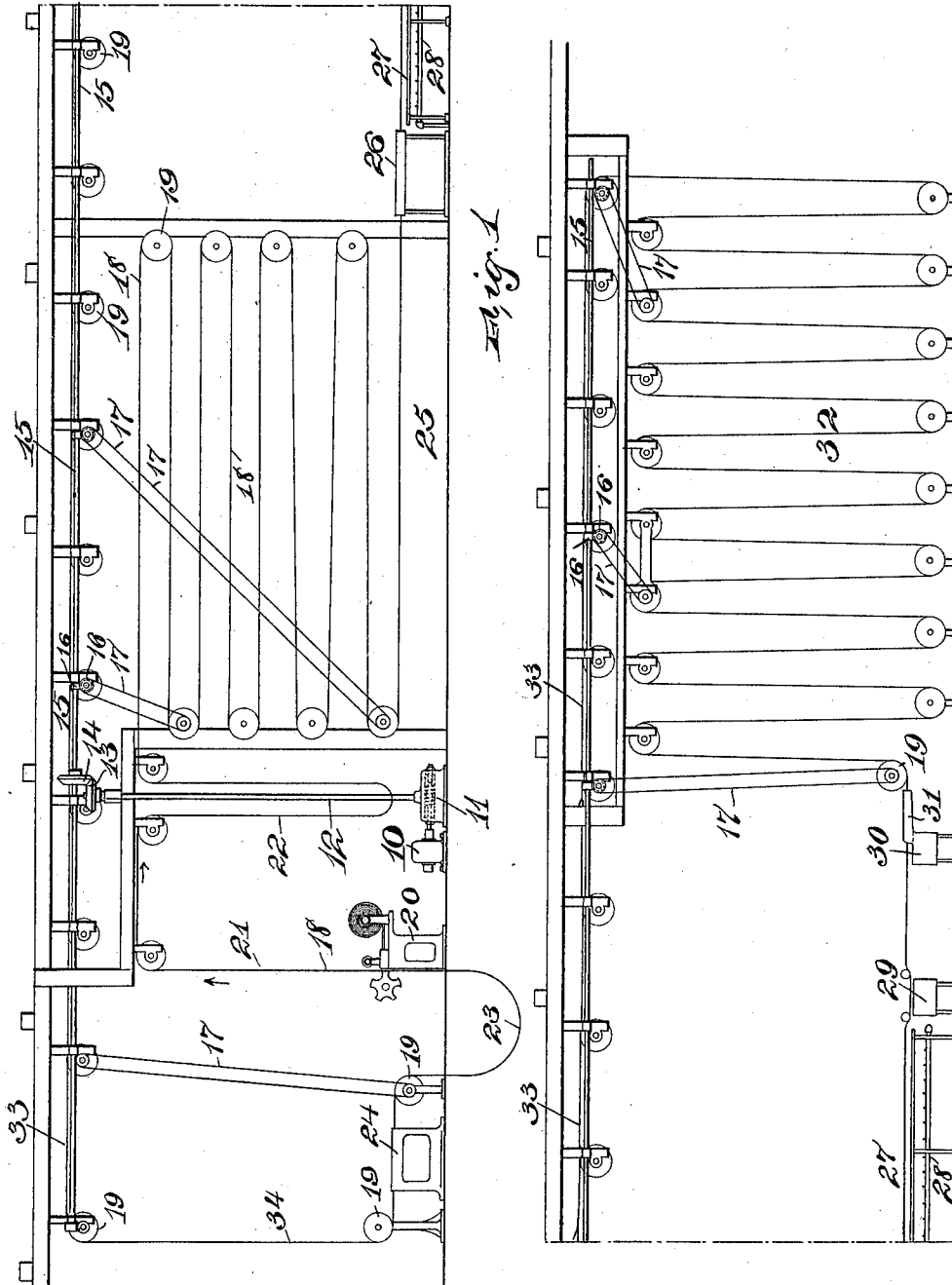


W. H. PARKER.
MATCH MAKING APPARATUS.
APPLICATION FILED JULY 31, 1911.

1,036,894.

Patented Aug. 27, 1912.

4 SHEETS—SHEET 1.



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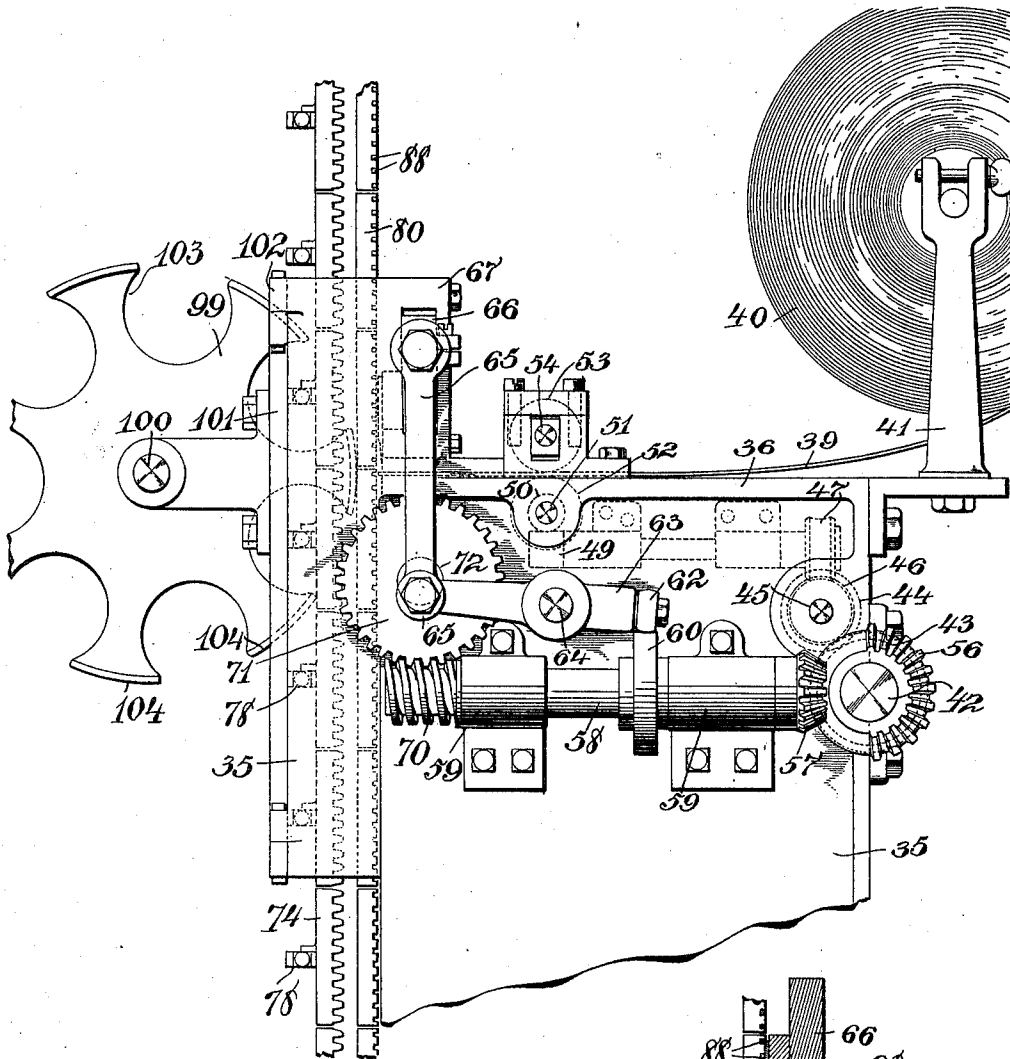


Fig. 2

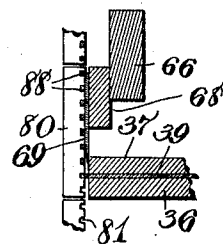


Fig. 3

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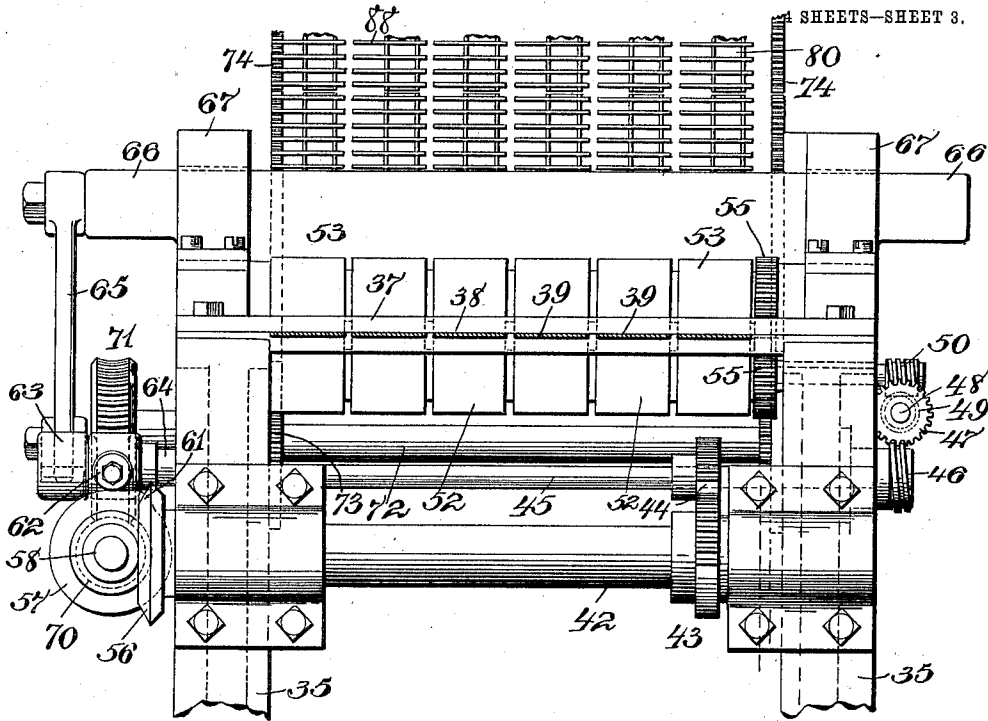


Fig. 4

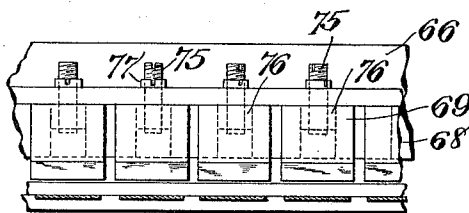


Fig. 5

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4 SHEETS—SHEET 4.

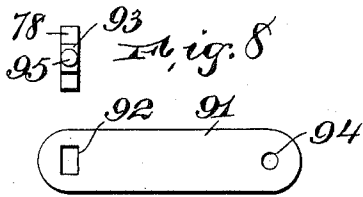
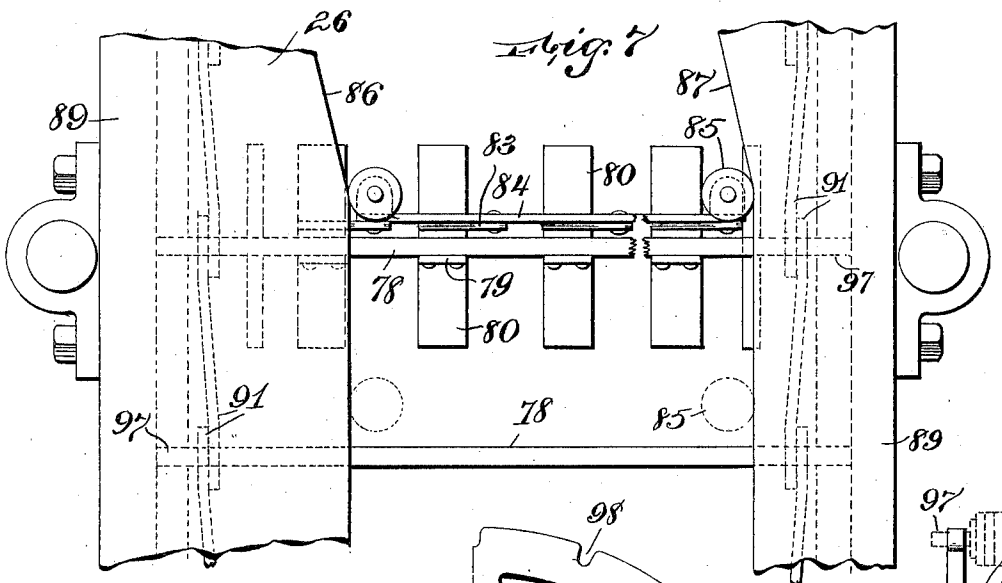
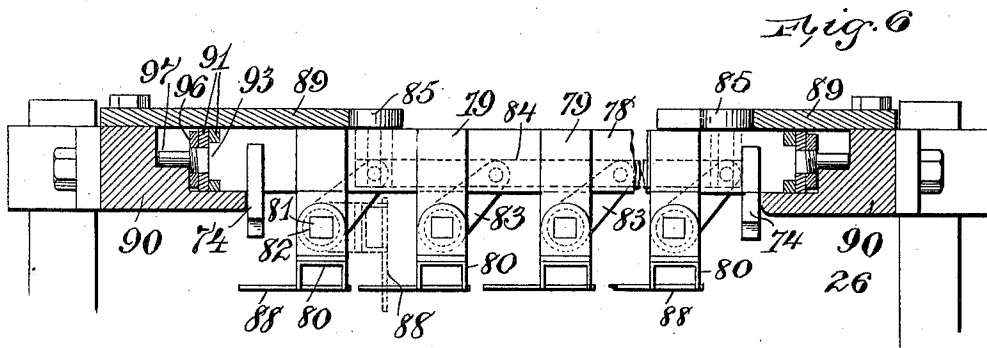


Fig. 9

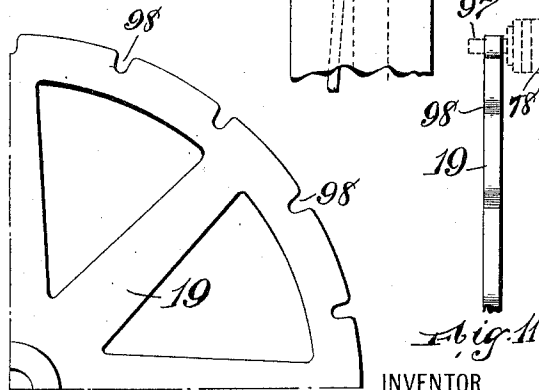


Fig. 10
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UNITED STATES PATENT OFFICE.

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MATCH-MAKING APPARATUS.

1,036,894.

Specification of Letters Patent.

Patented Aug. 27, 1912.

Application filed July 31, 1911. Serial No. 641,631.

To all whom it may concern:

Be it known that I, WILLIAM H. PARKER, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Match-Making Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved apparatus for making matches and consists of a carrier which is adapted to receive splints from a splint machine, the machine being new and novel in its construction, the carrier having means thereon for holding splints or matches in such a way that said splints, after having been inserted in the carrier, can be turned or swung so as to adapt them for different operations to which they are subjected. The carrier, with these match-holders that can be swung or moved to change the position of the matches relative to each other or relative to the carrier, is adapted to receive the splints from the splint machine and to move the splints so that they can be subjected to other steps and elements in the process of making a match from a splint and then used in an unloader of any adaptable type so that the splint and the match are economically and positively handled.

The invention is designed to provide an apparatus for making matches which conveys the splint from the splint machine to the unloader and through the steps that intervene and subjects the splint to the successive treatments to which it is subjected, such as to paraffin impregnation and the dipping into composition, and also the drying, this being accomplished by constructing the carrier in the shape of a chain and making the process a continuous one, it being understood, however, that the carrier used herein could be made in separated parts and not necessarily made in the shape of a chain.

The apparatus is illustrated in the accompanying drawings, in which—

Figure 1 is a view, the right half being arranged below the left half and illustrating

the assembled elements which go to make up a complete equipment for making matches. Fig. 2 is a side view of the upper part of the splint machine used in this apparatus. Fig. 3 is a section through the cutting mechanism of the splint machine. Fig. 4 is an end view of the machine with the veneer roll removed therefrom. Fig. 5 is a front view of the knife-bar with knives attached for cutting the rows of veneer into splints. Fig. 6 is a section showing one of the bars forming a match carrier and illustrating in section turning plates through which it is passed, which turning plates are constructed to force the match-holders of the carrier to move to shift the splints. Fig. 7 shows one of the match carriers in top view, also showing the turning plate illustrated in Fig. 6, and illustrating a second carrier only in skeleton form and showing how they can be connected by links to form a chain. Fig. 8 is an end view of a bar used in the carrier. Fig. 9 is a side view of one of the links used when the bars are formed into a chain. Figs. 10 and 11 are a side view and an end view broken away, each of the views illustrating one of the pulleys over which the chain is passed to carry the splints or matches.

In my improved apparatus I use a suitable motor 10 which is connected up by means of a worm 11 with a shaft 12 which drives, by means of the gears 13 and 14, a main shaft 15. The main shaft is elevated and drives, by means of suitable spiral or beveled gears 16, suitably disposed auxiliary drive chains or belts 17 which are disposed at suitable points to distribute the strain on the chain 18, this chain being hereinafter described in detail, the chain running over suitable pulleys 19 which will also be described in detail hereafter.

The chain 18 receives the splints from a splint machine 20 which feeds the splints into the chain, as will be hereinafter described, the chain running upward as at 21 and then across in a horizontal manner, and then downward to form a loop 22, which loop is a take-up loop and which serves to balance, somewhat, the part 21 which is leaving the splint machine and traveling upward.

In case the splint machine 20 is a machine that feeds the splints in such a man-

ner as to make a step-by-step movement of the chain necessary, the take-up loop 22 takes up the difference in the movement of the different parts of the chain, along with the loop 23 which is primarily a loop for intermittent take-up. This loop for intermittent take-up takes up the movement in the chain between the steady motion of the chain through the unloader 24, which unloader can be of any type and is not claimed or described herein in detail. The chain 18, after passing the splint machine and after forming the take-up loop, passes through a kiln 25, then through a turning plate 26 to be described hereinafter, and then passes over a heating plate 27 of any usual type, but preferably provided with the induction gas-burners 28. The chain then passes the splints over and subjects them to the action of the paraffin pan 29, then through the composition pot 30, through the turning plate 31, then over a series of pulleys through the drying space 32. After passing through the drying space the upper chain portion 33 passes back, as shown at 34, to the unloader 24.

The foregoing is a brief and somewhat diagrammatic exposition of the apparatus and the steps, and I will now proceed to explain in detail the different mechanisms and parts that go to make up the apparatus and that are preferably used in this system.

The splint machine shown at 20 in Fig. 1 is shown in detail in Figs. 2, 3, 4 and 5, and consists of any suitable frame-work 35 which forms side-plates or supports, and a table portion 36 and a top-plate 37 are so cut away as to form a series of guides 38 through which strips 39 of veneer are passed, and in the drawings, particularly in Fig. 4, I show six strips of veneer, which strips come from the veneer rolls 40 shown in Fig. 2, these rolls of veneer being placed in the standards 41 in such a manner as to be easily inserted and quickly replaced so as to make it possible to feed the veneer in each of the guides continuously. The veneer is fed forward with a step-by-step movement which is brought about as follows: The main driving shaft 42 of the splint machine is provided with an intermittent spur-gear 43 which has blank spaces, that is, spaces without teeth, which combine with an intermittent pinion 44 to give an intermittent rotary motion to the counter-shaft 45 which has, on its end, a worm 46 which is in mesh with the worm-gear 47 on a shaft 48, the shaft 48 having a spiral-gear 49 which meshes with the spiral-gear 50 on the shaft 51 of the lower feed roll 52, this feed roll coöperating with an upper feed roll 53 to feed the veneer positively forward a certain distance at certain intervals. To insure their simultaneous rotation, the shaft 51 of the roll 52 and the

shaft 54 of the roll 53 are connected by gears 55 which are in mesh and which are shown particularly in Fig. 4. On the shaft 42 I also install an intermittent beveled gear 56, shown more particularly in Fig. 2, which meshes with an intermittent pinion 57 so that an intermittent motion is transmitted to the shaft 58 on which the intermittent pinion 57 is fastened, the shaft 58 passing through suitable bearings 59 and having a cam 60 thereon, which cam 60 has a raised portion 61 which operates a roller 62 on a lever 63, which lever swings on a rod 64, and on its forward end is provided with a connecting rod 65, which connecting rod can be formed on one or both sides of the machine, being shown in Fig. 4 but on one side, and operating a knife-bar 66 which passes across between the guides 67 and, as shown more particularly in Figs. 2, 3 and 5, is provided with a plate 68 on which is secured the knives 69, these knives acting to descend and cut off the strips of veneer 39 into splints, the veneer having previously been fed far enough ahead to provide enough material to make a splint, as shown in Fig. 3. When the knives descend they cut off the splints from the veneer and the bevel of the knife forces the splint into match-holders which are installed in the carrier and which will be described in detail hereafter.

To feed the match-holder, that is, the carrier, I provide the shaft 58 with a worm 70 which is in mesh with a worm-gear 71 mounted on a shaft 72 which passes across the machine and is provided with two feeding gears 73, and it will thus be seen that when the intermittent motion of the shaft 58 is communicated to the shaft 72, the feed-gears 73 are moved ahead together, and their being in mesh with the feeding racks 74 of the carrier, the carrier is moved ahead with a step-by-step movement so as to move the carrier ahead, after one splint has been placed in it, a sufficient distance to meet the next splint. The machine is so adjusted that first the veneer is fed by the rolls 52 and 53, then the knife is operated, by means of the connecting link 65 operated by means of the cam 60 through the intermittent mechanism, to cut off the splint, and then the feed-gears 73 are operated, by means of the worm 70 and the worm-gear 71, to advance the carrier the necessary distance. The knives 69 are adjustably arranged and are movably attached to the plate 68 by means of the screws 75 passing down into the bosses 76 on the back of the knives, and being held in place by suitable lock-nuts 77. It will be evident from the above description that these splints, cut off from the veneer strips, are alined as shown in Figs. 2 and 4, being formed in parallel rows and lying in substantially the same

plane, which makes them easy to cut, but makes it impossible to head them in the position in which they come from the splint machine, or to subject them at one end to the paraffin in the paraffin pan, and the carrier is made so that the splints can be swung to project one end of each splint from the carrier and arranged transversely to the path of travel of the carrier. The carrier can be made of single elements, but I prefer to make the carrier in the form of a chain, each carrier being connected to the next succeeding carrier by suitable links, as will be hereinafter described.

The carrier consists of a bar 78 which has depending therefrom suitable plates 79, and on each plate is pivotally arranged, so that it can swing thereon, a match-holder 80, the match-holder being preferably made U-shaped and provided with notches 81, (see Fig. 3) these notches being alined so as to receive a splint, when the splint is forced into the notch, and hold it by friction, the notch being made slightly smaller than the splint so that the splint is forced in the notch and will be held therein by friction, even after it is dried in the kiln. Each of the match-holders is provided with a series of these notches so that the successive layers of splints, as they are cut in the splint machine as before described, are received in parallel rows and held in such relation. This arrangement of the splints is shown clearly in Fig. 4 and also in Fig. 6. Movable carriers 80 are mounted on the ends of the plates 79 so as to swing in these plates, being actuated by a squared end 81 of a stud which fits a square perforation 82 in the holder and is attached to a lever 83, a lever being attached to each holder, and each of the levers, on its end, being secured to a transverse bar 84. The transverse bar is provided with rollers 85, and as the rollers are moved, the match-holders are swung. The turning plates which are shown in Fig. 1 at 26 and 31, are designed to engage the rollers to swing the match-holders, and the plate 26 is shown in Figs. 6 and 7, being broken away, one side having a cut-away inclined portion 86 and the opposite side having a similarly projecting slanted portion 87, and it will be seen that as the carrier proceeds through the turning plate 26, the rollers, particularly the one on the right, engage a projecting slanted portion 87 and it moves the transverse bar 84 to actuate all the match-holders and swings them so that all the splints are placed in the position shown in dotted outline at the left holder in Fig. 6, where the splints 88 are shown arranged vertically, that is, perpendicular to their previous position, and the splints so held are in proper position to be treated in the paraffin pan and in the composition pot. It will be readily understood that the

turning plate 31, shown in Fig. 1, which brings the match-holders to the position shown in Fig. 6, has its portions, that are slanted or inclined to engage the rollers 85, arranged in a reverse direction to the plate 26. The slanted or oblique portions 86 and 87 are on plates 89 which are fastened to the top of the body portions 90 on either side of the plate 26, the numeral 26 being used to designate the whole structure, and between the body portion 90 and the plate 89, on either side, is a space through which the ends of the bars 78 pass and are held in position. On the ends of the bars, when they are used in a chain, are the links 91, a link being shown in detail in Fig. 9, and the end of the bar being shown in Fig. 8. One end of the link 91 is provided with a rectangular portion 92 which fits over a corresponding rectangular portion 93 on the end of the bar 78, and the other end of the link has a round perforation 94 which fits over the rounded end 95 of the bar 78, and a nut 96 secures the links on the end of the bar. A stud 97 projects from each end of each bar and is used for propelling the chain on the pulleys 19, the pulley construction being shown in detail in Figs. 10 and 11, the pulley being of any suitable size and substantially flat and having recesses 98 in its periphery, each recess 98 being spaced apart from its adjacent one the distance between the bars 78, and the studs 97 of the bars fit in the recesses 98 in the pulley 19, as will be understood. On each of the bars, and on each side thereof, so as to equalize the strain, are arranged the feeding racks 74 which are shown in Fig. 2 as meshing with the feeding-gears 73 to insure the passage of the carriers through the splint machine at the proper speed and with the proper intermittent motion.

In this specification I have not gone into detail about the method of heating or paraffining the splints or dipping them in the composition, since these steps are well known in the art of making matches, but it will be evident that with this apparatus the splints can be quickly and easily made and fed into the carrier in parallel rows in substantially the same plane, the match-holders or the carriers can then be swung, by means of the turning plate 26, so that the splints are projected with their ends downward to engage the paraffin and also the composition, and after they are dipped, the turning plate 31 swings the match-holders to bring the matches back to their original positions, and they are then dried and led to the unloader.

The apparatus also provides the intermittent take-up loop between the unloader and the splint machine to allow for the difference in the motions of the chain, and the take-up loop 22 equalizes the weight of the

chain when it passes up from the splint machine as at 21 in Fig. 1.

While I have illustrated and described the match-holder or carrier as a chain, it will be readily understood that the holder can be used and manually operated without departing from the scope of this invention.

To provide for a stability at the ends of the match-holders, and to prevent their being turned by the pressure of forcing the splint into the recess 81, I provide a backing-up wheel 99 mounted on a shaft 100 secured to a swinging plate 101 which is pivoted, as at 102, to the side-frames 35 of the splint machine. The backing-up wheel 99 has recesses 103 which permit the passage of the bars 78. The periphery of the wheel, at intervals, as at 104, when the wheel 99 is rotated, comes in register with the ends of the match-holders as shown in dotted outline in Fig. 1, and when the splints are forced in at the ends of the holders, the holders do not back away and are not twisted or strained on the bar 78.

Having thus described my invention, what I claim is:—

1. In a match-making apparatus, a carrier comprising a bar, match-holders suspended from the bar and arranged to swing thereon, levers secured to the match-holders, a transverse bar connecting the levers, and means for operating the trans-

verse bar to cause the match-holders to be swung in unison.

2. In a match-making apparatus, a carrier comprising a bar, U-shaped match-holders suspended on the bar and arranged to swing thereon, a lever on each match-holder, a transverse bar connecting the levers, a roller on the transverse bar, and an element with which the roller coöperates to cause the transverse bar to be shifted and simultaneously swing the match-holders.

3. In a match-making apparatus, a carrier comprising a set of bars transversely arranged and substantially parallel, links connecting the bars, U-shaped match-holders depending from the bars and extending in the direction of the travel of the chain and adapted to swing transversely on the chain, and means for swinging the holders on a bar transversely and upward, each of the holders having notches to receive match splints in the same plane so that when swung upward the splints in the different holders are in different planes.

In testimony, that I claim the foregoing, I have hereunto set my hand this 27th day of February 1911.

WILLIAM H. PARKER.

Witnesses:

C. J. TUCKE,
W. G. JAEGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."