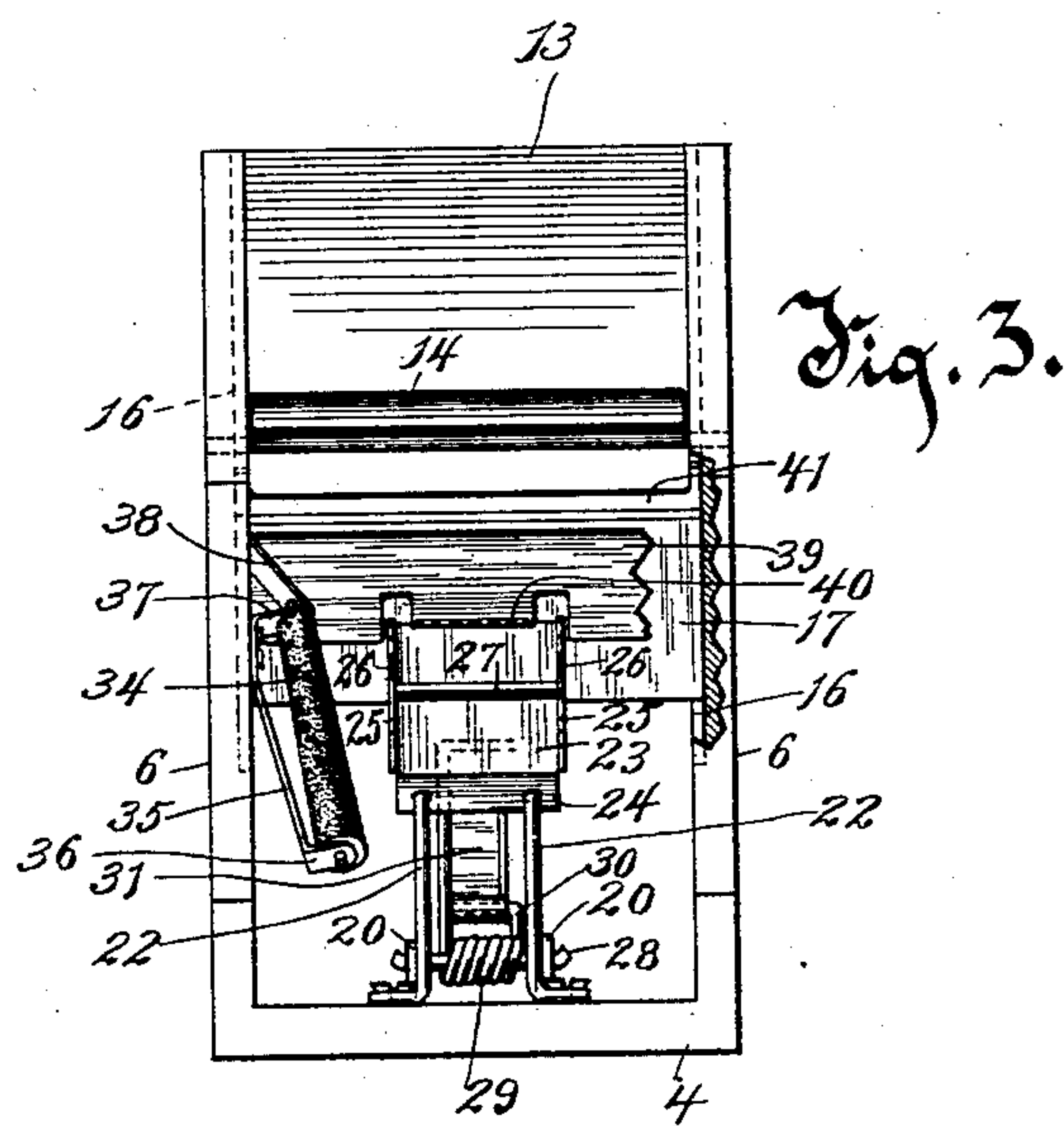
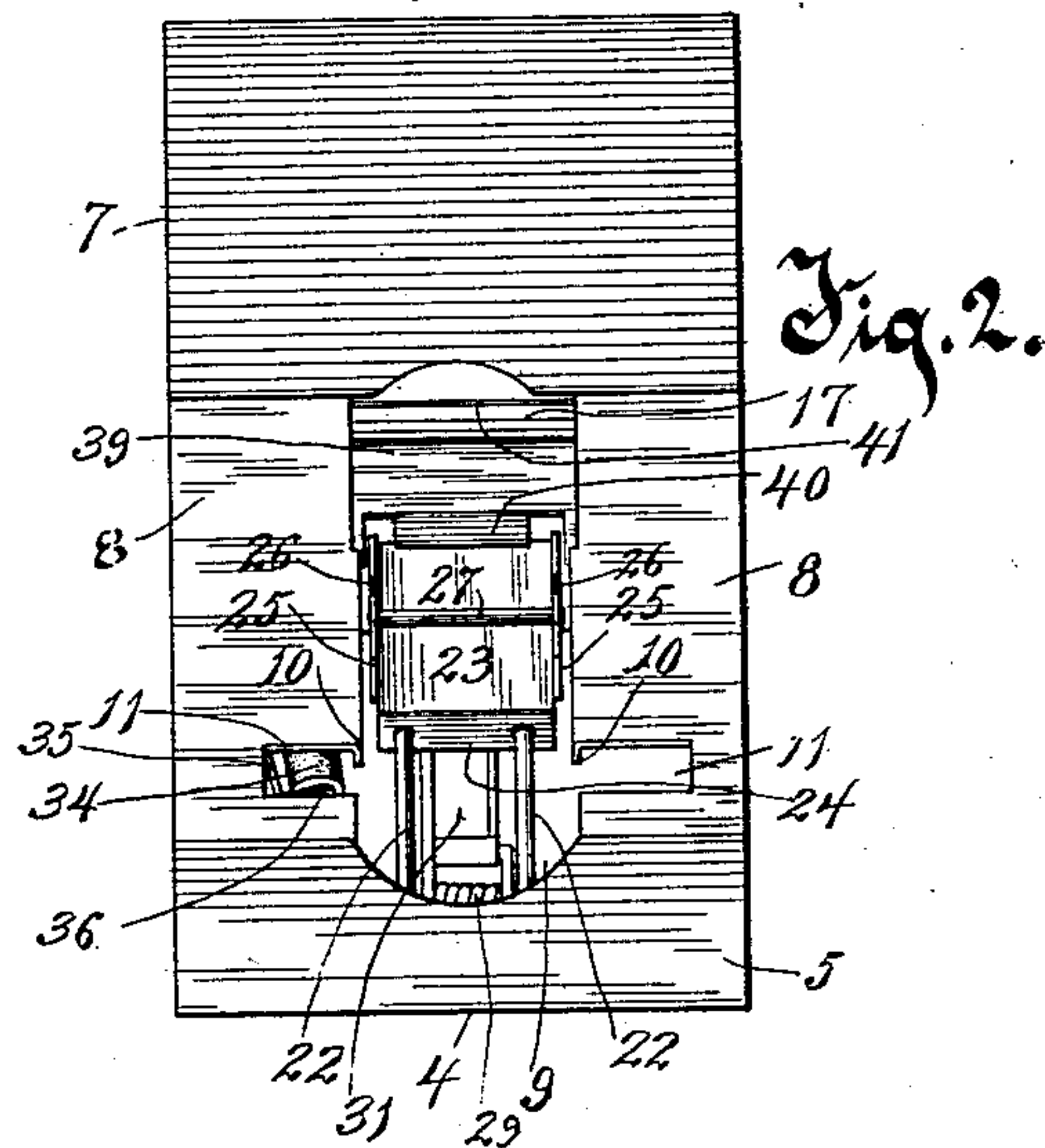
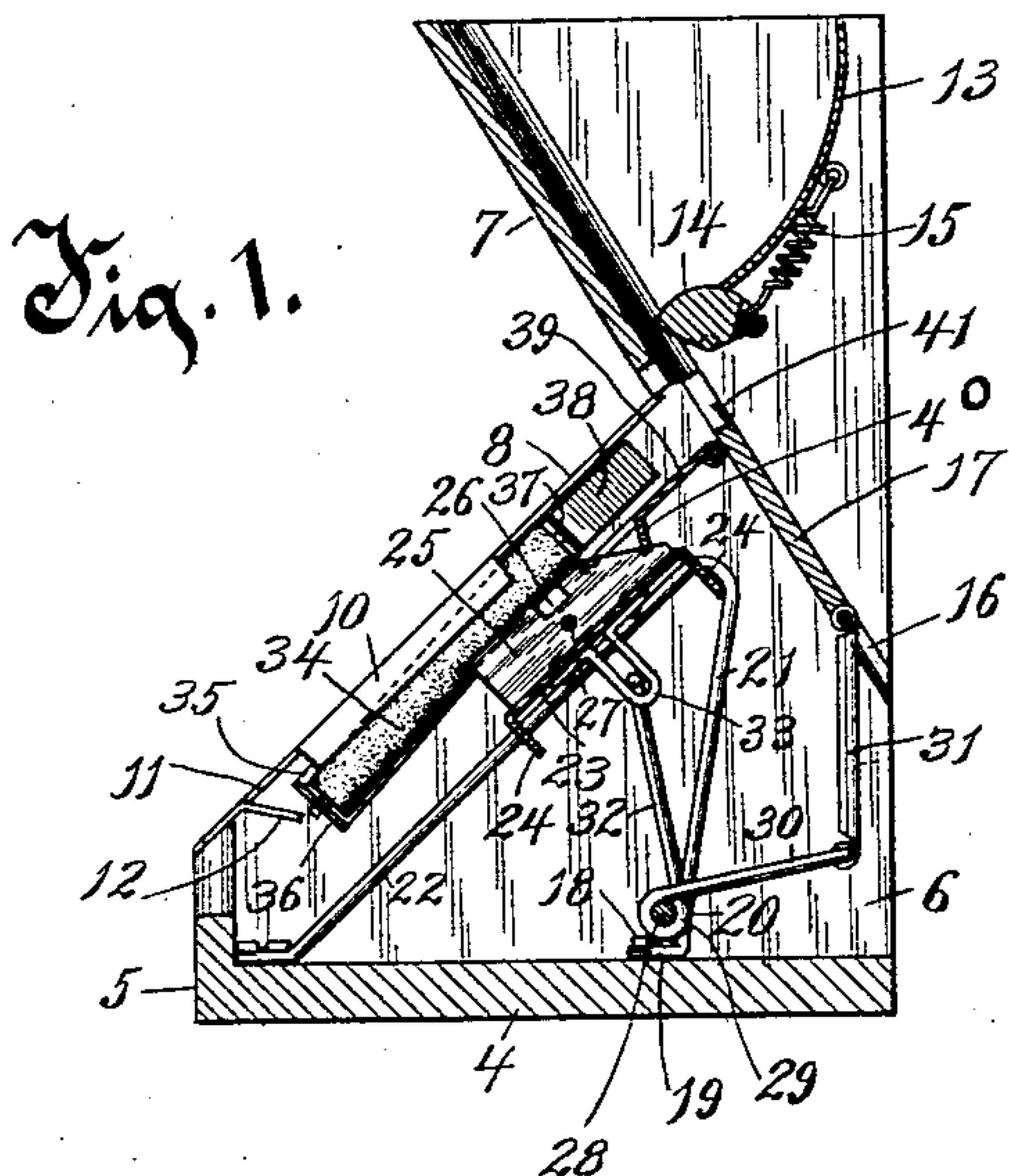


(No Model.)

A. RIPPLE & G. E. DURLER.  
COMBINED MATCH BOX AND LIGHTER.

No. 591,932.

Patented Oct. 19, 1897.



Witnesses.

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# UNITED STATES PATENT OFFICE.

AUGUST RIPPLE AND GEORGE E. DURLER, OF OSHKOSH, WISCONSIN.

## COMBINED MATCH BOX AND LIGHTER.

SPECIFICATION forming part of Letters Patent No. 591,932, dated October 19, 1897.

Application filed May 6, 1897. Serial No. 635,375. (No model.)

*To all whom it may concern:*

Be it known that we, AUGUST RIPPLE and GEORGE E. DURLER, of Oshkosh, in the county of Winnebago and State of Wisconsin, have  
5 invented a new and useful Improvement in a Combined Match Box and Lighter, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

10 Our invention has relation to improvements in a combined match box and lighter.

The primary object is to provide a device capable of holding any desired number of matches which its capacity will admit of, and  
15 being so constructed as to prevent more than one match from being withdrawn at a time, the match so withdrawn being automatically ignited during the process of removal.

20 With the above primary object in view the invention consists of the devices and parts, or their equivalents, as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a central vertical sectional view. Fig. 2 is a  
25 front elevation of the device, and Fig. 3 is a similar view to Fig. 2, with the front strips removed and a part broken away.

The frame of the device consists of a bottom piece 4, having the front transverse strip 5,  
30 side pieces 6 6, and an upper front piece 7. The upper edges of the side pieces slant inwardly for a desired distance, and against these inclined edges is secured the upper front piece 7. The front edges of the side  
35 pieces below this front piece 7 are also inclined downwardly to the lower transverse strip 5. The front edges of the side pieces, therefore, are of an approximate V form. Plates 8 8, preferably of metal, are secured  
40 to the lower inclined front edges of the side pieces and extend inwardly for a desired distance, forming the longitudinal opening 9 between their inner edges. Said inner edges of the plates are also advisably provided me-  
45 dially with downwardly-bent portions or flanges 10 10. At their lower ends they are provided with angular cuts, forming slots or openings 11 11. The lips 12 12, formed by these cuts, are bent inwardly to provide ledges  
50 upon which the ends of a match are received prior to its final removal.

The upper portions of the side pieces 6 6

and the upper front piece 7, together with a curved back piece 13, form the hopper or re-  
ceptacle for the matches. This curved back  
55 piece is advisably of metal. The curved back piece curves forwardly toward the lower end of the upper front piece 7, but not in contact therewith, leaving a narrow space across the  
60 bottom of the hopper. This space is normally closed by means of a yielding bottom strip 14, which is provided at opposite ends with pin-  
tles which are journaled in the opposite side  
pieces 6 of the framework. The upper sur-  
65 face of this yielding bottom strip is preferably curved in the arc of a circle. The lower edge of the curved back piece rests against a medial point of the curved surface of the  
70 bottom strip, the back edge of said bottom strip extending rearwardly beyond the curved back piece. To a medial point of the pro-  
jecting rear edge of the strip is connected the lower end of a coiled spring 15. The upper  
end of said coiled spring is connected to the  
75 back piece 13. The normal tendency of this spring is to pull upwardly on the rear edge of the bottom strip, so as to force the front edge of said strip against the inner side of the up-  
per front piece 7 of the frame, and thereby  
80 close the bottom opening of the hopper.

The inner sides of the side pieces 6 are pro-  
vided with inclined recesses 16 16, forming  
guideways for the opposite edges of the slide  
17. The upper portions of these recesses or  
85 guideways are just back of the upper front piece 7, and said guideways are continued rearwardly to the rear edges of the side pieces, as clearly shown in Fig. 1. In the bottom  
piece of the frame, toward the rear of said  
bottom piece, are secured screws, or equiva-  
90 lents 18 18. These screws pass through eyes 19 19, formed at the ends of wires, said wires being then bent up to form other eyes 20 20  
at right angles to the eyes 19, the coils of the  
95 wire being then extended upwardly to form the rear arms 21 21, and then downwardly to form the front inclined members or arms 22 22.

The numeral 23 indicates a match-carrying carriage which at its upper and lower edges  
is bent downwardly to form the flanges 24 24,  
100 said flanges provided with openings through which the front inclined arms 22 pass, said arms thereby serving as rails for the travel of the carriage. The side edges of the car-



riage are also bent upwardly to form the side flanges 25 25, and these side flanges are formed medially with the notches 26 26. From the notches upwardly the edges of the flanges 25 are beveled, so as to admit of a match when it is received by the carriage to slide readily along said edges and to engage the notches 26. The side flanges are connected by a transverse rod 27, which forms a convenient finger-grasp for operating the carriage.

Fixedly mounted in the eyes 20 20 is a transverse shaft 28. A wire is coiled around this shaft, as indicated at 29, so as to turn freely thereon, the coils being arranged between the rear arms 21 21. One of the end coils is extended rearwardly to form the arm 30, which at its extremity is bent inwardly or cranked to pivotally engage the lower end of a link 31, the upper end of said link being pivotally connected to the lower edge of the slide 17. The other end coil of the series of coils 29 is extended forwardly to form the forwardly-extended arm 32, and the extremity of this arm is also bent inwardly or cranked to pivotally engage a loop 33, projecting rearwardly from the carriage 23.

We do not wish to be understood as restricting ourselves to the specific arrangement herein shown and described of the rails for the traveling carriage, nor to the specific arrangement of the crank-arms for engaging, respectively, the slide and the carriage. Any desirable form of track for the traveling carriage, or of arms or cranks for causing an upward movement of the slide with the downward movement of the carriage, or, vice versa, a downward movement of the slide with the upward movement of the carriage are considered within the spirit and scope of our invention.

The numeral 34 indicates an emery bar, which is arranged longitudinally beneath one of the front plates 8. It is advisably provided at opposite ends with pintles, which are loosely journaled in suitable bearings, so as to admit of the bar turning. These bearings are advisably formed by means of a strip 35, which is secured to the inner side of one of the side pieces 6. Its lower end is bent inwardly at right angles to form the bearing 36, and its upper end is bent inwardly to form the upper bearing 37, and thence outwardly at an angle, its outer end joining the side piece 6. This outwardly-bent portion forms an inclined surface 38, against which the sulfur end of the match bears when it first leaves the receptacle or hopper, and is thereby more effectually guided to the traveling carriage.

Immediately below the opening of the hopper is a transverse inclined strip forming a ledge 39. The center of the front edge of this strip is cut out, and a little tongue bent downwardly therefrom, which acts as a guard to prevent a match when received on the traveling carriage from passing rearwardly off the inclined edges of the side flanges of the carriage. The ledge serves to

receive a match when it first leaves the hopper, and conveys the same to the carriage.

As previously stated, the yielding bottom strip 14 of the hopper is adapted to close the opening in the bottom of said hopper. The receptacle or hopper is first filled with the matches, care being taken that the sulfur ends of said matches are arranged adjacent to that side piece 6 to which the emery bar is attached. The hopper in practice is intended to be supplied with a cover which is designed to be securely locked, so as to prevent matches from being removed directly therefrom. If the carriage is at the upper ends of its rails, as shown in the drawings, the finger-grasp 27 of the carriage is now engaged by the thumb and finger, and the carriage pulled downwardly. This will cause a downturning of the forwardly-extending arm 32, and an upward movement of the rearwardly-extending arm 30, said arms 32 and 30 forming and acting as a bell-crank lever. The rearwardly-extending arm pushes upwardly on the link 31, and said link necessarily acts to cause an upward movement of the slide 17. As the upper edge of said slide contacts with the front edge of the bottom strip 14, it causes a turning of said strip on its journals sufficiently far to admit of the passage of the slide for a desired distance into the hopper or receptacle. The upper edge of the slide is preferably provided with a projecting rear flange 41, which just provides sufficient space to admit one match between said flange and the inner side of the upper front piece 7. A reverse movement is now given to the traveling carriage—that is to say, it is forced upwardly—and this has the effect of turning the bell-crank lever so as to cause the descent of the slide. The slide in its descent carries a single match therewith, and after the upper edge of the slide has passed below the front edge of the yielding bottom strip 14 said strip, by reason of the recoil of the spring 15, returns to its normal position, so as to effectually close the bottom opening of the receptacle, to prevent more than the match carried by the slide to pass out of said hopper. When the slide has completed its upward movement, its upper edge will be in line with the ledge 39, and the match will be deposited on said ledge, and guided thereby and also by the inclined surface 38 onto the inclined edges of the side flanges 25 of the carriage, and then into the notches 26. The sulfur end of the match will then be against the upper end of the emery bar. The carriage is now pulled downwardly, and the match is prevented from jumping out upwardly from the carriage by the downwardly-turned flanges 10 of the plates 8. As the carriage continues to travel downwardly the sulfur end of the match is drawn along the emery bar, and is thereby lighted. Inasmuch as the emery bar preferably tapers from its upper end downwardly the lighting of the match is assured. By the time the carriage has reached the lowest limit of its travel the notches 26



26 are in line with the slots 11 of the plates 8, and the ends of the match also necessarily in line therewith, so that the lighted match can be readily withdrawn by the fingers. Of course with this final down movement of the carriage the slide is simultaneously forced upward into the receptacle or hopper, ready for the removal of another match.

What we claim as our invention is—

1. In a match-box, the combination, of a frame provided with a match compartment or receptacle, a yielding bottom strip adapted to close the bottom opening of the receptacle, a slide, and means for actuating the slide, said slide, when moved upwardly, adapted to act on the yielding bottom strip so as to move the same and permit the upper edge of the slide to extend into the receptacle, and said slide on its reverse movement outwardly adapted to withdraw a match through the opening of the receptacle, said opening being automatically closed by the yielding strip, when the slide has traveled sufficiently far in its reverse direction to remove its contact against said yielding strip.

2. In a match-box, the combination, of a frame provided with a match compartment or receptacle, having an opening in its bottom, a slide provided at its upper edge with a rear upwardly-extending flange forming a space between it and the inner face of the front piece of the receptacle to accommodate a single match, said slide adapted to work in the opening of the bottom of the receptacle, and means for actuating the slide, said slide when moved downwardly adapted to withdraw a match through the opening of the receptacle.

3. In a match-box, the combination, of a frame provided with a match compartment or receptacle having an opening in its bottom, a strip extending across said opening, and having its ends, journaled in suitable bearings, a spring secured at one end to a fixed point and at its opposite end to the bottom strip, said bottom strip adapted to close the opening of the match-receptacle under normal conditions, a slide, and means for actuating the slide, said slide when moved upwardly adapted to act on the bottom strip to cause said strip to turn and thereby provide an opening for the passage of the upper edge of the slide into the receptacle, and said slide on its reverse movement outwardly adapted to withdraw a match through the opening of the receptacle, said opening being automatically closed by the spring-actuated bottom strip, when the slide has traveled sufficiently far in its reverse direction to remove its contact with the spring-actuated strip.

4. In a match-box, the combination, of a frame provided with a match compartment or receptacle, having an opening in its bottom, a slide adapted to work in the opening of the bottom of the receptacle, a carriage, and a connection between the carriage and the slide, whereby as the carriage is caused

to travel in one direction, the slide is caused to travel in the opposite direction, the carriage when traveling downwardly causing the slide to move upwardly into the receptacle, and when said carriage travels upwardly the slide is caused to travel downwardly out of the receptacle, and to carry the match therewith and deposit said match onto the carriage.

5. In a combined match box and lighter, the combination, of a frame provided with a match compartment or receptacle, having an opening in its bottom, a slide adapted to work in the opening in the bottom of the receptacle, a carriage, and a connection between the carriage and the slide, whereby as the carriage is caused to travel in one direction, the slide is caused to travel in the opposite direction, the carriage when traveling downwardly causing the slide to move upwardly in the receptacle, and when said carriage travels upwardly, the slide is caused to travel downwardly out of the receptacle, and to carry the match therewith, and to deposit said match onto the carriage, and an igniting-surface against which the match is adapted to bear and to be thereby ignited in the travel of the carriage downwardly.

6. In a match-box, the combination, of a frame, provided with a match compartment or receptacle having an opening therein, a traveling carriage adapted to receive one match at a time from the receptacle, and an inclined ledge adapted to receive the match from the opening and deposit said match onto the carriage said ledge provided with a downwardly-bent lip adapted to prevent the match from passing rearwardly off the carriage.

7. In a match-box, the combination, of a frame provided with a match compartment or receptacle, and having a longitudinally-arranged opening along its front face, the opposite bordering edges of said opening being turned downwardly, to form downwardly-extending flanges, a traveling carriage within the frame and beneath the longitudinal opening, and means for actuating the carriage, said carriage adapted, when at the limit of its movement in one direction to receive a match from the receptacle, and when at the limit of its movement in the other direction adapted to permit the match to be withdrawn through the longitudinal opening.

8. In a match-box, the combination, of a frame provided with a match compartment or receptacle having an opening in its bottom, a slide adapted to work in the opening of the bottom of the receptacle, a carriage, and a bell-crank lever having one arm or member connected to the carriage and the other arm or member to the slide, whereby, as the carriage is caused to travel in one direction, the slide is caused to travel in the opposite direction, the carriage when traveling downwardly causing the slide to move upwardly into the receptacle, and, when said carriage travels upwardly, the slide is caused to travel downwardly out of the receptacle,



and to carry a match therewith and deposit said match onto the carriage.

9. In a match-box, the combination, of a frame provided with a match compartment  
5 or receptacle having an opening in its bottom, a slide adapted to work in said opening, a traveling carriage, a fixed shaft, and a wire coiled around said shaft, and having one end  
10 extending in one direction to pivotally connect with the slide and the other end of the coil extending out in an opposite direction to pivotally connect with the carriage.

10. In a match-box, the combination, of a frame provided with a match compartment  
15 or receptacle, said receptacle having an opening in its bottom, a slide working in said opening, wires coiled around at opposite

points to form eyes, and then extended upwardly, and thence downwardly, a carriage traveling on the downwardly-bent portions of 20 the wires, a pivot-shaft having its ends in the eyes of the bent wire, and a bell-crank lever turning on this pivot-shaft, and having one arm pivotally connected to the carriage, and 25 having its other arm pivotally connected to the slide.

In testimony whereof we affix our signatures in presence of two witnesses.

AUGUST RIPPLE.  
GEORGE E. DURLER.

Witnesses:

GEORGE HILTON,  
EDWARD LYNESS.