

G. PERNET-JOUFFROY.  
Machine for Cutting and Stamping Matches.

No. 208,100.

Patented Sept. 17, 1878.

Fig. 1.

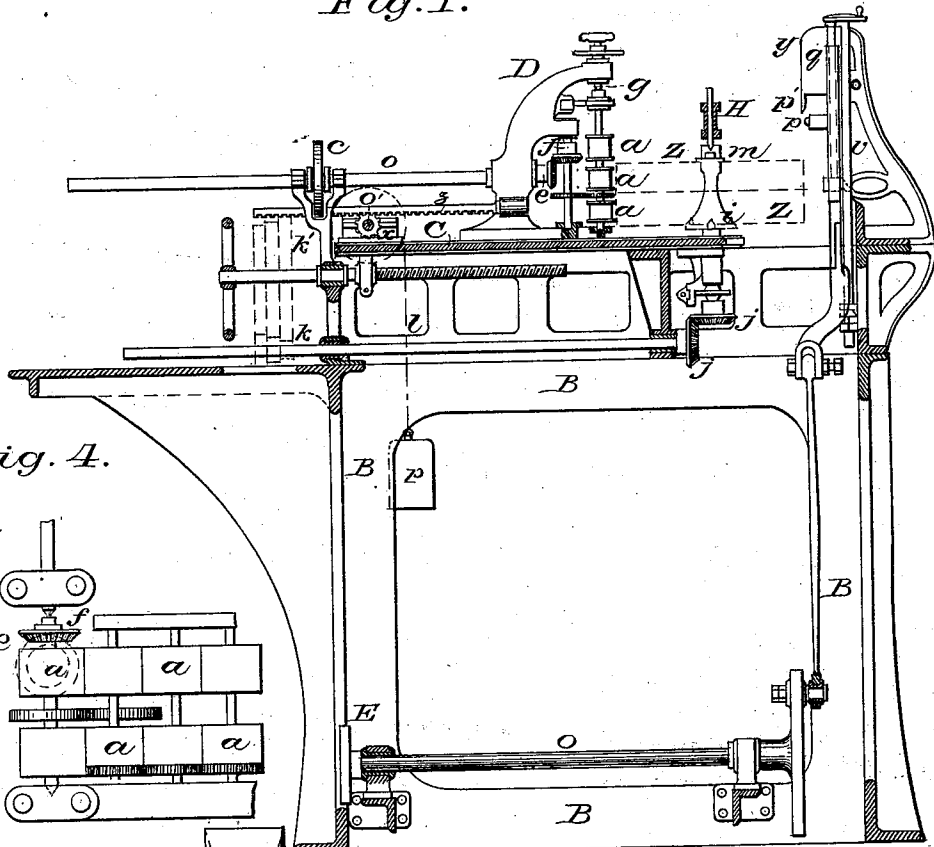
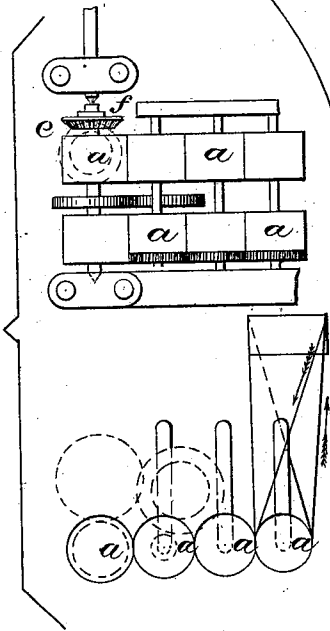


Fig. 4.



Witnesses:

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By atty *Wm. E. C. C.*

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Fig. 2.

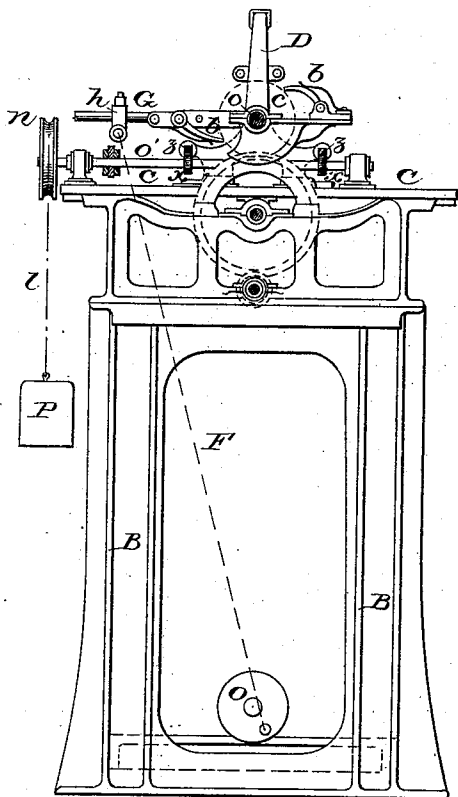


Fig. 3.

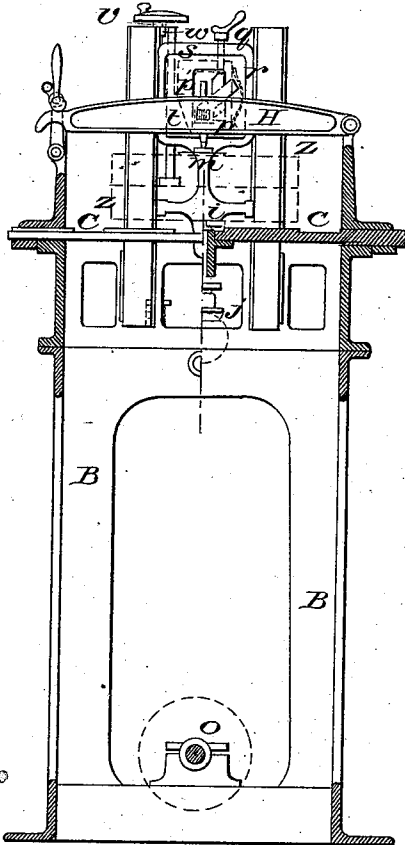


Fig. 5.

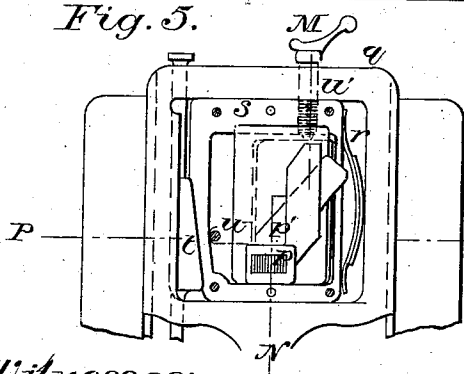


Fig. 6.

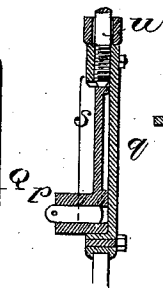
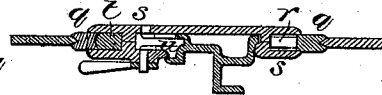


Fig. 7.



Witnesses:

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# UNITED STATES PATENT OFFICE.

GABRIEL PERNET-JOUFFROY, OF CHALON-SUR-SAÔNE, FRANCE.

## IMPROVEMENT IN MACHINES FOR CUTTING AND STAMPING MATCHES.

Specification forming part of Letters Patent No. **208,100**, dated September 17, 1878; application filed February 25, 1878.

### *To all whom it may concern:*

Be it known that I, GABRIEL PERNET-JOUFFROY, of Chalon-Sur-Saône, France, have invented an Improved System of Cutting and Simultaneously Stamping Matches and other articles, of which the following is a specification:

The object of this invention is to stamp or mark matches simultaneously or consecutively with the operation by which they are cut; and the invention essentially consists in combining, with the cutting-tools, means of impressing or producing on the matches, before or after being cut or while being cut, marks or words which may serve either to register the manufacture or as means of advertising or otherwise. The stamping or marking might be effected by brands embossed in intaglio or in relief; but this method, which cuts into the match or depresses it too much, would injure it and would not produce sufficient distinctness. For these reasons I prefer to impress or print in colors, and I effect the impression with a stamp which carries the mark or type, or by means of rollers or rolls engraved in relief or in intaglio, and acting by blows, pressure, or rolling.

My mode or system of stamping the matches can be applied to the existing machines employed in making matches; but, in order the better to carry out the object, I have designed a special machine for the purpose—that is to say, for simultaneously cutting and stamping matches.

There is a roller or roll engraved on its periphery with signs, figures, letters, or words, and itself serving to draw the block of wood from which the blades cut off the matches, following a spiral displacement of the said block. This drawing-roller impresses the wood before it is cut. It is therefore important for the cut to be made exactly in the middle of the vertical space which separates two successive inscriptions. With whatever care the machine may be constructed, it is impossible that the cut can be mathematically between the impressed lines. For this reason the attendant should shift the blade-carrier in one direction or the other, so that the cut produces matches stamped exactly in their middle. In short, there should be absolute concordance

between the impression and the cut, which are produced by independent devices separated from each other. This is an indispensable condition if the stamped matches are to come into general use, and it is this condition which I produce by the addition to the blade-carrier of a regulating apparatus, which the attendant can easily work as required, and while the machine is in operation.

My machine for cutting and stamping matches is represented in the annexed drawings.

Figure 1, Sheet I, is a longitudinal elevation; Fig. 2, Sheet II, an end view; Fig. 3, Sheet II, a transverse section.

The machine is composed of a fixed frame, B, supporting at one end the vertical frame B', on which the blade-carrier works. On the table of the frame B a carriage, C, can move, which carriage carries the turning block of wood.

As this block is cut and its diameter diminishes it ought to gradually and regularly approach the cutting-tools. On this movable frame C, and opposite the said tools, is the impressing-cylinder. It turns in the support D, necessarily movable on the frame C, as it must always be in contact with the block Z, and therefore approach its center in proportion to its being cut. These different movements are effected in the following manner: The driving-shaft O carries a crank-plate E, which by the rod F actuates the lever G, furnished with two pawls, b, for causing the ratchet-wheel c to advance by degrees. This latter is connected to the shaft o by a key, but the shaft can slide in the boss of the wheel c. It carries a pinion, e, which gears with a pinion, f, of the shaft, from which connection is made to the shaft carrying the rollers a, and so as to cause the said rollers to intermittently rotate. This shaft can receive one or more superposed rollers for impressing one or more superposed blocks of wood, Z. The roller-shaft is held at its lower end in a socket, and at its upper end by a pressure-screw, g. The superposed rollers a are each provided with one or more drawing or driving disks, and each has an inscription, and they may either be all alike or have varying inscriptions, according to the purpose required—for ex-

ample, for registering the manufacture, or for a trade-mark for advertising, &c.

For varied inscriptions I can especially employ, instead of rollers engraved by hand, mechanically-engraved or cast type-rollers, constituting by their combination a printing-form. The dimensions of the rollers and of the characters thereon can be varied according to the size of the matches or articles cut.

The inking of the rollers is effected automatically by means of a set of rollers and of an endless band taking the ink from a special reservoir arranged on the carriage C. This arrangement is shown separately in Fig. 4, Sheet I. It is repeated as many times as there are impressing-rollers, and can be divided into as many colors as the inscriptions comprise.

The drawing-disks of the rollers can at the same time be blades, sawing or cutting the match in the case in which the wood is presented in the block, and not in washers or disks previously cut and superposed. The drawing-disks can also be utilized for impressing. The relation of the gearing of the wheels *d* and *f* and the dimensions of the teeth of the wheel *c* are calculated so that the displacement of one tooth of the wheel *c* causes the block *Z* to advance a distance equal to the thickness of a match. For six ordinary matches the angular advance of the wheel *c* is about twenty degrees. In order to vary this angular displacement at will the rod *F* is jointed to the lever *G* by a movable cap, *h*. On the other hand the position of the pin of the crank-plate *E* can be varied, so that there is a double way of adjusting. The angular displacement given to the wheel *c* is transmitted to the rollers *a*, which by their drawing or impelling disks cause the blocks of wood to turn while impressing or stamping them. The rotation of the block of wood causes its proper advance. For this purpose the pointed disk *I* is fitted to a vertical shaft, on which a pinion, *j*, is keyed, gearing with a pinion, *j'*, the shaft of which carries pinions *k*, gearing with the wheels *k'*. The pinions and wheels are of different diameters, which allows of varying at will the speed of advance of the nut of the carriage on the screw *l*, with the object of making matches of variable thicknesses.

The blocks of wood are held at their upper part by a pointed disk, *m*, centered beforehand, held by the socket of a beam, *H*, Fig. 3, which is jointed at one end and secured at the other by an eccentric handle. The upper and lower pointed disks can vary in size to suit the diameter of the block or washers of wood.

The weight *P*, the string of which is rolled upon the pulley *n* secured to the axle *o'*, serves to press the printing-rollers *a* against the blocks *Z* by means of the pinions *x* gearing with the racks *z*.

The impressing-roller may be made to act independently of its use as a driver, and also at any point of the circumference of the wood.

I will now proceed to describe the driving of the cutting-tools. These tools comprise a

set of vertical blades or knives, *p*, arranged according to a mean radius of the block *Z*, and another, *p'*, also vertical, at a direction tangential to the block, or at right angles to the first. I thus cut at each motion of the blade-carrier a row of several matches of practically square and regular section, and it will be understood that by this means the curve according to which the block of wood is cut is not strictly a spiral curve. It is rather according to a regular spiral polygon with a very large number of sides that the block is cut.

The cut matches are lifted by the blade-carrier, which places them in a chute, *y*, from which they fall loosely into a suitable box or holder.

The regulating mechanism, the necessity for which I have already explained, is shown separately in greater scale by Sheet II. Fig. 5 is an elevation. Fig. 6 is a vertical section on line *M N*, and Fig. 7 is a horizontal section on line *P Q* of Fig. 5. It is arranged as follows: The blade-carrier *g*, the form of which is analogous to a large cross-head, carries a frame, *s*, forming a slide. A key, *t*, which can be raised or lowered, shifts the frame *s* horizontally, which frame is constantly pushed by the spring *r*. The blade-carrier is fixed in the horizontal direction by means of a bolt, *u*, and in the vertical direction by a screw, *u'*, with broken thread, whose nut is formed in the frame *s*, and which is actuated by a simple quarter-turn, and allows of promptly changing the blade-carrier in case of need. The key *t* engages, by a dovetail, in a corresponding mortise of the carrier *g*. It is terminated at top and bottom by a swelled part. As long as the cutting is produced normally in the movements of the blade-carrier the two ends of the key are at an equal distance from two corresponding surfaces of a regulator, but without meeting them. This regulator consists of a threaded rod, *v*, engaged in a fixed nut, *w*, terminated by two horizontal surfaces, between which the key *t* can abut. It is worked by a handle fixed to the threaded rod. If a deviation takes place between the regular normal planes of cutting and the planes of the blades—that is to say, if the cut is not made strictly in the middle of two consecutive impressions or stamps—the attendant works the regulator so as to raise or lower it slowly. The key, which is graduated, follows the movement, and consequently, from the displacement of the frame *s* which results therefrom, the regular cutting between the impressions is re-established.

My machine will naturally vary according to the requirements of the cutting, the nature of the wood, and other causes. Thus various ways of cutting may be used—for instance, a blade cutting the wood as for veneering, or an endless saw cutting the wood into strips capable of being simultaneously or consecutively divided into matches by blades or saws. This mode of cutting involves a turning, or, more strictly speaking, a sort of unwinding of the wood according to a spiral movement, and the unwound cut wood can be taken hold of

and drawn between impressing-rollers. The matches can thus be stamped on several faces and be better held and directed in the dipping operations, &c.

As I have already stated, the object of my invention is to stamp the matches simultaneously or consecutively with the operation which cuts them. The stamping may be effected by brands or marks embossed in intaglio or in relief, but preferably by printing in one or several colors with any suitable compositions, and this by means of a stamp carrying the device or by type or by engraved rollers acting by blow-pressure or rolling; or the stamping or impression may be produced by rollers, pads, or brushes and stencil-plates.

The application of my invention is not limited to matches only. It can be applied to tooth-picks, spills, wood for pencils, shavings or strips of wood for match-boxes, and to any articles of wood or other material capable of being cut and stamped simultaneously.

I am aware that machines have been made

for printing and cutting railway-tickets, &c., from a strip, and therefore do not wish to be understood as making any claim to such a device.

Having now described the nature of my said invention and in what manner the same is to be performed, I declare that I claim—

The combination, in a machine for cutting match or other sticks, of a device for holding and rotating the block from which the splints are to be cut, an intermittent stamping or printing device, with cutters operating to cut the printed or stamped sticks from the said intermittently-rotated block, substantially as described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

G. PERNET-JOUFFROY.

Witnesses:

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