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# UNITED STATES PATENT OFFICE.

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## MATCH-LIGHTER.

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*To all whom it may concern:*

Be it known that I, JESSE J. WILLINGHAM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Match-Lighters, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to match lighters. Its object is to provide a simple, economical and durable device of this character, easily operated with one hand to automatically ignite, hold and drop matches stored therein one at a time, the burning match being held outside the box in safe and convenient position for lighting.

In the accompanying drawings, I have shown a device, embodying my invention, in one of its preferred forms.

Figure 1 is a top plan view of the device as it appears when the lid of the upper compartment or match receptacle is raised. Fig. 2 is a top plan view, the partition separating the upper from the lower compartment, being removed to reveal the match grip in its inactive position. Fig. 3 is a similar view showing the match grip in active position, the match being held outside the box. Fig. 4 is a view partly in plan and partly in section of the match grip and Fig. 5 is a sectional view on line 5 of Fig. 2, illustrating my preferred means of removably securing the striking or sandpaper surface.

In the drawings, A indicates a box made of some light rigid material, such as sheet metal, wood or the like, divided by a partition *b* into upper and lower compartments B and C, the upper adapted to hold a store of matches, vestas, tapers, or the like, and provided with an open top, having a suitable lid or cover 6, so that the supply of matches may be replenished when necessary, and the lower adapted to contain the longitudinally slidable swinging match grip D and striker E. The lower compartment has two openings, opening *e* cut in an end wall of the box and prolonged into the side wall thereof, through which the rear or operative end of the match grip D projects with ample space for its swinging and sliding motions and an opening *f* on the opposite side wall near the opposite end wall, through which the forward or grip end of D is adapted to be thrust to present the lighted match outside the box. In partitions *b* is cut a nar-

row slot *g* adapted to permit a single match to drop through it from the upper to the lower compartment with its head or tip forward. The rear portion of this slot is located directly over and in registration with the area occupied by a channel *h* cut in the grip D when the latter is in its inactive or normal position.

The match grip D includes a main frame 7, having a slot 8 intermediate the center and rear end thereof on the side opposite opening *f*, through which projects a pin 9 rigidly fastened at one end to the bottom of box A, the rear or operative end projecting through opening *e*. The length of the grip and of slot 8 and the position of the parts as shown are such that when the operator swings the grip upon the above described pivotal and longitudinally slidable connection, the lower end thereof is swung in a curve and pushed outside the box through the deliver opening *f*. This operation is preferred against tension normally tending to pull the grip back into the compartment C and under slot *g* into the inactive or normal position. I prefer to accomplish the return swinging motion by constructing an eye 10 on the side of frame 7 adjacent to opening *e* near the operative or rear end thereof, attaching thereto one end of a spring 12, the other end of which is secured to a lug 11 in the box located so that complete retraction will swing the grip D into this inactive or normal position. Coacting with the spring 12 is a spring 20 secured to an eye in the rear of frame 7 and to block 22, mounted on a slidable plunger *i* in channel *h* the spring 20 pulling on pin 9 through a cord 25, secured at one end to a lug 24 in block 22, passing over a pulley 23 in the forward end of frame 7 and secured at the other end to pin 9. These parts are so arranged (Fig. 3) that during the return swinging motion the spring 20 causes the grip to slide on pin 9 rearward until arrested by the forward end of slot 8, and complete retraction of the spring 20. In this inactive position, the channel *h* is below the rear portion of slot *g* so that a match, dropping through the latter will fall with its rear portion resting in channel *h* and its tip extending somewhat beyond the forward end of grip D. Substantial projection of the tip of the match beyond the forward end of the grip is further insured by the action of the sliding plunger block 22. This block, longi-



nally movable in channel *h* is attached to a plunger *i* inserted through an orifice in the rear of frame 7, its rear end projecting beneath button 15, by which it is moved in conjunction with the action of cord 25 above described, as well as by the retraction of spring 20. Frame 7 has a hollow or recess 13, extending from end to end and also open at one side into channel *h*. Sliding freely within this recess is a grip bar 14, having a shank 14<sup>a</sup> at its rear end, about which is coiled a spring 33.

The rear end of frame 7 is cut out at 34 as shown in Figs. 2 and 3 and the shank 14<sup>a</sup> prolonged beyond the rear surface 16, 16<sup>a</sup> of the frame, terminating in a finger push button 15. One end of spring 33 rests on the frame 7 in 34 while the other contacts with the button 15. The tension of spring 33 is adapted to hold apart the surfaces 16, 16<sup>a</sup> and rear end of plunger *i* from the button 15, the parts being so arranged that the forward sliding motion of bar 14 is made against tension and arrested by contact of the button 15 with surfaces 16, 16<sup>a</sup>. The rearward or return sliding motion of 14 is limited preferably by providing the shoulder 17 on the rear of bar and prolonging pin 9 to serve as a stop back of it, thereby preventing the bar from being pulled out of the recess 13 rearward. It will thus be seen that the bar 14 has a longitudinal play within recess 13 limited by block 17<sup>a</sup> and shoulder 17 and by button 15 and surfaces 16, 16<sup>a</sup>. Bar 14 has also a lateral movement so as to form a match grip between the side wall of channel *h* and a side of bar 14 when button 15 is pressed down against 16 and 16<sup>a</sup>. I prefer to provide a cam surface 18 on the side of the bar opposite the channel *h* and to secure within recess 13 a curved spring 19. The cam 18 and the curve of spring 19 are similarly inclined and adapted to push bar 14 sidewise to narrow channel *h* when button 15 is pressed toward the box, holding the bar yieldingly or elastically supported in this position until button 15 is released. A curved striker E is provided within the compartment C, located so as to contact with the match tip as the match is swung into the opening *f*. I prefer to provide removable ignition surface by constructing the striker with a curved support or strip back 26 turned over the edges to form lips 27 and 28 (Fig. 5) to guide the strip of sand-paper or other roughened surface removably inserted therein.

In order to close the slot *h* when channel *g* is withdrawn from beneath it, I provide a thin swinging plate *k* adapted to turn in an arc alternately to open and close the slot. The forward end of this plate is provided at opposite sides with lugs 29 and 30. The arc, in which this plate swings, is limited by a side of box A and a stop 35 so that lug

30 is in the path of and adapted to contact with pin 31 on the lower end of bar 14 when plate *k* is swung under opening *h*, while the return motion of D swings the plate away from *h* as soon as channel *g* is brought into registration (Fig. 1) the lug 29 lying in the path of pin 31 to engage the same and draw plate *k* under *h* as grip D is swung away. The swinging motion of D is also limited by block 32 on the bottom of box A.

The operation of my device is as follows: Compartment B being supplied with matches and the parts in the position shown in Fig. 2, one of the matches falls through opening *h* into channel *g*. The operator clasps the box in one hand and presses upon button 15 against the tension of spring 33, thereby forcing bar 14 longitudinally within recess 13. This causes cam 18 to ride upon the curved surface of spring 19 to crowd the lower end of bar 14 sidewise into channel *g*, thereby clasp ing the match between it and the opposite wall of the channel. Frame 7 slides along pin 9, the length of slot 8 simultaneously crowding plunger block 22 against the butt of the match in channel *g* to adjust and force it out into contact with striker E. At the same time, plate *k* has been swung under opening *h* to close it, and pin 31 and lug 29 disengaged. The operator continues to swing the grip D thus rubbing the tip of the match sharply on the striker surface and bringing D against block 32. The parts thus assume the position shown in Fig. 3, presenting the lighted match outside the box through opening *f*. The finger of the operator is now removed from button 15, whereupon the tension of spring 33 separates cam 18 and spring 19, unclasping the burned match, thereby allowing it to slide out of the channel *g*, while simultaneously the tension of springs 12 and 20 swing the grip D back into normal position, sliding it along pin 9, while pin 31 engaging lug 30 turns plate *k* away from beneath opening *h* and permits another match to drop there-through into the channel *g*.

I am aware that many modifications of my invention will suggest themselves to those skilled in the art and I do not wish to be understood as limiting myself to the form shown and described, but

What I claim is:

1. In a match lighter, a swinging match grip, a slot therein, a pin rigidly secured at one end of said box and projecting through said slot, the operative end of said grip projecting through an opening in said box, whereby said grip may be swung on said pin as a pivot and slide thereon the length of said slot substantially as and for the purposes described.

2. A match lighter having a partition dividing it into upper and lower compartments, a slot in said partition, adapted to



allow matches in said upper compartment to drop one at a time into said lower compartment, and a swinging match grip slidably mounted therein adapted to clasp a match fallen through said slot, one end of said grip projecting through an opening in said box, whereby a match delivered to said grip may be swung within said compartment and projected through said opening substantially as described.

3. In a match lighter, a box compartment, a match grip pivotally and slidably mounted therein, a channel in said grip, a plunger in the rear of said channel, a spring adapted to draw said plunger rearward, a cord attached to said plunger and to a pin at the pivotal point of said grip, a spring attached to the rear of said grip and to said box, said springs being adapted to draw said channel into normal position in registration with the rear portion of a slot in the top of said compartment when deflected therefrom.

4. In a match lighter, a grip frame having a longitudinal channel on its upper surface adapted to receive a match, formed between a rigid wall and movable bar, a movable bar secured in said frame to slide therein longitudinally and swing laterally to narrow said channel, elastic means for withdrawing said bar to restore said channel to normal size, and yieldingly supported means adapted to narrow the same by crowding said bar laterally toward said rigid wall, whereby a match inserted in said channel may be alternately locked and unlocked between said bar and wall for the purposes described.

5. In a match lighter, a box divided into two compartments, a partition having a slot through which matches stored in one compartment drop into the grasp of a swinging grip, a swinging grip pivotally mounted in the other compartment with capacity for longitudinally slidable motion therein,

means on said grip, operated from without said box, for clasp ing a match so delivered in said grip, swinging it against a striker and presenting it through a delivery opening, a delivery opening, a striker and means operated by said grip for alternately opening and closing said slot.

6. In a match lighter, a box divided into two compartments by a partition having a match delivery slot therein, a swinging grip pivotally and slidably mounted in one of said compartments, having a channel normally held in registration with the rear portion of said slot, means on said grip, operated outside said box, for grasping the rear portion of a match delivered through said slot into said channel, closing said slot, swinging the match against a striker and presenting it through a delivery opening in said box, means on said grip for automatically dropping the match when said first mentioned means are released returning said channel to normal position and opening said slot, a striker and a delivery opening in said box substantially as described.

7. In a match lighter, a box compartment having a slot, a match grip adapted alternately to swing under and away from said slot, a swinging plate adapted alternately to close and open said slot, provided with right and left hand forward lugs, and a pin on said grip adapted when said grip is swung away from said slot to engage the left hand lug and swing said plate beneath the slot to close it and when said grip is swung under said slot, to engage the right hand lug and swing said plate away from slot to open it substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

JESSE J. WILLINGHAM.

Witnesses:

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