J. Emerson.

Dynamometer.

No. 79,562. Patented Jul. 7, 1868.

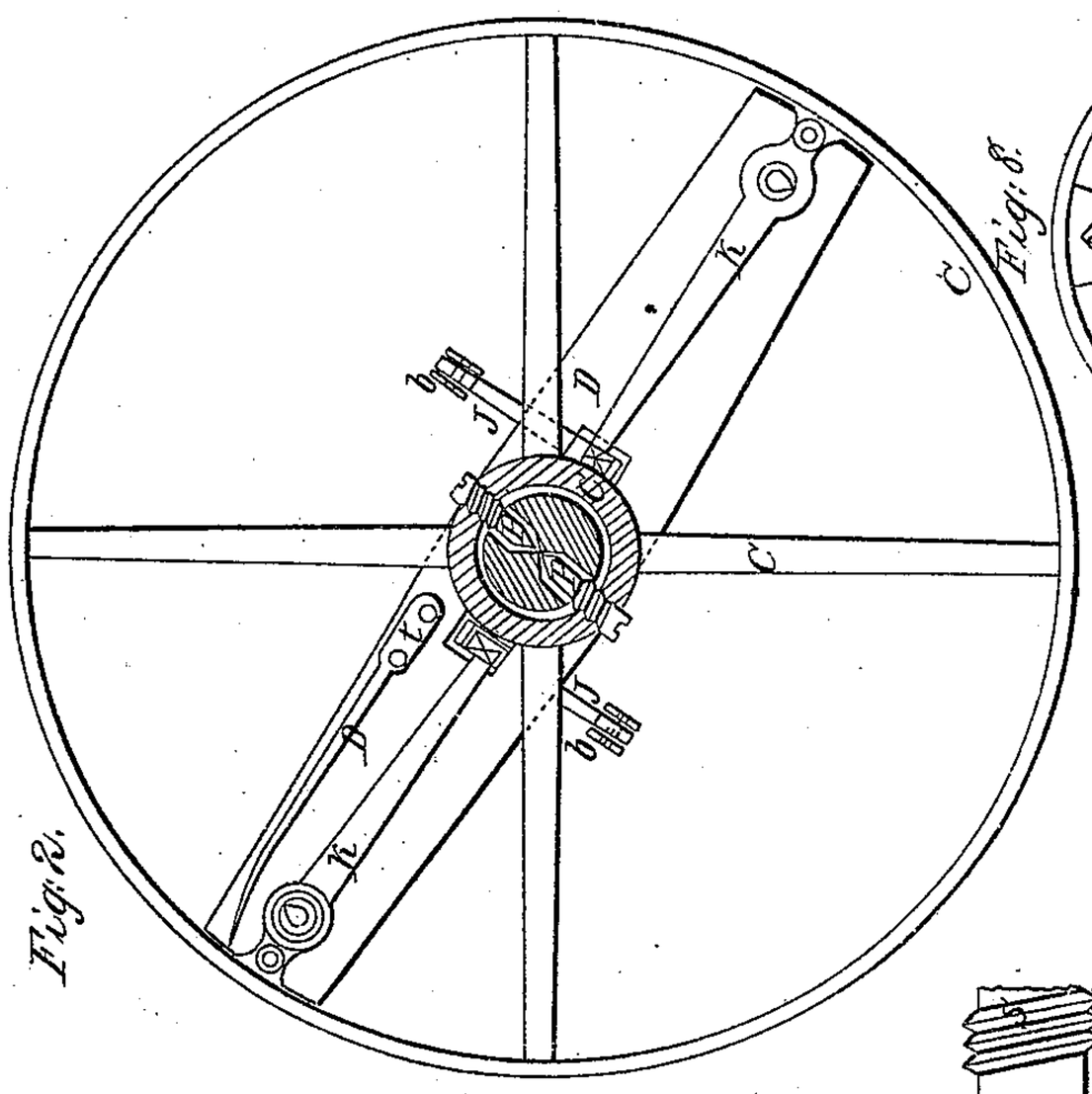

Fig. 2.

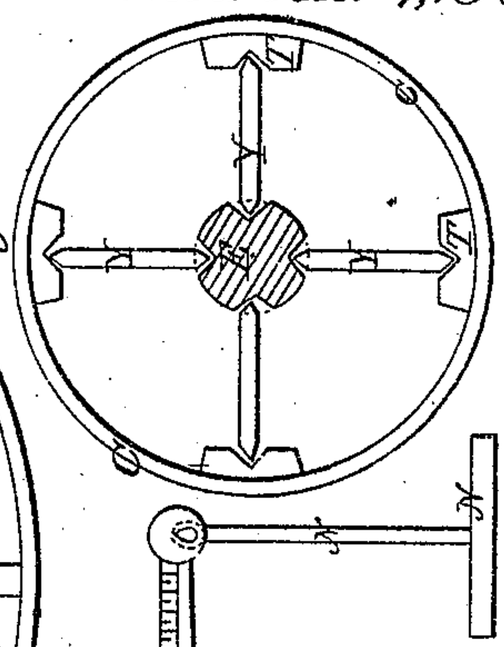

Fig. 8.

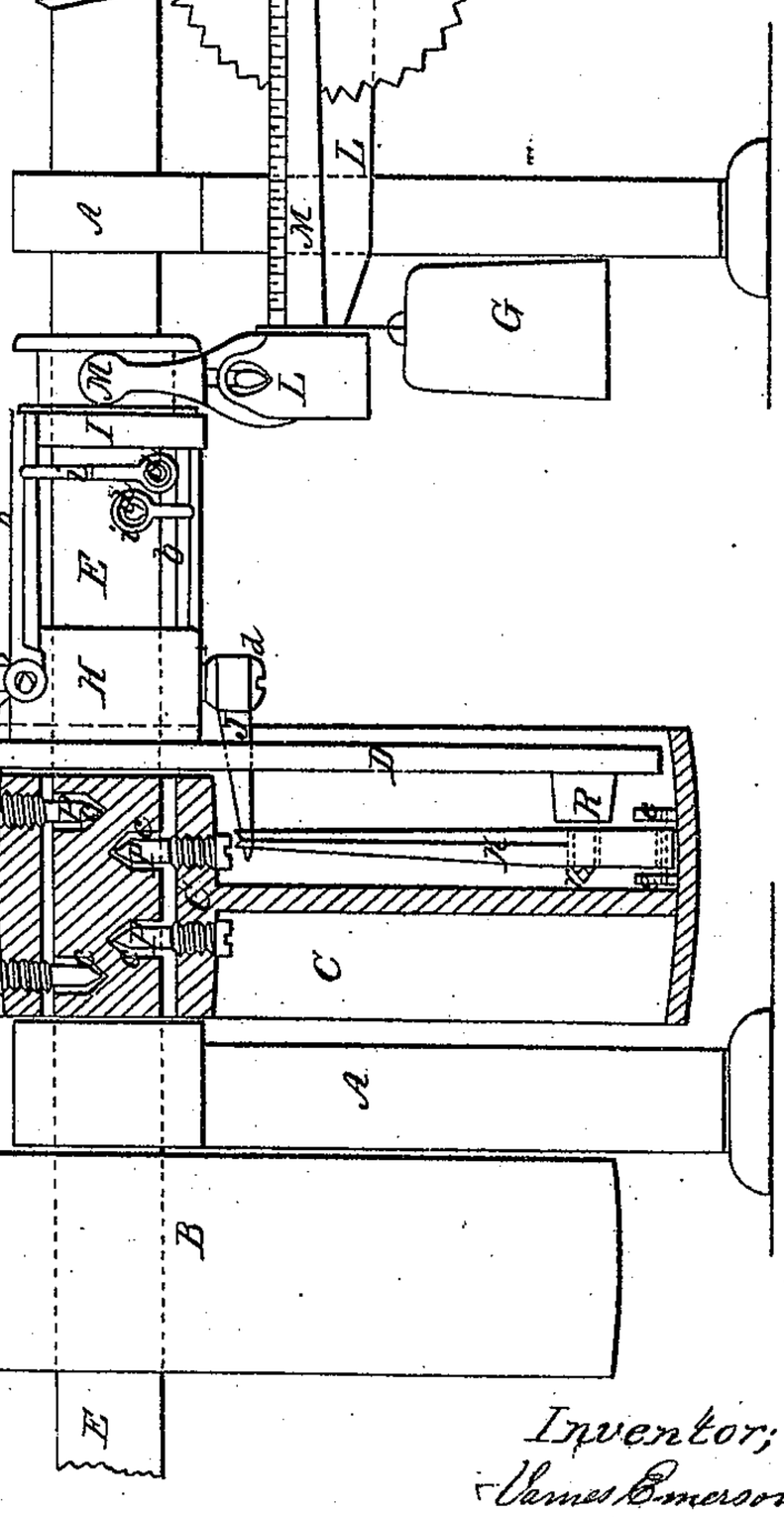

Fig. 1.

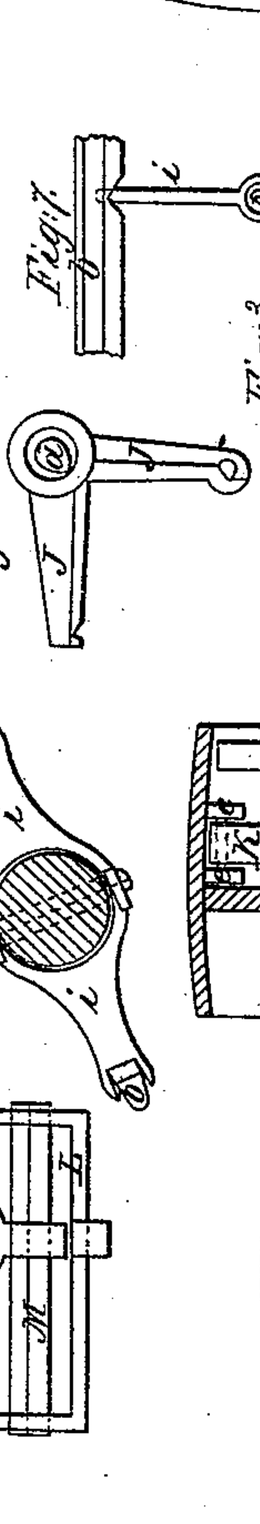

Fig. 7.

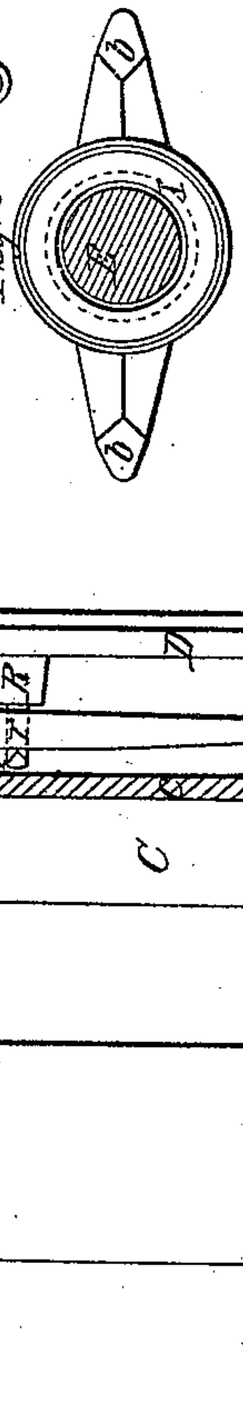

Fig. 3

Fig. 6

Fig. 5.

Fig. 4.

Witnesses:
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United States Patent Office.

JAMES EMERSON, OF LOWELL, MASSACHUSETTS.

Letters Patent No. 79,562, *dated July* 7, 1868.

IMPROVEMENT IN DYNAMOMETERS.

The Schedule referred to in these Letters Patent and making part of the same.

Be it known that I, JAMES EMERSON, of Lowell, county of Middlesex, and State of Massachusetts, have invented a new and improved Device for Weighing Power; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, and to the letters of reference marked thereon.

Figure 1 is a perspective, the pulley C being longitudinally divided through its centre. The shaft E is also divided in the same way at that point.

Figure 2 is a side view of the pulley C, the fulcrum-bar D, and the levers K.

Figures 3, 4, 5, 6, and 7 are sections necessary to the explanation.

The nature of my invention consists in applying the principle of the platform-scale to the driving-pulley of a shop or machine in such a way as to enable any one to weigh the power used thereby, the pulley being the platform, the power used, the load.

The frames A A support the whole. The pulley B is rigidly secured to the shaft E.

The pulley C has a hole through its hub, considerably larger than the shaft E on which it operates. It is entirely supported on the sharp points of the screws P, which are made of hardened steel, and rest exactly on the centre of the shaft, at the bottom of the holes *c c*, the said holes being larger than the screws P. This arrangement is used to avoid friction. The screws are on a line longitudinally, but transversely are placed as shown in fig. 1. The shaft E is made of hardened steel, to prevent wear, and while the points of the screws P are sharp, the pulley C oscillates very lightly on the centre of the shaft E.

Another plan to prevent friction is shown in Figure 8, which represents pulley C, made with separate arms, each end of which is made knife-edged, resting in longitudinal V-shaped grooves in the shaft E and pieces T, the arms Y, pieces T, and shaft E all being made of hardened steel.

The fulcrum-bar D, rigidly secured to the shaft E, is a thin, flat bar of iron, extending nearly across the pulley C, with the hub H on its right and the projections R R on its left side. From these projections extend the knife-edged studs *r r*, for the levers K to rest upon. These levers are connected to the rim of the pulley C by the hangers *e e*, the other end of the levers resting against the longitudinal arm of the elbows J. These elbows are secured to the hub H by the screws *d*, the body of these screws being knife-edged, as shown in fig. 6. The transverse arm of the elbows J is connected by knife-edged bolts to the prongs *b b* of the connecting-link I, as shown in the figs. 1 and 2. The said link has a hole through its neck larger than the shaft E, as represented in fig. 3, and is so made that it may not touch the shaft at all, being supported and kept parallel with the shaft by the pieces *i i*, shown in figs. 1, 5, and 7.

The rear end of the scale-beam M is forked, as shown in fig. 4, which turns up at a right angle with the beam. The fork is placed astride of the neck of the link I. The beam rests on knife-edges in the frame L, as shown in fig. 1. The beam is graduated, balanced, and used the same as the beam of the common platform-scale.

The gear F is secured to the frame L by the screw O. It is rotated by the screw S, one tooth at each revolution of the shaft E. Its use is to indicate the number of revolutions the shaft E makes in a given time.

The spring *t*, fig. 2, is secured to the fulcrum-bar D. Its outer end projects into the rim of the pulley C, and is so adjusted that it forces the periphery of the pulley in a direction contrary to that which it moves, by depressing the outer end of the beam M. The object of the spring is to balance the beam, which is done by making the weight N equal the strength of the spring when the weight G is at zero.

Operation.

Place a belt from the motor around the pulley B, which will drive the whole in one direction, the top of the pulleys from the observer. Place a belt on the pulley C, to drive any machinery desired, the resistance from which will react against the pulley C, forcing its rim against the levers K, and through them to the scale-beam M, where the resistance may be balanced by the weight G, as is done on platform-scales. If the

weight G is insufficient, more may be added on the rod N. If the power used is uneven, the weight N may be immersed in water to steady it.

To find the power used, multiply the weight shown on the beam by the speed of the periphery of the pulley C per minute, and divide by thirty-three thousand.

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

1. Connecting the rim of the driving-pulley C, placed loosely upon the shaft E, to the weighing-scale, in the manner and for the purpose as set forth.

2. Supporting the driving-pulley C upon the shaft by means of the screws *d d*, as and for the purpose set forth.

3. The connecting-links I, supported upon the knife-edges *i i*, as and for the purpose as set forth.

4. The spring *t*, connecting the fulcrum-bar with the driving-pulley, when used as and for the purpose described.

5. In combination with the driving-pulley C, fulcrum-bar D and weighing-scale, when connected and operating as and for the purpose described.

JAMES EMERSON.

Witnesses:

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EDWARD E. DIXON.