March 15, 1932. F. A. SIGGINS ET AL 1,849,887

DOOR OPERATING MECHANISM

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Fig. 1.

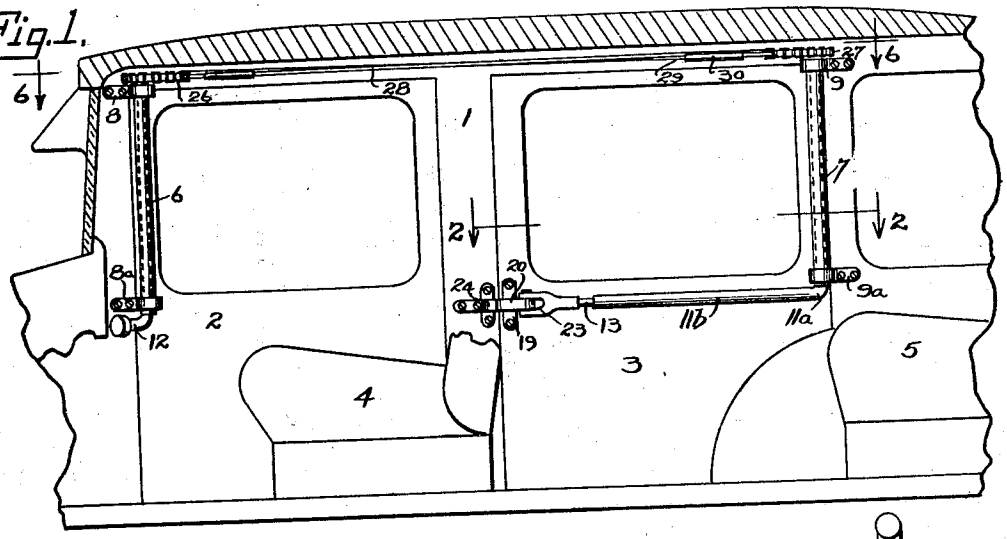


Fig. 2.

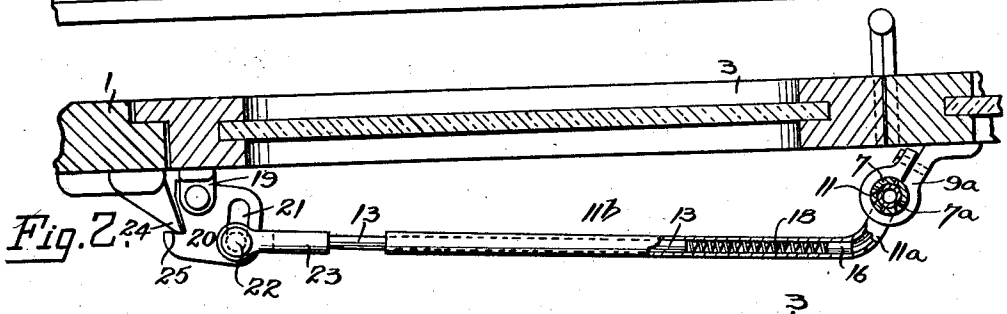


Fig. 3.

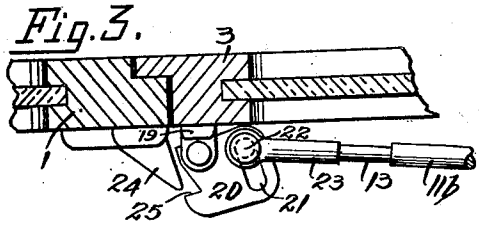


Fig. 4.

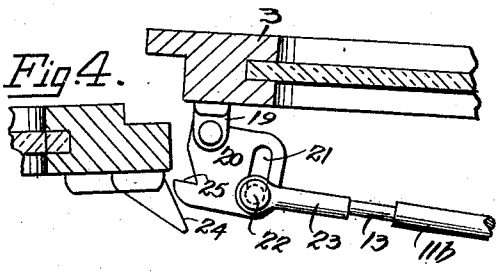
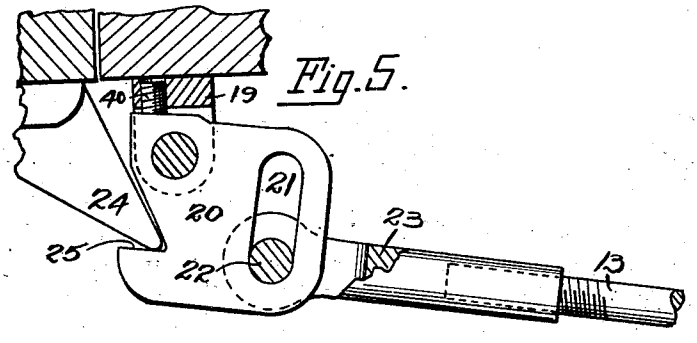


Fig. 5.



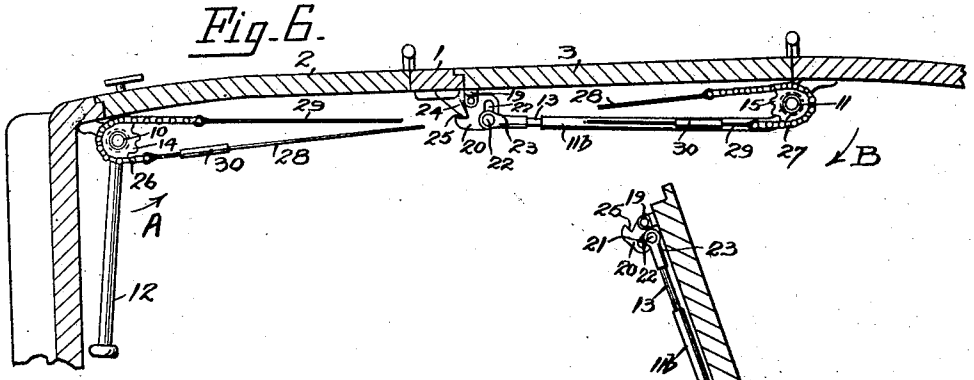
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DOOR OPERATING MECHANISM

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Fig. 6.



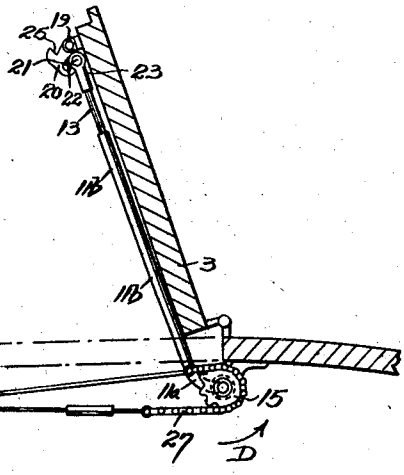


Fig. 7.

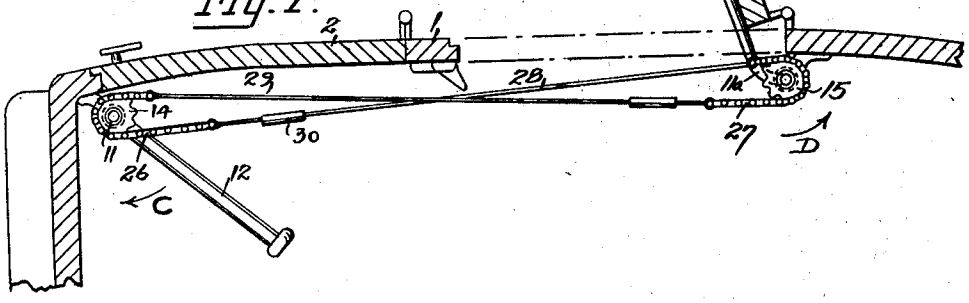


Fig. 8.

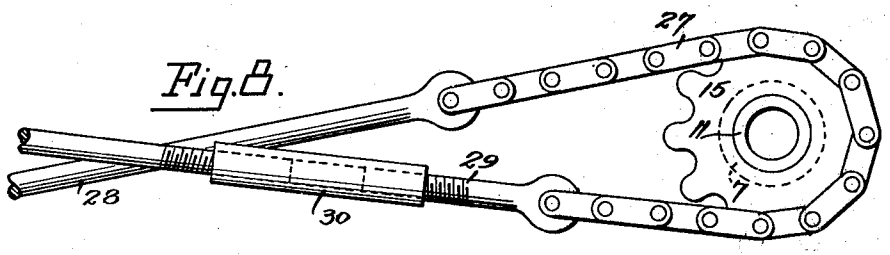


Fig. 9.

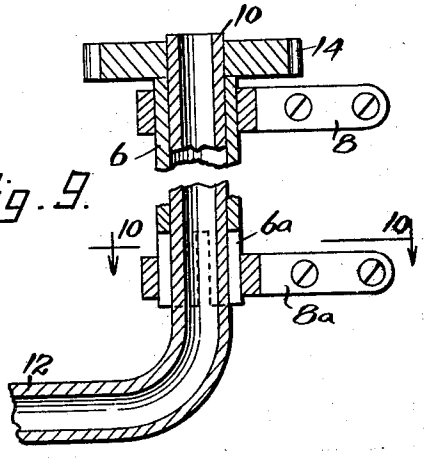
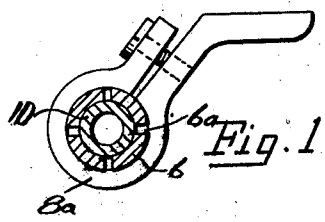


Fig. 10.



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UNITED STATES PATENT OFFICE

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DOOR OPERATING MECHANISM

Application filed January 17, 1930. Serial No. 421,419.

This invention relates to improvements in door operating mechanisms, and refers more particularly to a mechanism by which a door may be readily opened and shut from a location from which it could not otherwise be reached.

It is an object of the invention to provide a door operating mechanism for use in vehicles, such as taxicabs, with the aid of which the driver can open and shut one of the rear doors without moving from his seat.

Another object of the invention is to provide such a door operating mechanism which is simple to construct and install and positive in action.

With these and other objects and advantages in view which will become apparent as the specification proceeds, the invention is hereinafter more fully described with the aid of the accompanying drawings, in which:

Figure 1 illustrates a side elevation of a portion of the inside of a vehicle to which the invention is applied.

Figure 2 is an enlarged section on the line 2—2 of Figure 1.

Figure 3, 4 and 5 are enlarged details showing the fixed catch on the body and the dog pivotal on the door.

Figure 6 is a section on the line 6—6 of Figure 1.

Figure 7 shows a section similar to Figure 6 but with the door open.

Figure 8 is an enlarged detail of one sprocket and the chain around it.

Figure 9 is an enlarged detail showing one of the vertical tubular members and a rotary element extending through it, and

Figure 10 is a section on the line 10—10 of Figure 9.

Referring to the drawings, 1 designates a side of a vehicle having a front door 2, rear door 3, a front seat 4 and a rear seat 5.

Mounted on the inside of the vehicle adjacent the front of the front door 2 and adjacent the rear of the rear door 3 are vertically disposed tubular members 6 and 7 which are rigidly held in position by brackets 8 and 8*a*, and 9 and 9*a*. The members 6 and 7 are usually split longitudinally for a short distance from their lower extremities as shown at 6*a* and 7*a*, in Figures 9 and 2 respectively, so that these members may be pressed inwardly by their brackets 8*a* and 9*a* to fit snugly around the lower portions of rotary elements 10 and 11 which extend through them.

The lower extremity of the rotary element 10 is flexed substantially horizontally beneath the lower end of the member 6 to form a handle 12, and on the upper extremity of the said element 10 a sprocket wheel 14 is secured either by brazing or in any other preferred manner.

On the upper extremity of the rotary element 11 a similar sprocket wheel 15 is suitably secured, beneath the member 7 this element is offset at 11*a*, and its lower extremity beyond the offset portion is disposed substantially horizontally to provide an arm 11*b*.

For purposes of lightness the elements 10 and 11 are usually made hollow throughout their length. In any case the horizontal arm 11*b* must be made hollow to receive a rod 13 which is axially slidable therein. Adjacent the offset portion 11*a* the arm 11*b* is plugged as shown at 16, and between the plugged portion and the inner end of the rod 13 a spring 18 is arranged which tends to force the said rod outwards.

On the door 3 towards its outer margin a bracket 19 is secured in which a dog 20 is pivotally supported so that it may turn about a vertical axis. In the dog 20 a slot 21 is formed through which a pin 22 extends. This pin also passes through the bifurcated ends of a mounting 23 on the outer extremity of the rod 13. On the side of the body 1 adjacent the bracket 19 when the door 3 is in shut position is a projecting catch 24, which is adapted to be engaged by a locking recess 25 formed in one side of the dog 20.

Around the sprockets 14 and 15 short lengths of chain 26 and 27 are arranged. The ends of each chain are connected to the ends of the other chain by means of rods 28 and 29. These rods cross one another intermediately of their length so that the sprockets 14 and 15 will turn in opposite directions. In order that tension shall be readily obtained and maintained on both ends of the chains 26

and 27 the rods 28 and 29 are each provided with a turnbuckle 30.

By moving the handle 12 in the direction of the arrow A, Figure 6, the sprocket 15 is turned in the direction of the arrow B, thereby causing the door 3 to open; and when the handle 12 is moved in the direction of the arrow C, Figure 7, the sprocket 15 is turned in the direction of the arrow D and the door 3 is shut. The slot 21 is so positioned in the dog 20 that when the handle 12 is first moved to open the door 3 the pin 22 travels from its position shown in Figure 2 or 5 to that shown in Figure 3. This pin movement turns the dog 20 pivotally about its bracket 19 so that the locking recess 25 moves clear of the catch 24. When the door 3 is being closed the pin 22 is first moved to the end of the dog slot as shown in Figure 4 so that the dog is turned into such position that its locking recess 25 will engage the catch 24. Momentarily, of course, as the dog 20 strikes the catch 24 the former is turned sufficiently by the latter for the dog to pass the catch, but continued pressure on the handle 12 turns the dog again into such position that the recess 25 will engage the catch. The spring 18 also tends to force the rod 13 outwards to hold the dog in such position that its locking recess remains in engagement with the catch 24. A screw 40 may be employed in the bracket 19 for limiting the movement of the dog 20 about its axis.

The telescopic arrangement of the rod 13 in the arm 11*b* is provided on account of the fact that the dog 20 is usually further from the vertical portion of the portion 11 when the door 3 is open. The offset portion 11*a* of the rotary element 11 is provided so that the arm 11*b* will clear the side of the door 3 in all positions of the latter without it being necessary for the member 7 to be positioned at too great a distance from the side 1 of the vehicle.

While in the foregoing the preferred embodiment of the invention has been described and shown, it is understood that the construction is susceptible to such alterations and modifications as fall within the scope of the appended claims.

What we claim as our invention and desire to secure by Letters Patent is:

1. A door operating mechanism comprising a door frame, a door pivotally mounted in said frame, a tubular member in alignment with the axis of the door on said frame adjacent the pivotally mounted side of the door, an element extending through said tubular member, means for turning said element, a dog pivotal on the door having its axis in alignment with the axis of the door and having a recessed portion thereon, a catch secured to the side of the door frame remote from that to which the tubular member is secured, said catch being adapted to be engaged by said recessed portion, one extremity of the element being flexed at right angles to the tubular member, a rod axially slidable in the flexed extremity of the element, the dog having a slot formed therethrough, and a fastening means extending through said slot and through the outer end of said rod.

2. A door operating mechanism comprising a door frame, a door pivotally mounted in said frame, a tubular member in alignment with the axis of the door, an element extending through said tubular member means for turning said element, a dog pivotal on the door having its axis in alignment with the axis of the door, a locking member on said dog, a catch secured to the side of the door frame remote from that on which the tubular member is secured, one extremity of the element being flexed at right angles to the tubular member, a rod axially slidable in the flexed extremity of the element, a spring in said flexed extremity tending to force said rod outwards, the dog having a slot formed therethrough, a fastening means extending through said slot, and the outer end of the rod being connected to the dog by said fastening means so that by rotation of said element the locking member may be brought into engagement with or released from the catch.

3. In an arrangement of the character described, the combination of a door frame, a door pivotally mounted in said frame, a catch on said door frame, a dog pivotal on the door about an axis in alignment with the axis of the door, a locking means on said dog adapted to engage said catch, said dog having a slot formed therethrough in alignment with its pivotal axis, an element extending substantially at right angles to the axis of the door having one end flexed substantially at right angles, said flexed end being rotatably mounted on the door frame and on the side thereof on which the door is pivotally mounted, a rod axially slidable in said element, a fastening means extending through the dog slot, and the outer end of the rod being pivotal on said fastening means so that when the element is moved in the direction in which the door opens and the latter is shut the dog is so turned that its locking means disengages said catch.

4. In an arrangement of the character described, the combination of a door frame, a door pivotally mounted in said frame, a catch on said door frame, a dog pivotal on the door about an axis in alignment with the axis of the door, a locking means on said dog adapted to engage said catch, said dog having a slot formed therethrough in alignment with its pivotal axis, an element extending substantially at right angles to the axis of the door having one end flexed at right angles, said flexed end being rotatable on said door frame and on the side thereof on which the door is pivotally mounted, a rod axially slidable in

said element, a fastening means extending through the dog slot, and the outer end of the rod being pivotal on said fastening means so that when the element is moved in the direction in which the door closes the dog is moved so that its locking means assumes such a position that it will engage the catch, and a spring in said element tending to force the rod outwards and hold the dog so that its locking means remains in its catch engaging position.

5. In a door operating mechanism, the combination of a vehicle side, a door pivotally mounted therein, two parallel tubular members mounted on said vehicle side in alignment with the axis of the door, a rotary element extending through each tubular member, a handle on one rotary element by which it is adapted to be turned, connecting means between said elements so that when one is turned the other turns also, the other element having one extremity flexed substantially at right angles, a rod axially slidable in said extremity, a catch on said vehicle side, and a dog on said door pivotal about an axis in alignment with the axis of the door, said dog having a catch engaging portion thereon, and the outer end of the rod being pivotally connected to said dog.

6. In a door operating mechanism, the combination of a vehicle side, a door pivotally mounted therein, two parallel tubular members mounted on said vehicle side in alignment with the axis of the door, a rotary element extending through each tubular member, means on one rotary element for turning it, means causing the other rotary element to turn when the first element is turned, the other element having one extremity flexed at right angles, a rod axially slidable in said extremity, a spring in said extremity tending to force said rod outwards, a catch on said vehicle side, a dog pivotal about an axis in alignment with the axis of the door mounted on said door, a locking member formed on said dog adapted to engage said catch, said rod being pivotally connected to said dog, and means in the latter for causing its locking member to release said catch when the door is shut and the rotary elements are so turned as to cause the door to open.

7. In an arrangement of the character described, the combination of a vehicle side, a door pivotally mounted therein, elements rotatably mounted on said vehicle side in alignment with the axis of the door, a sprocket on each element, a chain around each sprocket, means connecting the ends of one chain with the ends of the other so that the sprockets rotate in opposite directions, means for turning one element, one end of the other element being flexed at right angles, a rod axially slidable in said flexed extremity, a catch on said vehicle side, a dog pivotal on said door a portion of which is adapted to engage said catch, and the outer end of said rod being so connected to the dog that movement of the flexed element extremity in one direction or the other causes the dog to move into or out of its catch engaging position.

8. In an arrangement of the character described, the combination of a vehicle side, a door pivotally mounted therein, elements rotatably mounted on said vehicle side in alignment with the axis of the door, a sprocket on each element, a chain around each sprocket, means connecting the ends of one sprocket with the ends of the other sprocket so that the sprockets rotate in opposite directions, means for adjusting the tension on said connection means, one element having one extremity flexed at right angles, means for turning the other element, a rod axially slidable in said flexed extremity, a spring in said flexed extremity tending to force said rod outwards, a catch on said vehicle side, a dog pivotal on said door about an axis in alignment with said door axis, a locking member on said dog adapted to engage said catch, a slot formed through said dog in alignment with its pivotal axis, and a fastening means through said slot which also passes through the outer end of said rod, said slot being so positioned that movement of said fastening means therein causes said dog to turn into its catch engaging or catch releasing position.

9. A door operating mechanism comprising a door frame, a door pivotally mounted in said frame, an element the main portion of which is rotatable about an axis parallel with the axis of the door, means for turning said element, a dog pivoted on said door having a recessed portion thereon, a catch secured to the side of the door frame remote from that on which the door is pivoted, said catch being adapted to be engaged by the recessed portion of said dog, one extremity of said element being flexed substantially at right angles to its main portion, a rod cooperating with the flexed extremity of said element so as to be axially slidable relative to the latter, the dog having a slot formed therethrough, and a fastening member extending through said slot and said rod.

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