No. 670,903. Patented Mar. 26, 1901.

J. J. McTIGHE.

INDICATOR.

(Application filed Oct. 6, 1900.)

(No Model.)

Fig. 1.

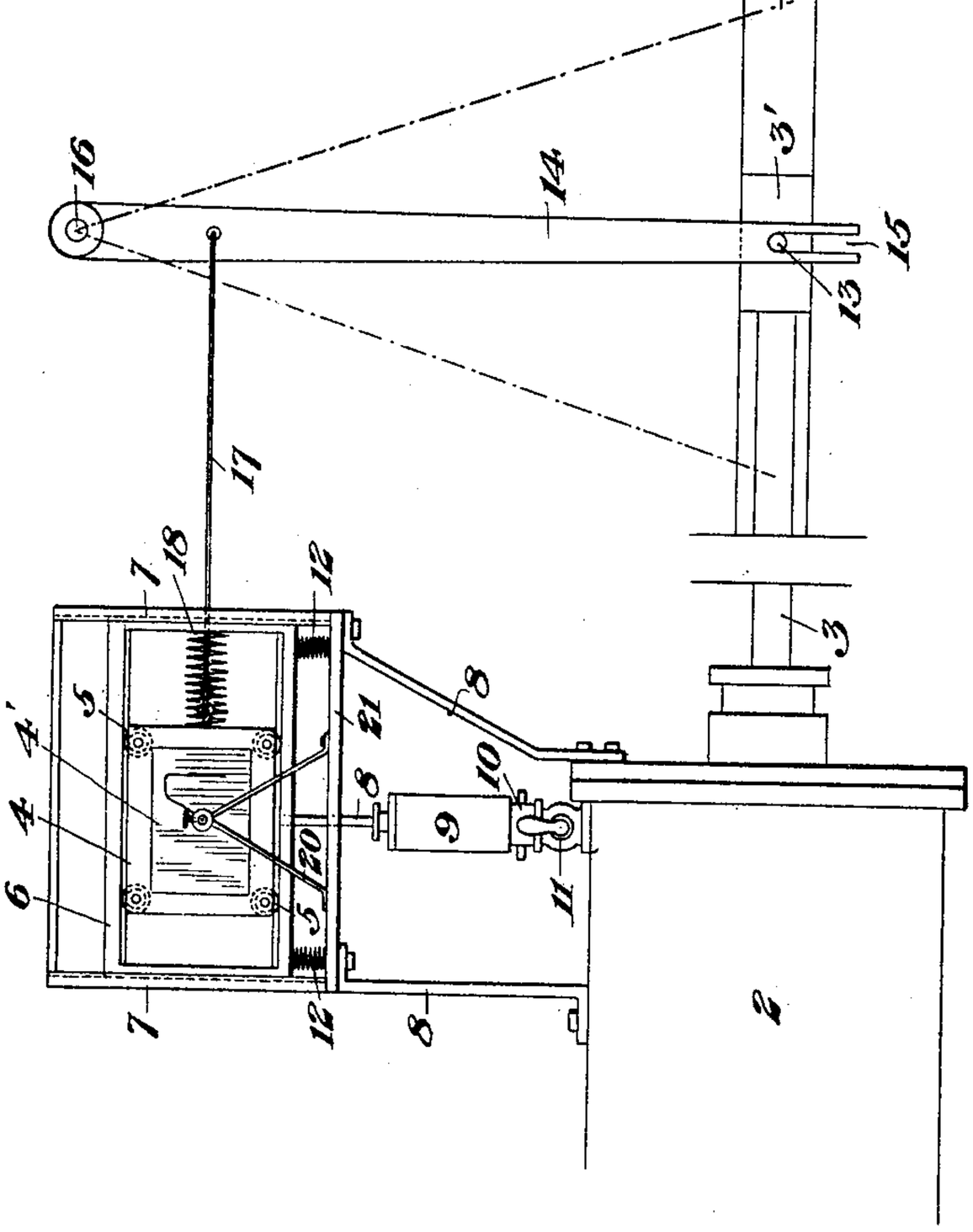
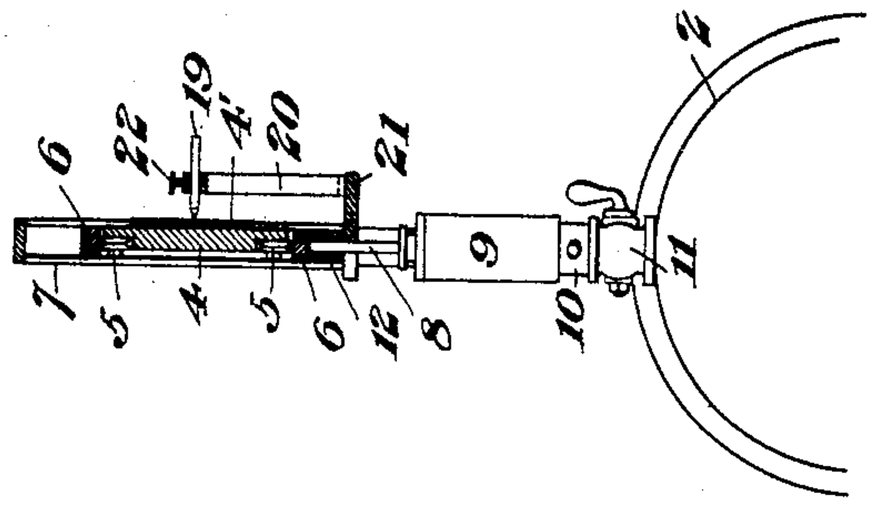


Fig. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES J. McTIGHE, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO GUY F. GREENWOOD, OF HAVANA, CUBA.

INDICATOR.

SPECIFICATION forming part of Letters Patent No. 670,903, dated March 26, 1901.

Application filed October 6, 1900. Serial No. 32,232. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. McTIGHE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Indicators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved indicator, and Fig. 2 is a cross-section thereof.

My invention relates to power-indicators; and it consists in providing a recording-surface, a marking-point in contact with this surface, and mechanism which imparts to one of these elements a compound movement which is controlled in one direction by the pressure and in the other direction by the speed, while the other part remains stationary.

In the drawings, 2 is the cylinder of an engine, having piston-rod 3 and cross-head 3′ of ordinary construction.

4 is a record-holder of any desired type, preferably mounted on rollers 5 5 in frame 6 and arranged to reciprocate horizontally therein.

7 7 are vertical guides in which frame 6 reciprocates, said guides being attached to engine-cylinder 2 by angles 8 8. Secured to frame 6 is piston-rod 8, reciprocating in pressure-cylinder 9, which communicates with engine-cylinder 2 by coupling 10 and valve 11.

12 12 are retracting-springs attached to frame 6 and adapted to normally retain said frame in its lowest position.

On cross-head 3′ I provide a pin 13, adapted to impart motion to arm 14 by reason of slot 15 at the end thereof, the said arm 14 being hung from any convenient pivot 16 and having connecting-rod 17 attached to frame 6, as shown. I preferably provide compression-spring 18 to preserve the position of frame 6 relative to arm 14, since it avoids the necessity of accurately-adjusted bearings therefor; but this spring may be dispensed with where such bearings are provided.

19 is a pencil or pen of any desired form, mounted on supports 20, which are secured to cross-piece 21 of guides 7, the said pencil or pen 19 being retained adjustably relatively to holder 4 by means of screw 22.

The operation is as follows: The engine being actuated in the ordinary manner, pressure is supplied in cylinder 2, and piston-rod 3 reciprocates therein. The reciprocation of rod 3, actuating arm 14, causes record-holder 4 to reciprocate in frame 6 proportionately to the reciprocation of piston-rod 3. If pencil or pen 19 be now brought into contact with card 4′, a straight line will be traced thereon. Valve 11 being then opened, the variable pressure in cylinder 2 is proportionately communicated to cylinder 9 and by piston-rod 8 transformed into motion, which is communicated to frame 6 at an angle to the motion imparted by arm 14, and jointly therewith imparting a compound movement to the record-holder and a consequent readable record.

I have described and shown in the drawings apparatus in which the compound motion is imparted to the record-holder while the pencil or pen is stationary; but it will be readily seen that this relation may be reversed without impairing the efficiency of the indicator—that is to say, the record-holder may be mounted on supports 20 and the pencil or pen on holder 4. Other changes will suggest themselves to the mechanic without departure from my invention.

I claim—

1. An engine or power-indicator, comprising a recording-surface, a marking-point in contact therewith, and mechanism for imparting to one of said parts compound movement controlled in one direction by the pressure and in the other by the speed, while the other part remains at rest; substantially as described.

2. An engine or power-indicator, comprising a recording-surface and a marking-point in contact with each other, and means for imparting to said recording-surface compound movement controlled in one direction by the pressure and in the other by the speed, while the marking-point remains at rest; substantially as described.

3. An engine or power-indicator, comprising a recording-surface, a marking-point in contact therewith, and mechanism for simultaneously imparting to said surface a movement in one direction proportional to the speed, and a crosswise movement thereto pro-

portional to the pressure; substantially as described.

4. An engine or power-indicator comprising a recording-surface, a carrier therefor, a marking-point in contact with said recording-surface, connections arranged to impart to the carrier a movement in one direction proportional to the speed, and in another direction proportional to the pressure, and springs arranged to oppose said movements; substantially as described.

In testimony whereof I have hereunto set my hand.

JAMES J. McTIGHE.

Witnesses:
G. I. HOLDSHIP,
GEO. B. BLEMING.