F. J. MORIN & R. SEILLIERE.

Rotary Dynamometer.

No. 212,728. Patented Feb. 25, 1879.

Fig. 1

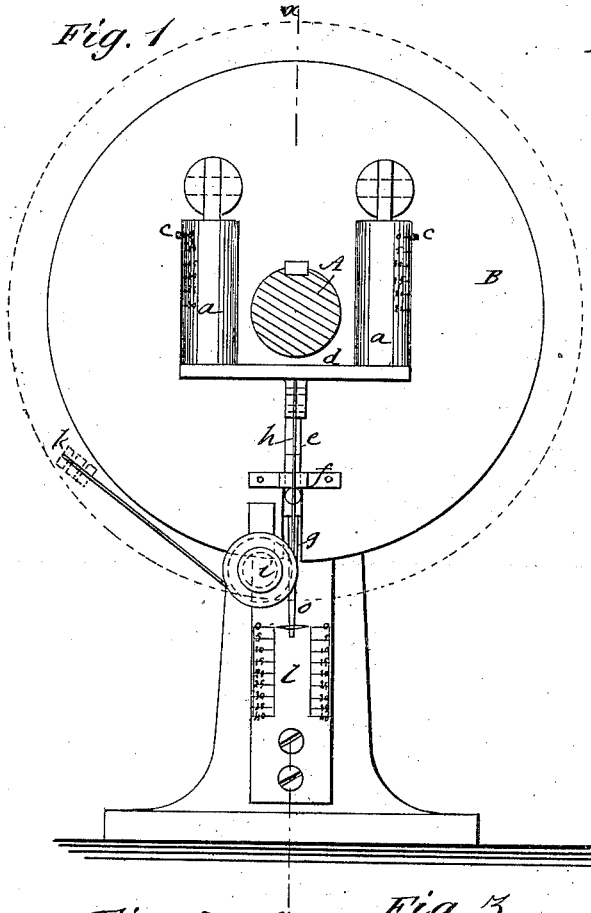


Fig. 2

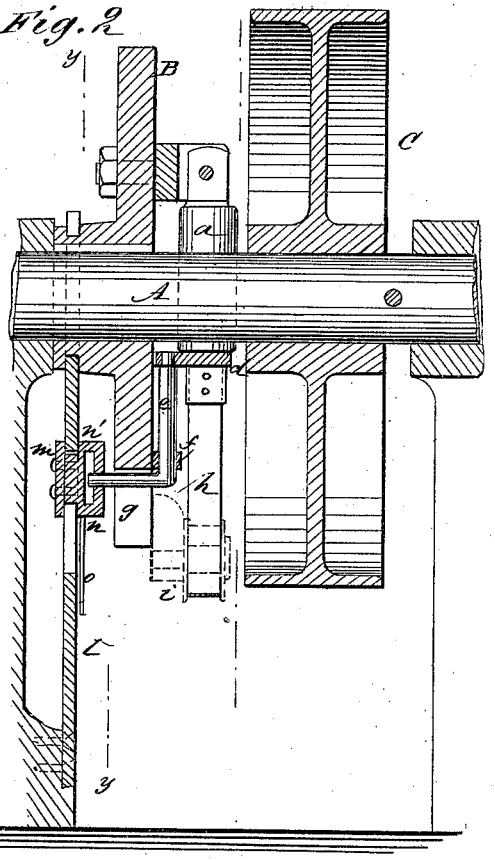


Fig. 5.

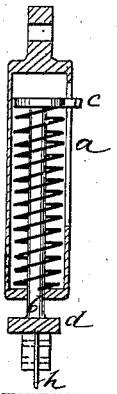


Fig. 3

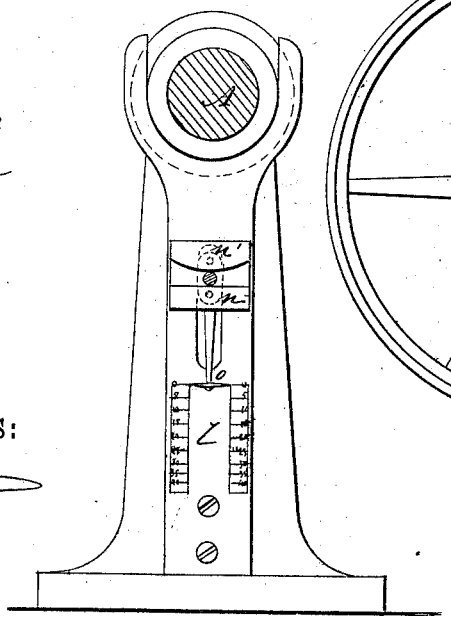
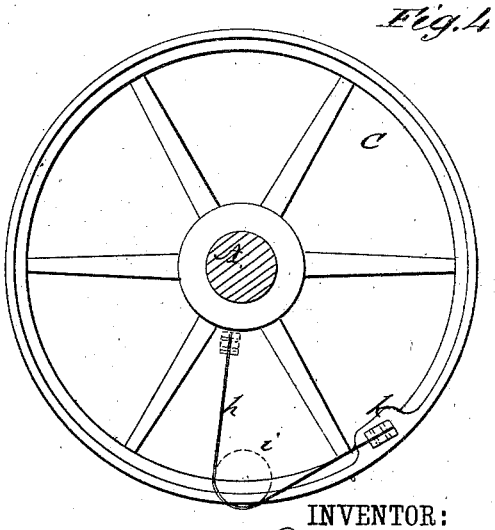


Fig. 4



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UNITED STATES PATENT OFFICE.

FRANÇOIS J. MORIN AND RAYMOND SEILLIÈRE, OF PARIS, FRANCE.

IMPROVEMENT IN ROTARY DYNAMOMETERS.

Specification forming part of Letters Patent No. **212,728**, dated February 25, 1879; application filed January 24, 1879.

To all whom it may concern:

Be it known that we, FRANÇOIS J. MORIN and RAYMOND SEILLIÈRE, of Paris, France, have invented a new and Improved Rotating Dynamometer, of which the following is a specification:

Our invention relates to the class of dynamometers in which the measuring devices are placed between the motor and the work, and operate without loss of power to the motor.

The apparatus will first be described in connection with the drawings, and the invention pointed out in the claims.

In the drawings, Figure 1 is a sectional elevation of the apparatus transversely of the motor-shaft. Fig. 2 is a vertical section on line *x x* of Fig. 1. Fig. 3 is a vertical section on line *y y* of Fig. 2. Fig. 4 is a side elevation of the driving-pulley, showing its connection to the registering mechanism. Fig. 5 is a section of one registering-cylinder.

Similar letters of reference indicate corresponding parts.

A is the shaft of the motor, carrying a fixed disk-wheel, B, and a loose pulley, C, from which the power is taken. Upon one side of wheel B there are connected spring-balances *a a*, placed parallel and at opposite sides of shaft A. Each balance *a* consists of a metallic cylinder inclosing a coiled spring upon a traversing rod, *b*, that projects from the bottom of the cylinder, and the rod *b* of each cylinder is connected to the cross-piece *d*. A projection from the rod *b* through the slotted side of each cylinder carries an index-finger, *c*, and the sides of the slot are marked with a scale that indicates the extent of compression of the spiral spring. Extending from the cross-piece *d*, in a line radial from shaft A, is a rod, *e*, adapted to move in a guide, *f*, and having its outer end bent at a right angle, which bent portion projects through a slot, *g*, that is cut radially in the rim of wheel B. There is also connected to the cross-piece *d* one end of a steel band, *h*, which extends in the direction of rod *e* to the rim of wheel B, around a friction-pulley, *i*, fitted on B, and from thence at nearly right angles to a point on the rim of pulley C, where the end of band *h* is attached by a connection, *k*. From the shaft A downward extends a vertical bar, *l*, on which is fitted to slide a block, *m*, having two face-plates, *n* and *n'*. The block *m* is retained upon bar *l* by friction, and between the plates *n* and *n'* the bent end of rod *e* passes to position-block *m* on bar *l*. The upper plate, *n'*, has a curved edge, against which the rod *e* acts, and from plate *n* an indicator, *o*, projects, to indicate by a scale on bar *l* the minimum and maximum effort exerted on the apparatus.

When the rod *e* is forced outward it moves block *m* downward, and when the effort is smaller it carries block *m* upward.

In operation, the pull on band *h* first acts on the spring of balance *a*, which will indicate the effort exercised. The band *h* then transforms the pull to a rotary motion by the connections described, and the minimum and maximum effort are indicated at each revolution by the block *m*.

The effect produced on the indicator *a* is multiplied by the distance traversed within one revolution by the point where the steel band *h* touches pulley *i*, and then again by the number of revolutions. Thus, if the indicators *a* mark six kilograms and the tangential point of the steel band is placed about sixteen centimeters from the center, so that it will traverse one meter per revolution when turning six hundred revolutions per minute, we shall then have 6 kilograms $\times 1 = 6$ kilometers, and as there are ten revolutions per second, $10 \times 6 = 60$ kilometers per second. The indicator *o* shows the result.

In place of the devices described for indicating the tangential movement of rod *e*, the rod *e* may be formed as a rack, to operate on a pinion that, in turn, operates a second horizontal rack that is connected with an annular disk fitted loosely on shaft A, so that the movement of rod *e* shall slide the disk on the shaft, and the movement will be indicated by a scale in connection with the edge of the disk.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. As an improvement in dynamometers, the combination, with the motor-shaft A, carrying a loose pulley, C, of the fixed wheel B, balances *a a*, connected to cross-piece *d*, flexible band *h*, and pulley *i*, the band *h* being connected to piece *d* and the pulley C, and pass-

ing around pulley *i*, substantially as and for the purposes set forth.

2. The combination, with the fixed wheel B, spring-balances *a*, piece *d*, and band *h*, arranged in connection with the motor-shaft and pulley, substantially as described, of the radial rod *e*, and mechanism for registering the tangential movement of said rod *e*, substantially as specified.

3. The combination, with the radially-fitted rod *e*, fitted for tangential movement, substantially as set forth, of the bar *l*, block *m*, and indicating devices, substantially as and for the purposes described.

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