

(No Model.)

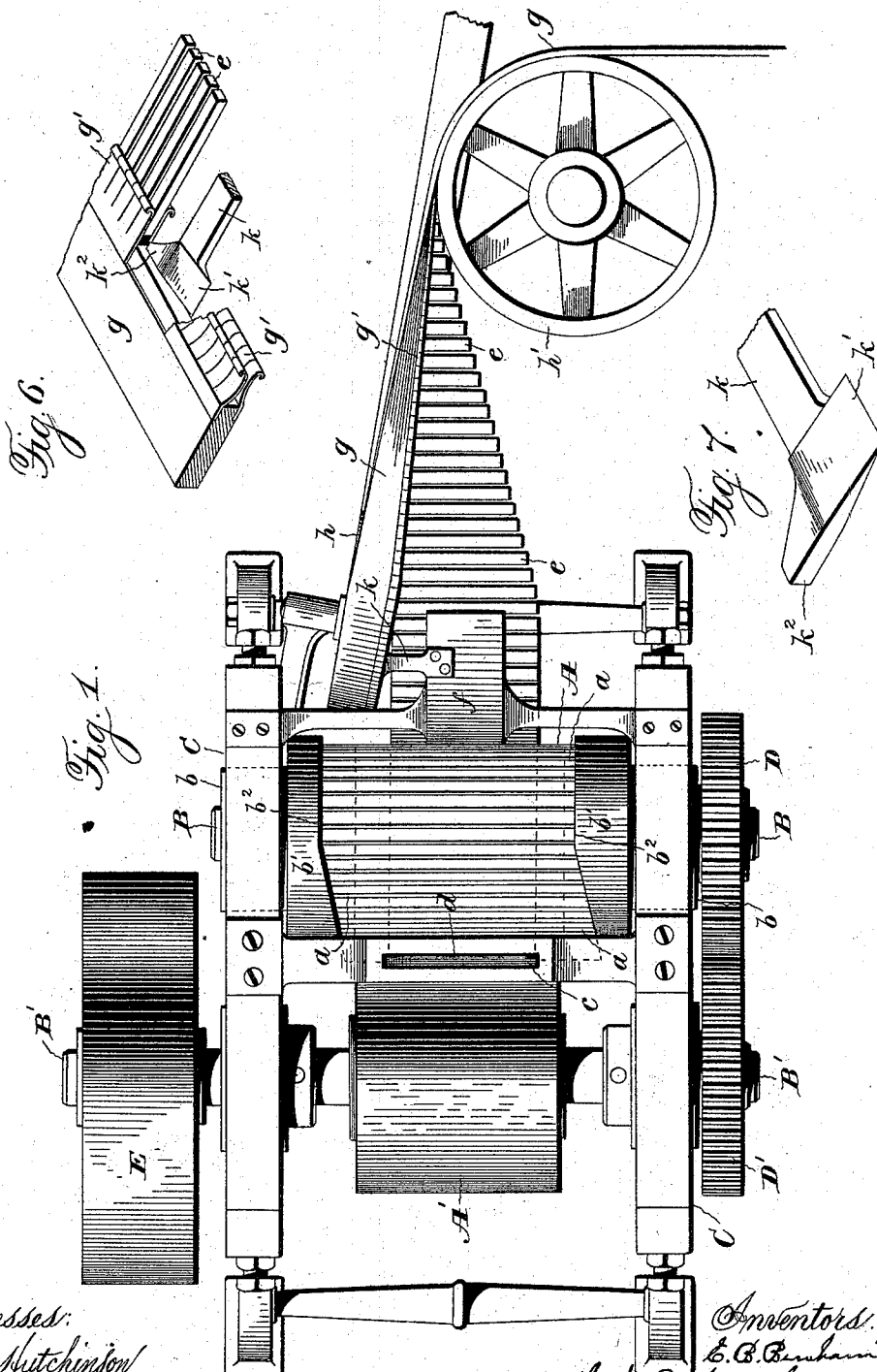
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E. B. BENHAM & H. E. BARLOW.

MACHINE FOR MAKING SPLINTS FOR MATCHES, TOOTHPICKS, &c.

No. 530,382.

Patented Dec. 4, 1894.



Witnesses:
Jas. Hutchinson
Henry C. Hazard.

Inventors:
E. B. Benham &
H. E. Barlow, by
Kimball Russell, their Attys

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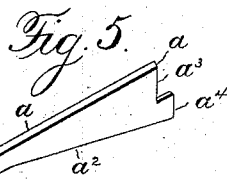
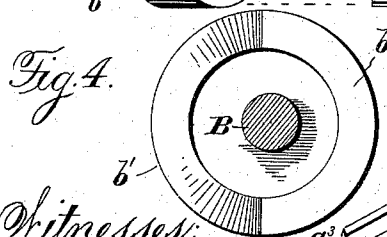
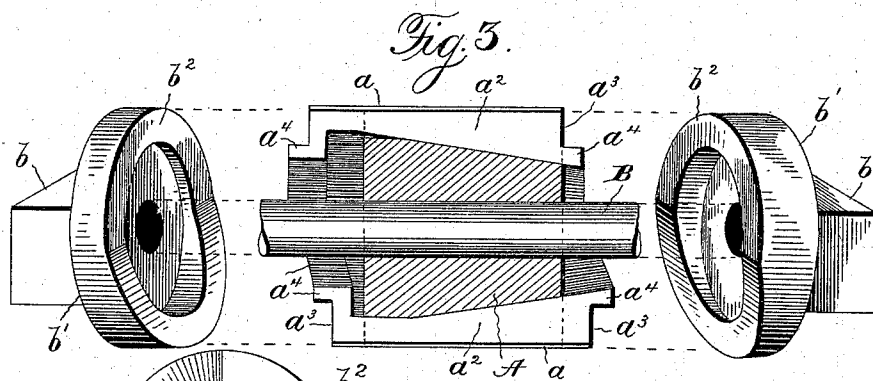
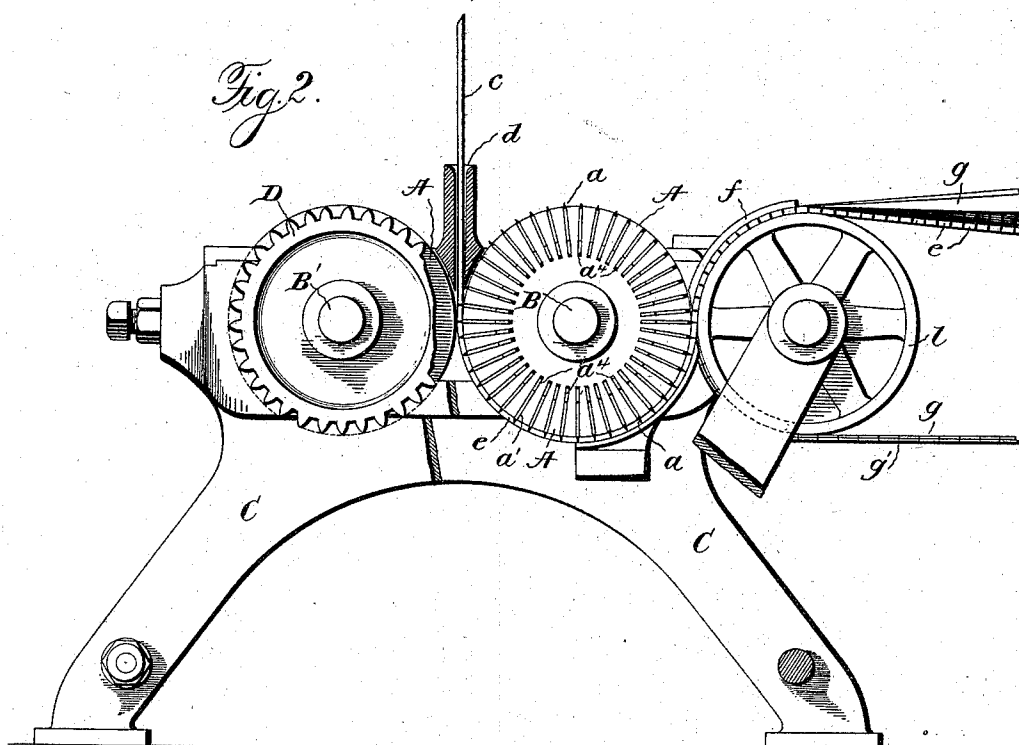
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Prindle & Russell, their Attys

UNITED STATES PATENT OFFICE.

ELIJAH B. BENHAM AND HOWARD E. BARLOW, OF PROVIDENCE, RHODE ISLAND, ASSIGNORS TO THE DIAMOND MATCH COMPANY, OF CHICAGO, ILLINOIS.

MACHINE FOR MAKING SPLINTS FOR MATCHES, TOOTHPICKS, &c.

SPECIFICATION forming part of Letters Patent No. 530,382, dated December 4, 1894.

Application filed September 19, 1893. Serial No. 485,798. (No model.)

To all whom it may concern:

Be it known that we, ELIJAH B. BENHAM and HOWARD E. BARLOW, of the city and county of Providence, in the State of Rhode Island, have invented certain new and useful Improvements in Machines for Making Splints for Matches, Toothpicks, &c.; and we do hereby declare the following specification, taken in connection with the accompanying drawings, forming a part of the same, to be a full, clear, and exact description thereof.

The machine hereinafter described is an improvement upon the machine shown and described in an application for Letters Patent heretofore filed by us, Serial No. 425,635.

The object of the present invention is to produce a machine in which the splints or blanks are severed from a thin strip or veneer of wood by a series of movable knives, to which, if desired, a draw-cut motion may be given.

To that end the invention consists of the arrangement and combination of parts hereinafter described.

Referring to the drawings, Figure 1 is a plan view of our machine. Fig. 2, is a view partly in side elevation, and partly in section. Fig. 3, is a view, partly in section of the knife roll or cylinder, and the cams for operating the same, the parts being shown as separated and detached. Fig. 4 is a detail side view of one of the eccentrics for moving the knives radially. Fig. 5 is a detail perspective view of one of the knives. Fig. 6 is a perspective view of a portion of the carrier belt; and Fig. 7, a detail perspective view of a device for opening the springs of the carrier belt.

The machine consists essentially of two rolls or cylinders A, A', secured respectively to the shafts B, B', said shafts being journaled in a suitable frame C. Only one of these rolls, as A, is a cutter roll, the other roll A' being simply a plain surfaced roll, preferably composed of, or covered with, rawhide, to afford a support for the stock under the action of the cutter roll. The shafts B, B', are geared together by the gears D, D', power being applied to the pulley wheel E secured to the shaft A'. The cutter roll A is provided

with a series of knives *a* radially arranged around the periphery of said roll, as shown in Fig. 1. Each of the knives *a* is arranged in a suitable slot *a'* formed in the face of the roll, and to each of these knives a compound movement is given by mechanism to be described, each of said knives being moved in and out of its slot, that is, toward and from the axis of the roll, and being also moved lengthwise of the roll. By this compound movement of the knives a draw cut is produced.

Each knife *a* is constructed substantially as shown in Fig. 3, its back being inclined for the greater portion of its length, as at *a*², and a portion of the cutting edge being cut away at each end so as to form shoulders *a*³ and projecting lips *a*⁴, as shown. The shaft B of the cutter roll A is mounted in journal bearings *b*, *b*, one at each end of the shaft, which said journal bearings, constructed substantially as shown in Fig. 2, are secured in the frame C. Each of said journal bearings *b* is provided at its inner end with a projecting annular flange *b'*. Into the space inclosed by this flange the projecting lips *a*⁴ of the knives *a* extend, said flanges thereby serving to hold the knives in the slots of the roll A. The inner face of this flange *b'* is eccentric to the axis of the shaft B, so as to permit the knives to be moved successively outward from the axis of the roll at one portion of the revolution of the roll, and to cause them to be returned toward the axis of the roll at another portion of the revolution of the roll. The faces of the flanges *b'* when the parts are in place, abut against the shoulders *a*³ of the knives, and said faces are constructed to form cams *b*² so shaped as to move the knives successively, during the revolution of the roll, lengthwise of said roll, first in one direction and then in the other. Thus said cams *b*² are so shaped that the cam on one of the journal boxes, said cam being stationary, will serve to move the knives successively in one direction as said knives are carried past said cam by the revolving roll, while the cam upon the other journal box, which is likewise stationary, will permit this movement of the knives. Then as the roll con-

tinues to revolve the cam upon the latter journal box will serve to return the knives to their normal position, the cam upon the first named journal box permitting such return movement of the knives.

As already stated the back of each knife is formed at an incline for the greater portion of its length. The bottom of each slot in which the knife is placed is shaped to correspond to the shape of the back of the knife, and so that when the knife is in its normal position lengthwise of the roll, the back of the knife will rest against the back of the slot for substantially its whole length, as shown at the lower side of Fig. 2. When the knife is moved lengthwise of the roll under the action of the appropriate cam b^2 , so as to move said cam from right to left in Fig. 2, the knife will at the same time, by reason of the inclination of its back and of the bottom of the slot, be moved outward from the axis of the roll, and so that its cutting edge will be caused to project beyond the surface of the roll, as shown at the upper side of Fig. 2, this compound movement of the knife serving to produce a draw cut.

The operation of the parts above described will be readily understood. A strip or veneer of wood c is fed down through the guide d and between the two rolls A, A' . When now power is applied to revolve said rolls the knives a will be successively operated as above described, that is, each knife in turn will be moved lengthwise of the roll and at the same time be moved outward from the axis of the roll against and through, or nearly through, the strip of stock, this combined movement serving to cut or sever a splint or blank e from the strip by a draw cut, the roll A' acting as a support for the stock under the action of the knives. Each knife after severing a splint from the strip remains in its outward position during a considerable portion of the revolution of the roll, and each splint after being severed is deposited in the space formed between the knife which severed it and the next knife in advance which still remains projected, as shown in Fig. 1. The splints or blanks are held in the spaces between the knives sufficiently firm to be carried around with the roll until such time as the knives are withdrawn into their slots and thus from between the splints. The cam and eccentric for returning the knives to their normal position may be timed to effect this withdrawal of the knives at any desired point in the revolution of the roll. As shown in the drawings, the cam and eccentric are timed so as to complete the withdrawal of the knives from between the splints at a point approximating one hundred and eighty degrees or so from the point where the splints were cut. At or near this point a stripper f is arranged to insure the delivery of the splints from the roll.

If the mechanism above described be employed for forming splints for toothpicks, and

if it be desired to print upon the splints, a type wheel and ink roll may be located below the roll A together with suitable mechanism for operating the same, as shown and described in our said prior application, the type wheel being arranged to print upon each splint as it is held in the space between two adjoining projecting knives, and when said splint is at its lowest position in the revolution of the roll A . The splint will be supported against the action of the type wheel by the surface of the roll A against which it rests.

If the machine be employed for making toothpicks upon which no further operation is to be performed, the splints or completed picks, when stripped from the surface of the roll A by the stripper f , may simply be allowed to fall into a delivery trough or into any suitable receptacle placed to receive them. If the machine be employed, however, for forming splints for matches, for instance, which require to be subsequently treated or coated at the ends with igniting material, the splints as they are stripped from the roll A may be delivered to an endless traveling belt to be carried thereby to the dipping solution. Any suitable form of delivery and conveying mechanism may be employed for this purpose. A novel and efficient form of such mechanism is shown in the drawings. An endless belt g is provided upon one edge and throughout its length with gripping springs g' arranged as shown in Fig. 5. This endless belt passes over a pulley h mounted upon a suitable arbor, and preferably arranged somewhat at an angle as shown in Fig. 4, thence around a horizontal pulley h' , to turn the splints from a horizontal to a vertical position, and thence to and around other pulleys not shown in the drawings. Secured to the stripper f is an opener k having a wedge-shaped blade k' terminating in a narrow thick heel k^2 , as shown in Fig. 6. The blade of opener is arranged between the springs g' of the endless belt, and so that as said belt travels along, the wedge-shaped portion k' serves to open the successive pairs of springs g' , and the heel portion k^2 holds said springs apart. This opener k is so arranged with relation to the path of travel of the splints as they are delivered from the roll A that the springs g' will be held open as the endless belt approaches and reaches the path of travel of the splints, and so that each pair of the open springs g' will embrace the end of one of the splints, and so that as the heel portion k^2 is withdrawn from between said springs they will grip and hold the splint by its end.

A guide roll l is preferably employed, arranged as shown in Fig. 1, to serve, in connection with the curved stripper f , to guide and support the splints until they are gripped by the springs of the endless belt.

By this construction and arrangement of parts the splints as they are delivered from the roll A will be automatically delivered to

and held in the endless belt by their ends, and so that they may be thereby carried to, and their free ends dragged through, the dipping solution.

5 What we claim as our invention, and desire to secure by Letters Patent, is—

1. In combination with a roll having in its periphery a series of longitudinal slots, a series of knives movably mounted in such slots, means for reciprocating the knives as the roll revolves, means for moving them outward, radially, on the roll as they move longitudinally in one direction, and surfaces eccentric to the axis of the roll to return the knives toward the axis of the roll, substantially as and for the purpose specified.

2. In combination with a roll having in its periphery a series of longitudinal slots, a series of knives movably mounted in such slots, 20 cams engaging bearings on opposite ends of such knives so as to reciprocate the latter as the roll revolves, cams engaging the knives to move them outward radially on the roll as they move longitudinally in one direction, 25 and surfaces eccentric to the axis of the roll engaging portions of the knives to return the latter toward the axis of the roll, substantially as and for the purpose shown.

3. In combination with a roll having in its periphery, a series of radial longitudinally extending slots, knives movably mounted in the latter, having faces on their backs or inner sides engaging inclined faces on the roll which force the knives radially outward on the roll 35 as they are moved longitudinally in one direction, cams at opposite ends of the roll engaging bearings on the knives to reciprocate the latter longitudinally as the roll revolves, and eccentric surfaces adapted to engage 40 bearings on the knives and carry the same radially inward toward the axis of the roller, substantially as and for the purpose specified.

4. The combination with a roll provided with a series of radially arranged slots, the bottoms of which are formed at an incline for a portion of their length, of a series of knives mounted in said slots, the backs of said knives being likewise formed at a corresponding incline for a portion of their length, whereby 50 as said knives are moved lengthwise of said roll in one direction they will be forced outward from the axis of said roll and means for reciprocating the knives longitudinally, substantially as described.

5. The combination, with a roll provided with a series of radially arranged slots, the bottoms of which are formed at an incline for a portion of their length, and a series of knives mounted in said slots and with their backs 60 formed at a corresponding incline, of a cam arranged to move said knives successively lengthwise of said roll in a direction to cause said knives to be also moved outward from the axis of said roll, substantially as described.

6. The combination with a roll provided

with a series of radially arranged slots, the bottoms of which are formed at an incline for a portion of their length, and a series of knives mounted in said slots and with their backs 70 formed at a corresponding incline, of journal bearings for said roll, each of said journal bearings being provided with an eccentric ring embracing the ends of said knives and with a cam face acting upon said knives, whereby as said roll revolves the knives 75 mounted therein will first be moved lengthwise of said roll in one direction, and will be at the same time moved outward from the axis of said roll, and then as the roll continues to revolve will be returned to their normal 80 position, substantially as described.

7. In combination with a splint cutting mechanism, a carrier consisting of a belt having along one edge series of couples of clamping springs projecting beyond such edge, and 85 means for guiding such belt so that the splints as delivered from the cutting mechanism, have their ends passed in between the clamping springs, substantially as and for the purpose specified. 90

8. In combination with a splint cutting mechanism, a carrier consisting of a belt carrying a series of pairs of clamping springs, means for guiding such belt so as to bring 95 such pairs of springs successively in position to receive the ends of the splints as they are delivered from the splint cutting mechanism, and an opener to spread apart the clamping springs, situated so as to spread the springs where the splints are fed to the same, substantially as and for the purpose shown. 100

9. In combination with a splint cutting mechanism and means for delivering the cut splints therefrom, a traveling belt guided at an angle to the line of travel of the splints 105 from the cutting mechanism, so as to approach the side of such path while traveling in the same general direction as the splints, a series of pairs of splint-receiving clamps on the belt, and an opener to open such clamps at the 110 point where they meet the path of the splints from the cutting mechanism, and then allow them to close on the splints between them, substantially as and for the purpose set forth.

10. In combination with a splint cutting 115 mechanism, a splint carrier to which splints are delivered from said cutting mechanism, consisting of a belt that has splint clamps which are normally closed by spring pressure, and an opener comprising a relatively 120 fixed part in the path of the carrier as it moves toward the place of delivery from the cutting mechanism, that engages and opens the clamps, as the carrier moves, substantially as and for the purpose specified.

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Witnesses:

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