May 20, 1958 J. FILKO 2,835,755

ADJUSTABLE CONTACT ASSEMBLY

Filed Oct. 25, 1956

FIG. 1

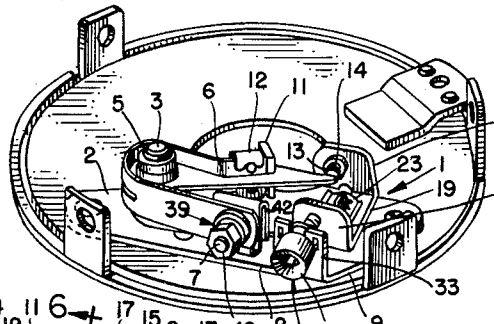


FIG. 2

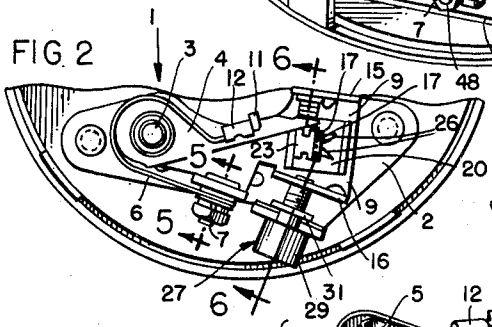


FIG. 3

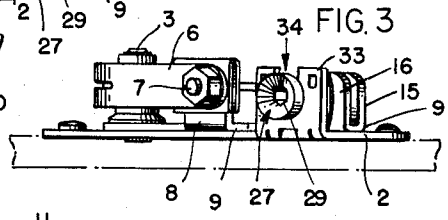


FIG. 4

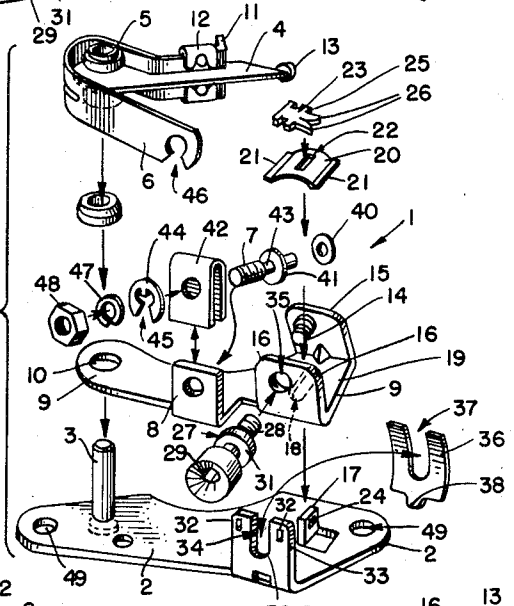


FIG. 5

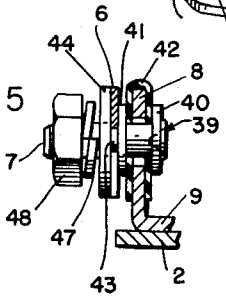
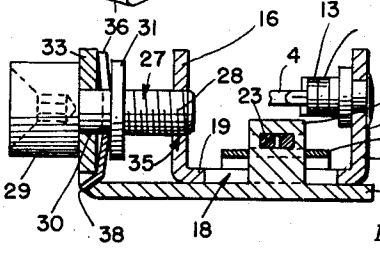


FIG. 6



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ADJUSTABLE CONTACT ASSEMBLY

John Filko, Chicago, Ill.

Application October 25, 1956, Serial No. 618,222

8 Claims. (Cl. 200—30)

This invention relates in general to a contact assembly for application to a distributor plate to effect automatic advancement and retardation of the spark for internal combustion motors of the type generally disclosed in applicant's U. S. Letters Patent No. 2,727,104, issued December 13, 1955.

The particular adjustable unit contact assembly of the present invention comprises a lower supporting plate which is adapted to be mounted on an oscillationg distributor plate. The unit contact assembly includes means to effect adjustment betwen the two contacts of the unit contact assembly. The supporting plate has frictionally mounted thereon an upper bracket plate which is adapted to be adjusted on the supporting plate so that there will be relative adjustment of the contact on the contact arm with respect to its other cooperating contact. The bracket plate is provided with two spaced apart upstanding ears, one ear carrying a contact, and the other ear threadedly engaging an adjusting screw for effecting shifting the contact on one ear of the bracket plate so that a proper adjustable contact may be maintained between that contact and the contact on the arm. The upper bracket plate is frictionally mounted on the lower supporting plate, and is adjustable by means of an adjustment screw threadedly engaging an upstanding ear on the bracket plate, whereby rotative movement of the adjustment screw will effect adjustment of the bracket plate and cause one contact to be shifted toward, and away from, the other, depending upon the rotational movement of the screw.

It is known that there is already on the market a contact assembly for adjusting one contact with respect to the contact on the contact arm, but such prior known devices become loosened when the adjusting screw is rotated too far in one direction. Furthermore, the frictional engagement between the upper bracket plate and the lower supporting plate of such prior device is insufficient and is incapable of providing the necessary proper frictional engagement between the two plates during full and complete adjustment.

The primary object of the present invention is the provision of new and improved means for correcting or curing the inherent disadvantages of such prior devices, and to provide new and improved means for effecting proper frictional engagement between the lower supporting plate and its cooperating upper bracket plate.

Another important object of the present invention resides in the provision of new and improved means for effecting adjustment of the upper bracket plate with respect to its lower supporting plate, whereby adjustment may be had with respect to the contacts without causing any of the parts to become loose or disengaged.

A further object resides in new and improved means for shifting one contact with respect to its other contact throughout complete adjustment movements of one contact with respect to the other.

A still further object of the invention resides in a new and improved adjustable unit contact assembly which may

be quickly and easily assembled and operably secured together, which comprises relatively few and simple parts, and which definitely and positively causes the adjustment of the parts that remain in such adjusted position.

Still another object resides in the provision of a new and improved locking means for locking the spring for the contact arm to be easily applied and removed, as well as to provide a lowered cost locking arrangement for securing the spring of the contact arm in insulated and fastened condition.

The accompanying drawing illustrates a certain selected embodiment of the invention, and the views therein are as follows:

Fig. 1 is a detail perspective view showing the adjustable unit contact assembly of the invention mounted on a conventional distributor plate;

Fig. 2 is a detail fragmentary plan view of a distributor plate having the adjustable unit contact assembly applied thereto;

Fig. 3 is a detail elevational view of the arrangement shown in Figs. 1 and 2;

Fig. 4 is a detail exploded view showing various parts of the adjustable unit contact assembly in perspective;

Fig. 5 is a detail transverse sectional view on the line 5—5 of Fig. 2, showing the manner in which the spring for the contact arm is secured together and still permits free and easy application and removal of the spring; and

Fig. 6 is a detail transverse sectional view on the line 6—6 of Fig. 2, showing the means for effecting relative adjustment of the contacts.

The particular construction herein shown for the purpose of illustrating the present invention comprises an adjustable unit contact assembly 1 which is adapted to be detachably mounted on a distributor plate. The unit contact assembly 1 comprises a lower supporting plate 2 which is adapted to have its bottom mounted on top of a conventional distributor plate, the unit being removably mounted on the distributor plate. An upstanding supporting post 3 is adapted to be secured to the supporting plate 2 and carries a contact arm 4 which is pivotally or rotatably mounted for oscillation about the post 3, the contact arm 4 being insulated as at 5, Fig. 4, from the post 3. A flat contact arm spring 6 is adapted to be fastened to the contact arm 4, one end of the spring 6 being secured to the contact arm 4, and its other end being secured to a screw member 7 carried by an upstanding ear 8 on an upper bracket plate 9.

The upper bracket plate 9 is mounted above the lower supporting plate 2, and is provided at one end with a circular opening 10, Fig. 4, to receive the upstanding post 3, whereby the bracket plate 9 has pivotal or oscillating movement with respect to the lower supporting plate 2.

The contact arm 4 carries a rubbing block 11 which is adapted to engage the usual rotary cam for shifting the contact arm to make and break electrical contact. The rubbing block 11 is secured to the contact arm 4 and to one end of the spring 6 by a clip member 12 which secures the rubbing block 11 and the spring 6 in fixed position with respect to the contact arm 4. A contact 13 is fixed to the free outer end of the contact arm 4 and is adapted to make periodical or intermittent contact with a contact 14 secured to an integral upstanding ear 15 on the bracket plate 9. The outer free end of the contact arm 4 is adapted to have oscillatory movement between the ear 15 and a second cooperating spaced upstanding ear 16 on the bracket plate 9.

It is desirable that the contacts 13 and 14 have relative adjustment, because continued operation of the contact 13 against the second cooperating contact 14 is likely to become pitted or otherwise worn, and thereby weaken the electrical energy between the two contacts 13 and 14. Relative adjustment of one contact with respect to the

other contact, is provided by shifting the bracket plate 9 and thus cause greater or less movement of the contact arm 4. Shiftable movement of the bracket plate 9 with respect to the supporting plate 2 will cause relative adjustment of the contacts 13 and 14. A substantial amount of frictional engagement between the bracket plate 9 and its supporting plate 2 is desirable, so that the bracket plate 9 will remain in its adjusted position, thereby preventing any tendency of the bracket plate 9 to move from its adjusted position with respect to its cooperating supporting plate 2.

The means assuring frictional engagement of the upper bracket plate 9 with respect to the lower supporting plate 2 comprises an upstanding lug 17 which is struck upwardly from the supporting plate 2. The lug 17 extends through an elongated slot 18 formed in the part 19 of the bracket plate 2 between the ears 15 and 16. A relatively flat spring 20, which is arcuate between its side edges 21, Fig. 4, is provided with an elongated slot 22 which receives the upstanding lug 17, the spring 20 being mounted above the upper surface of the part 19 of the bracket plate 9. A locking member 23, somewhat in the nature of a cotter pin, is adapted to overlie the upper surface of the spring 20, and is received in an opening 24 in the upstanding lug 17 on the supporting plate 2. This locking member 23 is provided with a shoulder 25 to limit the inward movement of the locking member in its cooperating opening 24. The locking member 23 is split at its outer free end terminating in two fingers 26, which are adapted to be spread apart, as shown in Fig. 2, and thus lock the locking member 23 in position in its cooperating opening 24. This locking member 23 also creates a pressure on the outer bowed or arcuate surface of the spring 20 and causes the bracket plate 9 to be held frictionally tight on top of the supporting plate 2, but, at the same time, the spring 20 permits for adjustable shiftable movement between the two plates 2 and 9. The amount of adjustable movement of the bracket plate 9 with respect to the supporting plate 2 is determined by the length of the slot 18 in the part 19 of the bracket plate and the length of the lug 17, the lug 17, of course, being less in length than the length of the slot 18 to permit such adjustment.

The bracket plate 9 is adapted to be adjusted in relation to the supporting plate 2 by means of an adjusting screw member 27. The screw member 27 has a stem 28, which is threaded on one end, and a head 29 on its other end. The adjusting screw 27 is provided with a smooth nonthreaded part 30 arranged between the head 29 and the threaded part of the stem. The smooth unthreaded part 30 of the stem 28 is that part which lies between an integral annular collar 31 inwardly of the head 29, and provides an annular groove, the space between the head and the collar being the smooth unthreaded part 30 of the stem 28. The screw 27 is arranged between the bifurcated ends 32, 32 of an integral lug 33 bent upwardly from one side of the supporting plate 2, the bifurcated ends forming a slot 34 in which the smooth section 30 of the screw 27 engages. The screw member 27 has free rotative movement in the slot 34 of the bifurcated ends 32, and because the part 30 of the screw 27 is smooth between the head 29 and the annular collar 31, the screw is free to have rotative movement but no longitudinal translation. The free threaded end 28 of the screw member 27 is adapted to engage a threaded opening 35 in the struck up ear 16 of the bracket plate 9. Therefore, when the screw 27 is rotated, the screw 27 will be rotated in the threaded opening 35 and cause the bracket plate 9 to be shifted inwardly, or moved outwardly with respect to the plate 2, depending, of course, upon the direction of rotation of the screw 27. This adjustment, therefore, moves the contact 14 accordingly.

Adjustment, by rotation of the screw 27 a proper amount, is maintained by frictional means to prevent accidental rotation of the screw because of vibration, or otherwise. A flat spring 36 having a slot 37 formed in one end thereof, Fig. 4, is adapted to be interposed between the annular collar 31 and the inside of the bifurcated lug 33 to create a friction on the screw 27 and thus prevent accidental movement of the screw. The friction against the screw 27 causes it to maintain the bracket plate 9 in its adjusted position with respect to the supporting plate 2. Shiftable movement of the bracket plate 9, by operation of the screw member 27, will cause corresponding adjustable movement of the contact 14 inasmuch as the contact 14 is rigidly secured to the rigid ear 15 of the bracket plate 9. The vertically disposed elongated slot 37 in the spring 36, Fig. 4, alines with the slot 34 in the ear 33 and is prevented from turning by an integral finger 38 on the spring 36 engaging a slot formed in the ear 33 below the stem 28 of the screw 27, Fig. 6.

The invention further includes improved means for locking the free end of the contact arm spring 6 in place to the upstanding ear 8 on the bracket plate 9, Fig. 5. The screw 7, which passes through an opening in the ear 8, is in the nature of a rivet 39 and includes spaced annular members or collars 40 and 41 arranged on opposite sides of an insulated clip 42 which extends on opposite sides of the ear 8. The screw 7 is undercut, as indicated at 43, Figs. 4 and 5, to receive a locking ring 44 and thus lock the rivet 39, including the screw 7, in position tightly against the insulating clip 42. The member or ring 44 is provided with a cutout 45, Fig. 4, so as to permit the same to be applied easily in position in the smooth undercut part 43 of the screw 7. The outer free end of the spring 6 is provided with an arcuate-like slot 46, Fig. 4, and is adapted to be arranged in position between the collar 41 at the undercut part 43 of the screw 7 and the locking member 44. A lock washer 47 is arranged exteriorly of the member 44 and the parts are all locked together by means of a nut 48 on the threaded outer end of the rivet screw 7. The arrangement is such that the rivet member 39 is secured to the ear 8, and, therefore, the slot 46 in the free end of the contact spring 6 may be slipped into position and held in that position even before the nut 48 is screwed in place. The arrangement for supporting, holding and locking the free end of the spring 6 is such that it may be quickly and readily applied and removed by the slot 46 engaging the screw 7. When the nut 48 is locked, the parts are maintained in positive locked position.

The supporting plate 2 is adapted to be mounted on top of the distributor plate, there being holes 49, Fig. 4, provided for locking the plate 2 to the distributor plate. The bracket plate 9 is maintained in position by having one end pivotally mounted on the upstanding post 3, and its other end adjustably held in place by the screw member 27 cooperating with the upstanding bifurcated ear 33 on the plate 2 and threadingly engaging the upstanding ear 16 on the bracket plate 9.

The invention provides new and improved means for effecting adjustment of the contact 14 with respect to the contact 13 by the relative adjustment of the bracket plate 9 with its lower supporting plate 2. Also, the invention is unique in the manner in which the free end of the contact spring 6 may be arranged in assembled position by applying the contact arm slot 46 over the screw 7 and then finally locking all the parts in adjusted position by means of tightening the nut 48.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fall fairly within the scope of the following claims.

The invention is claimed as follows:

1. An adjustable contact assembly comprising a lower supporting plate, a post on said plate and extending upwardly therefrom, an upper bracket plate arranged on top of said supporting plate, said bracket plate having one

end mounted on said post, opposed ears on said bracket plate and extending upwardly therefrom, a contact on one of said ears, a contact carrying arm mounted on said post and arranged between said ears and adapted for engagement with said first contact, a lug struck up from said supporting plate and engaging a slot formed in the bracket plate between said ears, a spring member mounted on said lug and engaging the bracket plate, and a cotter-pin-like locking member passing through said lug and engaging said spring to create a friction against the bracket plate and consequently creating a friction between said bracket plate and the supporting plate, an ear struck up from the supporting plate, a screw member freely rotatable in said latter ear and threadedly engaging one of said first ears to translate the bracket plate on the supporting plate.

2. An adjustable contact assembly comprising a lower supporting plate, a post on said plate and extending upwardly therefrom, an upper bracket plate arranged on top of said supporting plate, said bracket plate having one end mounted on said post, opposed ears on said bracket plate and extending upwardly therefrom, a contact on one of said ears, a contact carrying arm mounted on said post and arranged between said ears and adapted for engagement with said first contact, a lug struck up from said supporting plate and engaging a slot formed in the bracket plate between said ears, a spring member mounted on said lug and engaging the bracket plate, and a cotter-pin-like locking member passing through said lug and engaging said spring to create a friction against the bracket plate and consequently creating a friction between said bracket plate and the supporting plate, an ear struck up from the supporting plate, a screw member freely rotatable in said latter ear and threadedly engaging one of said first ears to translate the bracket plate on the supporting plate, and means engaging the screw member and the last named ear constantly creating a friction between the screw member and the last named ear to frictionally prevent accidental turning movement of said screw member.

3. An adjustable contact assembly comprising a lower supporting plate, a post on said plate and extending upwardly therefrom, an upper bracket plate arranged on top of said supporting plate, said bracket plate having one end mounted on said post, opposed ears on said bracket plate and extending upwardly therefrom, a contact on one of said ears, a contact carrying arm mounted on said post and arranged between said ears and adapted for engagement with said first contact, a lug struck up from said supporting plate and engaging a slot formed in the bracket plate between said ears, a spring member mounted on said lug and engaging the bracket plate, and a cotter-pin-like locking member passing through said lug and engaging said spring to create a friction against the bracket plate and consequently creating a friction between said bracket plate and the supporting plate, an ear struck up from the supporting plate, a screw member freely rotatable in said latter ear and threadedly engaging one of said first ears to translate the bracket plate on the supporting plate, and means engaging the screw member and the last named ear constantly creating a friction between the screw member and the last named ear to frictionally prevent accidental turning movement of said screw member, said screw member having a head and a spaced rigid collar, said last named ear having a U-shaped opening into which the part of the screw member between the head and collar is received.

4. An adjustable distributor contact assembly comprising a lower supporting plate, an upwardly extending post on said plate, an upper bracket plate on said supporting plate and pivoted at one end on said post, a lug extending from said supporting plate, said bracket plate having a slot receiving said lug, spring means creating a friction between said plates, and means to effect translation of one plate with respect to the other plate, said last named means comprising a threaded adjustment screw having a screw stem on one end and a head on the other end, a collar spaced from said head, a bifurcated finger on said supporting plate receivable in the space between the collar and the head, said threaded stem threadedly engaging a part of the bracket plate.

5. An adjustable distributor contact assembly comprising a lower supporting plate, an upwardly extending post on said plate, an upper bracket plate on said supporting plate and pivoted at one end on said post, a lug extending from said supporting plate, said bracket plate having a slot receiving said lug, a flat spring through which the lug passes to create a friction between said plates, a locking device passing through the lug and engaging the spring, and adjusting means for translating one plate relative to the other, said last named means comprising a threaded adjustment screw having a screw stem on one end and a head on the other end, a collar spaced from said head, a bifurcated finger on said supporting plate receivable in the space between the collar and the head, said threaded stem threadedly engaging a part of the bracket plate.

6. An adjustable distributor contact assembly comprising a lower supporting plate, an upwardly extending post on said plate, an upper bracket plate on said supporting plate and pivoted at one end on said post, a lug extending from said supporting plate, said bracket plate having a slot receiving said lug, a flat spring through which the lug passes to create a friction between said plates, a locking device passing through the lug and engaging the spring, and adjusting means for translating one plate relative to the other, said last named means comprising a threaded adjustment screw having a screw stem on one end and a head on the other end, a collar spaced from said head, a bifurcated finger on said supporting plate receivable in the space between the collar and the head, said threaded stem threadedly engaging a part of the bracket plate, and a flat U-shaped spring between the head and collar and engaging the finger to create a friction on the adjusting means to hold normally the adjusting means in adjusted position.

7. An adjustable contact assembly comprising a supporting plate, a post on the plate, a bracket plate pivoted on said post, means to create a friction between said plates, a pair of spaced ears struck up from said bracket plate, a finger struck up from said supporting plate, and an adjusting screw threadedly engaging one of said ears to shift the bracket plate relative to the supporting plate, a contact on one of said ears, a contact arm pivoted to the post and movable between said ears, a contact on the arm for engagement with the contact on the ear, an ear on the bracket plate, a spring having one end secured to said contact arm, and means connecting the free other end of the spring to the last named ear, said means comprising a rivet secured to said last named ear, a stem on said rivet having a threaded part, said stem having a smooth part inwardly of the threaded part of the stem, a split locking member on said smooth part, said free end of the spring having a notch engaging said smooth part of the stem between the last locking member and the last ear, and means to lock said free end of the spring against the last ear.

8. An adjustable contact assembly comprising a supporting plate, a post on the plate, a bracket plate pivoted on said post, means to create a friction between said plates, a pair of spaced ears struck up from said bracket plate, a finger struck up from said supporting plate, and an adjusting screw threadedly engaging one of said ears to shift the bracket plate relative to the supporting plate, a contact on one of said ears, a contact arm pivoted to the post and movable between said ears, a contact on the arm for engagement with the contact on the ear, an ear on the bracket plate, a spring having one end secured to said contact arm, and means connecting the free other end of

the spring to the last named ear, said means comprising a rivet secured to said last named ear, a stem on said rivet having a threaded part, said stem having a smooth part inwardly of the threaded part of the stem, a split locking member on said smooth part, said free end of the spring having a notch engaging said smooth part of the stem between the last locking member and the last ear, means to lock said free end of the spring against the last ear, and a strip of insulating material arranged on both sides of said last ear.

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