July 8, 1958 F. X. LAMB 2,842,739

CLAMP VOLT-AMMERTER

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Fig. 1.

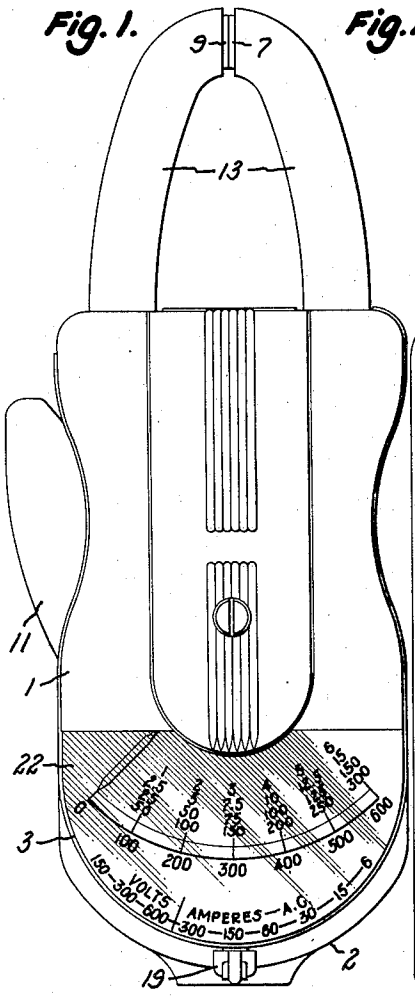


Fig. 2.

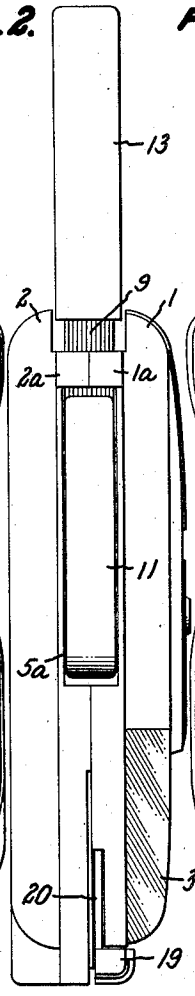


Fig. 3.

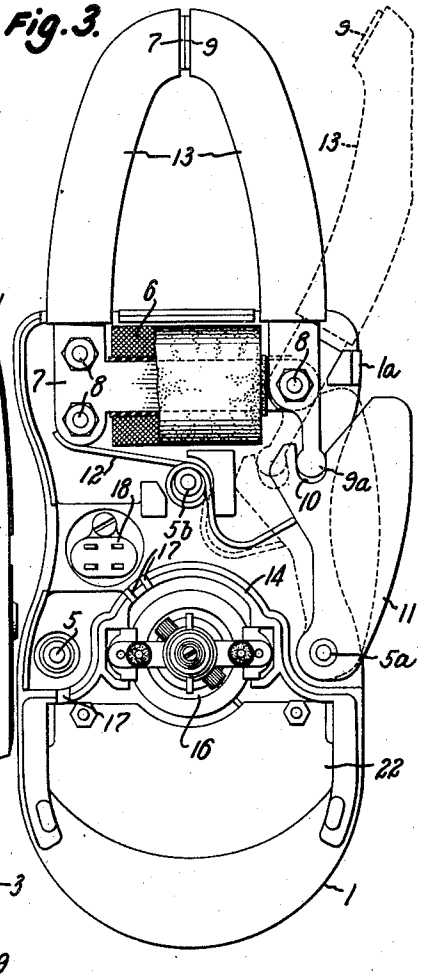
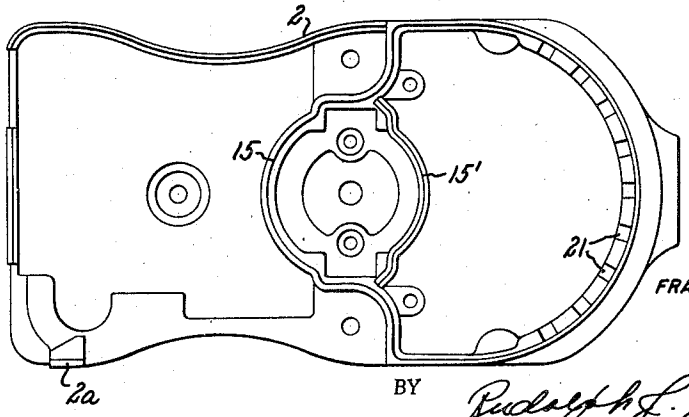


Fig. 4.



INVENTOR
FRANCIS X. LAMB

BY Rudolph L. Lunick
ATTORNEY

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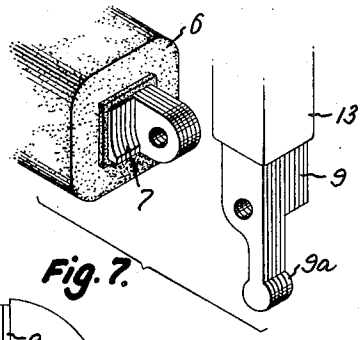


Fig. 7.

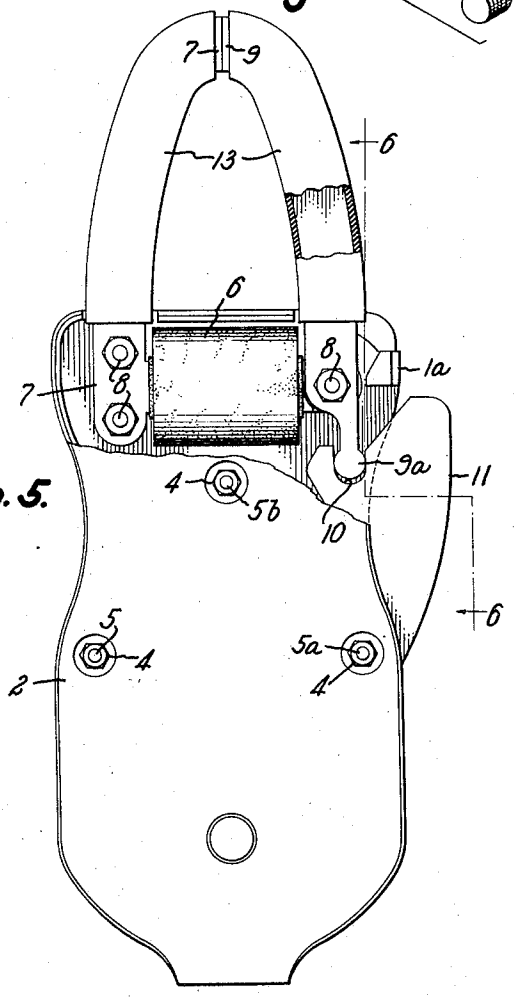


Fig. 5.

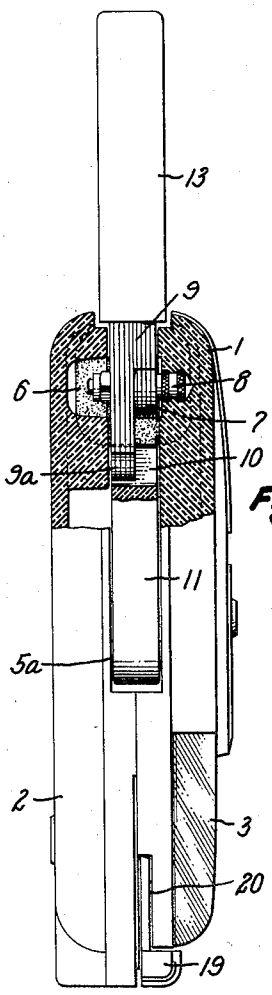


Fig. 6.

INVENTOR
FRANCIS X. LAMB

BY Rudolph J. Gruick
ATTORNEY

United States Patent Office

2,842,739

Patented July 8, 1958

2,842,739

CLAMP VOLT-AMMETER

Francis X. Lamb, East Orange, N. J., assignor, by mesne assignments, to Daystrom, Incorporated, Murray Hill, N. J., a corporation of New Jersey

Application June 6, 1955, Serial No. 513,428

2 Claims. (Cl. 324—127)

This invention relates to a clamp volt-ammeter and more particularly to the mechanical construction of the instrument case, the movable tong and the associated trigger for actuating the same.

An object of this invention is the provision of a clamp volt-ammeter having a case made up of a minimum number of parts and which may be readily assembled.

An object of this invention is the provision of a miniature clamp volt-ammeter having a case of small size which may be held in the palm of one hand in position to separate the movable tong from the fixed tong by squeezing a trigger.

An object of this invention is the provision of a clamp-type instrument in which the joint of the movable tong is within the instrument case, and thereby protected, and the movable tong is extended beyond this joint and directly coupled to the trigger.

These and other objects and the advantages of the invention will be apparent from the following specification when taken with the accompanying drawings illustrating an embodiment of the invention. It is to be understood that the drawings are for the purpose of illustration and are not to be construed as defining the scope or the limits of the invention, reference being had for the latter purpose to the appended claims.

In the drawings wherein like reference numerals denote like parts in the several views:

Figure 1 is a front elevation of a clamp volt-ammeter embodying the invention;

Figure 2 is a side view of the same;

Figure 3 is an elevation of the instrument as seen when looking into the front case section after removal of the back case section;

Figure 4 is a view of the interior of the back case section;

Figure 5 is a rear elevation of the instrument, with parts broken away;

Figure 6 is a side view with parts in section on line 6—6 of Figure 5; and

Figure 7 is a fragmentary exploded view, in perspective, of the joint between the fixed tong and the movable tong of the core.

In the drawings, the reference numerals **1** and **2** identify, respectively, the front and back sections of the instrument case which preferably are molded from an opaque plastic. The lower portion of the front of the case comprises a separate semi-circular window **3** of glass or a transparent plastic which is held in position in any manner, not forming a part of the present invention, but preferably as described and claimed in the co-pending application of C. S. Peterson, Serial No. 513,195, filed June 6, 1955.

The case is of broad hour-glass shape, being wider at its ends than its central section, and is held in assembled relation by nuts **4** threaded upon the rear ends of three studs **5**, **5***a* and **5***b* whose forward ends are embedded in the front section **1** of the case. The case sections are deeply domed to provide space for the pre-wound secondary winding **6** which is fitted upon the short straight leg of the laminated soft iron tong **7** of approximately L-shape which is anchored within the front case section by studs **8** having their forward ends embedded in the front case section **1**. The movable tong **9** is also made of soft iron laminations, and one half of the laminations of each tong are cut away for a lap joint adjacent the right side of the case, as seen from the rear as in Figures 3 and 5, where the movable tong **9** is pivotally supported on one of the studs **8** which secures the tongs and winding **6** to the case. The lower end of the movable tong **9** extends beyond its hinge connection to the fixed tong **7** and terminates in a cylindrical portion **9***a* seated in an upwardly opening recess **10** in and intermediate the ends of a trigger **11** of molded plastic which is pivoted on the stud **5***a* adjacent its tong-remote end. The recess **10** is formed by bifurcating the portion of the trigger **11** remote from its pivot and extending the outer bifurcation outwardly and longitudinally of the case to facilitate actuation by the hand.

The sides of the case sections **1** and **2** are cut back to provide a recess for free movement of the trigger **11** and their ends have complementary grooves for the passage of tongs **7** and **9**; the outer edges of the grooves for the movable tong **9** being defined by integral portions **1***a*, **2***a* of the front and back case sections, respectively.

As shown in Figure 3, the coiled central portion of a torsion spring **12** is fitted over the stud **5***b* and thereby anchored within the case, and its ends bear against the tong **7** and slidably engage the diagonal inner side surface of the trigger **11**, respectively, to urge the latter into outer position, as shown in solid line, to hold the tongs in normally closed position. To open the tongs to place them about a current conductor, the central portion of the instrument case is tightly grasped in the hand, thereby moving the trigger **11** inwardly and rocking the moving tong **9** into open position as shown in dotted line. During such movement, as indicated by the dotted-line position of the trigger **11** and the spring **12**, the place of engagement of the spring with the trigger moves toward the trigger pivot **5***a*, thereby correspondingly decreasing the amount of force required to hold said trigger in an inner position, as compared with the force initially required to move the trigger to that position. The tongs are covered with insulating sleeves **13** which preferably extend from a point adjacent their outer ends to and within the instrument case.

The case sections **1** and **2** are provided with complementary ribs **14** and **15**, **15'** respectively which form an approximately cylindrical chamber in which a direct current measuring instrument mechanism **16** is mounted and the rib **14** has notches **17** through which wires extend to connect the secondary winding **6** with a bridge rectifier **18**, the instrument **16** and the contacts and blade, not shown, of a range changing switch. The wiring of the instrument forms no part of the present invention and, for clarity of illustration of the mechanical construction, it is not shown in the drawings.

A plastic handle **19** for adjusting the range changing switch extends through a slot formed between the case section by cutting back the front case section **1**, as indicated at **20** in Figures 2 and 6. The inner surface of the back case section **1** is provided with recesses **21** for indexing the switch handle **19**, and a multirange scale plate **22** is mounted back of the window **3**.

Claims to the case construction and the mounting of the instrument therein are presented in my co-pending applicatin, Instrument Case, Serial No. 513,490, filed June 6, 1955.

Having now described my invention in detail in accordance with the requirements of the patent statutes

what I desire to protect by Letters Patent of the United States is set forth in the following claims.

I claim:

1. In a clamp-type meter, a two part case comprising a domed front case section and a complementary domed back case section, means for securing the two case sections together, a tong of laminated soft iron of approximately L-shape having a short straight leg, a winding on the short straight leg of said tong, means anchoring said tong to said case with the short leg thereof and said winding within the case and with the longer tong leg extending from the end of said case, a movable tong of laminated soft iron, means pivotally connecting said movable tong to the outer end of the short leg of said first tong so that it cooperates with the longer leg of the anchored tong, said movable tong extending inwarly beyond the pivotal connection and terminating in a cylindrical portion, a trigger extending longitudinally of and protruding from said case, said trigger being connected by a pivot to said case adjacent the trigger end which is remote from said tong, said trigger having an inner side surface extending diagonally longitudinally inward with respect to the longitudinal axis of said trigger and toward the tongs, said trigger also having a part with a

recess in which the cylindrical portion of said movable tong is seated, the adjacent sides of said case sections being cut back to provide a recess for inward movement of said trigger to actuate the movable tong to open position, and a trigger return spring within said case having a coiled intermediate section encircling a fixed stud located between the longer leg of said tong and the trigger pivot, one end of said spring bearing against the anchored tong and the other end slidably engaging said diagonal inner side surface, whereby as said trigger is pressed inward of the case, the place of engagement with said other spring end moves toward the trigger pivot, thereby correspondingly decreasing the amount of force required to hold said trigger in an inner position, as compared with the force initially required to move the trigger to that position.

2. The invention as recited in claim 1, wherein the fixed stud is one of said case-securing means.

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