(No Model.)

E. WESTON.

SHUNT FOR ELECTRIC LIGHT AND POWER STATIONS.

No. 497,482. Patented May 16, 1893.

Fig. 1.

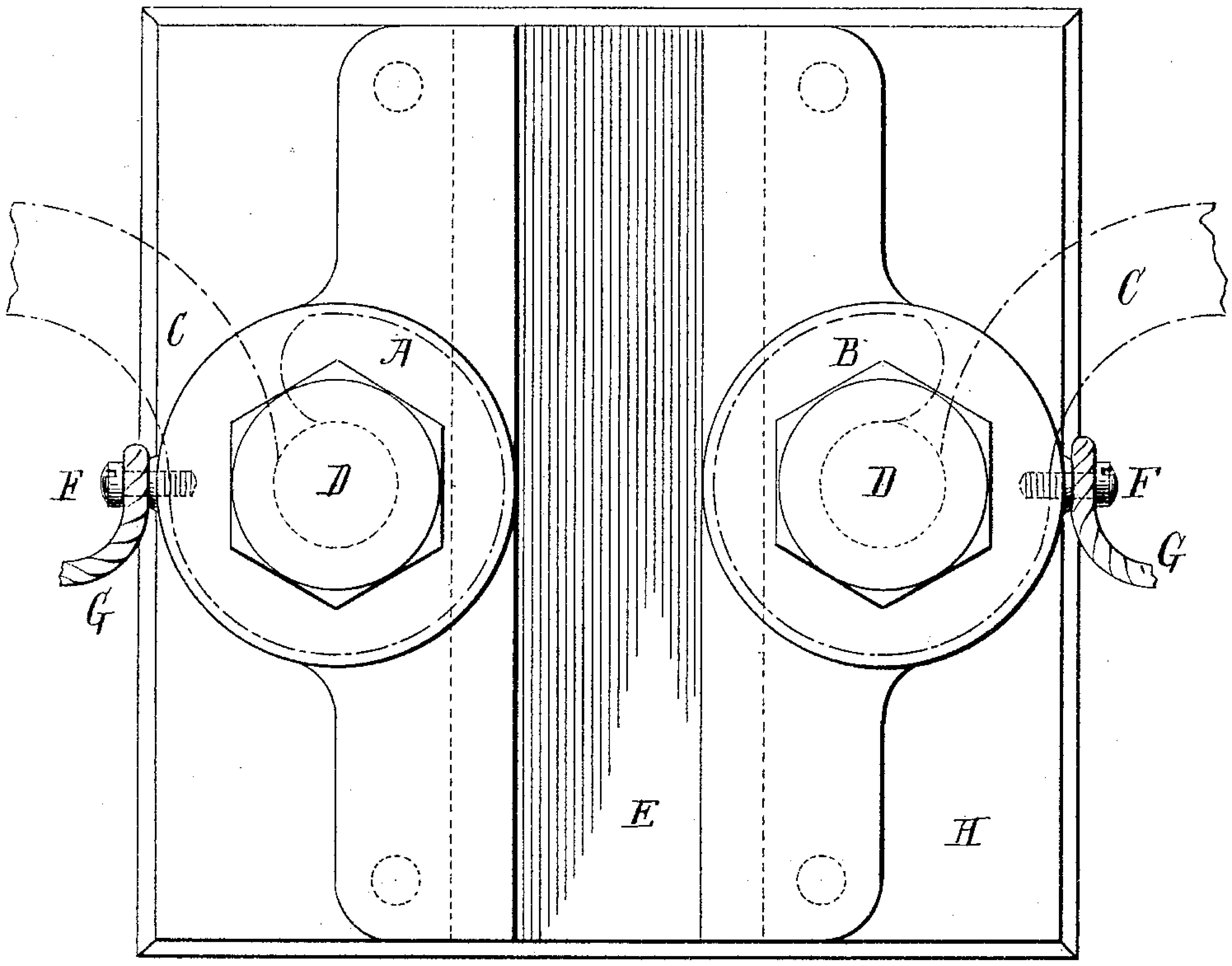
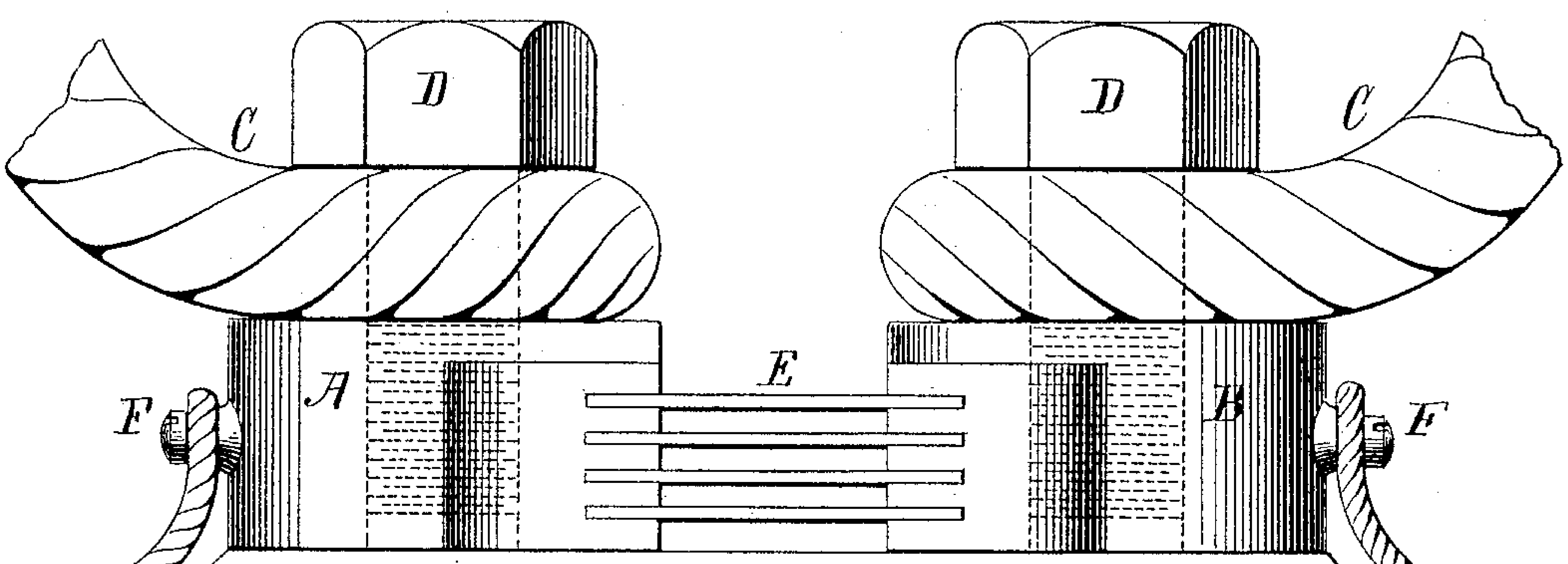


Fig. 2.



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SHUNT FOR ELECTRIC LIGHT AND POWER STATIONS.

SPECIFICATION forming part of Letters Patent No. 497,482, dated May 16, 1893.

Application filed November 28, 1892. Serial No. 453,361. (No model.)

To all whom it may concern:

Be it known that I, EDWARD WESTON, of Newark, Essex county, New Jersey, have invented a new and useful Improvement in Shunts for Electric Light and Power Stations, of which the following is a specification.

My invention consists of a permament shunt adapted to be placed in the main circuit of a light or power plant, and to be connected with an electrical measuring instrument so that only a portion of the current of known difference of potential may be conducted to said instrument for purposes of measurement or indication.

My invention consists in the construction of the shunt substantially as herein shown and described, and more particularly in the arrangement of two or more short conducting plates of high resistance disposed with an air space between them and secured to and extending between large masses of metal forming terminals. By reason of the separation of these plates so that air may freely circulate between them, and also by reason of their attachment to and proximity to the large masses of metal forming the terminals, the said plates are prevented from overheating.

In the accompanying drawings, Figure 1 is a plan view and Fig. 2 is a side elevation of my improved shunt.

Similar letters of reference indicate like parts.

It is now generally the custom in electric-lighting stations to place the measuring instruments, such as the ammeter, above the switch-board at which the current on the lines is controlled. As the main conductor usually comes in at the lower part of the switch-board, it follows that, in order to make connection with the measuring instrument, it is necessary to carry the conductor upward and downward, and thus, especially in the case of large mains, an additional length of cable is required for this purpose. In connecting the instrument to the mains, even in shunt, it is difficult to make such connections so that there will be a certain and definite fall of potential between the terminals; and therefore, it becomes difficult to regulate the percentage of current which the instrument is receiving. My present device can be connected directly in main circuit and there left, permanently; and the small connecting wires for the electrical measuring instrument can be led from it to any desired point.

A and B are the shunt terminals of metal. To these the ends of the electric main, C, are secured by means of the bolts D. Extending between the terminals A and B is a number of metal plates E, so arranged that a free and open air space is left between them. It will be noticed that these plates E are quite short and that they are attached to the relatively large masses of metal A and B. By this construction I am enabled to use in the plates E a metal of high resistance, and, at the same time, I may make the plates of quite short length without danger of overheating; this because, first, of the free circulation of air between said plates, and, second, of the conduction of heat therefrom by the large metal masses of the terminals A and B. Using copper terminals, I have caused a current of one thousand ampères to pass through each square inch of cross-section of German silver plates, E, without overheating. Also connected to the terminals A and B, by means of screws, as F, are the shunt wires G which may lead to the electrical measuring instrument. The main current on the cable C will pass to one terminal, as A, and there divide; part passing through the plates E to the other terminal, as B, and so to the other part of the cable C, and part, by way of the shunt conductor G, to the other terminal, B. As the terminals A and B are permanently fixed once for all upon their support H, and as the plates E are permanently secured to said terminals, it is evident that the fall of potential between the said terminals, depending upon the length of said plates, for a given current strength, is constant.

In place of metal plates, as E, I may use filaments, wires, or any other attenuated form of conductor.

I claim—

1. In a permanent shunt for electric circuits two fixed blocks or masses of conducting material, forming terminals, and two or more conductors extending between said blocks and having a free opening or air space between them, substantially as described.

2. In a permanent shunt for electric circuits two fixed blocks or masses of conducting

material, forming terminals, and two or more conductors in plate or lamellar form extending between said blocks and having a free opening or air space between them, substantially as described.

3. In a permanent shunt for electric circuits, two fixed blocks or masses of metal, forming terminals, and two or more metallic conductors extending between said blocks and having a free opening or air space between them; the mass of said blocks being relatively large as compared with that of said conductors, substantially as described.

4. In a permanent shunt for electric circuits, two fixed blocks or masses of metal, forming terminals, and two or more metallic conductors extending between said blocks and having a free opening or space between them; the aggregate cross-sectional area of said conductors being relatively small as compared with the corresponding cross-sectional areas of said blocks, substantially as described.

5. In a permanent shunt for electric circuits, two fixed blocks or masses, forming terminals, and two or more conductors having a free opening or space between them and extending from one block to the other; the said conductors being constructed of a material of higher resistance than said blocks, substantially as described.

6. In a permanent shunt for electric circuits, two fixed blocks or masses, forming terminals, having opposing faces separated by an interval, and two or more conductors mutually separated by air spaces connected at their extremities to said opposing faces and located wholly within said interval, substantially as described.

7. In a permanent shunt for electric circuits, two fixed blocks or masses, forming terminals, and two or more conductors having a free opening or air space between them and extending between said blocks, and means for connecting the shunt and main circuit conductors to said blocks, substantially as described.

8. In a permanent shunt for electric circuits, two fixed blocks or masses of metal, forming terminals, two or more conductors in lamellar or plate form having a free air space between them, connected to said blocks and extending from one to the other and means for connecting shunt and main circuit conductors to said blocks, substantially as described.

9. In a permanent shunt for electric circuits, two metal blocks, as A, B, of copper or other material of relatively large heat-conducting capacity, forming terminals, and two or more metal plates, as E, connected to and extending between said blocks, separated from one another by a free air space and constructed of a material, such as German silver, of higher electrical resistance than the material of said blocks; the heat-radiating surface and the cross-sectional area of said blocks A, B being relatively large as compared with the heat-radiating surface and cross-sectional area of the plates E, substantially as described.

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Witnesses:

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