Jan. 18, 1938. G. T. DERBY 2,105,857

TRAFFIC SIGNAL DEVICE

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FIG. 1

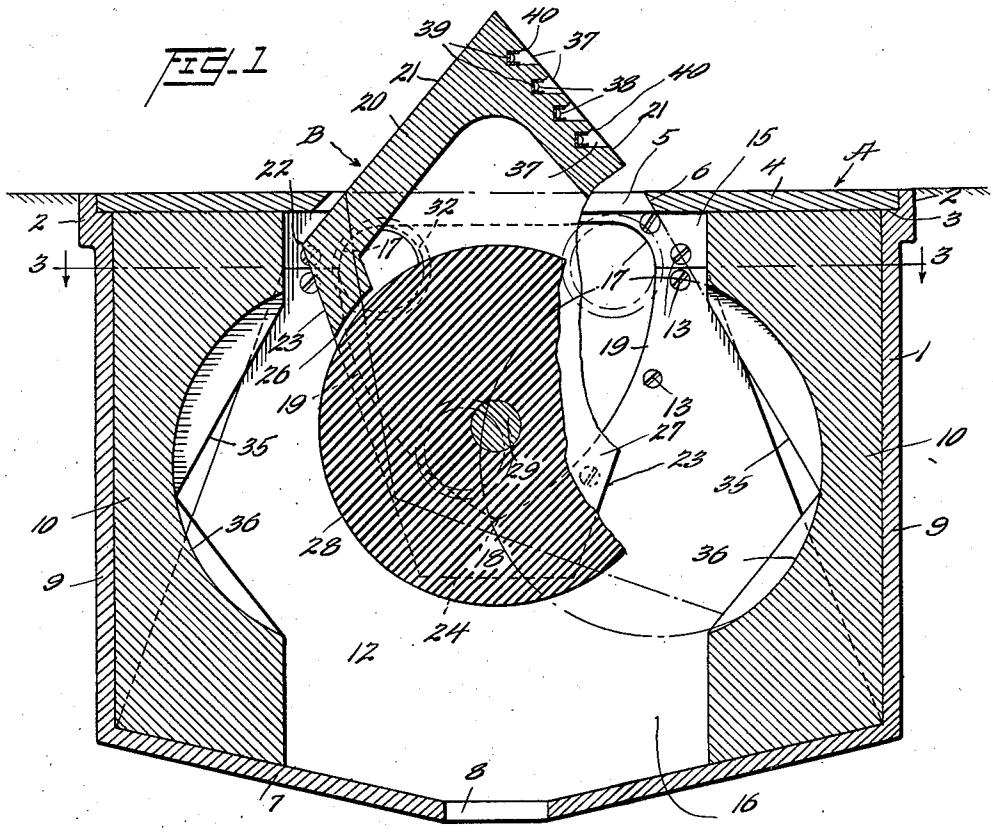
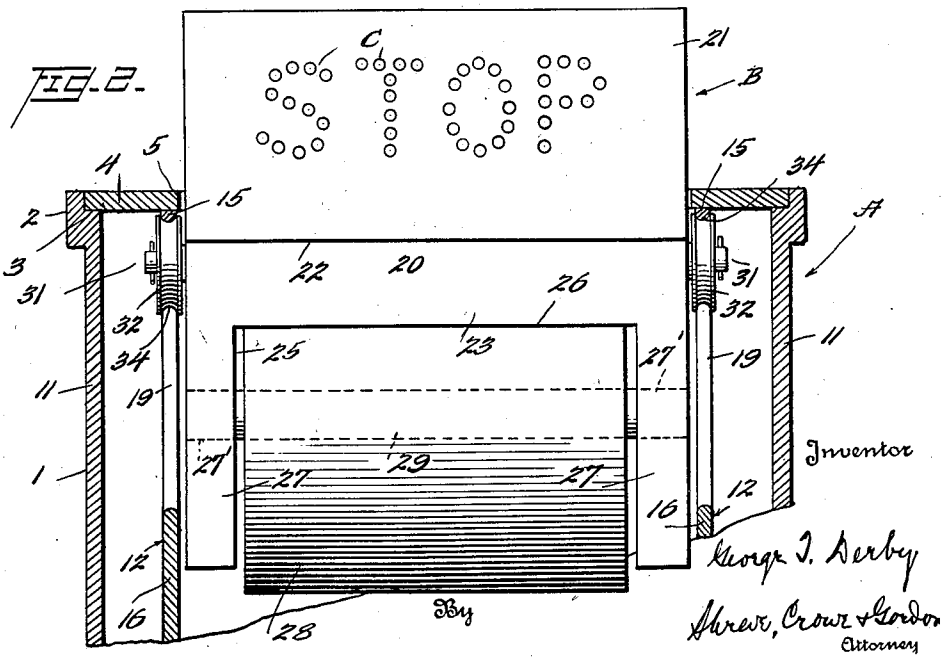


FIG. 2



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FIG. 3.

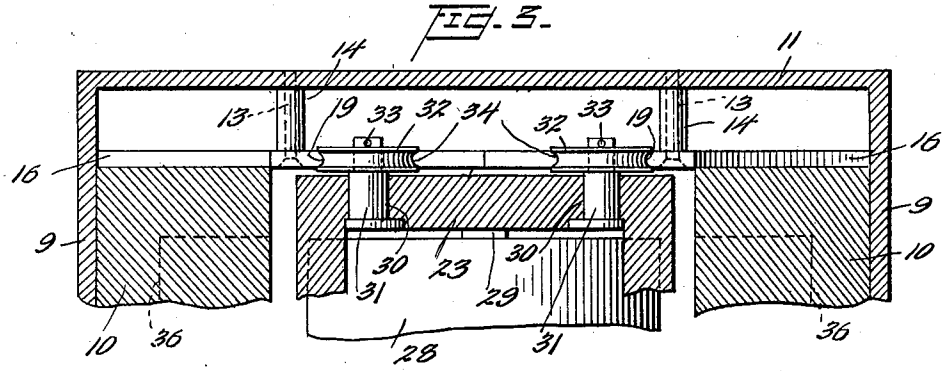


FIG. 4.

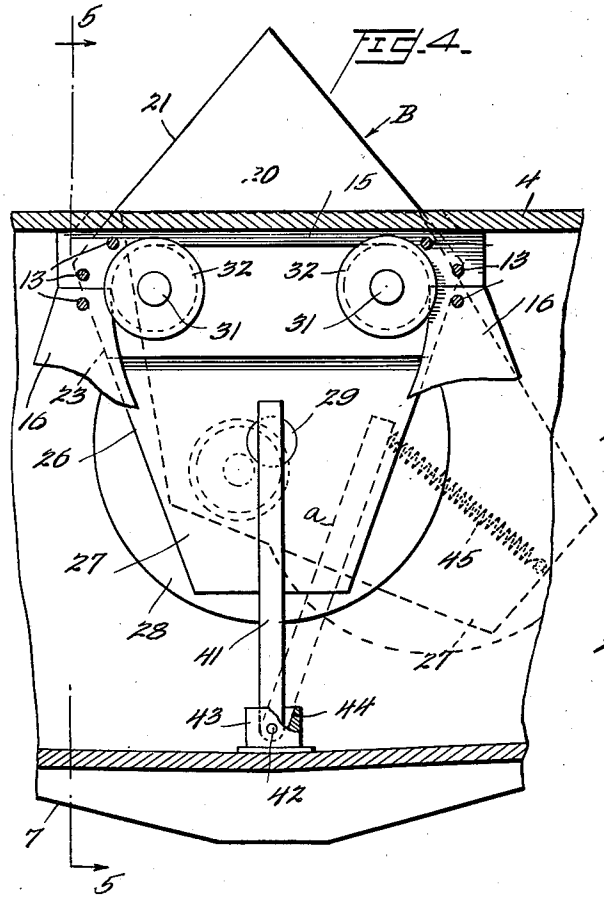
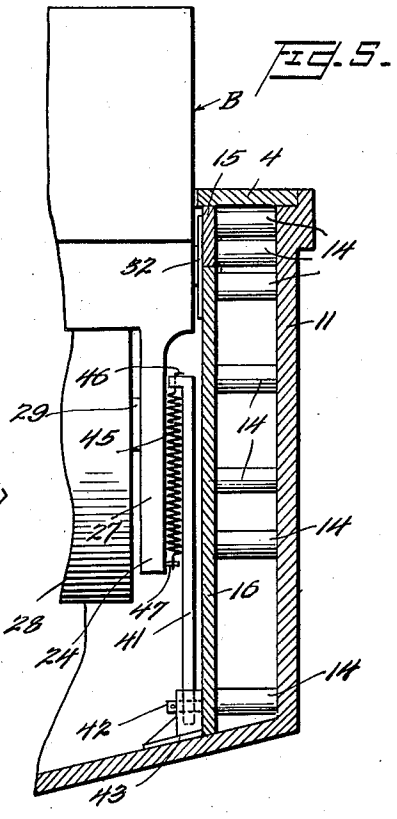


FIG. 5.



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TRAFFIC SIGNAL DEVICE

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Application January 2, 1936, Serial No. 57,306

13 Claims. (Cl. 40—125)

Generically this invention relates to signalling devices, but it more especially is directed to traffic signals of the type mounted in a pavement surface, and directly in the path of traffic, and wherein the signal is normally disposed above the pavement level and movable under pressure to said level.

One of the principal objects of this invention is the provision of a signal device of this character comprising a normally erect pivotally mounted inertia controlled signalling element and alternately operable to street level positions depending upon the direction of the depressing force.

Another important object of this invention is the provision of a signal device of this character so mounted that the signal element normally projects above the said pavement level but movable in opposite directions to street level position depending upon the direction of the depressing force and including a counterweight element, said element constituting a shock absorbing medium.

Another object of this invention is the provision of a signalling device of this character pivotally mounted and formed with a counterbalance structure, the signal element adapted to normally project through a restricted opening in the pavement surface above the level thereof, the design of said element and its pivotal mounting being such as to alternately shift the pivotal point, depending upon the direction of the depressing force, and permitting movement of the signalling element in either direction from erected to closed positions within such restricted opening.

Another object of this invention is the provision of a signal device of this character wherein the signal element is adapted to project above the pavement level through a restricted opening, and operable in opposite directions from erected to closed positions in such a manner that the opening is always completely closed irrespective of the position of said element.

Another object of this invention is the provision of a signal device of this character comprising a casing having its top wall adapted to be mounted so that it will be flush with and constitute a continuation of the pavement surface and formed with a restricted opening, a normally erect signalling element adapted to project through said opening and pivotally mounted to permit depression of the element from opposite directions, the pivotal points being shiftable in accordance with the direction of the depressing force to permit easy operation with slight force of said element within said restricted opening.

Another object of this invention is the provision of a signal device of this character including a depressible pivotally mounted signal element and a counterweight element adapted to normally maintain said signal element in erected position, and means coacting with said counterweight to limit the depressing movement of the signal in either direction, said counterweight additionally constituting a shock-absorbing medium.

With these and other objects in view, which will become apparent as the description proceeds, the invention resides in the construction, combination and arrangement of parts, hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which like characters of reference indicate like parts throughout the several figures, of which:

Fig. 1 is a vertical transverse sectional view of my improved traffic signal device with parts broken away.

Fig. 2 is a vertical sectional view at right angles to Fig. 1.

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 1.

Fig. 4 is a broken view somewhat similar to Fig. 1, showing a modification.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Traffic signals with which I am familiar have proven deficient in many respects, being operable in only one direction, spring controlled, not positive in action, requiring large surface openings, and subject to wear and damage by reason of faulty shock absorbing mediums or none at all, and high maintenance cost, and it was to overcome such deficiencies by providing a casing having a restricted opening in its upper surface adapted to rest in the same plane as the road or pavement surface in which is mounted a normally erect signalling element projecting above the pavement surface and having mounted in its face suitable illuminating indicia, pivot points alternately shiftable depending upon the direction of the depressing force, inertia controlled means coacting with the signalling element to effect its return to normal position following its depression, a stationary frame structure formed with cradle-like seats adapted to receive and support said counterweight and its supporting frame and to constitute stops for limiting movement of the signal and supporting frame in depressing direction, and means for guiding and directing the alternate movement of said movable frame, that

I designed the safety signal device forming the subject matter of this invention.

In the illustrated embodiment characterizing this invention there is shown my improved traffic signal device A comprising a substantially square casing or housing 1 offset at its upper edge as at 2 to form a seat 3 for the removable top-plate 4 formed with a central rectangular slot-like opening 5 with its side walls 6 extending downwardly from the upper to the lower edge of said top-plate, for a purpose directly appearing. The casing is also formed with a bottom 7 inclined from its edges to a central opening 8, which when the casing is submerged with its top-plate 4 flush with the street or road surface, will permit drainage of any water finding its way into said casing so that the latter at all times will be in a substantially dry condition.

Suitably positioned in the casing 1 at opposite sides 9 are the solid bumper block members 10, and adjacent the opposite sides 11 are the supporting frames 12 with their lower edges conforming to the configuration of bottom 7 on which they are supported, and said members are secured to sides 11 by screw bolts 13, and spaced from said sides by sleeves 14. The plate or guide rail frame members 12 are formed at their upper ends with removable sections 15 secured to sides 11 by bolts 13 and sleeves 14 similar to the base sections 16.

The inner edges of sections 15 and 16 when assembled, are curved downwardly from their widest points, as at 17, converging at point 18, and are rounded to form the guide rails 19, for a purpose directly more fully appearing.

A movable frame structure B, preferably cast from aluminum, or from other light or suitable metal, has an upper signal portion or element 20 formed with the outwardly and downwardly inclined sections 21 to points 22, and from such points the sides 23 extend downwardly and inwardly in meeting direction to bottom edge 24. The sides 23 are formed with cut out portions 25 extending from edge 24 upwardly to the edges 26 forming the depending arms 27, between which the counterweight buffer or shock absorbing roller 28 formed from substantially hard rubber or the like, is mounted on shaft or axle 29 journalled in suitable bearings in arms 27, as at 27'. Said roller 28 is adapted to extend within the hollow portion of frame B above edges 26 which latter are curved to correspond with the curved surface of member 28. The roller 28 extends beyond the side surfaces 23 and bottom 24 of arms 27, for a purpose which will directly appear.

Spaced inwardly from points 17 and 17 each end of frame B is formed with openings 30 in which are suitably secured stub shafts 31, and on the free ends of which are mounted on suitable bearings the wheels 32 secured by pins or other suitable elements 33. Said wheels 32 are formed with grooved threads 34 adapted to travel on the complementally formed rails 19. Therefore it will be apparent that the frame B is mounted on a pair of aligned wheels 32 at each side substantially at the base of the signal portion 20, and when the said signal member is in its normally erect or perpendicular position the pair of wheels at one side will be positioned at point 17 on rails 19 and the other or opposite pair similarly positioned at point 17, so that the frame is normally positioned on all four wheels.

In order to limit the movement of frame B and form a positive support therefor when a respective side 21 is depressed so that its surface is flush with that of top plate 4 and the pavement or road in which it is placed, each of the bumper blocks 10 is recessed as at 35 conforming in configuration to the portion of arm 27 adapted to seat therein, and is also recessed as at 36 conforming to the configuration of the roller 28 and adapted to form a seat therefor, the depth of said recess being such that the roller will engage its seat slightly in advance of members 27 engaging seats 35, so as to absorb the shock of the moving parts when signal element 20 is depressed, as will be apparent.

My improved signal device is adapted to be positioned in the surface of a street or roadway in the path of traffic normally proceeding in a given direction only, therefore the safety sign elements or indicia C, usually spelling the word "STOP", is mounted in the inclined side 21 of signal element 20 facing the direction of travel so as to be clearly discernible. Said sign C comprises a plurality of recessed openings 37 in which are mounted glass reflectors 38 set in rubber cushion seats 39 so as to resist vibration and be unaffected by vehicular movement thereover, the openings 37 being flared as at 40 so that the reflected light rays may be properly diffused.

While it is not essential to the operation of the device, yet if it should be desired to provide a booster or positive return of the signal element to its upright position, a supplemental spring rocker-arm structure may be employed and which modification is illustrated in Figs. 4 and 5 of the drawings. At each end of frame B adjacent the respective arms 27 is a normally upright rocker-arm 41 with its lower end pivotally mounted on pin 42 in anchor base 43 suitably secured to bottom 7, the open end of said anchor member being of such diameter that the opposite side walls 44 constitute stops to permit movement of said rocker-arm only through an arc of about 20 degrees, in order to lessen the tension of spring 45 having one end suitably secured to the upper end of rocker-arm 41 as at 46 and its other end as at 47 to the lower end 24 of arm 27 during its alternate movement from side to side. It will be apparent that when arms 27 engage seats 35 rocker-arms 41 are in the position as shown at *a*, and when the depression force is removed from element 20 and the wheel 28 and frame members 20 start their gravitational movement to normal position they will be urged forward by the action of springs 45, the same being true when they have reached their limit of movement in the opposite direction.

While the operation of the device would seem to be clear from the above description, it might be well to further state that when the device A is operatively positioned with its top plate 4 flush with the street or road level D, the wheels of a vehicle engaging surface 21 cause frame B to pivot on the pair of wheels positioned at point 17, and as said element 20 is depressed, arms 27 and buffer-wheel counterweight 28 are elevated and just before surface 21 is completely depressed the buffer-wheel 28 engages seats 36 and by reason of its resiliency is compressed, absorbing the shock and permitting members 27 to engage with slight force seats 35 which constitute a positive and uniform supporting medium for the frame B when in completely depressed position, and as the depressing force is removed from surface 21 the resiliency of member 28 tends to boost the counterweight action and return frame B to its normal position, and without the possibility of jamming of the parts in their seats, and any drag-

ging or binding action of member 28 with its seat, being prevented by its pivotal mounting.

It will be further observed that when frame B moves about its pivot at 17 the opposite pair of wheels 32 move downwardly on rails 19 toward point 18 thereby supporting and constituting a positive guide for said frame during its travel in either direction. When a vehicle contacts the surface 21 opposite to indicia C the identical operation takes place except, that the wheels 32 at point 17 constitute the pivot, and the opposite pair of wheels travel on rails 19 from point 17 toward point 18, and the arms 27 and buffer-wheel 28 engage the opposite seats 35 and 36, returning to their normal positions as before.

It will thus be seen that my improved signal is depressible and operable in either direction, and that the movable frame is positively supported and guided during its travel movement, and any wobbling, jamming, or disarrangement of parts caused by the depressing force of a vehicle at an angle to the line of traffic as well as direct, is prevented. It will also be noted that by pivoting the frame B off center, that is, at the side against which the depressing force is applied, not only causes a lesser elevating movement of the arms 27 and roller 28, but requires less force to effect the depressing movement of frame B and at the same time, permits operation of the signal element in a comparatively small or narrow opening in the top plate 4 or pavement surface.

From the above it will be apparent that I have designed a traffic signal device compact in form, manufacturable for installation as a unit in a roadway surface, comprising few parts, simple in construction, positive in operation, manufacturable at a reasonable cost, and efficient for the purposes intended.

Although in practice I have found that the form of my invention illustrated in the accompanying drawings and referred to in the above description as the preferred embodiment is the most efficient and practical; yet realizing the conditions concurrent with the adoption of my invention will necessarily vary, I desire to emphasize that various minor changes in details of construction, proportion and arrangement of parts, may be resorted to within the scope of the appended claims without departing from or sacrificing any of the principles of this invention.

Having thus described my invention, what I desire protected by Letters Patent is as set forth in the following claims:

1. A traffic signal comprising a normally erect signalling element pivotally mounted to permit depression of the element from opposite directions including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot.

2. A traffic signal comprising a normally erect signalling element pivotally mounted to permit depression of the element from opposite directions including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot according to the direction of the depressing force, and inertia controlled means coacting with said element to effect its return to its normal position after depression.

3. A traffic signal comprising a normally erect signalling element pivotally mounted to permit depression of the element from opposite directions including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot alternately according to the direction of the depressing force, and inertia controlled resilient means coacting with said element to effect its return to its normal position after depression, said means constituting a shock absorbing medium.

4. A traffic signal adapted to be mounted in the surface of a roadway comprising a normally erect signalling element pivotally mounted to permit its depression from opposite directions including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot, inertia controlled means carried by said element to return it to normal position after depression, the pivots adapted to be alternately shiftable with respect to said paths depending upon the direction of the depressing force, and means for guiding and limiting the movement of said element when moving in depressing direction.

5. A traffic signal comprising a normally erect signalling element pivotally mounted to permit depression of the element from opposite directions including two spaced pivots, either of which is movable through a predetermined pivot directing path means when the other functions as a pivot alternately according to the direction of the depressing force, and inertia controlled means coacting with said element to effect its return to its normal position after depression, said pivot directing means constituting a positive guide for said element during its travel movement.

6. A traffic signal comprising a movable frame, said frame including a normally erect signalling element and a counterweight constituting a shock absorbing medium adapted to return said element to its normal position after depression, two spaced pivots for said frame, either of which is movable through a predetermined path when the other functions as a pivot, means in connection with said pivots for directing their respective movements alternately through said predetermined path depending upon the direction of the depressing force.

7. A traffic signal comprising a casing having its upper edge flush with the road surface and formed with an opening, a normally erect signalling element mounted in said casing and operable in said opening, said element being pivotally mounted to permit its depression from opposite directions, means for returning the element to normal position after depression, said pivotal mounting including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot alternately according to the direction of the depressing force.

8. A traffic signal device comprising a casing having its upper edge flush with the road surface and formed with an opening, a normally erect signalling element pivotally mounted in said casing formed with oppositely inclined surfaces to permit depression of the element from opposite directions, said pivotal mounting including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot, means coacting with said signalling element to effect its return to normal position after depression, said pivots being alternately operable as such in accordance with the direction of the depressing force whereby said element pivots from the side corresponding to the inclined surface to which the depressing force is applied.

9. A traffic signal comprising a casing having its upper edge flush with the road surface and formed with an opening, a normally erect signalling element pivotally mounted to permit de-

pression from opposite directions including spaced pivots and means in connection with said pivots for directing their travel through respective predetermined paths, said signalling element being operable in said opening, means for returning said element to its normal position after depression, the pivots of said device being so arranged with respect to said opening as to be alternately operable as such depending upon the direction of the depressing force and whereby said opening is continuously closed irrespective of the movement of said element.

10. A traffic signal comprising a normally erect signalling element pivotally mounted including a pivot means at each side shiftable to permit depression of the element from opposite directions, a supporting structure for said pivot means including track means for directing the respective pivot means through predetermined paths, means coacting with said element for returning it to normal position after depression whereby each of said pivot means operates alternately as a pivot and supporting guide means moving with the element during its depression and return travel, depending upon the direction of the depressing force.

11. A traffic signal for roadways comprising a normally erect signalling element pivotally mounted to permit its depression from opposite directions including spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot according to the direction of the depressing force, means in connection with said pivots for normally maintaining the same in pivoting position and adapted to alternately direct the travel of each pivot through a predetermined path, and inertia controlled means co-acting with said element to effect its return to normal position and said pivot to pivoting position upon removal of the depressing force from said element.

12. A traffic signal for roadways comprising a normally erect signalling element pivotally mounted to permit depression from opposite directions including spaced pivot members, the pivotal action with respect to said members being shiftable according to the direction of the depressing force, supporting means in connection with said members for normally maintaining the same in pivoting position and adapted to direct said members respectively through a predetermined path in accordance with the direction of the depressing force, and inertia controlled means co-acting with said element to return it to erect position upon removal of the depressing force.

13. A traffic signal comprising a normally erect signalling element pivotally mounted to permit its depression from opposite directions including two spaced pivots, either of which is movable through a predetermined path when the other functions as a pivot according to the direction of the depressing force, an inertia controlled means coacting with said element to effect its return to its normal position after depression, and means connected to said inertia means to accelerate the return of said element to erect position upon removal of the depressing force.

GEORGE T. DERBY.