C. NEER.

Dynamometer and Register.

No. 24,753. Patented July 12, 1859.

Fig. 2.

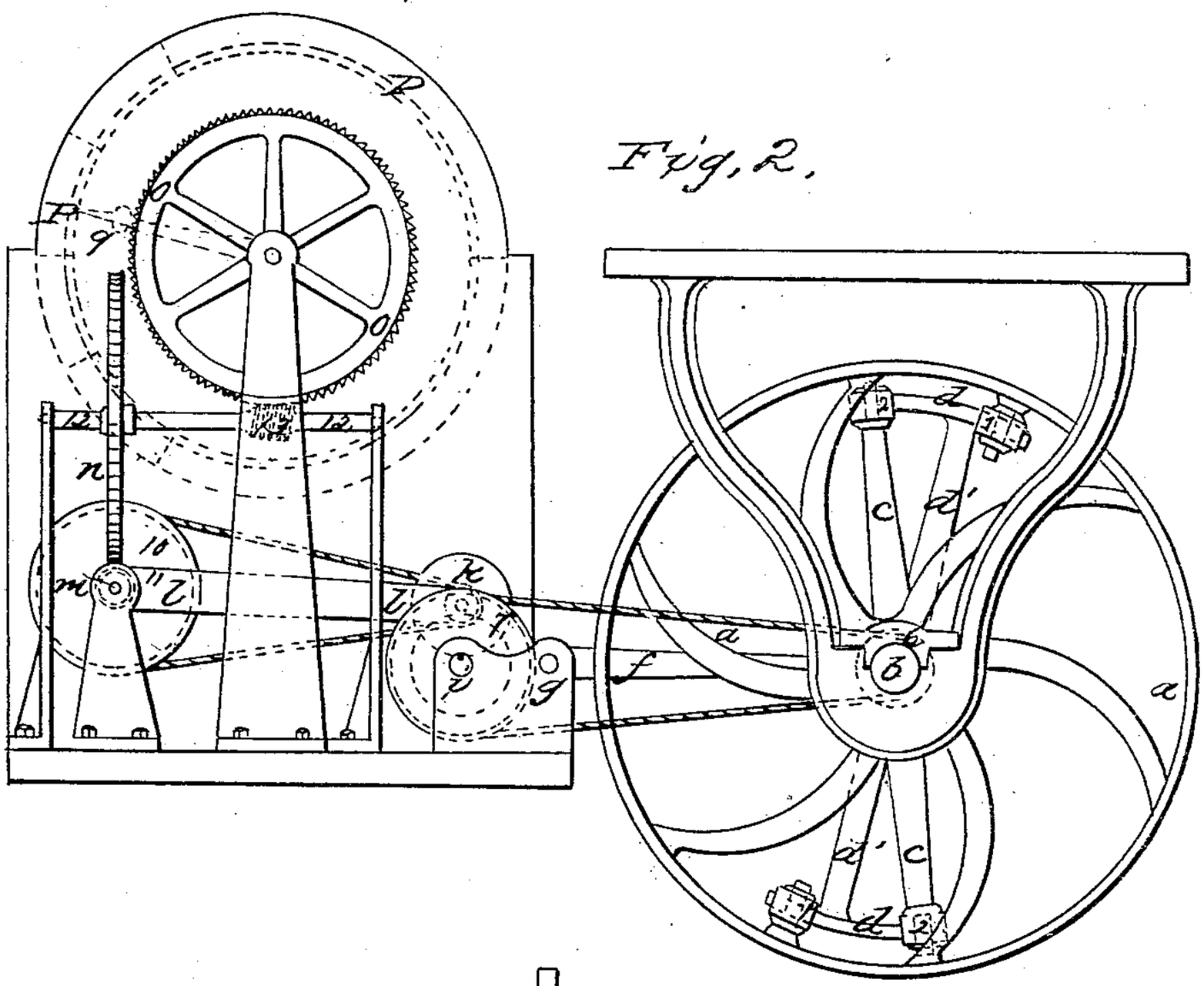
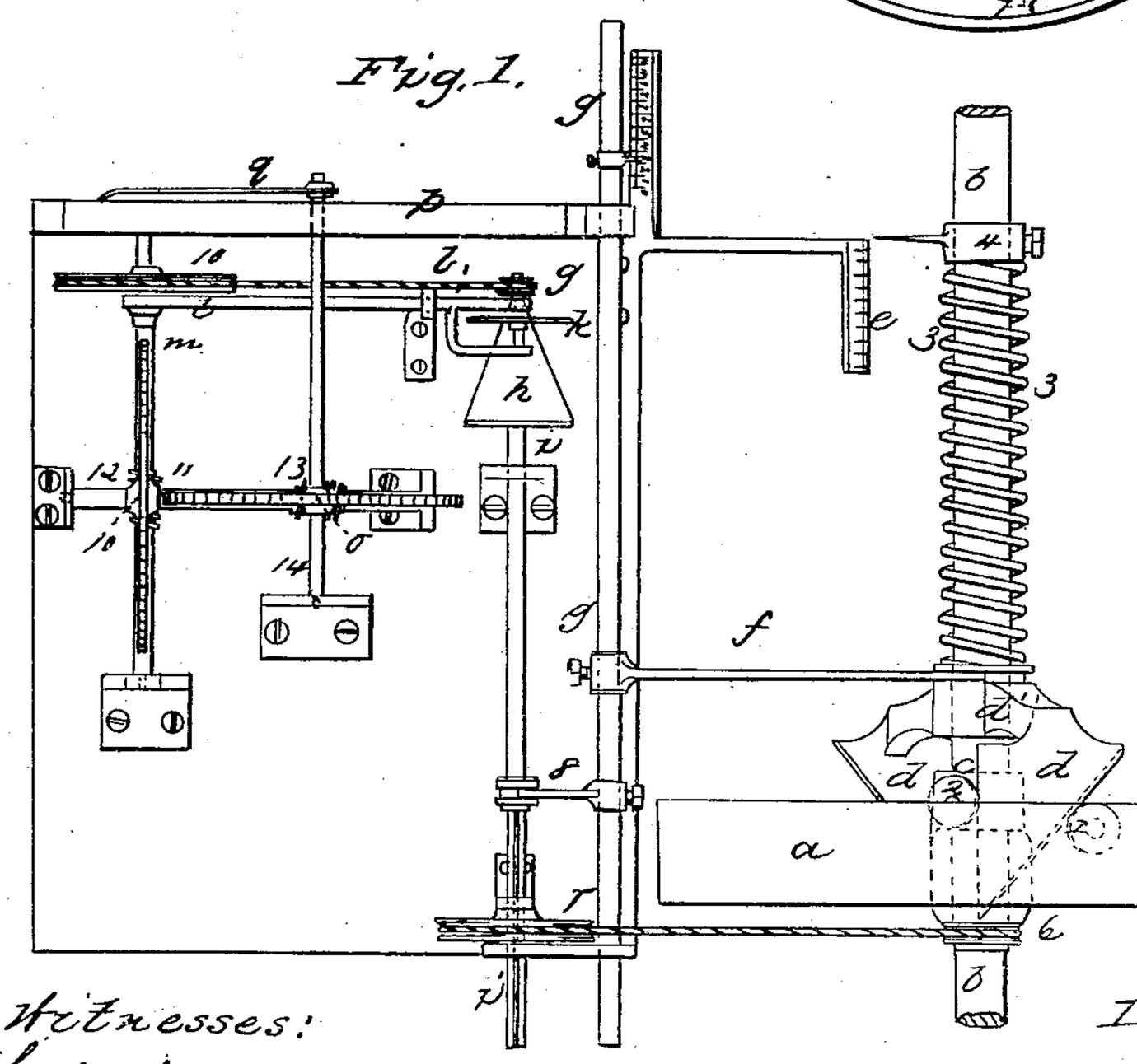


Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES NEER, OF ALBANY, NEW YORK.

DYNAMOMETER.

Specification of Letters Patent No. 24,753, dated July 12, 1859.

To all whom it may concern:

Be it known that I, CHARLES NEER, of Albany, in the county of Albany and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Dynamometers, which I term the "Rotary Dynamometer and Register;" and I do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1, is a plan of my said invention and Fig. 2 is a side elevation of the same.

Similar marks of reference denote the same parts.

In manufactories, mills and other places one person will hire a certain number of horses' power from another person that runs a steam engine, or it is desired to know the number of horses' power exerted in running a certain machine. In all these cases difficulty has heretofore existed in introducing a dynamometer between the rotating prime mover and the line shaft from which power is taken, so as to indicate the number of horses' power consumed on the average per day, or where the work varies greatly as is the case in some shops to show the power that has been used per week, month, or quarter.

My said invention is intended to accomplish the before mentioned object, and consists in an arrangement of mechanism by which the power made use of at any time may be determined by inspection, or the whole amount of power consumed in a day week month or longer period can be determined, so that the consumer may not be charged with power he does not use, or the manufacturer furnish power for which he receives no pay.

In the drawing *a*, is a loose pulley on the line shaft *b*. to which pulley the power is applied by a belt, in any usual manner. This pulley if not otherwise fitted, would revolve freely between the collar 6, and the fixed cross arm *c*, without turning the shaft *b*. In order to communicate motion to this fixed cross arm *c*, and the shaft *b*, to which it is attached, I provide rollers 2 2, or the ends of the said arms *c*, and similar rollers (or their equivalents) 1, 1, on the drum, pulley, or wheel *a*, and between these rollers I introduce sections of a cylinder *d*, *d*, forming inclines or wedges, these are on the arms *d'*, of a collar or hub that surrounds the main shaft *b*, and is free to slide endwise on said shaft or partially turn thereon. The rollers 1, 1, and 2, 2, acting on opposite sides of the inclines *d*, *d*, tend to force the arms and hub *d'*, endwise of the shaft *a*, and as the shaft *a*, receives its rotation entirely from the arms *c*, through the rollers 1, 2, and intervening inclines *d*, *d*, the power exerted to rotate said shaft will be proportioned to the force tending to keep the wedges or inclines *d*, *d*, up to the rollers compared with the inclination of said inclines *d*, *d*. For this purpose I apply any suitable spring or springs. I have represented a helical spring 3, around the shaft *b*, with a collar 4, taking its outer end. Around the hub *d'*, is a groove taking a forked arm *f*, from a slide *g*, at one end of which is an index and pointer 5. The parts and divisions of the index (5) being proportioned mathematically according to the inclines *d*, *d*, and the power of the spring, as will be well understood by a competent person, the index 5, will indicate the number of horses' power that is being applied to the shaft *b*, from the motor *a*. If the collar 4, be set along so as to compress the spring a larger amount of power can be availed of without increasing the length of the inclines *d*, *d*. In this instance the index *e*, denotes the horses' power (to which the apparatus is set) which must be exerted before the index 5 commences to move, so that the sum of the indexes *e* and 5 will be the power made use of.

In order to keep account of the actual power made use of I apply a cone *h*, on a shaft *i*, which shaft *i*, is rotated by a band from 6, to the pulley 7, and said pulley 7 is fitted with a key or feather so as to allow the shaft *i* to be moved endwise by an arm 8, from the slide *g* to a grooved collar around this shaft *i*.

k is a roller on the end of the frame *l*, that is fitted to rise and fall on the shaft *m*, as a center.

9 and 10 are pulleys connecting the shaft of roller *k*, to the shaft *m*, to give motion to this latter shaft *m*.

11, is a worm on *m*, to a wheel *n*, on the shaft 12, on which a worm pinion 13, gears to wheel *o*, on the shaft 14, that carries a hand *q*, revolving over the dial *p*. The proportions of these parts and the divisions

of the dial are of any desired character as circumstances may require, care being taken to make the calculations correctly so that if the index 5, denote say that ten horse power is being used uniformly for one day, the cone *h*, will give such motion to the roller *k*, and through the gearing to the hand *q*, that the dial will in a day (of ten hours) indicate ten horses used; hence the cone will regulate the register in the proper proportion and the total number of horse power used in a given number of days will determine the average power used.

If the springs 3, be compressed by the collar 4, the difference of power may be allowed for by the use of changeable pulleys or cones of pulleys at the pulleys 9, and 10, to make the registration perfect.

It will be evident that the same operation as before specified would be produced if the rollers 1 and 2, were dispensed with, said rollers only acting to avoid friction; and if deemed more convenient the inclines *d*, *d*, might be placed on a pulley instead of on the cross arms and hub (*d'*,) and the spring 3, may be made and applied in any convenient manner to regulate the extent of motion from the inclines in proportion to the power exerted, the spring in all instances becoming the measurer of the power either directly or through the medium of the inclines *d*, *d*, to form the dynamometer as set forth.

Having thus described my said invention and shown the manner of applying the same, I remark that I do not limit myself as to the size or proportion of the parts; but

What I claim as my invention and desire to secure by Letters Patent is—

1. The combination of the rigid arm or arms *c*, and yielding incline or inclines *d*, with the loose pulley *a*, or its equivalent, whereby the power exerted to rotate the shaft *a*, is denoted by the motion resulting from the pressure against said yielding incline or inclines for the purpose of forming a rotary dynamometer substantially as specified.

2. I also claim the revolving and sliding cone *h*, adjusted in its position according to the power applied from the pulley *a*, to the shaft *b*, when combined with a registering apparatus substantially as set forth, to record the amount of power made use of as described.

In witness whereof I have hereunto set my signature this twenty first day of May, 1859.

CHARLES NEER.

Witnesses:

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THOS. GEO. HAROLD.