—SHEET 2.



Witnesses:
Edward Maxwell
C. L. Rogers

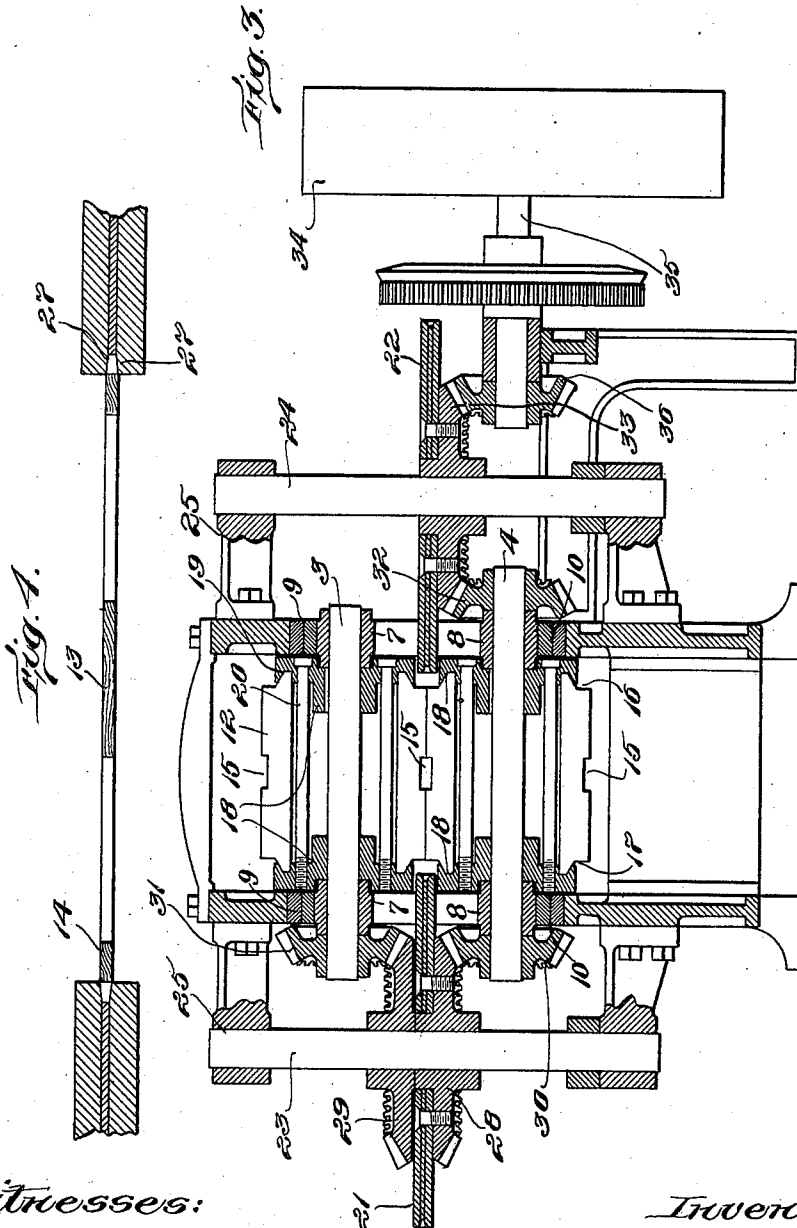
Inventors:
Thomas Nimmo,
Almon G. Libby,
by Geo. H. Maxwell Esq.

T. NIMMO & A. G. LIBBY.
MATCH MAKING MACHINE.
APPLICATION FILED MAY 8, 1911.

1,029,218.

Patented June 11, 1912.

4 SHEETS—SHEET 3.



Witnesses:
Edward Maxwell
C. L. Rogers

Inventors:
Thomas Nimmo,
Almon G. Libby,
by Geo. H. Maxwell, atty.

T. NIMMO & A. G. LIBBY.
MATCH MAKING MACHINE.
APPLICATION FILED MAY 8, 1911.

1,029,218.

Patented June 11, 1912.

4 SHEETS—SHEET 4.

Fig. 5.

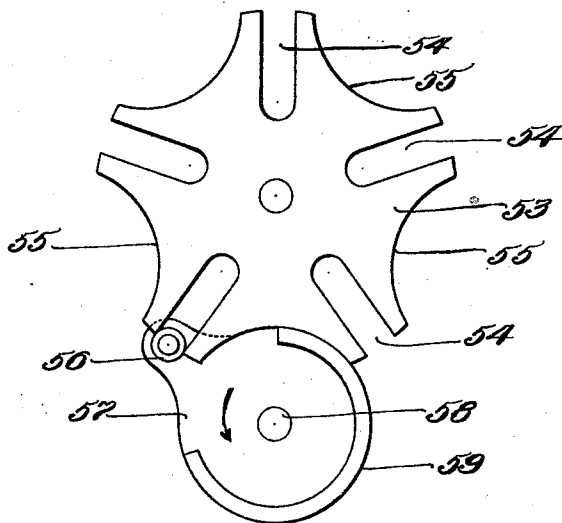
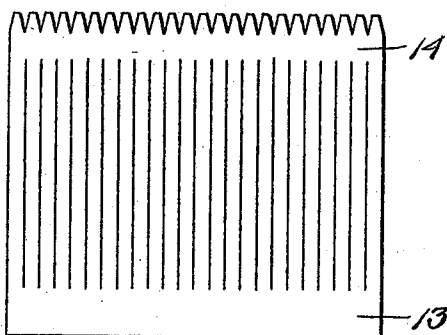


Fig. 6.



Witnesses:

Edward Maxwell

C. L. Rogers

Inventor

*Thomas Nimmo,
Almon G. Libby,*

by Geo. W. Maxwell, atty.

UNITED STATES PATENT OFFICE.

THOMAS NIMMO, OF SOUTH PORTLAND, AND ALMON G. LIBBY, OF PORTLAND, MAINE.

MATCH-MAKING MACHINE.

1,029,218.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed May 8, 1911. Serial No. 625,816.

To all whom it may concern:

Be it known that we, THOMAS NIMMO and ALMON G. LIBBY, citizens of the United States, and residents, respectively, of South Portland and Portland, both in the county of Cumberland and State of Maine, have invented an Improvement in Match-Making Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to match making machines of the type adapted to produce matches in cards of a desired number from veneer stock, the matches of each card being nearly severed, but held together by a small portion of uncut stock.

More particularly, our invention has for its objects to provide mechanism for pressing or molding the end of the stock to form the match points, the stock being compressed to form the tapering ends, thus obviating the necessity of sawing away or otherwise removing portions thereof.

A further object of our invention is to provide novel means for effecting the partial severing of the stock into individual matches as well as the complete severing at intervals into cards, such means and the point-forming means being also adapted to constitute a feeding device for the stock.

Still further objects of the invention are to provide a mechanism for simultaneously producing the points and slices in a double match-length card, severing such card into single match lengths and causing the overlapping of one match length over the other as the cards are delivered in a column, as requisite for the subsequent dipping operation.

The above and other specific objects of the invention will more fully appear from the following detailed description, taken in connection with the accompanying drawings, and will be thereafter pointed out in the appended claims.

Referring to the drawings, Figure 1 is a plan view of the machine, a portion thereof at the delivery end being broken away; Fig. 2 is a longitudinal vertical section on line 2—2, Fig. 1; Fig. 3 is a transverse vertical section on line 3—3, Fig. 1; Fig. 4 is an enlarged sectional detail showing the action of the pressing disks to form the

match points; Fig. 5 is a detail of the stop motion for governing the operation of the card-carrying drum; and Fig. 6 is a view showing a card of matches as formed by our improved machine.

Upon a suitable base framework 1, a guideway 2 is formed for the veneer stock of a width to receive stock two cards in length. In this framework are journaled in vertical alinement supporting shafts 3, 4 for the slicer carrying drums 5, 6. The bearings 7, 8 for these shafts are preferably adjustable for the proper spacing apart of the drums, as by means of slidable wedges 9, 10 between the bearings and the framework, and may be clamped in proper adjustment by bolts 11. The drums 5, 6 carry a series of slicer blades 12 spaced apart the proper distance to divide the stock into individual matches, and the drums are adjusted so that the respective blades on each as they come to opposing position substantially meet to slice entirely through the stock.

In the particular type of match cards to be produced by the present machine, it is designed to leave a band of uncut stock at the butt ends and another adjacent the point, as shown at 13, 14, and to this end the slicer blades have central cut out portions 15 and other cut out portions 16, 17 at each end, the central cut out portions 15 being of a length to leave uncut bands of proper width at the butt ends of each of the match cards, and the cut out portions 16, 17 being of a size to leave the single uncut bands adjacent the points of the cards.

The cards to be produced by the present machine consist of a strip of any desired number, usually about twenty three matches, and, to effect the severance of the stock as thus fed and slitted into such card lengths, the opposing blades which meet at the ends of each card length have continuous edges, *i. e.* there are no cut out portions 15, 16, 17, so that these blades will completely sever the stock into the individual cards. The slicer blades 12 may be secured to the drums 5, 6 in any desired manner; as shown in Fig. 4, flanged plates 18 are fixed to the shafts with recesses 19 formed therein to receive beveled projecting ends of the blades, and these are drawn together by screw bolts, one of said flanged members being for this purpose splined so as to be

slidable on its carrying shaft. The slicer drums which thus slice the stock to form individual matches and divide it into cards also form a feeding means for the stock to advance the same along the guideway 2.

To form the match points, opposing disks 21, 22 are fixed on shafts 23, 24 mounted in bearings 25 on the framework, preferably in the same plane as the axes of the slicer drums. These disks are provided with peripheral radially extending V-shaped teeth 26 centrally thereof and with side flanges 27 with inwardly converging walls spaced apart at the circumference the width of the stock and narrowing down somewhat toward the bottom. The point-forming disks 21, 22 and the slicer drums 5, 6 are in geared connection so as to revolve in properly timed relation so that the successive pairs of matches, as produced by the slicer knives, will have their points properly pressed and molded to shape by the pointing disks 21, 22. To this end, oppositely facing bevel gears 28, 29 fixed to shaft 23 engage pinions 30, 31 fixed on the slicer-drum shaft, and like bevel gear connections 32, 33 are formed between the shaft 24 and the drum shaft 4. Driving impulse is imparted to the slicer drums and pointing disks by any suitable means, shown as a belt pulley 34 fixed on a shaft 35 journaled in the framework and driving the beveled gear 33 through a bevel pinion 36. The stock thus sliced and pointed is fed along the slide-way to a central cutter for dividing the double length stock into separate cards. This cutter is shown as a circular saw 37 fixed on a shaft 38 journaled in bearing blocks 39, these blocks being slidable in vertical ways 40 and urged downward by springs 41 whose tension may be adjusted, as by screw bolts 42 fitted to a part of the framework. The backing for the stock as it is acted upon by the saw 37 is provided by a drum 43 fixed on a shaft 44 suitably journaled in the framework, the saw being shown as extending into a groove thereof. This drum may, as desired, have a further function of printing any desired matter, as an advertisement, on each card as engaged therewith, and to this end the circumference of the drum may be provided with any usual or desired kind of printing dies 45. These dies may be inked in any usual manner from an ink containing receptacle 47, the details of these features being of any ordinary form and constituting no part of the present invention. The guideway for the stock comes to an end at 48, and a drum 49 mounted on a shaft 50 journaled in the framework carries a series of plates or blades 51 which extend to the delivery end 48 of the guideway when brought opposite thereto in the turning of the drum as shown at 52. These plates or blades extend from the drum of a length to receive thereon an entire card of

matches as produced by the slicer knives, and the drum is so driven with intermittent movement as to have periods of rest so as to bring each successive blade opposite the slideway end 48 so as to constitute virtually a continuation of said slideway. To effect this intermittent rotation and definite timed stopping of the plate-carrying drum, it may be driven by any suitable mechanism for this purpose, shown as a stop motion consisting of a plate 53 having a series of radial slots 54 and intermediate concave portions 55 adapted to cooperate with a driving pin 56 on a crank arm 57 fixed on a shaft 58, this shaft also carrying a disk portion 59 opposite the pin 56, adapted to fit into the concave parts 55 to lock the drum from rotation except when turned by the pin 56 engaging one of the radial slots 54. Driving impulse may be imparted to the shaft 58 by bevel gearing 60, shaft 61 journaled at 62 in the framework and bevel gearing 63 connected with the driving shaft 35. This gearing is so proportioned and timed relative to the slicing knives that as said knives feed the sliced and pointed stock forward, a plate 51 will remain in alinement with the guideway as at 52 while each pair of match cards is being delivered thereon, and as the severing line between cards comes opposite the end 48 of the guideway, the blade-carrying drum 49 will be started up by the stop motion described, thus carrying the severed card upward on the plate and cooperating with the top 64 of the guideway to shear off any remaining fibers which may hold the successive cards together. It is desirable for the subsequent dipping operation that the match cards, thus delivered with their butts end to end, should have said ends overlapped to a certain extent, and, to effect this result, pusher plates 65 mounted on arms 66 slidably mounted in the drum 49 are arranged adjacent each card-carrying plate 51. These pusher plates are operated by pins 67 moving in a cam slot 68 stationarily mounted at 69 on the framework, this cam slot being arranged to cause each pusher plate to be moved inwardly lengthwise of the drum as it turns with the drum from the horizontal card-receiving position to the vertical, thus pushing in the match cards at that side and causing their butts to overlap the butts of the cards on the other side of the drum. To enable this sliding of the butt ends of the cards at one side of the drum past those at the other side, the plates 51 are formed with parts 70, 71, one offset from the other, the part 71, over which the pusher plates 65 operate being somewhat higher than the other part 70, so that the card resting thereon can slide over the other card without the butts hitting. To prevent the cards on the other side from being chucked off endwise, the drum plates 51 may each have a flange

or shoulder 72 projecting radially from its other end. For the subsequent treatment of the matches, it is desirable that the cards be delivered stacked in columns as well as in the overlapping relation described. To this end, a slideway 73 is mounted to extend outward from the top of the drum 49. This way 73 is extended as a series of rods or bars 74, preferably three in number, *i. e.* an intermediate one and one at either side, and these rest in an intermediate circumferential groove 75 and like side grooves 76 formed in the drum, the blade portions 70, 71 being slotted as shown at 77 so as not to interfere with said bars 74. A swinging arm 78 is fulcrumed at 79 at a suitable point in the framework, as shown, above the drum, though this is merely illustrative, and its end is provided with a series of projecting wiping fingers 80 to project within the slots 77 of the plate-carrying drum. This arm is given timed intermittent oscillations to cooperate with the successive blades 51 by any suitable means, shown as a link 81 operated by a cam 82 fixed on shaft 58. This link has a slotted end 83 fitting over and guided on shaft 58, and it is periodically lifted by cam 82 engaging a pin 84 shown with a roller thereon. The cam 82 has an abrupt, nearly radial portion, and when the pin 84 rides over this portion the link 81 is suddenly moved downward by a spring 85 which engages an arm 86 rigid with arm 78 and to which link 81 is connected the other end of said spring, being held by a pin 87 fixed to the frame. Thus the arm 78 will be given a swing by the cam 82 and link connection 81 to cause its wiper fingers to pass between the parts 70, 71 to transfer the overlapped cards thereon to the bottom of the column of cards 90 on the way 73, where they are caught and held by spring latches 91, and then a quick return so as to be in readiness to cooperate with the next card-carrying blade. The machine thus is adapted to feed in continuously double card lengths of stock, simultaneously mold the points on the two ends of the stock, and slit the same to form individual matches and to completely sever the stock into cards of the desired length. We consider this combination to be an important feature of invention, especially in conjunction with the further construction and arrangement of parts whereby the stock is severed into single card lengths and these lengths delivered in a continuous column in overlapping relation as required for the subsequent dipping operation. We also consider the improved means for receiving the cards as delivered in continuous lines, forwarding the same in overlapping relation, and assembling the same in continuous columns so overlapped, to be a novel and valuable construction irrespective of

the manner in which the card lines are produced, and we desire to cover broadly the construction whereby this is effected. The showing is therefore to be understood as illustrative and not restrictive as to the several features of invention.

Having described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A match making machine, comprising means for supporting and guiding veneer stock, means acting laterally upon the stock to slice the same for individual matches, means acting endwise upon the stock to compress the same for forming individual match points, and connections for causing said slicing and point compressing means to operate in timed relation so that points are formed on the individual matches as divided by the slicing means.

2. A match making machine, comprising means for supporting and guiding a double match length of veneer stock, means acting laterally upon the stock to slice the same for forming individual matches, means acting endwise and simultaneously upon both ends of the stock to compress the same for forming match points, said slicing and point forming means being movable in the direction of stock feed, and geared connections for causing said slicing and point forming means to operate in timed relation for cooperation in feeding the stock and so that points are formed on individual matches as divided by said slicing means.

3. A match making machine, comprising a feed way for veneer stock, means mounted to operate endwise upon the stock for compressing the same to form individual match points, and a pair of rotary knife carriers mounted on opposite sides of said way having knives formed to slice through intermediate portions of the stock to produce individual matches and to leave an uncut band of stock near the points thereof as formed by said point forming means, and connections for causing said knife carriers and said point forming means to operate in timed relation.

4. A match making machine, comprising a feedway for veneer stock, point forming means, and a pair of rotary knife carriers mounted on opposite sides of said way having knives formed to slice through intermediate portions of the stock to produce individual matches said knives having cut-away positions arranged to leave uncut bands of stock at the butt end and near the points as formed by said point forming means.

5. A match making machine, comprising a pair of oppositely mounted rotary knife carriers for slicing the stock into individual matches, and a pair of oppositely mounted rotary forming disks adapted to continuously form points on the opposite ends of the stock, said forming disks and knife car-

riers being mounted on axes in a common plane and intergeared for relatively timed operation.

6. A match making machine, comprising
5 mechanism for producing in continuous lines two match lengths of veneer stock divided and pointed to form individual matches, means for bringing the butt ends of said lines into overlapping relation, and
10 means for transferring cards of definite length from said lines to form overlapping card columns.

7. A match making machine, comprising
15 mechanism for causing the overlapping of two lines of veneer stock continuously fed thereto with ends abutting, and means for transferring cards of definite length from said lines to form overlapping card columns.

8. A match making machine, comprising
20 mechanism for supplying two match lengths of veneer stock in continuous lines with ends abutting, means for causing the overlapping of said ends, means for transferring cards of definite length from said lines in overlapped
25 relation to form card columns, said means including a rotary drum with projecting forwarding arms and an oscillating member mounted to cooperate with said arms for transferring cards therefrom to a column, and a holder adapted to receive the overlapped
30 card columns so delivered.

9. A match making machine, comprising
35 mechanism for continuously pointing and feeding veneer stock and for slicing the same to facilitate division into individual matches, and means for successively separating cards of definite size from the advancing line and transferring the same to form a card column.

40 10. A match making machine, comprising means for continuously pointing, slicing, and feeding a double match length of veneer stock, means for dividing said stock into

single match lengths, means for causing the severed card lengths of stock to overlap, 45 and means for separating cards of definite length from the line and transferring the same to form overlapping card columns.

11. A match making machine, comprising means for simultaneously producing two 50 lines of match cards with their butts abutting and their outer ends pointed, means for successively transferring cards from said lines in overlapping relation to form overlapped card columns. 55

12. A match making machine, comprising means for feeding and slicing veneer stock to form individual matches held together by uncut bands, said means having provision to completely sever the stock at intervals to form match cards, and means 60 for transferring said cards to form a continuous column.

13. A match making machine, comprising means for slicing and pointing a double 65 match-length line of veneer stock to form individual matches held together by uncut bands, said slicing means being arranged to completely sever the stock at intervals to form match cards, means for transversely 70 dividing the stock into single match lengths, and means for transferring the cards in overlapped relation to form a continuous column of overlapping cards.

In testimony whereof, we have signed our 75 names to this specification, in the presence of two subscribing witnesses.

THOMAS NIMMO.
ALMON G. LIBBY.

Witnesses for T. Nimmo:

GEORGE GARDNER,
FRANK A. MONGIN.

Witnesses for A. G. Libby:

FRANK H. HASKELL,
ISA E. PIERCE.

It is hereby certified that in Letters Patent No. 1,029,218, granted June 11, 1912, upon the application of Thomas Nimmo, of South Portland, and Almon G. Libby, of Portland, Maine, for an improvement in "Match-Making Machines," an error appears in the printed specification requiring correction as follows: Page 3, line 121, for the word "positions" read *portions*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of July, A. D., 1912.

[SEAL.]

C. C. BILLINGS,

Acting Commissioner of Patents.