

C. L. JAEGER.

ELECTRIC RECORDING DEVICE FOR COMPASSES.

No. 472,124.

Patented Apr. 5, 1892.

Fig. 1.

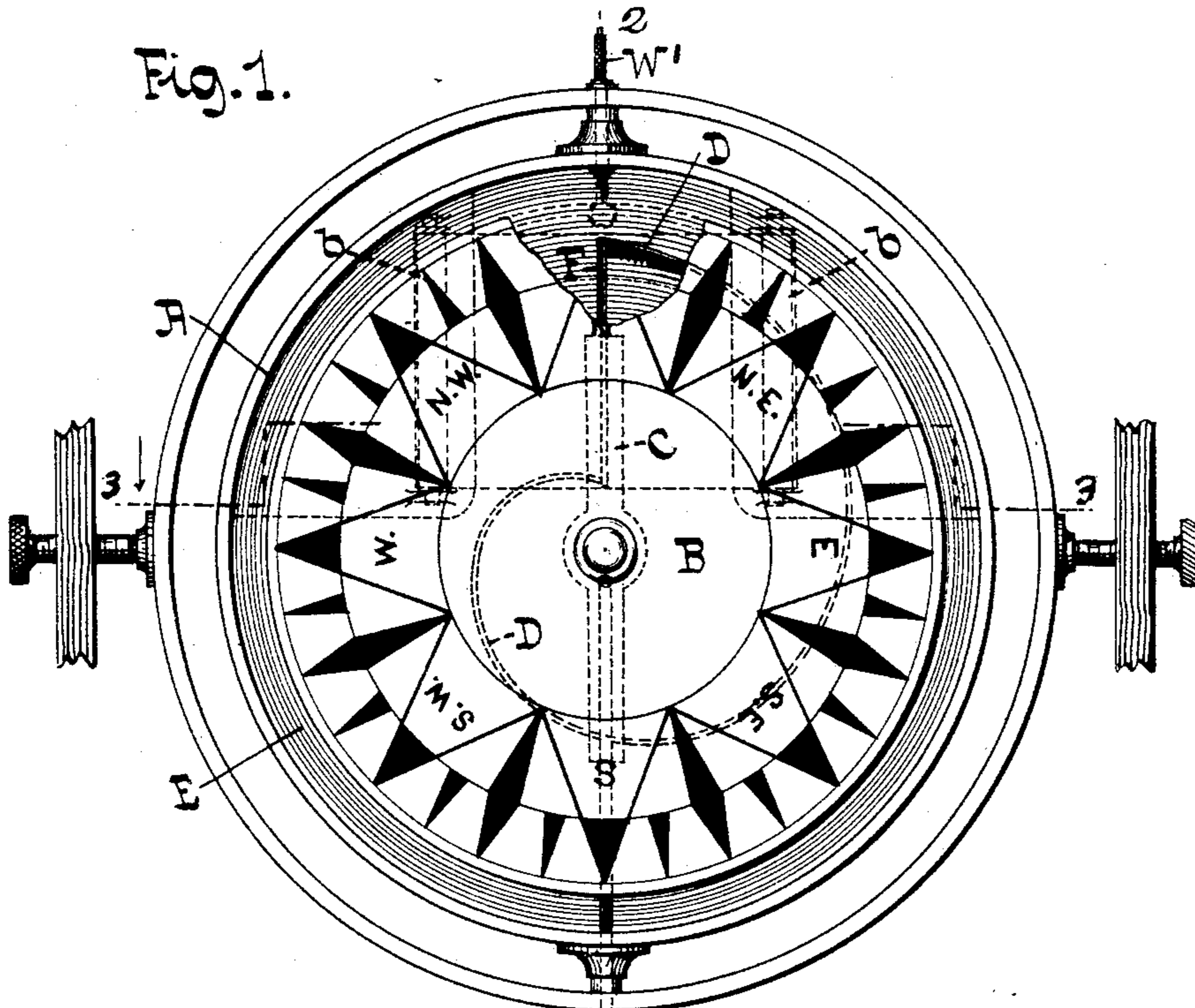
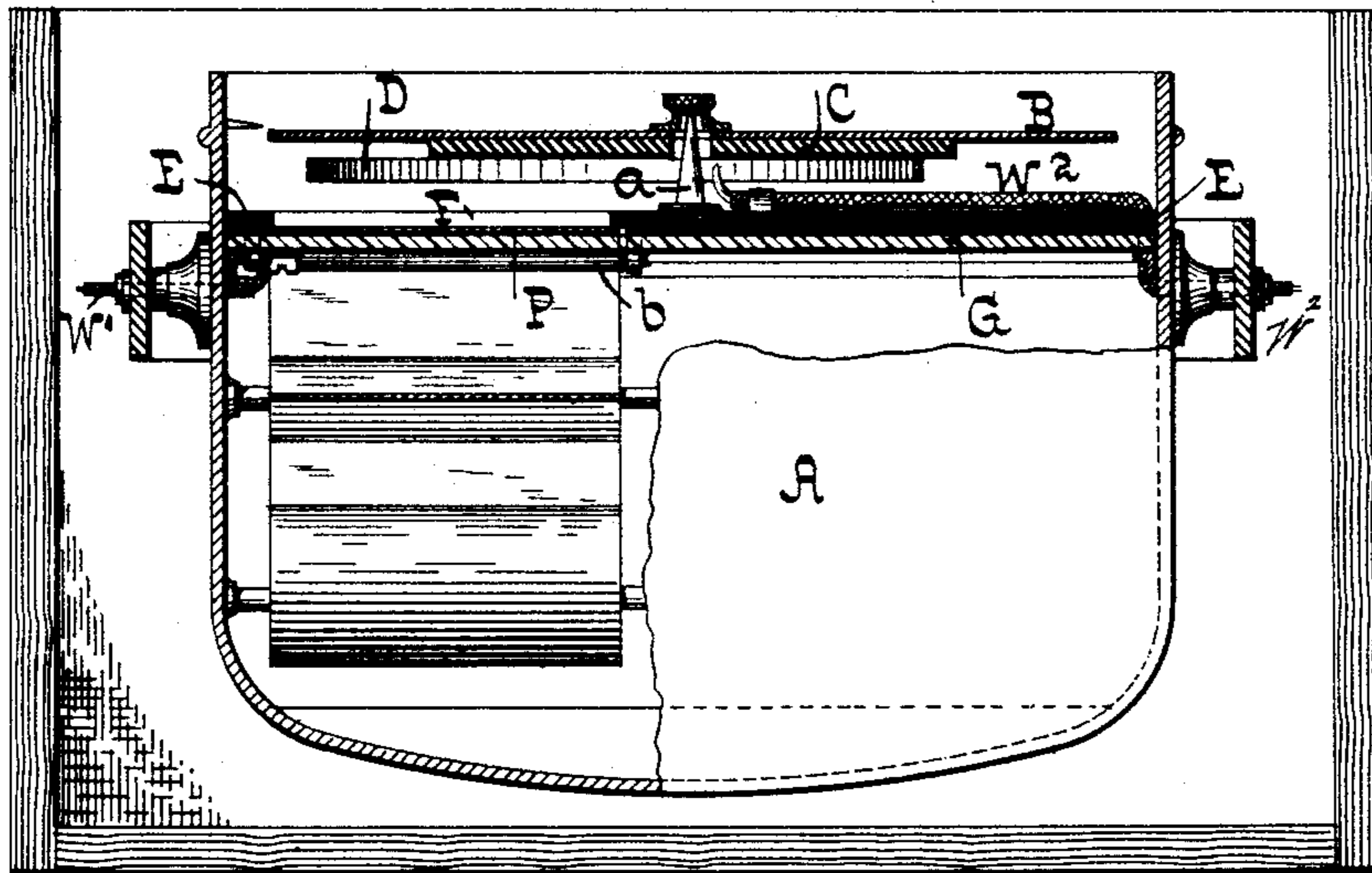


Fig. 2.



WITNESSES:

*Benj. W. Tucker.*  
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his ATTORNEY

(No Model.)

2 Sheets—Sheet 2.

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Fig.3.

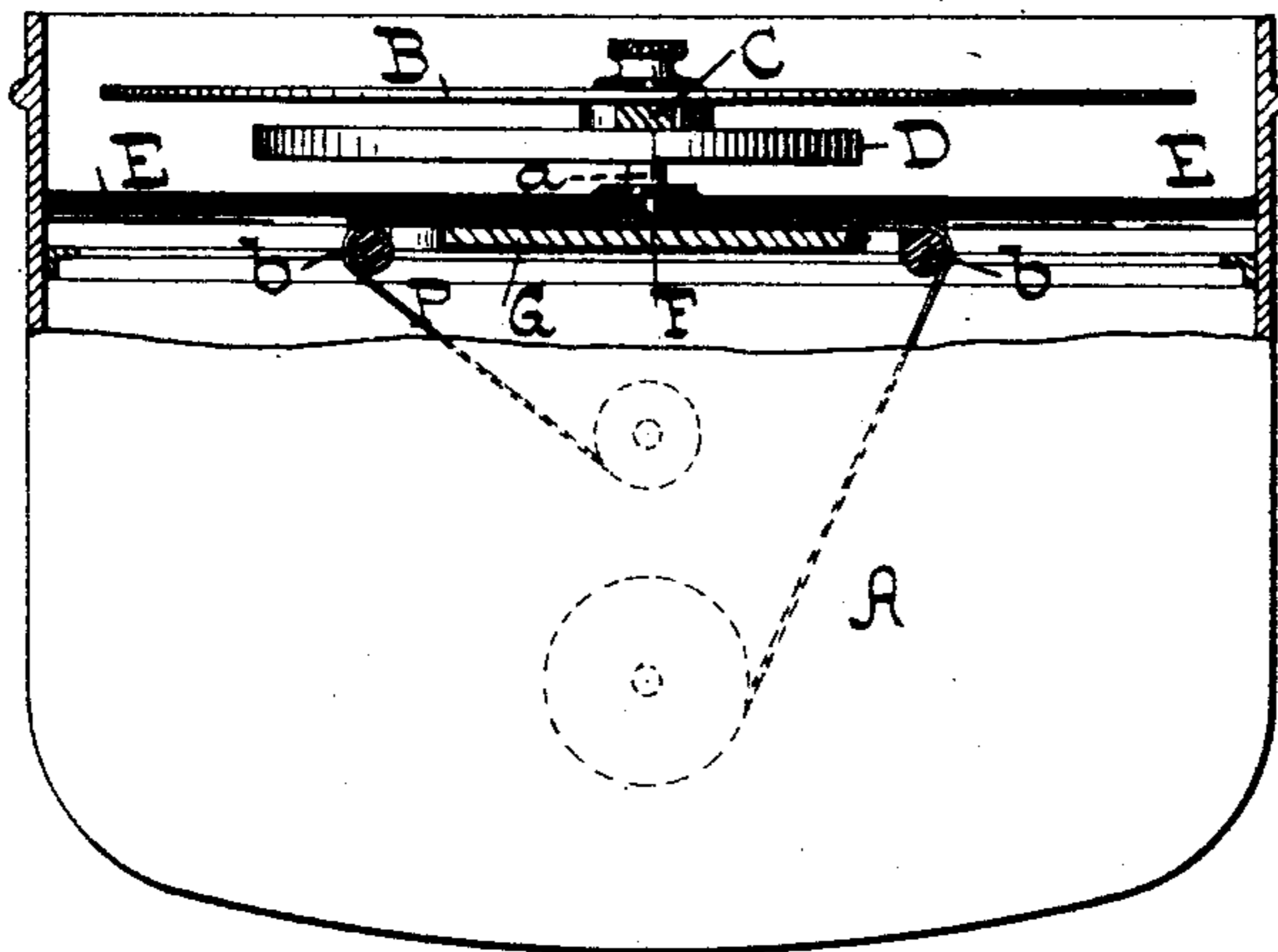
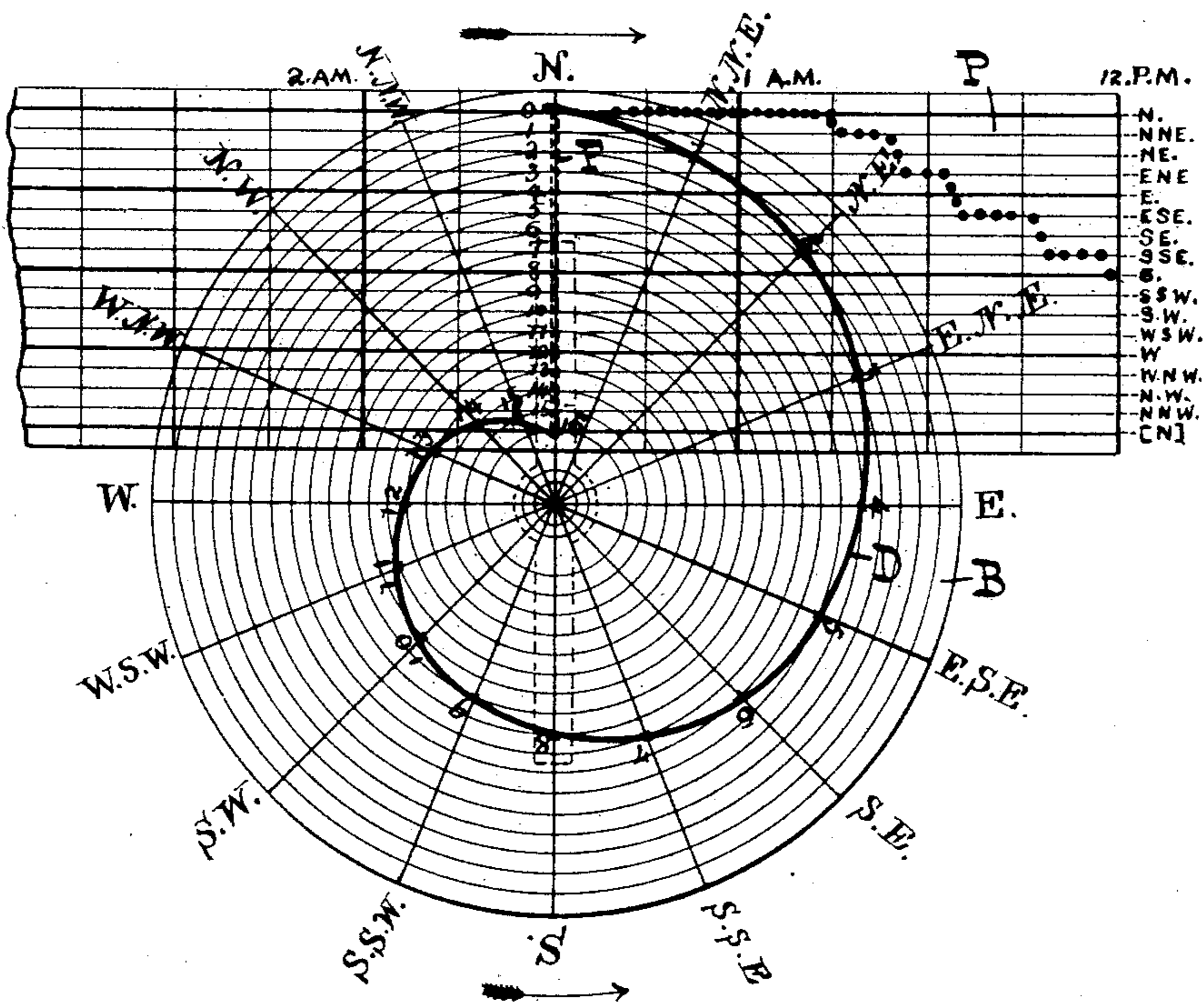


Fig. 4.



**WITNESSES :**

Bury W. Tucker,  
A. Faber des Faur

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A Faber au Faun  
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# UNITED STATES PATENT OFFICE.

CHARLES L. JAEGER, OF NEW YORK, N. Y.

## ELECTRIC RECORDING DEVICE FOR COMPASSES.

SPECIFICATION forming part of Letters Patent No. 472,124, dated April 5, 1892.

Application filed April 14, 1891. Serial No. 388,886. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES L. JAEGER, a citizen of the United States, and a resident of New York, in the county and State of New York, have invented certain new and useful Improvements in Electric Recording Devices for Compasses, of which the following is a specification.

My invention has reference to improvements in electric recording devices, and especially to mariners' recording-compasses.

It consists, essentially, in combining with the deflecting bar or needle a spiral metallic recording-arm, which participates in the movements of the needle, said recording-arm being arranged above a narrow radial conductor, or over a metallic plate forming a conductor. In the latter case an insulating-plate containing a radial slot is interposed between the conductor and the recording-arm, the strip being fed across the slot in the insulating-plate. Upon this strip the deflections of the needle are registered by the passage of sparks from the particular part of the recording-arm, which may be over the narrow conducting-strip, or over the slot at the time to the conductor, the curvature of the said recording-arm being so laid out that the record left by the passage of a spark between the point thereof, which may be over the slot or the narrow conductor, corresponds to a particular degree of deflection of the needle.

In the accompanying drawings, Figure 1 represents a plan or top view of a mariner's compass constructed according to my invention. Fig. 2 is a vertical section thereof in the plane 2 2, Fig. 1. Fig. 3 is a sectional elevation of the compass, the section being taken on the line 3 3, Fig. 1. Fig. 4 is a diagram illustrating the method of producing the record.

Similar letters indicate corresponding parts throughout the several views.

In the drawings, the letter A designates the bowl hung in gimbals, B is the compass-card, and C the magnetic needle, all constructed and arranged as usual in mariner's compasses.

To the lower face of the needle C is secured a thin spiral strip D, made from a good conductor, aluminum being preferred, said strip participating in the movements of the needle about the pivot *a*. Below this spiral strip, which I shall hereinafter term the "recording-

arm," is secured in the bowl A a plate E, of hard rubber or other suitable insulating material, having therein a radial slot F. Beneath this insulating-plate and contiguous therewith is arranged a metallic conductor G, Figs. 2 and 3, which may be in the form of a circular disk, or merely a strip applied to the insulating-plate below the slot in the latter.

Electrical connection is made with an induction-coil or other suitable apparatus, as follows: One wire *W'*, Figs. 1 and 2, is connected to the conductor G and the other wire *W''* is caused to enter the bowl between the insulating-plate E and the magnetic needle C, its inner terminal being shaped to a point and arranged in close proximity to the needle. The strip P, upon which the ship's course is recorded, is passed across the slot F, either above or below the insulating-plate E, suitable guide-rolls, as *b b*, having bearings in the plate being provided. The means for feeding the paper continuously at a uniform rate may be of any usual type and form part of my invention, the only essential point being that the supply and take-up rolls should be arranged one above the other in the same vertical plane to keep the compass in balance, Fig. 3. It is now evident that a spark will pass from that part of the recording-arm which is over the slot to the conductor G, and only at this point, (in view of the insulating-plate,) to puncture the continually-moving strip. By referring to Fig. 4 it will be seen that if the vessel is sailing due north the outer end of the recording-arm D is just across the outer terminal of the slot F. Consequently a series of perforations will be marked along the line marked "zero" or "N" on the strip P. If the vessel now turns to north northeast, the point of the recording-arm marked "1" will be brought across the slot at the point marked "1" to produce a line of perforations on line "1" or "N. N. E." of the strip, &c. Assuming that the vessel is sailing due north and turns to north northwest, part 15 of the recording-arm would be brought across the slot at point marked "15" to produce a line of perforations along line marked "15" or "N. N. W." on the strip. In general it will be noticed that the spiral to which the recording-arm is bent extends through three hundred and sixty degrees, and

each degree thereof corresponds to a degree on the compass-card. The strip P is subdivided by transverse lines to indicate the time, so that the course of the vessel at any time  
5 can be ascertained. The record can be duplicated by any well-known process in virtue of the perforations.

In the simplest form of the device the insulating-plate may be omitted and a narrow  
10 radial strip of conducting material used in place of the conducting-plate, the sparks then passing from the recording-arm to the conducting-strip at their intersection, or, if desired, the positions of the recording-arm and  
15 conductor can be reversed—*i. e.*, the recording-arm can be secured to a suitable rigid support and a narrow conductor secured to the needle in line with its axis.

It is evident that the means herein described  
20 can be applied equally well for recording the deflections of a bar or needle in other devices. Consequently I do not wish to restrict myself to their use in mariner's compasses.

What I claim as new, and desire to secure  
25 by Letters Patent, is—

1. In a recording device, the combination of a conductor, a recording-arm arranged to revolve above said conductor and curved, as

described, to bring successive parts thereof over the conductor in its said revolutions, 30 means for feeding a strip of paper between the two, and electrical connections, substantially as described.

2. In a recording device, the combination of a spirally-curved recording-arm, an insulating-plate containing a radial slot, a conductor arranged beneath the slot, electrical connections, and means for feeding a strip of paper across the slot, substantially as described. 35

3. In a recording-compass, the combination of a recording-arm participating in the movements of the needle, an insulating-plate provided with a radial slot, a conductor arranged beneath said slot, electrical connections, and  
40 means for feeding a strip across the slot, substantially as described. 45

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 4th day of April, 50 1891.

CHARLES L. JAEGER.

Witnesses:

A. FABER DU FAUR;  
BENJ. W. TUCKER.