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CONNECTION BETWEEN CLOSURES AND CONTROL ARMS OF WINDOW REGULATORS

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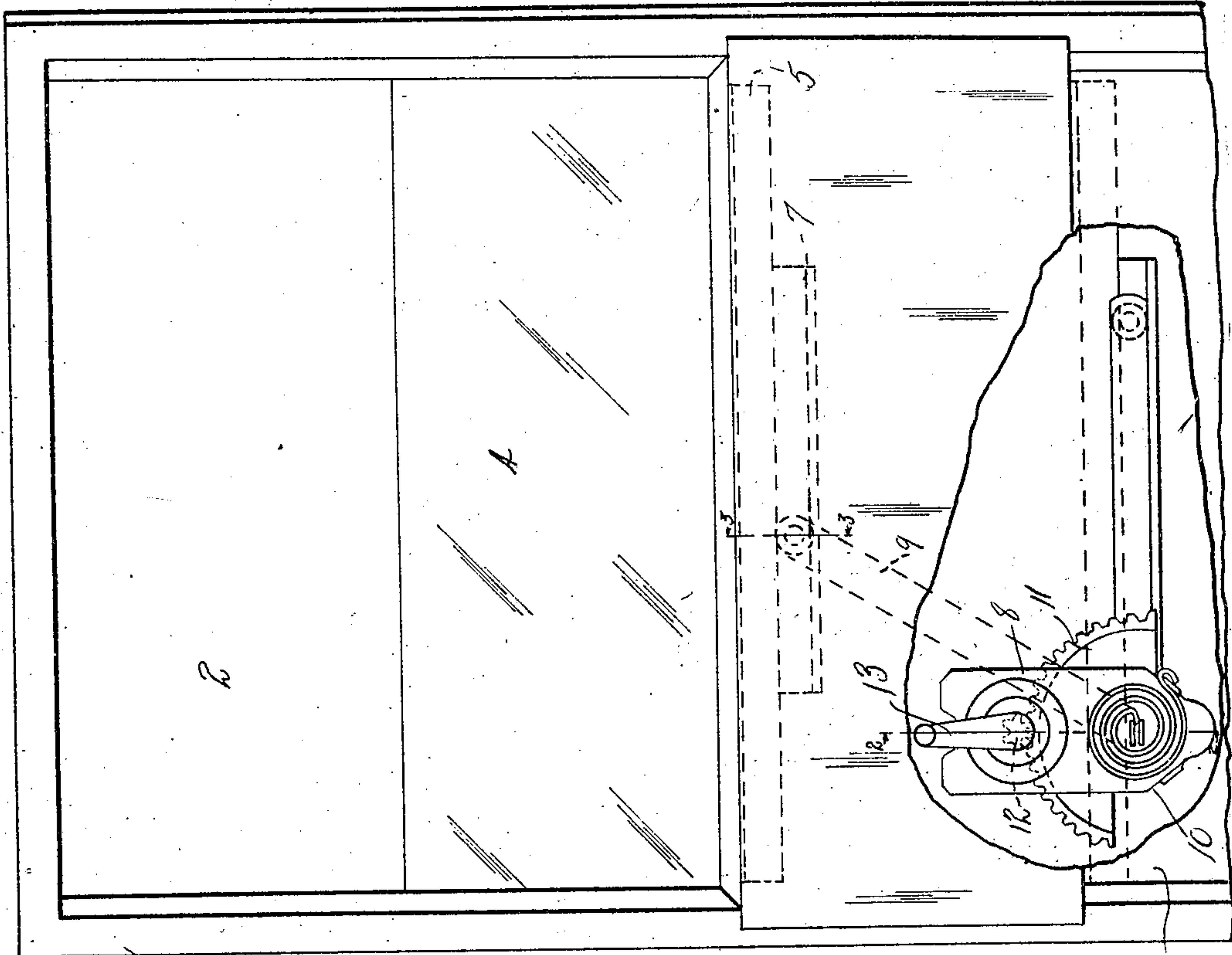


Fig. 1

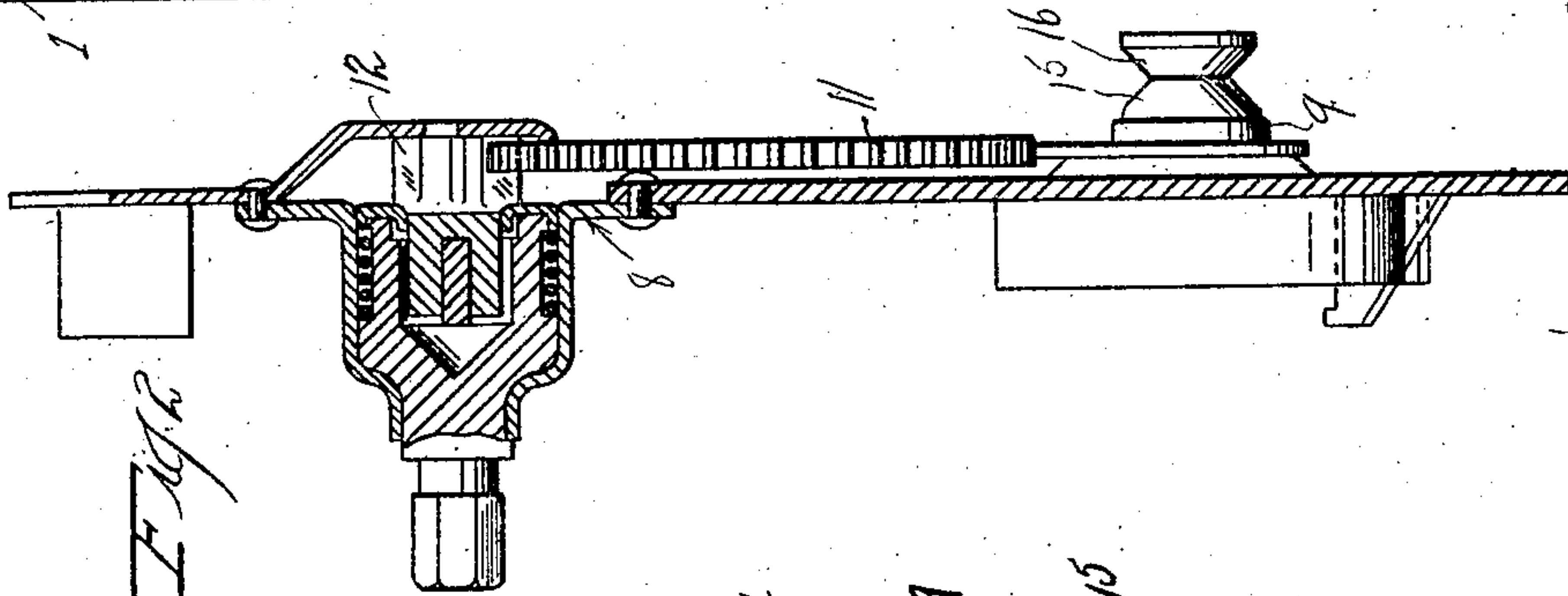
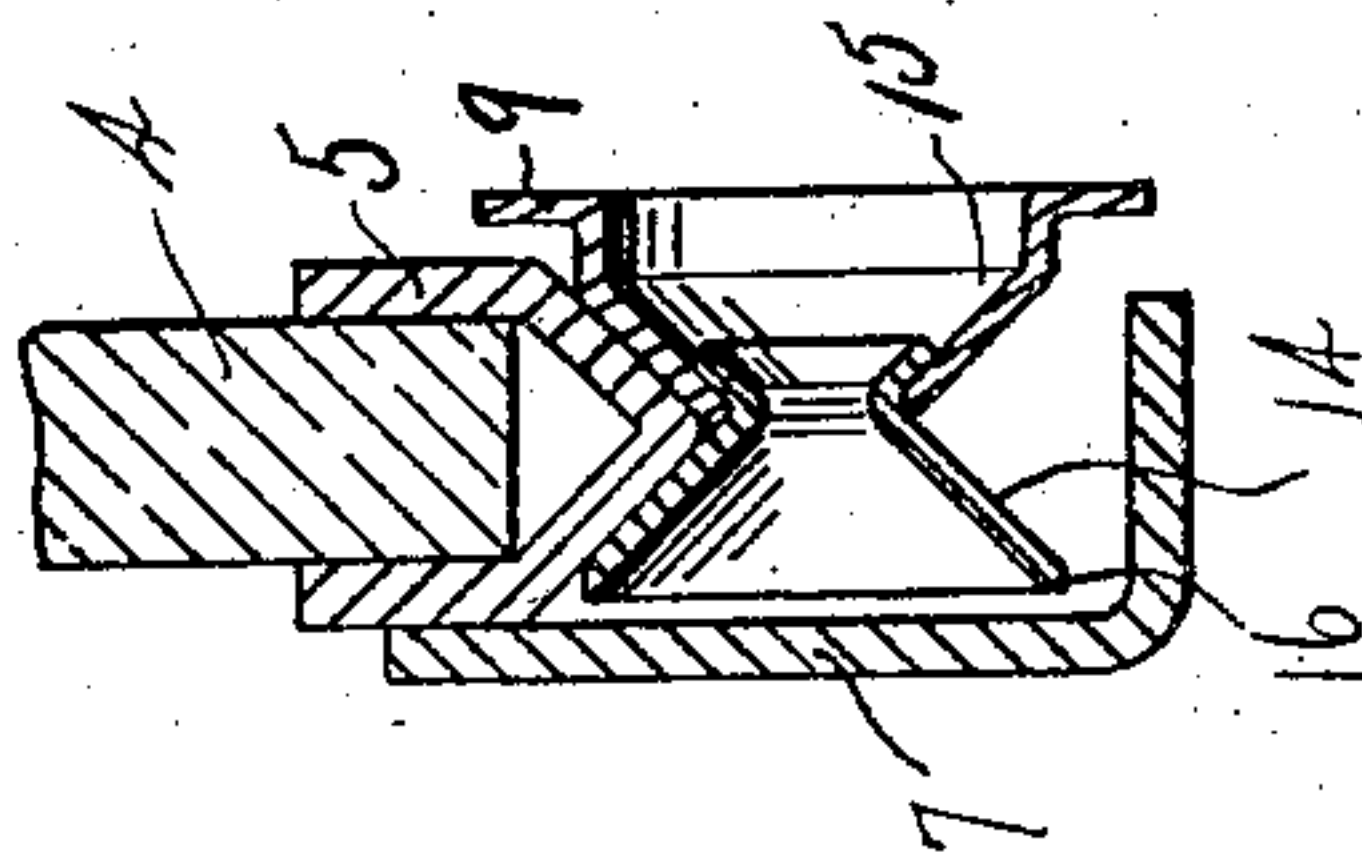


Fig. 2

Fig. 3



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CONNECTION BETWEEN CLOSURES AND CONTROL ARMS OF WINDOW REGULATORS.

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The invention relates in general to window regulators and refers more particularly to the means for connecting a window regulator to a closure or window. One of the objects of the invention is to provide an improved form of connection between a closure and regulator therefor which may be readily and cheaply manufactured. Other objects of the invention reside in the novel features of construction and combinations and arrangements of parts as more fully hereinafter set forth.

In the drawings:—

Figure 1 is an interior side elevation, partly broken away, of a vehicle door having applied thereto a window regulator embodying my invention;

Figures 2 and 3 are cross sections, respectively, on the lines 2—2 and 3—3 of Figure 1.

In the present instance, I have shown a vehicle door 1 having an opening 2 in its upper portion and a chamber 3 in its lower portion. 4 is the closure or window slidable in suitable guideways in the door uprights and adapted to be lowered from a position closing the opening 2 into the chamber 3. This closure has a sheet metal clip 5 embracing and secured to the lower edge of the glass 6 and having secured thereto the retainer 7 which is in the nature of a sheet metal angle-shaped section.

8 is the regulator which, as shown in the present instance, has a sheet metal lifter arm 9 which is pivotally mounted at its inner end upon the mounting plate 10 and which is adapted to be operatively connected at its outer end to the closure. This lifter arm is angularly moved about its pivot by suitable means including the gear segment 11 which is rigidly secured to the lifter arm and the pinion 12 meshing with the gear segment and suitably driven from the crank or handle 13, both the pinion and crank or handle being also mounted upon the mounting plate.

For operatively connecting the outer end of the lifter arm of the regulator to the closure, I have provided the sectional bearing 14 which is located between the base of the clip 5 and the retainer flange spaced from and extending substantially parallel to the base. This bearing comprises the inner and outer bearing members 15 and 16, respectively. The inner bearing member is formed

integral with the lifter arm and is tubular, it being struck out from the lifter arm and having a frusto-conical outer end portion. The outer bearing member is also tubular and has a frusto-conical portion cooperating with the frusto-conical portion of the inner bearing member to form an annular groove in the bearing with opposed bearing faces for engaging the bearing faces of the base of the clip 5, these latter bearing faces being on opposite sides of the apex of the base, which is V-shaped. The inner end of the outer bearing member extends through the opening in the outer end of the inner bearing member and is bent over upon the inner surface of this inner bearing member to rigidly secure the outer bearing member to the inner bearing member. The outer end of the inner bearing member preferably extends at right angles to the frusto-conical portion of the outer bearing member to form a closed joint between the bearing members.

A bearing forming the connection between the closure and the regulator such as formed in the present instance may be cheaply manufactured. Furthermore, this bearing forms a strong and substantial connection.

What I claim as my invention is:

1. The combination with a closure and a regulator for operating said closure including an angularly movable sheet metal member operatively connected to said closure, of means for operatively connecting said sheet metal member and closure including a sectional bearing extending transversely of said angularly movable member and having a section integral with and struck out from said angularly movable member.

2. The combination with a closure and a regulator for operating said closure having a sheet metal member operatively connected to said closure, of means for operatively connecting said sheet metal member and closure, including a sectional bearing extending transversely of said sheet metal member and having a section integral with and struck out from said metal member.

3. The combination with a closure and a regulator for opening said closure including a sheet metal member operatively connected to said closure, of means for operatively connecting said sheet metal member to said closure including a bearing member extending transversely of and struck out

from said sheet metal member and a cooperating bearing member riveted to said first mentioned bearing member.

4. The combination with a closure and a
5 regulator for operating said closure, including a sheet metal member operatively connected to said closure, of means for operatively connecting said sheet metal member to said closure, including a tubular bearing
10 member extending transversely of and struck out from said sheet metal member and provided with a frusto-conical portion and a cooperating bearing member riveted to said first-mentioned bearing member and having
15 a frusto-conical portion cooperating with the frusto-conical portion of said first-mentioned bearing member to form opposed bearing surfaces.

5. The combination with a closure and a
20 regulator for operating said closure, including a sheet metal member operatively connected to said closure, of means for operatively connecting said sheet metal member to said closure, including a tubular bearing
25 member extending transversely of and struck out from said sheet metal member, and a second tubular bearing member in axial

alignment with said first mentioned bearing member and riveted thereto, said bearing members having opposed frusto-conical
30 bearing surfaces.

6. The combination with a closure, of a regulator for operating said closure including an angularly movable sheet metal arm, of means for operatively connecting said
35 arm to said closure including a sectional annularly grooved bearing formed of a tubular bearing member struck out from said arm and a second tubular bearing member riveted to the outer end of said first men-
40 tioned bearing member.

7. The combination with a closure and a regulator for operating said closure, including a lifter arm operatively connected to
45 said closure, of means for operatively connecting said lifter arm to said closure, including a bearing member engageable with said closure and riveted to said lifter arm, said lifter arm having an integral struck-out
50 portion engageable with said bearing member for positioning the same relative to said lifter arm.

In testimony whereof I affix my signature.

MILES G. HANSON.