

(No Model.)

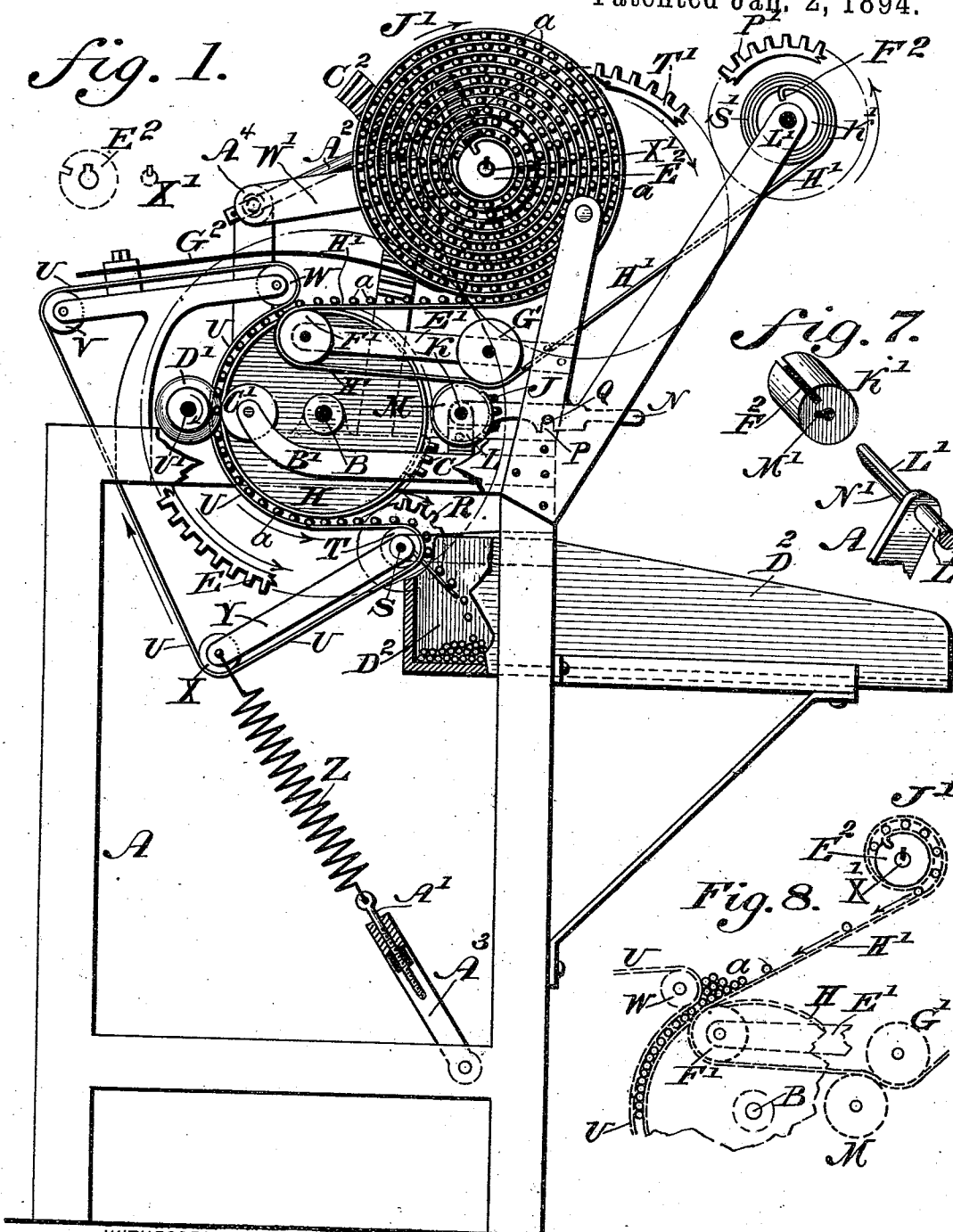
2 Sheets—Sheet 1.

F. SCHAFER.  
MACHINE FOR CUTTING MATCH SPLINTS.

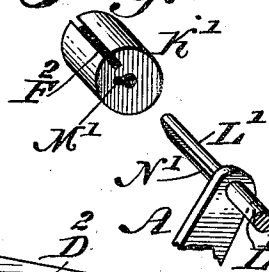
No. 512,062.

Patented Jan. 2, 1894.

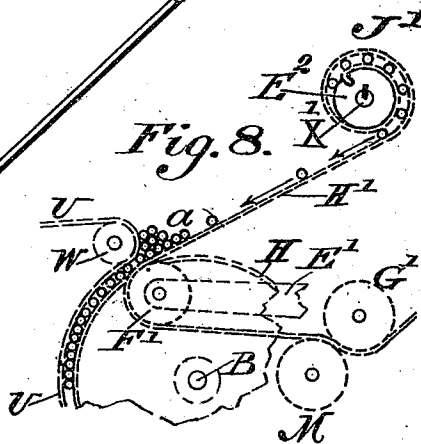
*fig. 1.*



*fig. 7.*



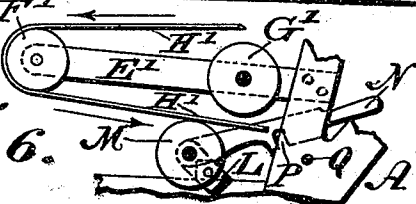
*Fig. 8.*



WITNESSES:

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*fig. 6.*



INVENTOR

Frank Schaffer

BY

ATTORNEY.

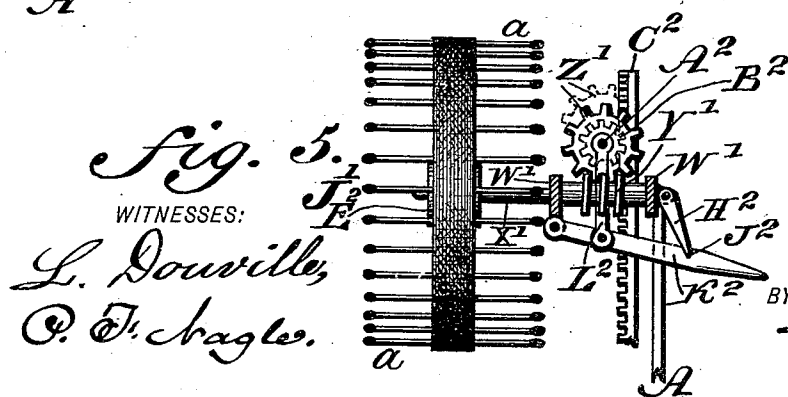
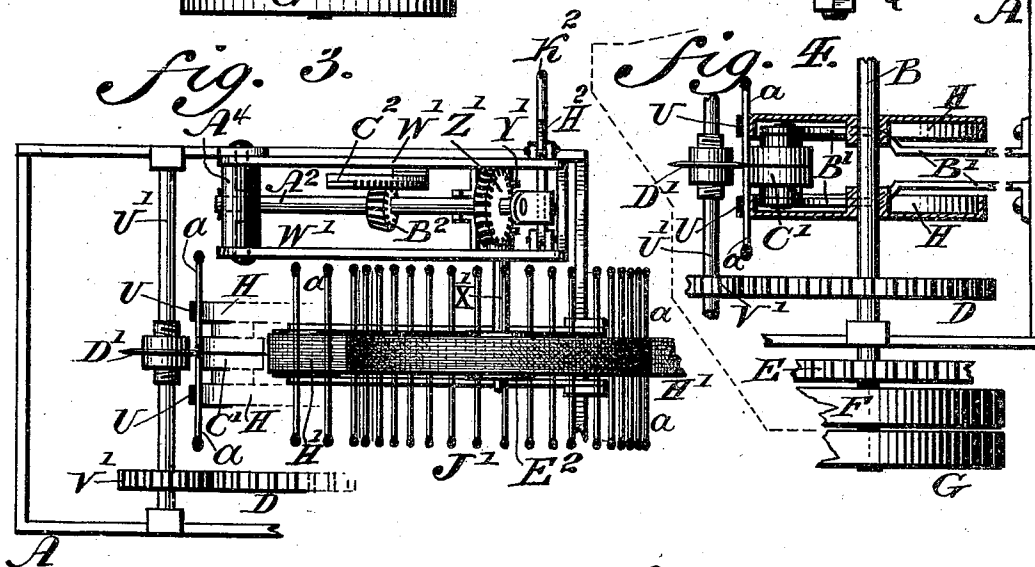
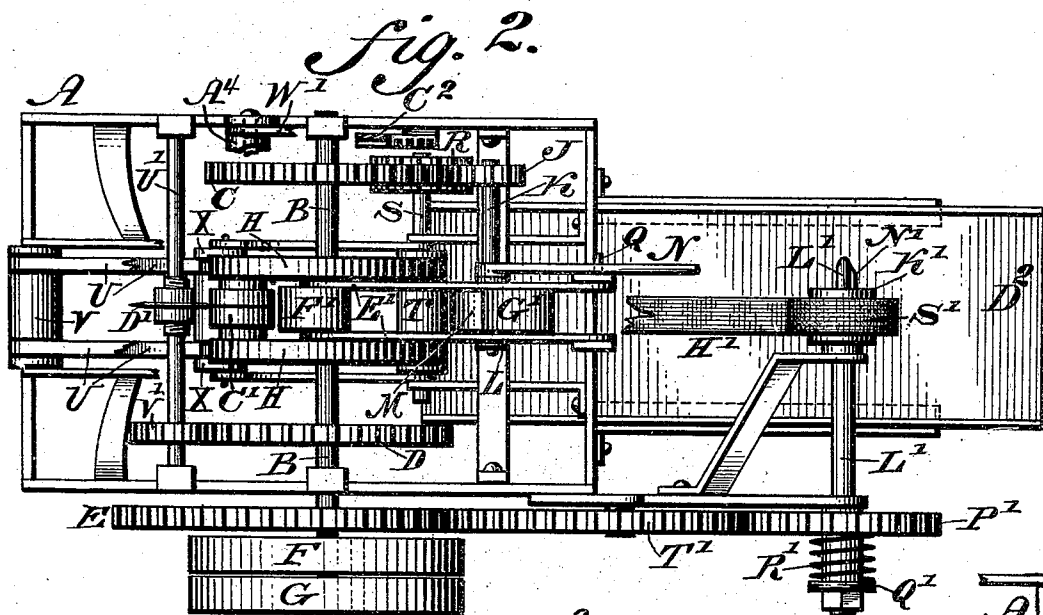
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2 Sheets—Sheet 2.

F. SCHAFER.  
MACHINE FOR CUTTING MATCH SPLINTS.

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Patented Jan. 2, 1894.



INVENTOR  
Frank Schaffer  
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# UNITED STATES PATENT OFFICE.

FRANK SCHAFER, OF PHILADELPHIA, PENNSYLVANIA.

## MACHINE FOR CUTTING MATCH-SPLINTS.

SPECIFICATION forming part of Letters Patent No. 512,062, dated January 2, 1894.

Application filed October 23, 1892. Serial No. 450,305. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK SCHAFER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Machines for Cutting Match-Splints, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of improvements in machines for cutting match splints, embodying novel means for feeding the splints to the cutter, and novel means for causing the lowering of the coil of stick as said coil is reduced in diameter, thus causing the portion of the belt that is unwound from said coil to be placed in horizontal or approximately horizontal position, whereby the splints are prevented from gathering and igniting.

It also consists of details of construction as will be hereinafter set forth.

Figure 1 represents a partial side elevation and partial vertical section of a machine for cutting match splints embodying my invention. Fig. 2 represents a plan view of a portion of the machine. Fig. 3 represents a plan view of a portion of the machine, showing the parts not seen in Fig. 2. Fig. 4 represents a plan view of a portion of the machine, partly sectional. Fig. 5 represents an end view of a portion of the machine, partly sectional. Fig. 6 is a view of a detached portion, with certain parts in different positions from those shown in Fig. 1. Fig. 7 is a perspective view of a detached portion. Fig. 8 is a diagram showing how the splints may improperly gather and ignite.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings:—A designates the frame of the machine, on which is mounted the driving shaft B, which carries the gear wheels C, D, and E, the driving pulley F, the loose pulley G, and the flanged pulleys H. The wheel C meshes with a pinion J on a shaft K, which latter is mounted on a swinging frame L, pivoted to the frame A. The shaft K carries also a friction roller M and a lever N, provided with a recess P which engages a pin Q on the frame A, see Figs. 1, 2 and 6. The wheel C meshes also with a pinion R on a shaft S, the latter being provided

with a roller T, around which pass the belts U, the latter also passing around the rollers V and W, mounted on the frame A, and a roller X, mounted on a swinging frame Y pivoted to the frame A. The free end of said swinging frame Y is connected by a spring Z to an adjustable screw-threaded rod A', fitted in a suitable swinging arm A<sup>3</sup> on the frame A, said spring Z taking up the slack in the belts U, when such exists.

Projecting inwardly from one end of the frame A, are the brackets B', see Figs. 1 and 4, whose inner or free ends occupy a portion of the space between the flanged pulleys H, and carry a roller C', against which works the cutter D', the latter severing the splints a, and producing two matches from one splint, headed at both ends, as shown in Figs. 3 and 4, said roller C' acting as the bed of the cutter D'. Brackets E' projecting inwardly from one end of the frame A, carry the rollers F' and G', it being noticed that the roller F' occupies a portion of the space between the pulleys H, as shown in Figs. 1 and 2, and around these rollers passes the tape H' from the coil J' of matches, said tape being then wound around a roller K' on a shaft L' mounted on the frame A. It will be noticed that the bore of the roller K' is formed with a groove, M', which is adapted to fit a key N' on the shaft L', so that when said shaft rotates, it imparts motion to the roller K'. See Figs. 1, 2 and 7. The shaft L' is provided with a gear wheel P', loosely mounted thereon, and a disk Q' firmly secured to said shaft.

Interposed between the gear wheel P' and disk Q', is a spring R', which transmits, owing to the friction thereof against the sides of said wheel and disk, motion to the shaft L'. The speed of the gear wheel P' is a fixed one, while that of the shaft L' varies according to the diameter of the coil S' of the belt H' on the roller K', for when said coil is started, the roller K' revolves faster than it does when the coil S' is nearing completion. When a different speed exists between the gear wheel P' and shaft L', the spring R' slips, and thus permits the gear wheel P' and shaft L' to revolve at their respective speed, without injury to the machine. The gear wheel P' receives motion from an idler T' driven by the gear wheel E. The cutter D' is mounted on a

shaft U', provided with a pinion V' driven by the gear wheel D.

Mounted on the frame A, is a swinging frame W', provided with a shaft X', which carries a worm Y', engaging a worm wheel Z', mounted on a shaft A<sup>2</sup>, which is journaled at one end in the axle A<sup>4</sup> on said frame, carries a bevel wheel B<sup>2</sup> meshing with a segment C<sup>2</sup> secured to the frame A, the several parts just described, serving to lower the free end of the swinging frame W' at a proper speed relatively to the constantly diminishing diameter of the coil J'.

A tray D<sup>2</sup> secured to the frame A, receives the matches as delivered by the belts U, after being cut, as hereinbefore described.

The operation is as follows:—A roller E<sup>2</sup> supplied with a coil J' of matches, is slipped on the shaft X' of the swinging frame W', whose free end, in which said shaft is journaled, occupies a position near the upper end of the segment C<sup>2</sup>. The bore of the roller E<sup>2</sup> is formed with a groove which receives a key on the shaft X', as shown in dotted lines to the left of Fig. 1, so that when said roller rotates, it transmits motion to the shaft X', which in turn rotates the worm Y' thereon. The worm wheel Z' receives motion from the worm Y', and being secured to the shaft A<sup>2</sup>, rotates the same and consequently the bevel wheel B<sup>2</sup> thereon. As the latter meshes with the segment C<sup>2</sup>, it will either raise or lower the swinging frame W', according to the direction in which the worm wheel Z' rotates. The free end of the tape H' of the coil J', is passed around the roller F', and from thence between the rollers G' and M to the roller K', it being noticed that in order to pass said belt between the rollers G' and M, it is necessary first, to separate them, which is accomplished by raising the lever N, so that its recess P clears the pin Q, when the swinging frame L, is thrown back, carrying with it the roller M, thereby increasing the space between said rollers, see Fig. 6, and permitting the free end of the belt H' to be passed between the same, as shown in Fig. 6, and from this point, to and around the roller K', and then inserted in its groove F<sup>2</sup>. See Figs. 1 and 7. The swinging frame L, is then brought forward, and the lever N thereon lowered, so that its recess P engages the pin Q, thereby retaining the roller M in the position shown in Fig. 1. The rollers G' and M, when in this position, act as feed rollers, and the machine is then in readiness to be started. The tape H', as fed by the rollers G' and M, causes the coil J' to unwind, it being noticed that the speed of the roller M is governed by the gear wheel C and pinion J, so that only a certain amount of the tape H' passes between said rollers, in a given time, as the speed of said rollers is uniform while the machine is in motion. As the coil J' unwinds, the matches therein are carried by the tape H' to the roller F', and at this

point are transferred to the peripheries of the flanged pulleys H, as seen in Fig. 1, and from thence to the cutter D'. The rollers W and T are so located relatively to the flanged pulleys H, as to cause that portion of the belts U thereon, which are adjacent to said pulleys to coincide with their peripheries, as most clearly shown in Fig. 1, see also Figs. 3 and 4, the object of this being to firmly hold the matches against the pulleys H while being cut. The matches as delivered from the coil J', have heads on both ends, see Figs. 3, 4 and 5, and are about double the length of an ordinary match, so that when severed by the cutter D', two distinct matches are formed, and from said cutter they are conveyed by the belts U to the tray D<sup>2</sup> from which they are taken and put in boxes, and are ready for sale. As the coil J' unwinds, it becomes reduced in diameter, and the shaft X' which carries the same, imparts motion to the shaft A<sup>2</sup>, as hereinbefore described. This causes the shaft X' to lower by degrees, so that the portion of the tape H' which is between the roller F' and a point directly beneath the shaft X', will at all times be in an approximately horizontal position, so that the matches which freely rest on said portion of the belt H' will not slip on the same, which would otherwise be the case if the shaft X' did not lower, since there would be a steep incline of said portion of the tape H', when the coil J' is nearing its end, or is of reduced diameter, as shown in Fig. 8, at the right of Fig. 1, and the matches sliding down said incline would accumulate at the bottom of the same, and when held against the flanged pulleys H by the belts U, would be in contact with one another, and likely at any moment to be ignited, and especially so when the cutting is being accomplished, as the heads of the matches would rub against each other. A spring G<sup>2</sup> bears against the under side of the coil J', and is adapted to remove matches that may occasionally adhere to the coil J', and which would in such a case fail to be delivered to the proper part of the machine. When the coil J' has been completely unwound, the shaft X' is at its lowest point, and in order to raise said shaft so as to be in a proper position to receive another coil of matches, a pawl H<sup>2</sup>, pivoted to the swinging frame W' is removed from a recess J<sup>2</sup> in a lever K<sup>2</sup>, pivoted to said frame W'. The lever K<sup>2</sup> is connected by a link L<sup>2</sup>, to the shaft A<sup>2</sup>, which may be elevated, owing to the axle A<sup>4</sup>, so that when said lever is raised, it removes the worm wheel Z' from contact with the worm Y', and thus permits the worm wheel to revolve, without causing injury to the machine. The shaft X' is now raised the desired distance, and the lever K<sup>2</sup> is lowered. The worm wheel Z' and worm Y' then mesh with each other, and the pawl H<sup>2</sup> engages the recess J<sup>2</sup> in the lever K<sup>2</sup>, and thus holding the several parts together, as shown in Fig. 5. The pulleys H are flanged

for providing sufficient width for the belts U to pass around the same, without materially increasing their weight, but to this I do not limit myself.

5 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A machine for cutting match splints consisting of a main frame with a driving shaft thereon, a rising and falling frame attached to said main frame, and having a rotary shaft journaled therein, and adapted to carry a splint coil thereon flanged pulleys mounted on and rotatable with said driving shaft, 15 guiding, feeding and tape rollers journaled on the main frame, below said rising and falling frame a shaft with cutter, gearing substantially as described connected with said driving shaft, and the shaft of the tape roller 20 for operating the latter, and mechanism connected with said driving shaft and cutter shaft for rotating the latter, said parts being combined substantially as described.

2. In a machine for cutting match splints, a 25 main frame, a swinging frame pivoted to said main frame, above the same a shaft journaled on said swinging frame, and carrying a worm, a shaft journaled at one end in the axle of the swinging frame, and carrying a worm wheel 30 engaging said worm, and a bevel wheel engaging a segmental rack on the main frame, a driving shaft in the main frame, mechanism substantially as described connected with said driving shaft and feeding rollers for rotating 35 the latter and feeding and guiding rollers below said swinging frame, said parts being combined substantially as described.

3. In a machine for cutting match splints, a 40 main frame, a raising and lowering frame with a shaft for carrying the splint coil, feeding rollers for drawing off the coil tape, a rotary cutter, flanged pulleys for conveying said splints to the cutter, and a belt for keeping said splints on the said flanged pulleys while 45 being cut, said parts being combined substantially as described.

4. In a machine for cutting match splints, a 50 main frame, a rising and falling frame with shaft for carrying the splint coil, feeding rollers below said second frame for drawing off the splint coil tape, a rotary cutter, mechanism substantially as described for conveying the splints to said cutter, a cutter bed 55 against which the splints are held while being cut, and a spring arm secured to the main frame and adapted to bear against the periphery of the splint coil, said parts being combined substantially as described.

5. A main frame with a driving shaft thereon, a pivoted frame with a shaft having a worm 60 thereon, a shaft journaled on the pivoted frame and having a worm wheel and a bevel gear thereon, a rack on the main frame, a lever secured to the pivoted frame, and linked 65 to the shaft carrying the worm wheel, a pawl

fastened to the pivoted frame, and engaging in a notch or recess on said lever, said parts being combined substantially as described.

6. In a machine for cutting match splints, a 70 main frame, a swinging frame with a shaft for carrying the splint coil, rollers for drawing off the splint coil tape, a cutter, mechanism for conveying the splints to said cutter, belts for holding the splints in place while being cut and for conveying them from the cutter, 75 and a box or trough attached to the frame for receiving the cut splints, said parts being combined substantially as described.

7. In a machine for cutting match splints a 80 main frame with driving shaft, a rising and falling frame with a shaft for carrying a splint coil, feeding rollers below said last mentioned frame for unwinding said coil, flanged pulleys, a rotating cutter and a spring having its ends adapted to bear against the periphery 85 of said coil, said parts being combined substantially as described.

8. In a machine for cutting match splints, a 90 main frame with driving shaft thereon, a rising and falling frame with shaft for carrying the splint coil, feeding rollers journaled in arms on the main frame for unwinding said coil, a rotary cutter, a rotary cutter bed journaled in arms on the main frame, flanged 95 rollers for conveying the splints to the cutter, belts with tension devices for guiding the splints to the cutter, said parts being combined substantially as described.

9. A main frame having a rising and falling frame connected therewith, a shaft on said 100 rising and falling frame for carrying a splint coil, feeding rollers for drawing said coil from said shaft, and a spring connected with the main frame, and having its end bearing against said coil, said parts being combined substantially 105 as described.

10. A machine for cutting match splints consisting of a main frame having a swinging frame pivoted thereto, a shaft on said 110 pivoted frame for carrying a splint coil, feeding rollers for unwinding said splint coil, a driving shaft on said main frame, rotary flanged pulleys for conveying the splints to be cut, a rotary cutter, and a roller against which the splints bear while being cut, a 115 traveling belt for holding the splints against the flanged pulleys, mechanism substantially as described for raising and lowering said swinging frame in accordance with the diameter of the splint coil, a roller for receiving 120 the splint coil, operating mechanism for said roller having a frictional connection with gearing on the driving shaft, and a tray or receptacle for receiving the cut splints, said parts being combined substantially as de- 125 scribed.

FRANK SCHAFFER.

Witnesses:

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A. P. JENNINGS.