No. 615,611. Patented Dec. 6, 1898.

R. L. & E. DUNFORD & G. EMENS.

MATCH BOX, STAND, OR RECEPTACLE HAVING AUTOMATIC STRIKING ACTION.

(Application filed Aug. 13, 1897. Renewed Nov. 1, 1898.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

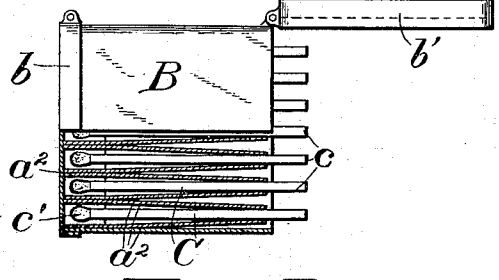


FIG. 4.

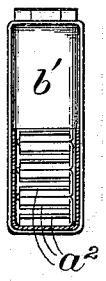


FIG. 3.

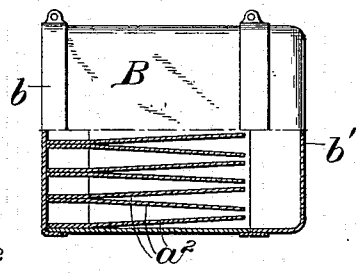


FIG. 2.

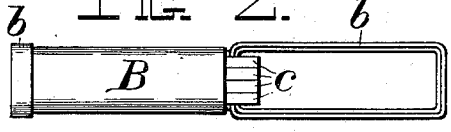


FIG. 5.

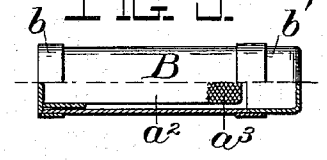


FIG. 6.

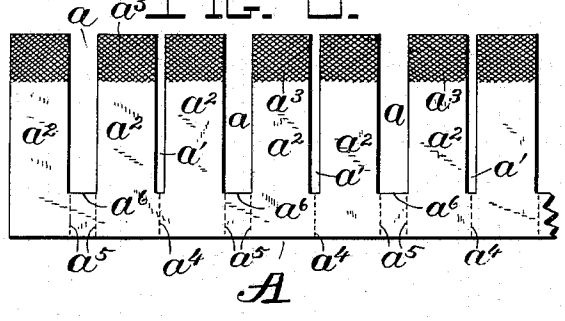


FIG. 7.

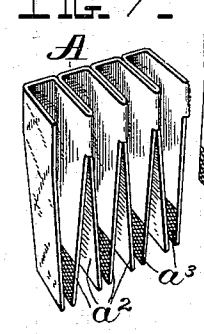


FIG. 8.

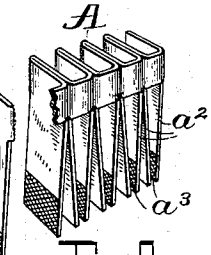


FIG. 9.

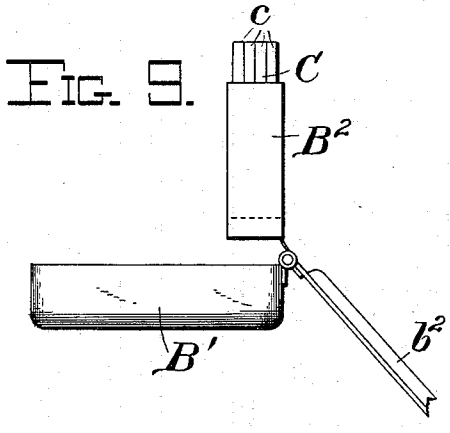
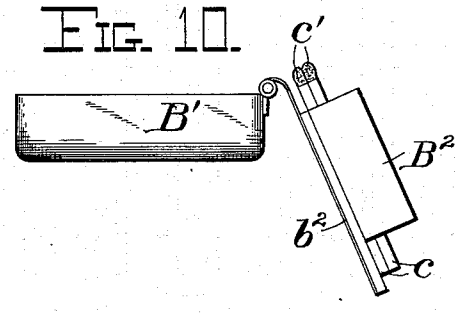


FIG. 10.



Witnesses

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Fig. 15.

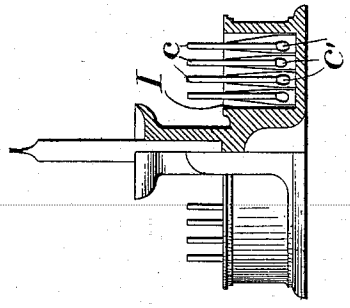


Fig. 16.

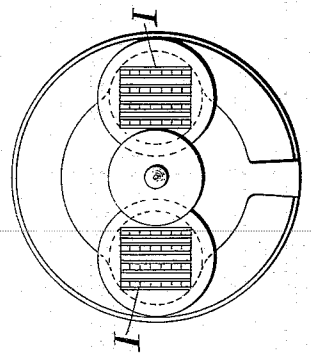


Fig. 13.

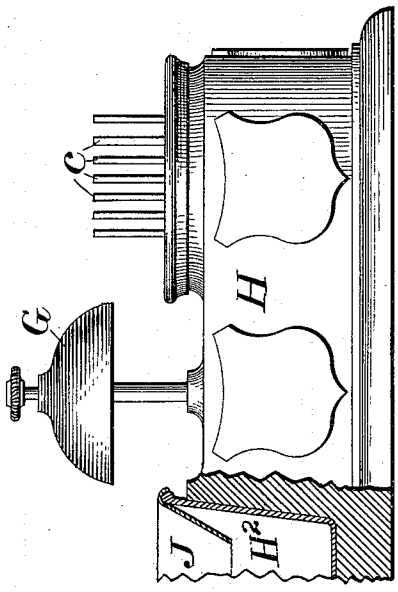


Fig. 14.

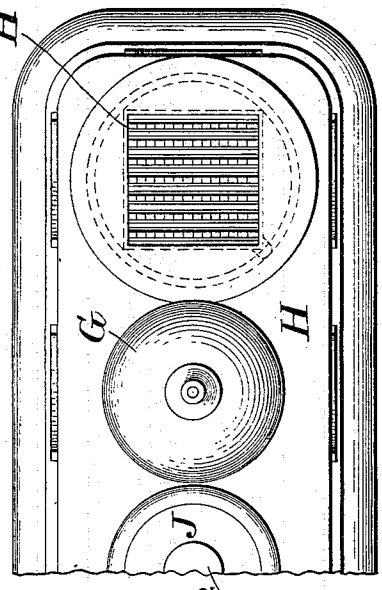


Fig. 11.

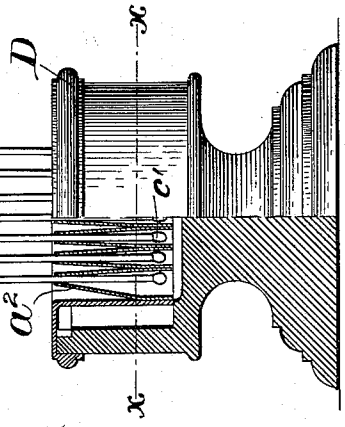
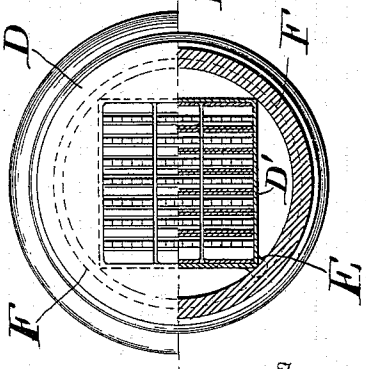


Fig. 12.



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UNITED STATES PATENT OFFICE.

ROBERT LAIDLAW DUNFORD AND ERRINGTON DUNFORD, OF NEWCASTLE-UPON-TYNE, AND GEORGE EMENS, OF HETTON-LE-HOLE, ENGLAND.

MATCH BOX, STAND, OR RECEPTACLE HAVING AUTOMATIC STRIKING ACTION.

SPECIFICATION forming part of Letters Patent No. 615,611, dated December 6, 1898.

Application filed August 13, 1897. Renewed November 1, 1898. Serial No. 695,244. (No model.)

To all whom it may concern:

Be it known that we, ROBERT LAIDLAW DUNFORD and ERRINGTON DUNFORD, of the city of Newcastle-upon-Tyne, in the county of Northumberland, and GEORGE EMENS, of Hetton-le-Hole, in the county of Durham, England, subjects of the Queen of Great Britain and Ireland, have invented certain new and useful Improvements in Match Boxes, Stands, or Receptacles Having Automatic Action, of which the following is a specification.

Our invention relates to certain improvements in the construction of ordinary and pocket match boxes, table, or other match stands, receptacles, or containers, portable or fixed, in which the action of withdrawing a match causes it to be ignited with perfect safety against accident, either by igniting the remaining matches (as sometimes occurs with ordinary match-boxes) or by particles of the striking composition flying off and inflicting personal injuries, and prevents the serious loss incurred in public bars, smoke-rooms, and like places by live matches being carried away, each match being ignited as it is drawn out, and there is no necessity for external striking-surfaces, for which mantels, walls, &c., are often misued, and thereby disfigured.

According to our invention the matches are contained in a series of "holders," and these series of holders being filled with matches are fitted into the match box, table, or other match stand or receptacle in such manner that when required the holders can be readily refilled, either in position or by being withdrawn, when the table or other stand or receptacle is fixed. Each receptacle, cell, or division contains one or more matches, which are filled in at the end and pushed forward till the igniting end is level with the inner end, when the shank will be projecting above the top of the holder sufficiently to be grasped by the finger and thumb to draw out any match, and each match is grasped between the spring-jaws of its holder, the inner surfaces of which are suitably prepared, so as to ignite the matches as they are drawn through the spring-jaws, either by friction in ordinary matches or by a chemical preparation applied to the inner surfaces in the case of "safety-matches." The series of spring-holders may be disposed in a variety of forms within the match box, stand, or receptacle to suit the varying shapes of same. Thus they may be in longitudinal or transverse series or concentric rings in rectangular, circular, oval, hexagonal, octagonal, or other polygonal receptacles, so as to contain the greatest possible quantity of matches.

The match-holders may be formed to receive any convenient number of matches and of any number of series preferably by stamping, rolling, or other process forming them into corrugated or trough-shaped strips, which can be cut off to any required size to form one of the series.

The match-holders may be made of any suitable material, according to price, such as aluminium, copper, brass, tin, steel, or iron in thin sheets or strips, or wire-gauze, or of vulcanite, cardboard, papier-mâché, wood-chip, or pulp having sufficient spring action, and in case of pocket match-boxes the outer case may be of gold, silver, silver-gilt, or electro-plated metals, aluminium, pure or as bronze and chased or oramented to any extent, or they may be of wood-chip, as ordinary match-boxes, or for table or wall stands, fixed or portable, may be of earthenware, china, porcelain, or of any metal, cast or otherwise, produced of any shape and ornamented or plain.

Referring to the accompanying drawings, in which like letters of reference designate the same parts in the several views, Figure 1 represents a side elevation, half in section, of a pocket-box, showing the lid open and the box filled with matches. Fig. 2 represents an edge view of the same. Fig. 3 represents a side elevation, half in section, of a similar match-box, showing the lid closed and the box empty. Fig. 4 is a top view of the same, half of the lid being shown in section. Fig. 5 is an edge view of the same, also shown half in section. Fig. 6 represents an elevation of the blank from which the holders are formed after being cut out and roughened before folding. Fig. 7 is a perspective view of a portion of the holder inverted, showing the same after folding. Fig. 8 is a similar view of the same, looking at the opposite side to that shown in Fig. 7. Figs. 9 and 10 are edge views of a modified form of box, showing the

same in different positions. Fig. 11 is a side elevation, half in section, of a modification in which the holder is placed in a stationary vase; and Fig. 12 is a view of the same, half in plan and half in horizontal section, on the line $x\,x$ of Fig. 11 and looking upward. Fig. 13 is a side elevation, partly in section, of another modified form of stand adapted for a bar-counter, smoking-room table, or the like; and Fig. 14 is a plan view of the same. Fig. 15 is a side elevation, half in section, of the device applied to a candlestick; and Fig. 16 is a plan view of the same.

Our invention consists, essentially, of a blank A, of resilient material, cut or stamped in the form of a continuous strip slotted transversely partially across its width with alternately wide and narrow parallel slots a and a', respectively, as shown in Fig. 6. The leaves a^2 are roughened, as indicated at a^3, preferably by perforating the same. The blank is then folded flat upon itself along the dotted line a^4 at each of the narrow slots and folded at right angles along the dotted lines $a^5\,a^5$ at the edges of each of the wide slots, the leaves being then bent toward each other over the part a^6 at the base of the wide slots, thus forming the holders, as shown in Figs. 7 and 8. The folded blanks or holders are then placed in the match-boxes, as shown in Figs. 1 to 5.

The match-boxes, as shown in Figs. 1 to 5, are formed of a case B, open at both ends and provided with a hinged bottom b and a hinged top b'.

To fill the match-box, the bottom b is opened and the matches C inserted between the spring-leaves a^2, so that the sticks c will extend above the top of the casing and the heads c' will remain in the bottom between the folds of the blank A. The leaves a^2 are sufficiently resilient to retain the matches C in the position shown, and when a match is withdrawn by grasping the end c of the stick the head c' is drawn through between the leaves a^2, (which are folded so that their roughened sides press against the matches,) the friction caused thereby igniting the match as it is drawn out.

Figs. 9 and 10 show a form of box B′ in which only one hinged lid is required, and thus the construction is much simplified. Here the match-case B^2, containing the holders, is hinged upon the match-box B′, so as to be inclosed in it, and the hinged lid b^2 closes the box till a match is required, when the lid b^2 is turned back, and the case B^2 is turned upward a quarter-circle, as in Fig. 9, leaving the match ends exposed. When the holders require to be recharged, the case is turned till it rests in the cavity of the lid b^2, as shown by Fig. 10, when the holders are replenished and the box is again closed. In an alternative form the holder and the lid b^3 may be hinged on the side instead of the end of the box B′. The holders thus formed out of a continuous ribbon or strip of metal slotted at intervals and folded, as hereinbefore described, will combine the essential considerations that they can be cheaply produced, be neat, and light in weight, and have sufficient elasticity to yield when a match is withdrawn, at the same time grasping the head of the match with sufficient force to cause it to ignite by the friction created in pulling out the match. These holders may be of any desired length and may be used not only in a continuous length, but may be folded together in parallel sections. The elasticity of the said holders will enable them to be held in suitable inclosing cases or boxes by their own tendency to extend after being slightly compressed, as in being fitted into such cases or boxes.

The striking prepared surface is indicated by the shaded lines on Figs. 6, 7, and 8 and will be such as to ignite ordinary matches or those called "safety-matches" by special composition. The required roughness of the striking-surfaces for igniting ordinary matches may be produced by parallel or crossing ridges; but in order to keep the spring-jaws of the holders free from being fouled with the igniting substance left behind we propose to perforate them, like the surface of a nutmeg-grater, with small holes, through which the powder will pass and fall between the holders.

The other forms in which our invention may be brought into practical use are numerous, such as for fixed receptacles on tables, counters, brackets, or like supports. The main receptacle in such cases may be of any ornamental shape externally and arranged to receive the match-holders, so that they can readily be inserted when charged and withdrawn to be replenished, the holders being divided into sections following the form of the receptacle, which may be rectangular, circular, oval, hexagonal, octagonal, or any other shape, and the external surfaces may be used for advertising purposes. In some cases the match-holders may be arranged around the outside of the receptacle, and the inner portion may form a stand for a gong or bell, as for a table, or the holders may be arranged to form part of a bedroom-candlestick, which will thus always have matches at hand.

Figs. 11 and 12 show, respectively, an elevation and plan of a vase D to stand on a table, desk, or the like and may be fixed. Fig. 11 is in section on the left hand, and Fig. 12 in plan, the upper half looking on top and the lower half on line $x\,x$, Fig. 11, looking upward. D′ is the square holder-case, which fits into a circular cavity provided in the vase of such diameter as to clear the corners of the case D′ and is secured therein by a horn E, which enters a circular groove F, and being turned around either way is fastened and in the same manner released to be recharged.

Figs. 13 and 14 show a match-stand H, adapted for a bar-counter, smoke-room table, or the like, to which it may be fixed. Here a gong or bell G is fitted at the center, and

at one end is a holder-case H', secured in the stand, as before described with reference to Figs. 11 and 12, and at the other a receptacle H^2 for burned matches, &c., concealed by a hopper J, or another holder-case for additional matches may replace this.

The stands may be of any suitable material, as carved wood, metal, (cast or sheet,) earthenware, china, or the like, and the sides may be ornamented and used for advertisements.

Figs. 15 and 16 show our invention applied to a bedroom-candlestick, (shown of china,) the "spring-holders" fitting into cases I, sunk in cavities and withdrawn to be refilled, and requires no further description.

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

1. In a match-holder, the combination with an inclosing case, of an inner holder composed of a continuous strip of resilient material slotted transversely from one side edge partially across said strip and folded at right angles at the side edges of said slot, and having the portions of said strip upon opposite sides of said slot bent toward each other in an inclined position; the said strip thus folded being fitted into said inclosing case, substantially as described.

2. In a match-holder, the combination with an outer case; of an inner holder composed of a continuous strip of resilient material slotted transversely partially across its width with alternately wide and narrow parallel slots, and folded flat upon itself throughout at each of said narrow slots, and folded at right angles at the two side edges of each of the said wide slots; and the portions of said strip upon opposite sides of each of said wide slots being bent over toward each other in an inclined position; the said strip thus folded being fitted into said outer case, and adapted to hold matches between said inclined portions thereof, substantially as described.

3. A match holder and igniter composed of a continuous strip of resilient material slotted transversely partially across its width and folded upon itself coincident with said transverse slots; the portions of said strip between said transverse slots being inclined toward each other in pairs; and the inner faces of each of said pair of inclined portions being roughened to cause the ignition of the head of the match when drawn therefrom, substantially as described.

4. In a match safe, holder, or cabinet, the combination with a match holder and igniter composed of a continuous strip of resilient material slotted transversely partially across its width from one side thereof, and folded upon itself coincident with said transverse slots in a zigzag manner; the portions of said strip between said transverse slots being inclined toward each other in pairs and roughened upon their inner faces; of an inclosing case adapted to hold said folded strip therein and allow access to both ends of the match-cells, substantially as described.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

ROBERT LAIDLAW DUNFORD.
ERRINGTON DUNFORD.
GEORGE EMENS.

Witnesses:
WILLIAM DAGGETT,
JASPER RICHARDSON.