

# United States Patent

<sup>[11]</sup> 3,633,311

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[33]		<b>France</b>
[31]		<b>154240</b>

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## References Cited

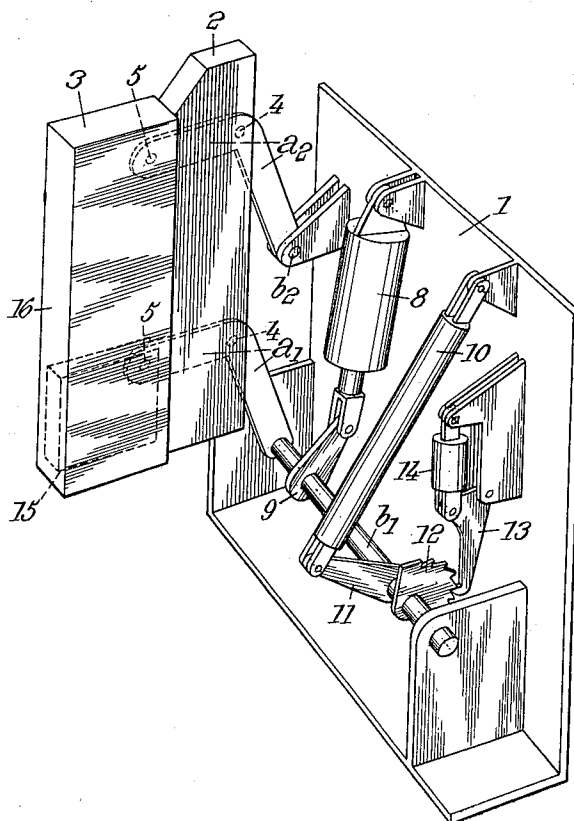
## UNITED STATES PATENTS

1,832,966	11/1931	Cook et al. ....	160/202
1,997,420	4/1935	Kiekert.....	160/202 UX
3,386,202	6/1968	Crews et al. ....	49/35
3,478,467	11/1969	May .....	49/35
1,822,152	9/1931	Kinnard et al. ....	49/25 X
2,601,250	6/1952	Bruns et al. ....	49/25 X
2,895,728	7/1959	Edelman .....	49/25
2,909,718	10/1959	Lawick.....	49/25 X

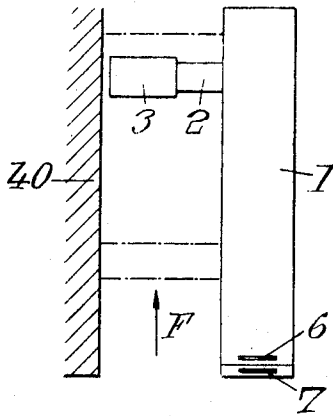
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[54]	<b>GATE</b>	
	<b>12 Claims, 9 Drawing Figs.</b>	
[52]	<b>U.S. Cl.</b> .....	<b>49/35,</b>
		<b>49/49</b>
[51]	<b>Int. Cl.</b> .....	<b>E01f 13/00</b>
[50]	<b>Field of Search</b> .....	<b>49/35, 49,</b>
		<b>25, 31; 160/202, 197, 193</b>

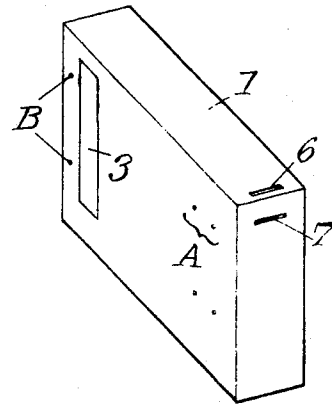
**ABSTRACT:** The gate comprises a casing supporting a barrier extendable and retractable transversely to the direction of the passage passing through the gate. The barrier has two telescopic elements which, in the extended position, extend across the passage; in the retracted position, one of these elements fits inside the other and they both fit inside the casing, whose width need then be only slightly greater than the width of the retracted barrier. The gate is actuated by bellcrank levers driven in one direction by an electromagnet and in the other direction by an elastic return device.



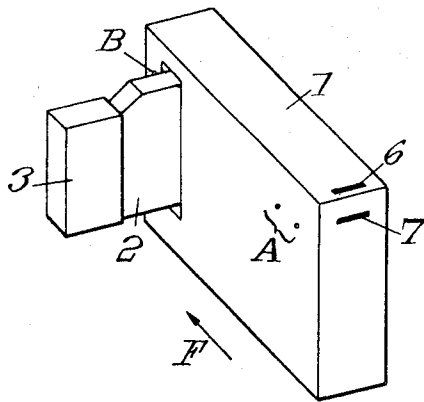
*Fig. 1.*



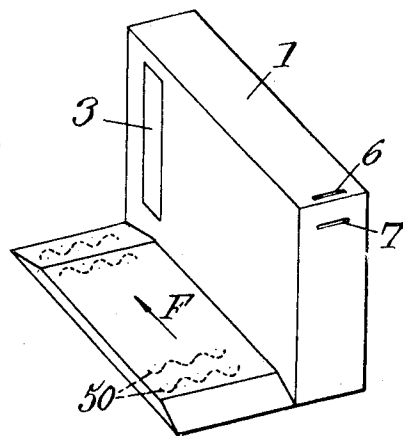
*Fig. 2.*



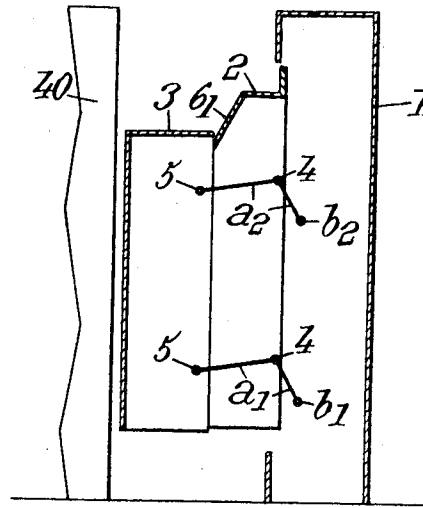
*Fig. 3.*



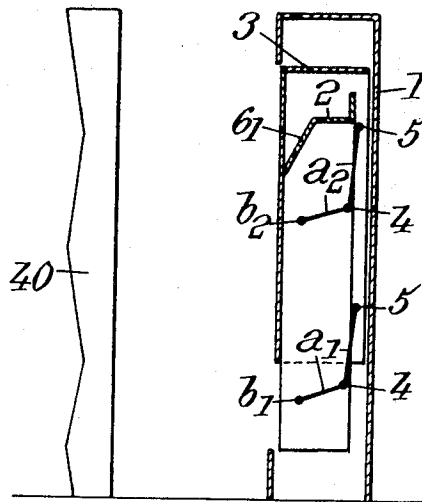
*Fig. 4.*



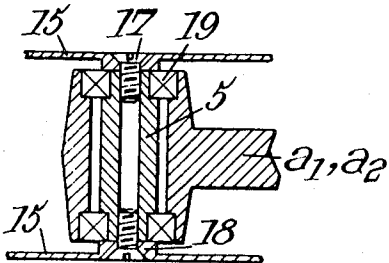
*Fig. 5.*



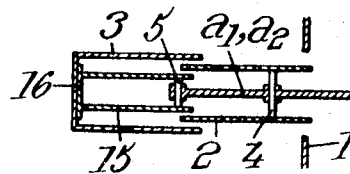
*Fig. 6.*



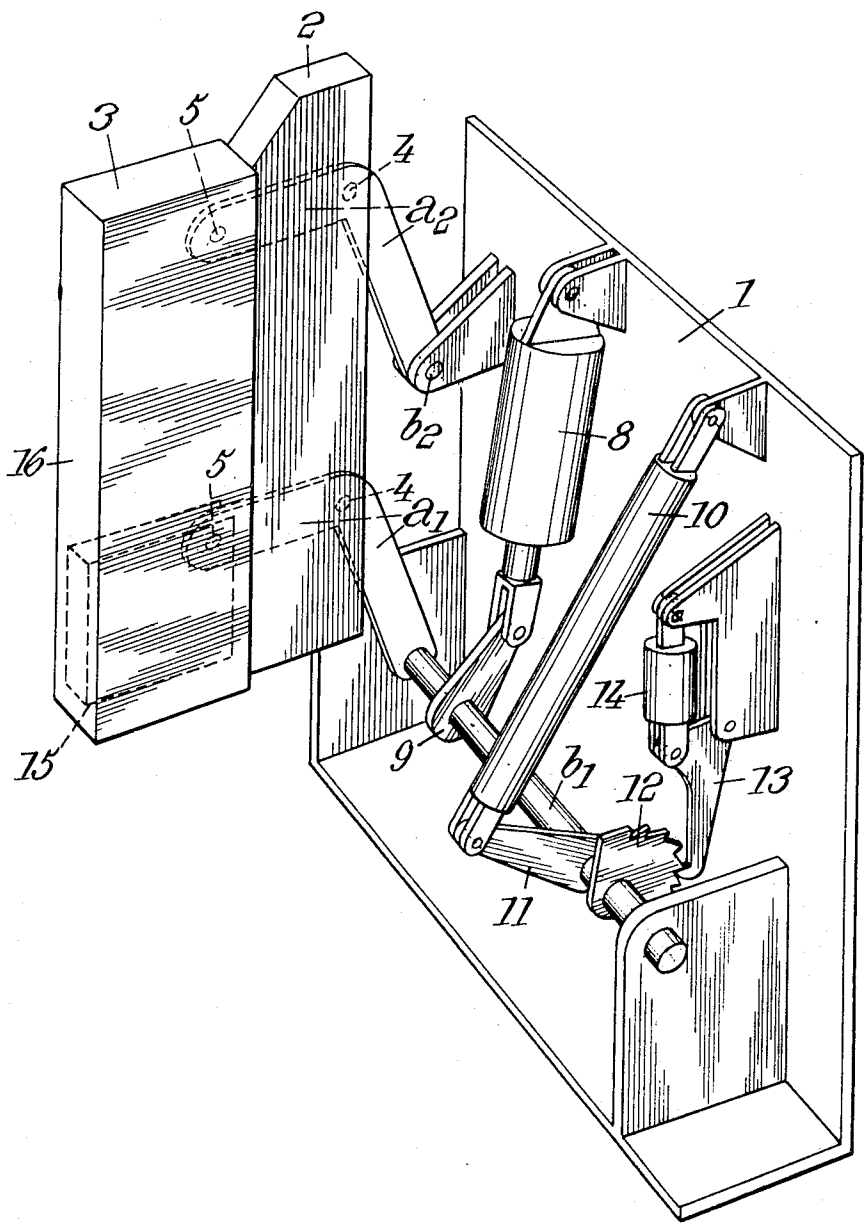
*Fig. 9.*



*Fig. 8.*



*Fig. 7.*



This invention relates to gates, this term designating any apparatus intended to ensure access through a passage, to authorized persons, in particular having a ticket (including tokens and the like), for example for permitting access to a transportation vehicle, to an entertainment hall, etc.

An object of this invention is to provide a gate which is practical, in particular with respect to its size, reliability (especially with regard to jamming), and maneuverability.

According to the principal feature of the invention, the gate comprises a telescopic barrier, in particular displaceable transversely to the direction of the passage, such a barrier being able, in its open position, to be retracted into a casing of small width adapted to contain the maneuvering members.

Various other features of this invention will become apparent from the following specific description, given merely by way of example, with reference to the accompanying drawings in which:

FIG. 1 shows in schematic plan one embodiment of a gate constructed according to the invention;

FIGS. 2 and 3 show in perspective a part of this gate, respectively with the barrier retracted and with the barrier extended;

FIG. 4 shows, also in perspective, another embodiment;

FIGS. 5 and 6 show in vertical schematic section, respectively in the extended position and in the retracted position, a gate like the gate in FIG. 1;

FIG. 7 shows in perspective, with portions removed, a gate like the gate of FIGS. 5 and 6, with more detail;

FIG. 8 shows in horizontal schematic section, a further embodiment of the barrier of this gate; and

FIG. 9 shows, in axial section and on a larger scale, one of the articulations of such a gate.

It is appropriate to mention first of all that many gates are already known, which differ in particular by the type of displacement of the gate. Some of them comprise a turnstile, whereas others comprise barriers displaceable by pivoting or otherwise. In general they have the disadvantage of being rather large and cumbersome, and, in addition, of giving rise to jamming, either between their constituent members, or between their elements and the users of their clothing.

In accordance with this invention, a gate is constituted essentially by a barrier (or at least one barrier) of a telescopic type, which can thus be retracted, from the open position, in to the minimum of space, in particular at inside a casing which can be of small width, while nevertheless containing the various actuating members.

In particular, this barrier is arranged so as to be displaced transversely to the direction of the passage.

In order to illustrate the principle of the invention, FIG. 1 shows the passage, defined, on one side, by a casing 1 from which can extend a barrier constituted by at least two telescopic elements 2, 3 and, on the other side, by a wall 40 (or any other member taking the place of this wall).

The perspectives of FIGS. 2 and 3 show the casing 1 in a lateral view, respectively with the gate in its retracted position (FIG. 2), and with the gate in its extended position (FIG. 3).

The casing can comprise all the actuating means of the gate, as well as, if the control is to be automatic, all the control members and circuits.

Such control members are already known, and can comprise photoelectric cells (FIGS. 1 to 3) or sensitive bands disposed on the floor, as visible schematically at 50 in FIG. 4.

The gate can be normally open, its barrier closing if the user attempting to pass through (in direction F in FIGS. 1, 3 and 4) has not introduced his ticket into an appropriate checker; conversely, the gate can be normally closed.

Assuming for example that photoelectric cells are used and that the barrier is of the normally open type, these photoelectric cells are arranged in at least two groups, one group A at the entrance (FIGS. 2 and 3) and the other group B at the exit. A checker is used in combination with these photoelectric cells, this checker being provided at the entrance of the casing 1; the checker is controlled by the introduction of the ticket

(token, etc.) and comprises an inlet slot 6 and an outlet slot 7 for the ticket. This ticket can in particular bear a magnetic inscription, but any other checking solution can be adopted. The group of photoelectric cells A, at the entrance of the gate, close the barrier when a user tries to pass through without having correctly actuated the checker, the barrier opening again when the user backs out; the photoelectric cells of group B, at the exit, are provided for resetting the checker to its neutral position after the correct passage of a user.

This solution is merely given by way of example; various other solutions can be adopted.

Returning now to the barrier proper and to its means of actuation, these can be constructed in various ways.

With regard to the barrier, its shape will depend on the manner in which its elements 2 and 3 are connected to each other. For example, the elements 2 and 3 can be arranged in a substantially similar manner if they are displaceable telescopically into one another along the same axis, but with the provision of appropriate connection means which move these elements in translation, under the effect of the actuating means.

Nevertheless, it is advantageous, in order to simplify the assembly, to provide the connection of these elements by levers, which will simplify actuation. In this case, the elements 2 and 3 are given an appropriate shape taking into account the angular displacements of the points of articulation of these levers. A solution of this type is represented in FIGS. 5 and 6, where the elements 2 and 3 are connected by a pair of bellcrank levers  $a_1, a_2$  articulated about pivot pins  $b_1, b_2$  inside a casing 1, each of these levers being articulated about the elements 2 and 3 by two pivot pins 4 and 5. In order to take into account the circular trajectory of these two pivot pins 4 and 5, one of the elements, for example the inside element 2, has at its upper part, at 6<sub>1</sub>, a bevelled shape, so that the element 3 can ride up on the element 2. Both the elements 2 and 3 have a box shape, the element 2 being of smaller cross section in order to be able to penetrate into the element 3.

It is essential that the elements of the barrier slide one in the other without the possibility of jamming.

It should be noted that, in the embodiment represented, the two pivot pins  $b_1, b_2$  have been disposed in a common vertical plane.

Turning now to the actuating means, they can be arranged in various ways, and they can be particularly simple in the case, just described, in which bellcrank levers, such as the levers  $a_1$  and  $a_2$ , are used; in this case, the actuating means can be constructed simply by making one of the pivot pins  $b_1, b_2$ , for example  $b_1$ , in the form of a shaft solidly secured to the corresponding lever  $a_1$ , this shaft being driven by a drive system (FIG. 7).

This drive system can also be constructed in various ways, and can comprise for example an electric motor, an electromagnet, a jack, etc. This drive system receives the orders which are sent to it on the one hand from a control device (not shown), actuated for example by the passage of a ticket or the like between 6 and 7 (FIGS. 2 and 3), and on the other hand from a group of circuits controlled by the passage of the user in front of the photoelectric cells A, B.

In the embodiment shown in FIG. 7, the shaft  $b_1$  is actuated by an electromagnet 8 driving a crank 9 solidly secured to this shaft.

Generally, the actuation of the shaft  $b_1$  will take place against the action of an elastic return system such as the one designated by 10 and 11 in FIG. 7. In this embodiment, the closing of the barrier is effected by the drive electromagnet 8 against the action of the elastic system 10, 11, and this elastic system actuates the return of the barrier to its open position; the reverse arrangement could also be used.

Locking means are provided for preventing the user from opening the barrier from its closed position, that is to say for ensuring irreversibility. These locking means comprise a toothed sector 12 mounted on the shaft  $b_1$  and cooperating with a pawl 13 driven by an electromagnet 14 or the like. It is to this electromagnet 14 that the orders are transmitted, with a

view to opening the barrier (when the drive electromagnet 8 acts in the direction of closing), from the control device.

In FIG. 8 a supplementary feature is illustrated relating to a particularly advantageous manner of articulating the levers  $a_1$ ,  $a_2$ , at 5, on the element 3 of the barrier.

According to this feature, the pivot pin 5 is articulated, not directly on the element 3, but on an inner box 15 having an open side fixed at 16 to the left-hand end (as viewed in FIG. 8) of the element 3.

In this manner, the flanks of the element 3 do not have to be pierced.

Another advantageous feature is shown in FIG. 9 and relates to the manner of fastening the pivot pin 5 on the flanks of the box 15.

According to this feature, the pivot pin 5 is formed by a tube threaded at its ends so as to receive screws 17 passing through openings formed in the flanks of the box 15.

The heads of these screws 17 are countersunk, and the openings through which the screws pass are reinforced by an annular element 18. About the thus-fastened tube 5, bearings 19 are mounted which ensure the articulation.

Such a system permits easy dismantling, for, by removing the screw 17, the box 15 is freed from the lever  $a_1$  or  $a_2$ .

The articulations 4 on the element 2 can be arranged in a similar manner.

Such a gate has numerous advantages with respect to already existing gates, in particular:

the advantage, due to the telescoping of the elements of the barrier, of reducing the width of the gate substantially to the width of the barrier in its retracted position; the control devices can easily be housed in a casing of this width;

the advantage of reducing the risks of jamming which exist with articulated gates having a vertically operating barrier or with gates in which a barrier is moved angularly;

the advantage of closing rapidly and irreversibly when the passage is not authorized;

and the advantage of permitting the use of a barrier of small thickness.

What I claim is:

1. A gate for permitting and blocking access through a passage, comprising:

a casing adapted to be fixed substantially parallel to and spaced from a facing surface so as to define with the latter the sides of said passage; and a retractable and extendable barrier connected to said casing,

said barrier comprising a first barrier element and a second barrier element, one said element being adapted to slide into the other said element;

means connecting said first barrier element to said casing so that said element is movable through an arcuate trajectory from a retracted position in which it is substantially wholly located within the width—in the transverse direction of the passage—of said casing to an extended position in which it extends transversely out from the casing to partially block the passage, and vice versa;

means connecting said second barrier element to said casing so that said second barrier element is movable through an arcuate trajectory from a retracted position in which it is substantially wholly located within the width of said casing to an extended position in which it extends out from the extended first barrier element to block further said

passage, and vice versa; and moving means, housed within said casing, arranged for moving said connecting means and hence said two barrier elements, at the same time, from their retracted positions to their extended positions, and vice versa.

2. A gate according to claim 1, in which said first and second barrier elements overlap, in the transverse direction of the passage, and connecting means between said first and second barrier elements adapted to slide one of these two barrier elements at least partially inside the other barrier element, and the upper outer corner of said one barrier element being bevelled so as to enable these two barrier elements to be brought into their retracted positions.

3. A gate according to claim 2, in which said connecting means comprise a bellcrank lever having two arms joined together at an apex, each arm having an end remote from the apex, one of said ends being mounted on said casing with freedom to pivot only, the apex being pivotably mounted on the first barrier element with freedom to move through a first circular arc, and the other said end being pivotably mounted on the second barrier element with freedom to move through a second circular arc of larger radius than said first arc.

4. A gate according to claim 3, in which there are two such bellcrank levers vertically spaced apart in a common vertical plane.

5. A gate according to claim 4, in which said moving means further comprise drive means for pivoting one of said bellcrank levers about its said one free end pivotably mounted on the casing.

6. A gate according to claim 5, in which said one bellcrank lever is pivotably mounted on said casing by the intermediary of a shaft which is solidly secured to that bellcrank lever, said drive means comprising on the one hand an electromagnet device connected to said shaft for rotating said shaft in one direction and on the other hand an elastic return device for rotating said shaft in the opposite direction.

7. A gate according to claim 6, in which a pawl-and-ratchet device is arranged to be put in and out of service, said pawl-and-ratchet device, when it is in service, permitting extension of the barrier but preventing retraction of the barrier, and when it is out of service, permitting both extension and retraction of the barrier.

8. A gate according to claim 1, in which the barrier is normally retracted, said gate including ticket checking means for extending the barrier when a person tries to pass through without having his ticket approved by said ticket checking means.

9. A gate according to claim 1, including sensing means for causing said moving means to retract said barrier in response to the presentation of a person at the gate.

10. A gate according to claim 2, in which each barrier element has the form of a box, one of which penetrates into the other during retraction of the barrier.

11. A gate according to claim 10, including a box member fastened to the distal end inside said second barrier element and pivotal means connecting said box member to said casing.

12. A gate according to claim 10, in which said second barrier element is arranged to cap said first barrier element so that said first and second barrier elements in their retracted position present a flush surface with the passage side of said casing.

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