

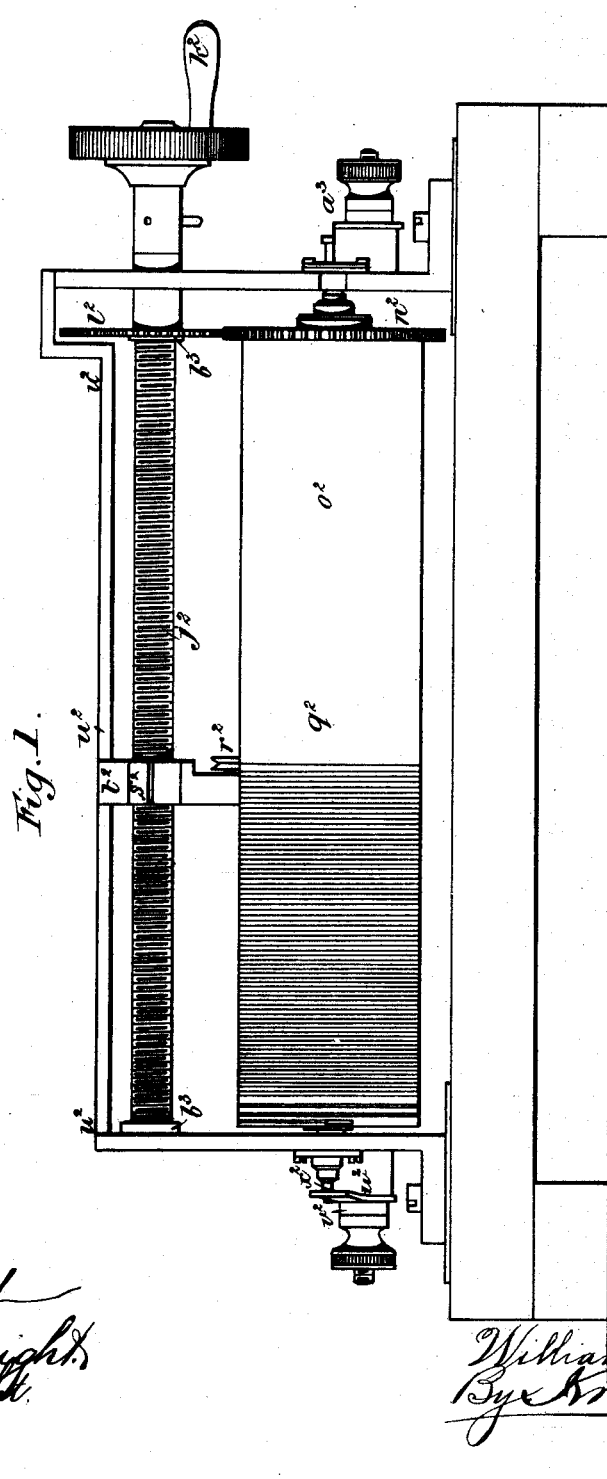
(No Model.)

3 Sheets—Sheet 1.

W. THOMSON.  
RHEOSTAT.

No. 420,894.

Patented Feb. 4, 1890.



Attest  
H. S. Knight,  
L. H. Knight.

Inventor.  
William Thomson  
By Knight Bros.  
Attys.

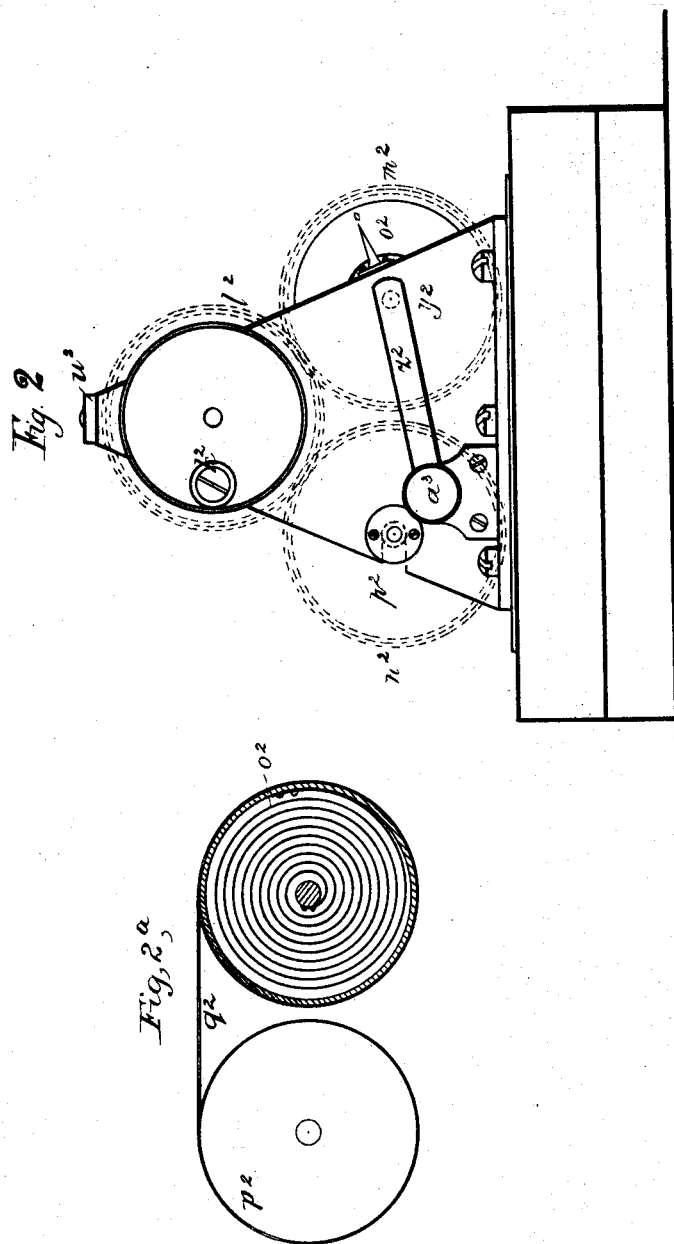
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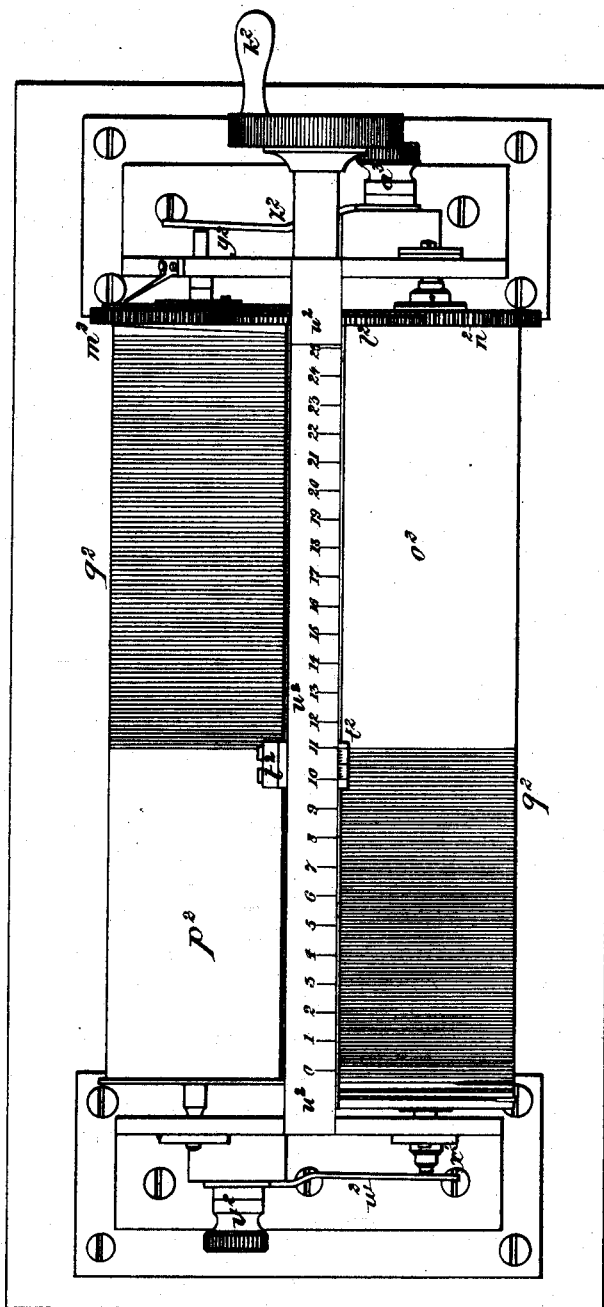
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Fig. 3.



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# UNITED STATES PATENT OFFICE.

WILLIAM THOMSON, OF GLASGOW, COUNTY OF LANARK, SCOTLAND.

## RHEOSTAT.

SPECIFICATION forming part of Letters Patent No. 420,894, dated February 4, 1890.

Application filed October 4, 1888. Serial No. 287,153. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM THOMSON, knight, doctor of laws and professor of natural philosophy in the University and College of Glasgow, of Glasgow, in the county of Lanark, Scotland, have invented an Improved Rheostat, of which the following is a specification.

This invention relates to an improved form of Wheatstone's rheostat. The rheostat consists of wire, preferably platinoid, wound on two cylinders. To adjust the resistance of the rheostat continuously to any desired amount, the wire of the instrument is guided from one cylinder to the other by a fork carried through the requisite range by a nut traveling on a long screw-shaft. The screw-shaft carries a toothed wheel which turns two cylinders by means of toothed wheels attached to their shafts. A watch-spring, as in Jolin's improvements of Wheatstone's rheostat, keeps the wire always tightened to the proper degree. A leather buffer at each end of the range of the nut acts as a guard against overwinding in either direction. The rheostat is worked by the hand to any extent necessary so as to keep the current constant.

In the drawings, Figure 1 is a front elevation of Wheatstone's rheostat arranged according to my improvements. Fig. 2 is an end elevation of the same. Fig. 2<sup>a</sup> is a detail view of the two cylinders. Fig. 3 is a plan thereof.

Referring to these drawings, a screw-shaft  $j^2$ , provided at one end with a convenient handle  $k^2$ , has a toothed wheel  $l^2$  fixed to it and in gear with two toothed wheels  $m^2$   $n^2$ , fixed, respectively, to the shafts of two cylinders  $o^2$  and  $p^2$ . One of these cylinders is fast on its shaft and the other is connected with its shaft through a coiled spring, which by its pull on the cylinder serves, as in Jolin's improvement of Wheatstone's rheostat, to keep the wire  $q^2$  tightened round the cylinder. (See Fig. 2<sup>a</sup>.) One of the cylinders presents a smooth insulating-covering. When the screw-shaft  $j^2$  is turned, the wire is guided from one cylinder to the other by means of a fork or a small wheel  $r^2$ , carried by a nut  $s^2$ . The nut is prevented from turning when the shaft is turned by a guide-fork  $t^2$ , which slides along the edges of a scale  $u^2$

and carries a vernier for indicating the position of the nut on the screw. The current-circuit through the wire passes from a terminal  $v^2$  through a flexible spring  $w^2$ , pressing against the end of a stud  $x^2$  in contact with one end of the wire, and from the wire it passes to a stud  $y^2$  to another flexible spring  $z^2$ , and through it to the other terminal  $a^2$ . A guard-washer  $b^2$ , of leather or other suitable substance, (placed at each end of the screw  $j^2$ ,) prevents overwinding in either direction by limiting the travel of the nut  $s^2$ .

I claim—

1. The combination of the cylinders  $o^2$   $p^2$ , the guide  $l^2$ , guide-roller  $r^2$ , and a nut  $s^2$ , carrying the guide and guide-roller, with a screw-shaft  $j^2$ , on which the nut travels, said shaft being geared to the cylinders and the nut being prevented from rotating, substantially as herein described.

2. The combination of the cylinders carrying the wire, the screw-shaft geared to the cylinders, the nut carrying the guide and mounted on the screw-shaft, and the bar  $u^2$ , said nut having the forks engaging the bar, whereby the nut is kept from turning, as explained.

3. The combination of the cylinders, screw-shaft, guide-nut, and guide-fork with the scale-bar engaged by the fork and adapted thereby to indicate the position of the nut, as explained.

4. The combination of the cylinders carrying the wire, screw-rod carrying the nut and gearing with the cylinders, and the guide-roller  $r^2$ , located on the nut, for the purpose explained.

5. The combination of the rollers, screw, nut, and bar  $u^2$  of the fork  $l^2$  on the nut engaging the bar, said bar having a scale and the fork having a vernier, for the purposes herein explained.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM THOMSON.

Witnesses:

ST. JOHN V. DAY,

JOHN LIDDLE,

Both of 115 St. Vincent Street, Glasgow.