

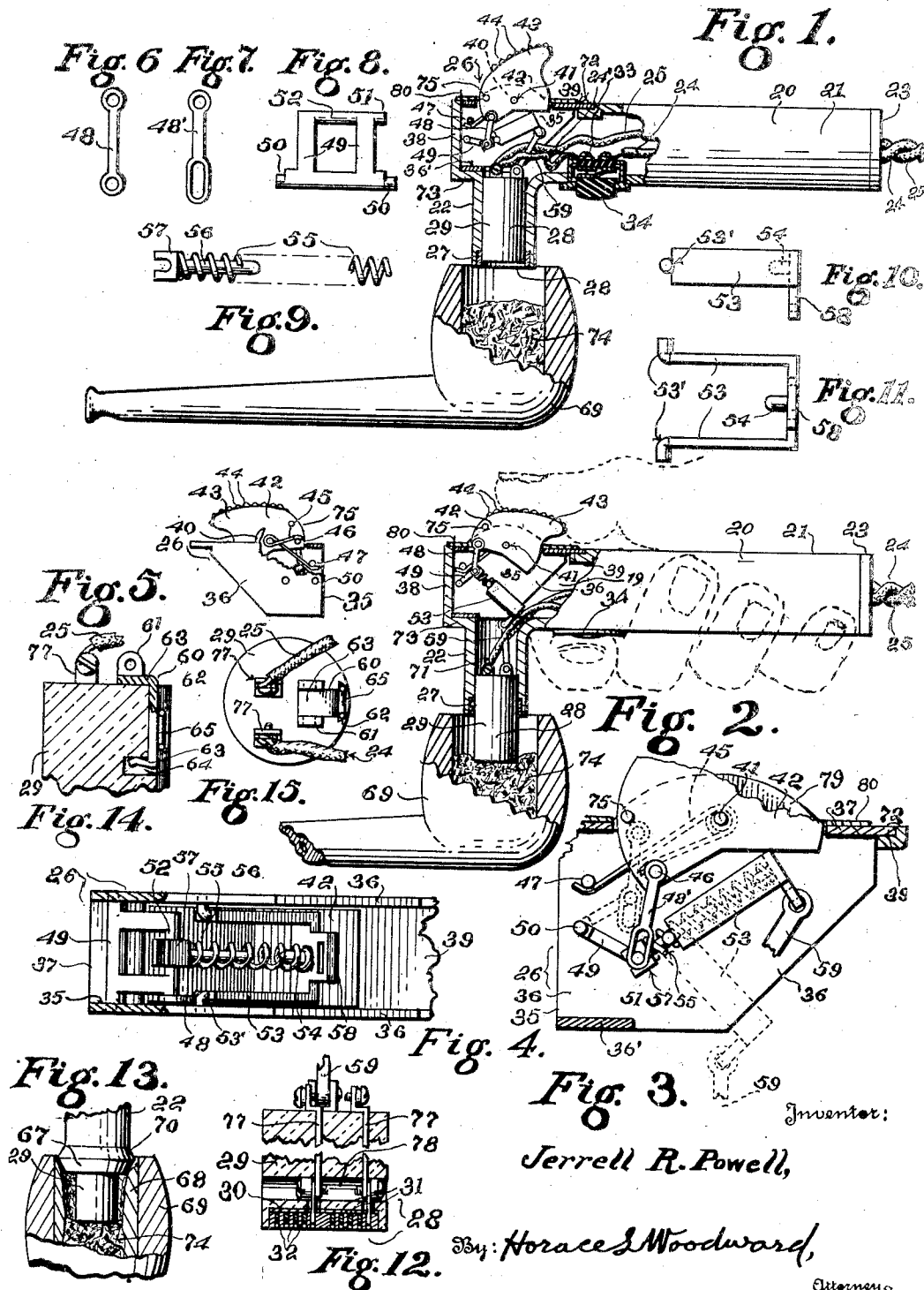
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COMBINED CIGARETTE AND PIPE LIGHTER

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COMBINED CIGARETTE AND PIPE LIGHTER

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9 Claims. (Cl. 219—32)

The invention relates to cigar, cigarette and tobacco lighters and particularly aims to present a device adapted to combine these uses.

It is a special aim to evolve a novel mechanical device having an electrical heating element extensible, by simple manipulation, into a pipe bowl, to properly contact and ignite the tobacco at whatever level it may be therein. It is also an important object to present a novel and simple device to effect proper extension of the heater or igniter element with a minimum effort on the part of the operator, without requiring electrical propulsion. One accomplishment of the invention is the perfection of a portable lighter which may be operated with greater certainty in lighting tobacco pipes by reason of certain novel functions contributing to effective contact of the heater element with the tobacco in the pipe, and yet may be utilized without diminished utility in lighting cigars and cigarettes.

An important object is to evolve a novel and useful mechanical movement applicable to this device and to other uses: for instance, where an implement or tool is to be extended and retracted to engage work or for other purposes.

It is an important object to evolve novel coordination of parts in the operation of an electrical switch and a heater projection means.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts constituting the invention, as a whole, as will appear from the following description and accompanying drawing, wherein

Figure 1 is an elevation partly in section of a pipe and my lighter initially presented thereto for ignition of the tobacco charge.

Figure 2 is a similar view showing the lighter operated for ignition.

Figure 3 is an enlarged sectional view of the operative unit removed from the holder, and also showing a possible modification.

Figure 4 is a bottom view of the structure of Figure 3.

Figure 5 is an elevation of the unit in Figure 2 from the opposite direction with parts broken away.

Figure 6 is a detail of the main link of Figure 2.

Figure 7 is a similar view of the main link of Figure 3.

Figure 8 is a detail of the outer toggle link.

Figure 9 is a detail of the spring and pin of the inner toggle link.

Figure 10 is a side view of the base member of the inner toggle link.

Figure 11 is a bottom view of the last mentioned member.

Figure 12 is an enlarged fragmentary section of the heater unit.

Figure 13 is a detail of a modification of the heater mounting engaged with a pipe.

Figure 14 is a detail of a possible construction of the heater and its operative and electrical connection.

Figure 15 is a top view thereof.

There is illustrated a lighter comprising a case 20 including a cylindrical tubular handle part 21 having an L extension 22 at its outer end, the whole being formed of a suitable material such as Bakelite or other synthetic gum, or other material found suitable. The end of the handle distant from the L 22 is closed by a plug 23 apertured and suitably adapted to receive and support the lead-in wires 24—25 from a suitable electrical source, not shown.

The case may be flattened or otherwise shaped at the junction of the handle and L to provide a chamber open opposite the L to receive snugly between its sides an operating unit 26, secured in the case in any approved manner and is open at the upper side between these flat parts from the outer end to a line inwardly on the handle a distance beyond a projection of the L, affording a good access opening for assembly and repair.

The outer end of the L 22 is reinforced by a metal ring 27 set permanently therein and serving as a bearing for a heater unit 28, engaged slidably in the L extension. This heater unit consists of a cylindrical slide body 29 of porcelain or other good insulating material, having a circular recess 30 in its lower end in which there is set a coil 31 of suitable resistance material. This body is of the same length as the L 22, and has a reciprocating movement approximating half its length. The heater is preferably of ribbon section, wound in a spiral or other form together with a slightly wider strip 32 of mica or other proper material, whereby an insulation is formed between the coils and the greater width of the mica projected at the lower side forms a guard by which tobacco will be held from direct contact with the material 31, minimizing accumulation of carbon on the coil. The ends of the coil may be extended upwardly through suitable passages in the slide 29, and connected respectively to the wire 25 and a slack wire 24' led from a switch 33 set in the handle at the lower side near the L 22. This switch is a simple normally open push button switch of any approved manufacture having the button 34 exposed slightly be-

yond the surface so that it may be pressed by a finger of the hand of an operator grasping the handle while the thumb is extended over the operating unit opposite the L, as will be described. The wire 24 is connected to the lead-in terminal of this switch.

The operating unit as here embodied is adapted to be assembled complete and set in the case simultaneously with the sliding heater unit after all parts are properly connected. It consists of a frame 35 of sheet metal plate bent to form two parallel side plates 36 between and upon which the operative parts are mounted, these plates being connected by flat top wall parts 37. The side plates have inwardly turned bottom flanges 36' at their lower edges parallel to the top wall and extending from the end wall 38 of the outer end of the handle. The lower edges of the side plates may be cut away from the bases of these flanges 36' so as to extend diagonally inward and upwardly beyond a projection of the L a distance at the top of the case, and the top wall 37 of the frame may have a lip 39 extended slightly over and set in a part of the top of the case shaped for that purpose and this may be utilized for a permanent or removable fastening by which the frame is held in the case. The junction of the inner side of the L and the lower side of the case is rounded as illustrated.

The frame is formed with a rectangular top opening flush with the side plates and stopping short of the ends of the frame sufficiently to afford proper transverse connecting material. Midway of the length of this opening upstanding ears 40 are formed on the side plates, apertured to receive a pivot pin 41 carrying a finger piece 42 or operating member in the form of a segment of a cylinder concentric with the pin and of a width and radius to lie close to the sides and ends of the top opening in the frame so that the opening is always closed. On the finger piece there is an extension or knob 43 to facilitate movement of the finger piece by pressure longitudinally of the case, and its outer face may be knurled or ribbed, as at 44.

The finger piece is normally held in initial position as shown in Figure 1 by a torsion spring 45 engaged around the pin 41 within a suitable recess at the right hand side of the piece, one arm of the spring engaging an eccentric pin 46 at the lower part of the piece toward the end wall 38, while the other arm of the spring is extended to a pin 47 connected between the upper parts of the side plates 36.

Below the finger piece a snap-action toggle link device is mounted between the plates 36 the middle pivot of which is connected to the before-mentioned eccentric pin 46 by a draw-link 48 located at the opposite side of the finger piece from the spring 45. The toggle device includes a front rectangular ring-link 49 shown in Figure 8 having trunnions 50 at opposite edges pivoted in respective plates 36 while its body portion swings forwardly therefrom. The link 48 is pivoted on a trunnion 51 on the left side of the link at its extreme swinging part, close beside the adjacent plate 36. This arrangement affords a transverse swinging cross bar 52 on this link which forms the middle pivot of the toggle and is coaxial with the trunnion 51, although this is not essential. The other member of the toggle proper is a two-piece telescopically extensible link with a compression spring confined therein. One piece is a stirrup 53 of U-shape with trunnions 53' at the extremities of its arms engaged in the

plates 36 and forming the fulcrum pivot of this member of the toggle although its body portion extends and swings entirely opposite from the middle pivot of the toggle. At the bight of the stirrup, a spring seat pin 54 is extended inwardly in the plane of the stirrup on a radius of the fulcrum pivot, and a helical compression spring 55 is fitted thereon so as to be held in the plane of the stirrup and projected a distance across the axis of the fulcrum pivot. Set in the opposite end of this spring there is a telescope pin 56 having a forked or saddle head 57 receiving the bar 52 of the ring link therein so that the head is held against the bar 52 and compressing the spring at all times, although this compression is less at the extreme limits of the toggle action. The stirrup is of longer radius than the distance from the fulcrum pivot axis to the bar 52 at all times, so that when the toggle is operated the stirrup swings over a longer arc than the middle pivot (bar 52) of the toggle device.

The stirrup is formed with a downwardly extended eye 58 at its lower side in which there is pivoted the upper end of the push link 59 by which the heater unit is projected. The link 59 is connected to the top of the slide 29 in any approved manner. This connection may be in the form of Figure 14, a bar 60 fixed on the slide and having ears 61 at the top of the slide between which ears the lower end of the link 59 is pivotally connected. In this instance the bar is set in a longitudinal channel 62 in the side of the slide, the bar having inturned upper and lower ends 63, the lower one set in a suitable recess 64 in the side of the porcelain above the heater coil 31. The side of the channel may be undercut and a C-spring 65 allowed to expand therein across the bar to hold the latter securely but removably in place without complication.

In use, the lighter may lie on a table or other support, or may be hung in a bracket or other device, and when to be used for lighting a cigar or cigarette, is grasped by the handle with the forefinger pressing the button of the switch 33 and then presenting to the cigar or cigarette as customary with other lighters, no operation of the finger-piece 42 being necessary.

In the case of lighting a pipe, the end of the L is presented downwardly over the bowl 69 of the pipe, and both the finger piece 42 and the switch 33 operated, the forefinger of the hand grasping the handle being utilized to press the button 34, while the thumb on the same hand is engaged over the finger piece and the end of the thumb pulled inward against the knob by flexing at the first joint of the thumb. In this way the slide will be projected until the coil mica engages the tobacco 74 in the bowl, and its movement will be checked by engagement with the tobacco, or the pipe pressed downward by the slide until the movement of the finger piece is checked on the case. Return of the finger piece is checked at initial position by a pin 75 fixed in the side of the finger piece so as to strike the upper edge of the side plate 36.

In the operation of the finger piece, the draw link 48 first pulls the middle pivot 52 of the toggle upwardly opposing the spring 56 which is thereby compressed, and as the cross bar 52 passes dead center between the axes of the trunnions 53' and the trunnions 50, the expansion of the spring 56 augmenting the force manually applied through the finger piece causes the pin 56 to thrust the bar 52 rapidly upward, causing a snap action by which the far part of the stirrup

is caused to move rapidly downward, and requiring less effort on the knob 43 to complete this movement and to hold the parts extended against the action of the spring 45. The pressure of the forefinger on the button 34 keeps the coil 32 energized and the tobacco under the slide becomes ignited.

On release of the pressure of the thumb on the knob 43, the spring 45 overcomes the resistance of the spring 55 to return movement of the toggle, and the link 48 then presses the toggle joint downward again. As soon as dead center is passed by the bar 52, the device independently snaps completely to retracted position. The switch 33 is opened as soon as pressure of the thumb is relieved on the knob 43, as that pressure is necessary to afford the necessary reaction to effect depression of the button 34. Consequently, opening of the switch is automatically caused by release of the finger piece, and tendency to waste current is minimized.

By forming the link 48 with a longitudinal slot receiving the trunnion 51, instead of a simple circular eye, an increased movement of the slide for a given movement of the finger piece is attained. This is shown in Figure 3 where the link 48' corresponds to the one 48 first described and the initial description may be read on this view as in the others. This link is formed with a slot 76 having its outer end located close to the end of the link, at a point such that on operation of the finger piece, it will engage and lift the link 49 above dead center position, and the length of the slot is such that, its upper end engaging the trunnion 51 on return movement of the fingerpiece, will depress the link 49 to a position slightly below dead center.

On operation of this last described device, after initial movement of the fingerpiece half the full swing, the toggle passing dead center will immediately independently and automatically complete movement of the parts to full and extended position, or until the slide is checked by engagement with tobacco in the pipe. This will obviate need for full operation of the finger piece, and also reduce failure to ignite pipes due to users of the appliance not pulling the finger piece to its full limit, or holding it so operated until ignition occurs.

In order to avoid the possibility that in placing the device over a pipe bowl 69, the slide may strike the side of the bowl or carbon accumulations 68 thereon and its movement obstructed before it reaches the tobacco, I have shown in Figure 13 a construction in which the device will be automatically centered in the bowl. In this instance an inverted external conical seat face 67 is formed on the lower end of the L 22 adapted to partly or completely enter the bowl. As shown the maximum diameter of the seat is less than that of a standard pipe bowl 69, but in case of a small bowl the conical part will partly enter the same and so be centered. Also, with carbon accumulations, as shown at 68, the conical portion will engage the upper part of such accumulation and so fend the slide 29 away from such accumulations. If desired, the conical end of the L may be made of larger maximum diameter so that it will function the same on large pipes as on small pipes. In the present instance the seat element is shown as an encircling rib 70 on the extremity of the L, thus reinforcing the material outwardly of the bushing ring 27.

In production, the complete operating unit in

the frame 35 is assembled, and connected with the slide while the whole is removed from the case, the wires 25 and 24' are properly connected also with as little slack as possible. In assembling on the case, the slide is inserted through the open top of the case and started into the passage 71 through the L which is without obstruction, and the frame 35 then inserted between the walls 19 of the case 20, and pressed to final position. A single fastening at 72 at the inner transverse edge of the top plate 37 will be sufficient to properly retain the assembly in the case, although other fastenings may be applied as discretion dictates. The outer end edges of the frame 35 rest snugly against the end wall 38 of the case and so prevent this portion of the frame from moving upward if the fastening 71 is provided, and as the lower side of the frame adjacent the wall 38 rests against a shoulder 73 at the outer side of the L 22, the unit is amply supported in the case.

It is obvious that various electrical sources may be employed to operate this device. It may be constructed in a standard form to operate on a 6-volt circuit such as is common in motor vehicles, and in case of 110 volt direct current circuit, a suitable resistance interposed between the wires 24—25 and the service connection. In case of the 110 volt alternating current, a simple transformer may be employed.

For connecting the coil 31 in a circuit, binding posts 77 are shown, these being bars inserted through suitable passages in the slide body 29, projecting at the upper side of the slide, and at their lower ends extending into a transverse passage 78 formed entirely across the slide just above the recess 30. Apertures open from the recess 30 into the passage 78 near the center of the recess 30 and near one side thereof, and through these respective ends of the coil 31 are extended, beside the bars 77, to which they are secured by conventional binding means or otherwise attached. The wires 25 and 24' are similarly connected to the projecting upper ends of the bars. Other terminal constructions may be utilized if desired.

A cowl or hood 80 may be provided to partially enclose the finger piece, leaving its upper part exposed at all times, but having side portions 79 raised beside the finger piece so as to enclose the operative connections and pivots.

In lighting the pipe with this appliance, it is possible to press the forefinger on the finger piece 42 while the thumb is pressed against the button 34. This produces the necessary opposing pressures by which proper operation of the two is secured, and when the finger piece 42 is released, the button 34, with a proper spring element in the switch will move to released position, breaking the circuit. In the claims hereinafter, the thumb may be included in the term "finger".

The present construction is such that pressure of the thumb or forefinger on the finger piece tends to draw the handle more firmly into the grasp.

The functioning of the devices 48 to 59 inclusive constitutes these an energy storing means up to the point at which the dead center relation of the parts is passed, and beyond this position the structure operates to release the stored energy and is a means to convey the stored energy into motion of the link 59 greater in extent than that of the operative connection 48 between the finger piece and toggle.

I claim:—

1. In a combined cigar, cigarette and pipe lighter, a case having a slidable igniter on its outer part normally retracted but exposed for engagement of a cigar and the like, means to project the igniter into a pipe, means to retract the igniter, and means to close an electrical circuit to the igniter at will, said case including a handle portion, and an L part in which said igniter is slidable from a position within the L to a position projected a substantial distance without the L for the purposes described, said means to project the igniter comprising a movable finger piece on the handle spaced from the said L operatively connected to the igniter and adapted to be operated by the thumb of a hand grasping the handle, and said means to control the electrical circuit being a push-operated switch beside the L on the opposite side of the handle from the finger piece, whereby the switch may be operated by the forefinger of the same hand named, in opposition to the thumb.

2. In an article of the character described, a case including a tubular part having an open outer end, a heater unit slidable therein of a size to be contained within the tubular part and projectable a distance therefrom approximating a substantial part of the depth of a pipe bowl for the purposes described, finger operated means to project and retract the heater unit, including a movable finger piece operatively connected with the unit by means between the finger piece and heater unit including a dead center snap action device movable protractively and retractively by the finger piece, and means to hold said finger operated means in initial position yieldable to finger operation.

3. In an article of the character described, a case including a tubular part having an open outer end, a heater unit slidable therein of a size to be contained within the tubular part and projectable a distance therefrom approximating a substantial part of the depth of a pipe bowl for the purposes described, finger operated means to project and retract the heater unit, including a movable finger piece operatively connected with the unit by means between the finger piece and heater unit including a dead center snap action device movable protractively and retractively by the finger piece, including a lost motion connection between the finger piece and the dead center device, and means to hold said finger operated means in initial position yieldable to finger operation.

4. In an article of the character described, a case including a tubular part having an open outer end, a heater unit slidable therein of a size to be contained within the tubular part and projectable a distance therefrom approximating a substantial part of the depth of a pipe bowl for the purposes described, finger operated means to project and retract the heater unit, including a movable finger piece operatively connected with the unit, and means to hold said finger operated means in initial position yieldable to finger operation, said tubular part being formed with exterior upwardly divergent parts at its extremity adapted to enter a pipe bowl at least partly.

5. In a lighter of the character described, a case having a handle and a tubular extension open at its outer end, an igniter device normally contained within the extension and slidable to project therefrom into a pipe bowl to contact tobacco in the latter, a movable finger piece on the handle operatively connected to the igniter

to project and retract the same, means to hold the finger piece in initial position yieldable to finger operation and movable operatively mainly by movement inwardly toward the longitudinal axis of the handle, and means to energize the igniter electrically including a push switch at the opposite side of the handle from said finger piece, whereby concurrent opposing pressures on the finger piece and switch are required to operate the two.

6. A device of the character described comprising a case having a handle with a chamber at the outer end open at one side of the handle, a guide extension from the chamber opposite the open side of the chamber and open at its outer end, a frame set in the chamber adapted to be withdrawn through said open side of the chamber, and closing the same, a slide in said guide, a finger lever pivoted in the frame and projected above the frame and case, means to hold the lever in initial position yieldable to finger pressure, operative connections between the slide and lever, an electrical heater element at the extremity of the slide and means to energize the heater.

7. A device of the character described comprising a case having a handle with a chamber at the outer end, a guide extension from the chamber, a slide therein having an electrical heater element at its outer end, an electrical circuit to the heater element including a circuit maker and breaker, a finger piece pivoted in the chamber and projected outwardly of the handle, means to hold the finger piece in initial position yieldable to finger pressure, a link pivoted in the chamber, an operating link connecting the finger piece and swinging portion of the first link, a lever pivoted in the chamber a distance from the pivot of the first link and extending away therefrom, a slidable section on the lever movable in the radius of the lever and connected to the swinging end of said first link, a spring confined between the lever and slidable section, and a link connected between the distal end of the lever and the said slide.

8. The structure of claim 7 in which the operating link is formed with a longitudinal slot at its inner end and a pivot projection on the first named link engaged slidably in the slot whereby a lost motion operative connection is effected.

9. A combined cigar, cigarette and pipe lighter, comprising a case having a reciprocable igniter projectable from its outer part, and having an inner operative position and an outer extreme operative position, means to energize the igniter at will at all positions, a finger piece mounted movably on the case, an energy storing and transmitting device having a motion receiving member operatively connected to the finger piece and a motion transmitting member operatively connected to the igniter, the first named operative connection and device being constructed and arranged to store energy imparted by movement of the finger piece over a part of its movement, and constructed to release and convert stored energy into motion of the motion transmitting member over a distance greater than the motion of the first named operative connection, whereby a short movement of the finger piece will project the igniter to greater distances from the casing, and spring means to move the finger piece to initial position and retract the igniter, yieldable to manual operation of the finger piece.