

No. 677,581.

Patented July 2, 1901.

E. F. W. VON MANTEY.

**MECHANISM FOR TRANSMITTING THE READINGS OF SHIPS' COMPASSES
TO DISTANT POINTS.**

(Application filed Apr. 20, 1900.)

(No Model.)

3 Sheets—Sheet 1.

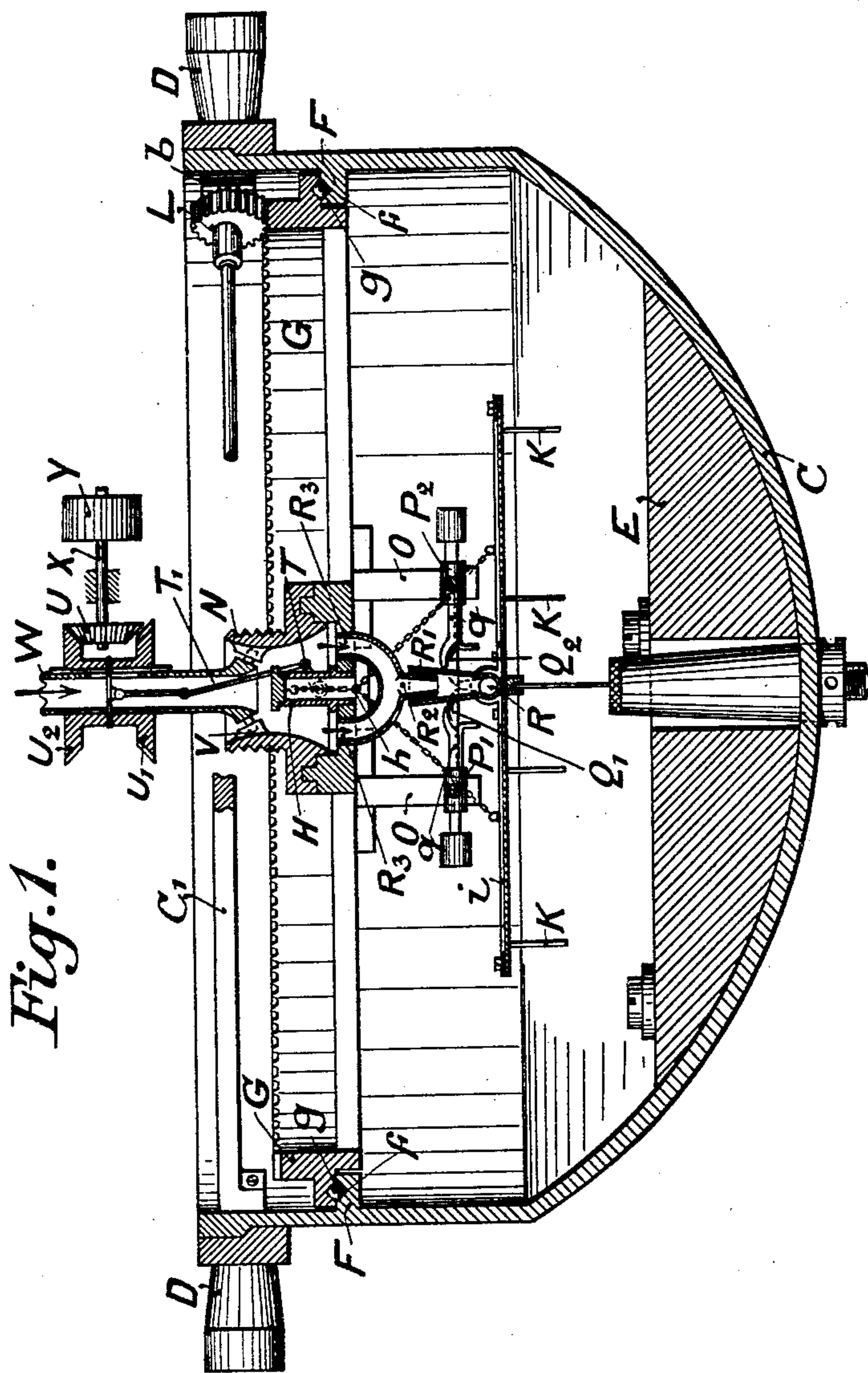


Fig. 1.

Witnesses

Estuero.

May W. Label.

Inventor

ERERHARD F. W. von Mantey

BY

Charles A. Brown & Co.

Attorneys

No. 677,581.

Patented July 2, 1901.

E. F. W. VON MANTEY.

MECHANISM FOR TRANSMITTING THE READINGS OF SHIPS' COMPASSES
TO DISTANT POINTS.

(No Model.)

(Application filed Apr. 20, 1900.)

3 Sheets—Sheet 2.

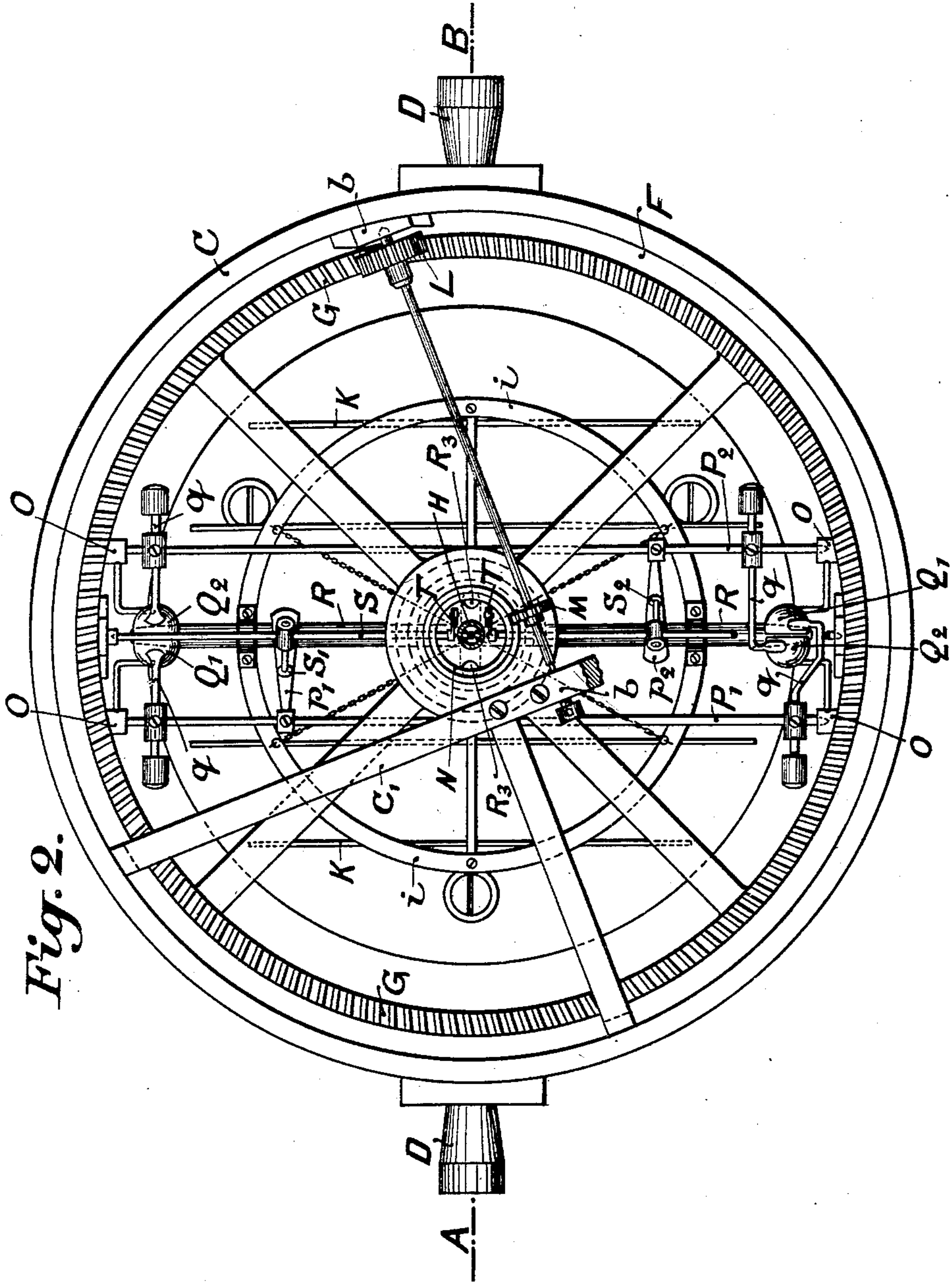


Fig. 2.

Witnesses

C. E. Stewart.

May W. Label.

Inventor

Eberhard F. W. von Mantey

By Charles A. Brown & Cragg

Attorneys

No. 677,581

Patented July 2, 1901.

E. F. W. VON MANTEY.

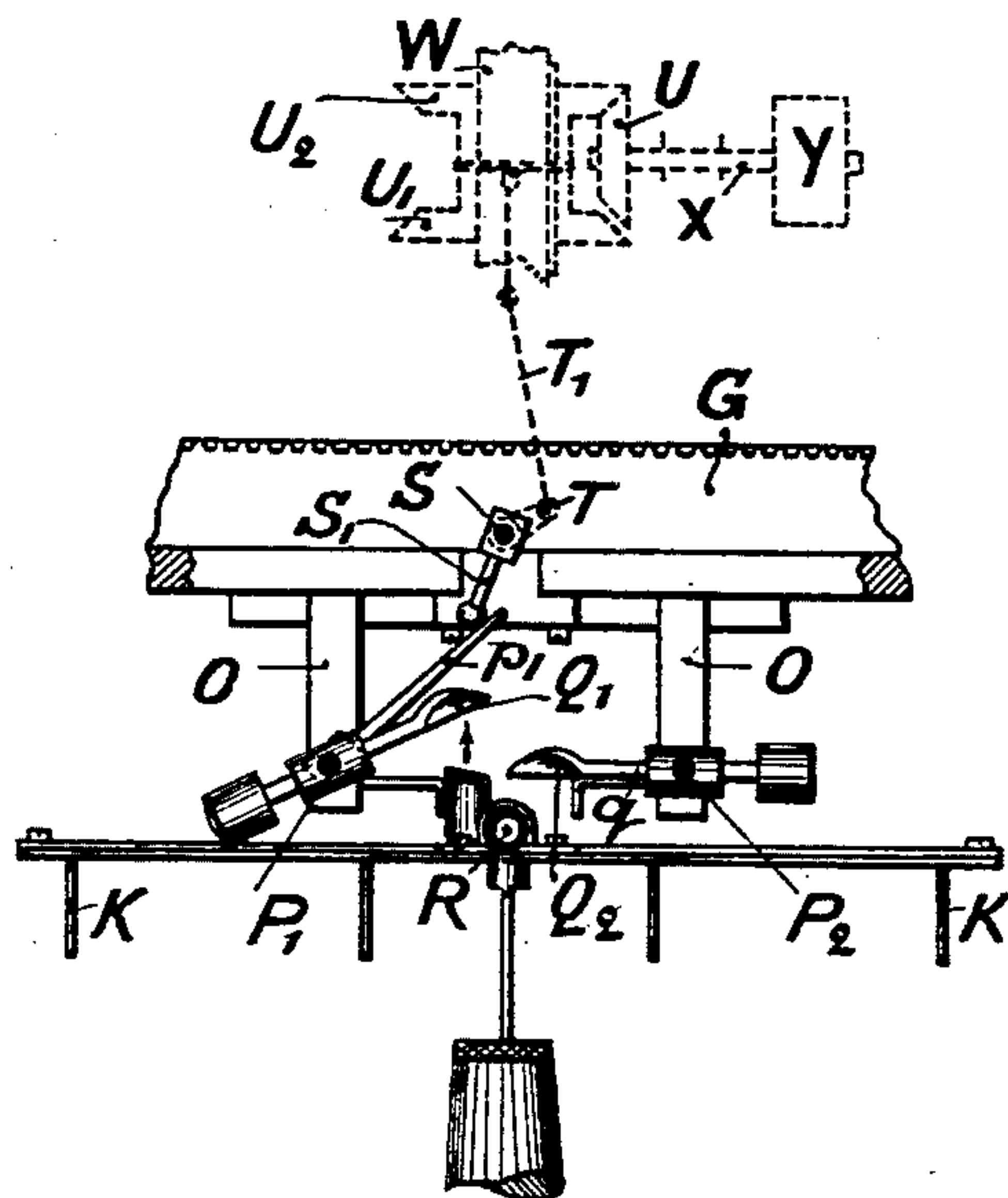
MECHANISM FOR TRANSMITTING THE READINGS OF SHIPS' COMPASSES TO DISTANT POINTS.

(No Model.)

(Application filed Apr. 20, 1900.)

3 Sheets—Sheet 3.

Fig. 3.



Witnesses

Comment.

May W. Zabel.

Inventor

EBERHARD F.W. von Mantey

BY *Charles A. Brown & Cragg*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

EBERHARD FRIEDRICH WILHELM VON MANTEY, OF KIEL, GERMANY.

MECHANISM FOR TRANSMITTING THE READINGS OF SHIPS' COMPASSES TO DISTANT POINTS.

SPECIFICATION forming part of Letters Patent No. 677,581, dated July 2, 1901.

Application filed April 20, 1900. Serial No. 13,633. (No model.)

To all whom it may concern:

Be it known that I, EBERHARD FRIEDRICH WILHELM VON MANTEY, officer in the navy, a subject of the German Emperor, residing at 35 Reventlov Allee, Kiel, Germany, have invented a certain new and useful Improvement in Mechanism for Transmitting the Readings of Ships' Compasses to Distant Points, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to ships' compasses, and more especially to the compasses that are used on ships containing large masses of iron—such as, for instance, warships.

In order to remove the compass as far as possible from the disturbing influence of the surrounding iron, it has been the practice in such ships to locate the compass in an elevated position and to place a special attendant to watch it and to continuously report to the officer in charge. My invention supplies the place of the said attendant by a mechanical arrangement which acts in such a way as to transmit continuously the movements of the needle to a hand or pointer moving over a correspondingly-marked dial, which may be placed practically at any distance from the magnetic system itself, preferably in full view of the officer in charge. Thus not only are the indications transmitted with greater reliability, completeness, and speed, but it also becomes unnecessary to risk the safety of the aforesaid attendant by placing him in an exposed position.

The invention consists in arranging concentrically with the pivot of the magnetic needle and inside the bowl of the compass a wheel or disk connected by suitable transmitting members to a motor which is adapted to rotate it slowly in either direction. For this purpose I interpose a reversing-gear between the disk and the motor and apply suitable means for controlling the reversing-gear, according to the relative position assumed by the disk with regard to the needle. It will be readily understood that this system will act to cause the disk or wheel to continuously follow the movements of the needle, and by any known electrical contrivance or by compressed-air transmission or by mechanical

means its movements can be utilized to indicate the movements of the needle itself by correspondingly moving a pointer placed in a position conveniently in sight of a person stationed at a distant point of the ship.

In the accompanying drawings those parts embodying the preferred construction of my invention are illustrated, other parts being left out the nature of which is well known to those conversant with the art.

Of the drawings, Figure 1 is a vertical section on line A B in Fig. 2. Fig. 2 is a sectional plan view of the compass, and Fig. 3 is a view showing details.

The same letters of reference serve to indicate corresponding parts in all the figures.

C is the ordinary metal bowl or casing containing the compass and hung in gimbals D D in the usual way. A mass of lead E serves to give the system the necessary weight, as is well understood. Near its upper edge the bowl C is provided with an internal flange F, in which a concentric groove *f* is shaped, containing a suitable number of balls *g g*. By these balls the ring or wheel G is supported, a corresponding groove being provided at its under side in order to accommodate the said balls. In the center piece or boss of this wheel an upright tube H is fixed, closed at the top, and in this tube is suspended a chain which forks at *h* into four branches, the ends of which are attached to a ring *i*, to which in its turn the magnets K K are attached.

It will be understood that since the wheel G is operated so as to constantly follow the movements of the needle this mode of attachment of the latter can be employed, the twist of the chain required for accommodating the small relative movements of the needle being quite insignificant. In order to secure the position of the needle in case of violent movements of the vessel, I provide a pin fixed at the bottom of the bowl in the usual way, but arranged with reference to the chain carrying the needle in such a way that the latter does not rest on the pin.

The upturned edge of the ring or wheel G is provided with teeth shaped so as to gear with a cog-wheel L, the shaft of which is journaled in fixed bearings *b b* on the wall of the bowl C and on a cross-bar C'. The shaft of the gear-wheel L carries a second gear-wheel

M, which meshes with a worm shaped in the outside of a sleeve N, concentrically supported on the boss of the wheel G and arranged so as to be rotated independently of the latter.

5 Thus it will be seen that the wheel G will be rotated when the sleeve N is rotated. The ring G carries four brackets or depending arms O O, which serve as supports for a pair of shafts P' and P², and to these shafts the

10 fans Q' Q' and Q² Q² are attached by means of arms q q, counterweights on the reverse ends of said arms q being added to balance the fans Q.

On the top of the magnetic system and secured to it is placed the tube R, bent up and having a nozzle at each end, as shown in Fig. 1. In the center of this tube R a funnel-shaped upright branch tube R' is attached, which surrounds a nozzle R², connected by

20 tubes R³ with the interior of the sleeve N. Another pair of shafts S S is journaled in bearings supported in the ring G and in its boss, each carrying near its center a small arm S' and S². These shafts S are balanced

25 in such a way that both the levers S' and S² hang down vertically when in their normal position. To each of the shafts P' and P² likewise an arm p' and p² is attached in such a position and of such a length as to engage

30 with the levers S' and S². Thus it will be seen that when either the pair of fans Q' or Q² is raised the corresponding shaft P' or P² will be rocked, and by means of the arms p' or p² either the lever S' or the lever S² will be engaged and the shafts S will be rocked either

35 in one or the other direction. To the ends of these shafts S S are attached a pair of cranks T, which both operate connecting-rods T' T', by means of which a couple of gear-wheels U' and

40 U² are either raised or lowered, accordingly as the shaft S is rocked in either the one or the other direction. The gear-wheels U' and U² are fastened by a pin-and-slot connection to a hollow spindle W, suitably journaled in

45 fixed bearings and being connected by a clutch-coupling V to the sleeve N in such a way that the sleeve will be rotated when the hollow spindle W is rotated, but that the coupling will leave the sleeve sufficient freedom of

50 motion to follow the swinging of the compass in its gimbals. Finally a shaft X is provided, likewise journaled in fixed bearings and carrying a third gear-wheel U. This shaft X is attached to a motor Y of any suitable known

55 kind, which gives it a constant rotation in one direction.

The operation of my invention is as follows: By any suitable known means a current of air is blown through the hollow spindle W, where-

60 by pressure is set up in the inside of the sleeve N and a jet of air is caused to issue from each of the nozzles at the ends of the tube R. If the position of the nozzles exactly registers with the space left between the fans Q' and

65 Q² the air-jets issuing therefrom will tend to raise both pairs of fans simultaneously; but since the two arms p' and p² both engage with

the arms S' and S² and by being rocked would rock the shaft S in different directions the whole system will remain at rest, neither of

70 the gear-wheels U' and U² meshing with U; but as soon as the ship deviates from her course either the fans Q' or the fans Q² will be brought over the nozzles at the ends of the

75 pipe R. They will thus be swung upward by the air-jets, will either raise or lower the gear-wheels U' and U², and will bring either the one or the other of them into mesh with the gear-wheel U, the result being that the spindle W

80 will be rotated either in one or the other direction.

I wish it to be understood that for the control of the reversing-gear it would be sufficient to provide a single pair of fans and to arrange the pipe R so as to emit only one jet

85 of air. However, in that case special means would have to be provided to secure a proper balancing of the magnetic system, and the plan of employing a plurality of jets and pairs of fans arranged so as to counterbalance

90 each other's reaction is preferred.

The rotation of the spindle W is transmitted by the coupling V to the sleeve N and by means of the gear-wheel L to the ring G. This ring G therefore immediately begins to

95 follow the excursion of the needle and continues to do so until the fans have been brought into a position in which the action of the air-jet is equally strong with regard to both.

100

If by suitable known means the rotations of the spindle W are transmitted to a pointer moving over a dial the division of which corresponds to the division of the compass, it is evident that the course of the ship can be

105 read from the pointer just the same as from the compass itself.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed,

110 I declare that what I claim is—

1. A mechanism for permitting the transmission of the readings of a ship's compass to distant points of observation consisting of the combination with an ordinary ship's compass of a disk or wheel concentrically pivoted in the vicinity of the magnetic needle, means for rotating said disk in either direction, and means for controlling the direction of rotation of said disk according to the relative position thereto assumed by the needle substantially as and for the purpose set forth.

115

2. A mechanism for permitting the transmission of the readings of a ship's compass to distant points of observation consisting of the combination with an ordinary ship's compass of a disk or wheel concentrically pivoted in the vicinity of the magnetic needle, means for rotating said disk in either direction, a vessel continuously fed with compressed air, attached to the needle and provided with means for emitting the air in the shape of a jet, a pair of fans movably attached to said disk, and means for controlling the direction

120

125

130

of rotation of said disk when either of the fans is struck by the air-jet, substantially as and for the purpose described.

3. The combination with a ship's compass of a disk or wheel placed within the bowl of the compass and adapted to be rotated concentrically with the magnetic needle, a shaft journaled in fixed bearings outside the bowl and driven continuously in one direction of rotation by a suitable motor, reversing-gear interposed between said shaft and said disk and means for controlling said reversing-gear according to the relative position assumed by said disk with regard to the needle, substantially as and for the purpose set forth.

4. The combination with a ship's compass of a disk or wheel pivoted concentrically within the compass-bowl, the magnetic needle being suspended therefrom, a shaft journaled in fixed bearings outside the bowl and driven continuously in one direction of rotation by a suitable motor, reversing-gear interposed between said shaft and said disk and means for controlling said reversing-gear according to the relative position assumed by said disk with regard to the needle, substantially as and for the purpose set forth.

5. The combination with a ship's compass of a disk or wheel placed within the bowl of the compass and adapted to be rotated concentrically with the magnetic needle, a shaft journaled in fixed bearings outside the bowl and driven continuously in one direction of rotation by a suitable motor, reversing-gear

interposed between said shaft and said disk, of a vessel continuously fed with compressed air attached to the needle and provided with means for emitting said air in the shape of a jet, a pair of fans attached to said disk and adapted to be rocked when struck by the jet of air, and means for operating said reversing-gear accordingly as the one or the other of said fans is rocked substantially as and for the purpose set forth.

6. The combination with a ship's compass of a disk or wheel preferably placed within the bowl of the compass and adapted to be rotated concentrically with the magnetic needle, a shaft journaled in fixed bearings outside the bowl and driven continuously in one direction of rotation by a suitable motor, reversing-gear interposed between said shaft and said disk, a vessel continuously fed with compressed air, attached to the needle and adapted to emit said air in the shape of a plurality of jets arranged so as to counterbalance each other's reaction, pairs of fans attached to said disk and adapted to be rocked when struck by the air-jets, and means for operating said reversing-gear accordingly as the one or the other fan of said pairs is rocked, substantially as and for the purpose set forth.

In witness whereof I hereunto subscribe my name this 3d day of April, A. D. 1900.

EBERHARD FRIEDRICH WILHELM VON MANTEY.

Witnesses:

F. RÖNKE,

H. MÖLLER.