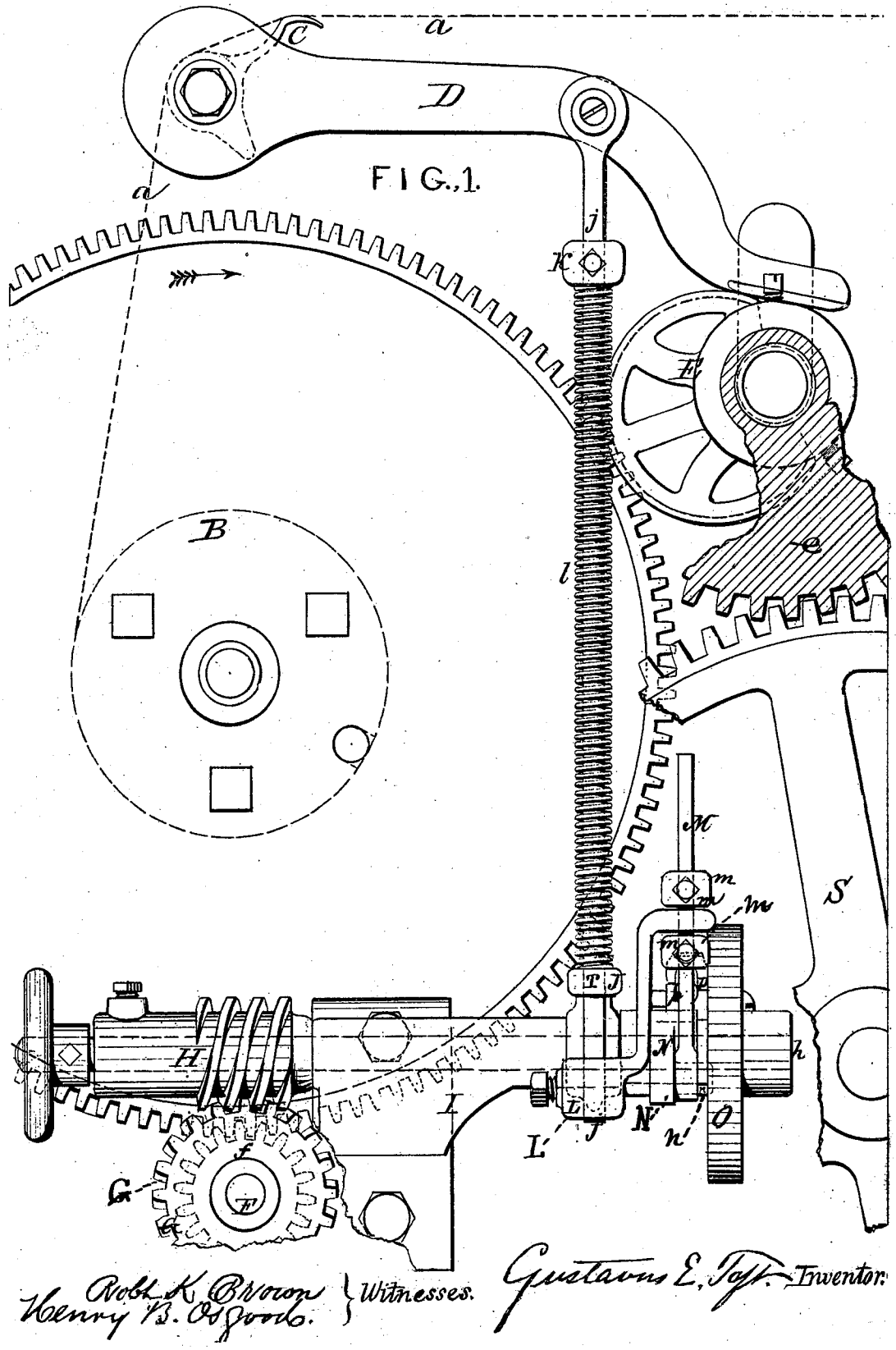
4 Sheets—Sheet 1.

# G. E. TAFT.

## LET-OFF MOTION FOR LOOMS.

No. 172,833. Patented Feb. 1, 1876.

FIG. 1.




Witnesses.
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Inventor.
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## LET-OFF MOTION FOR LOOMS.

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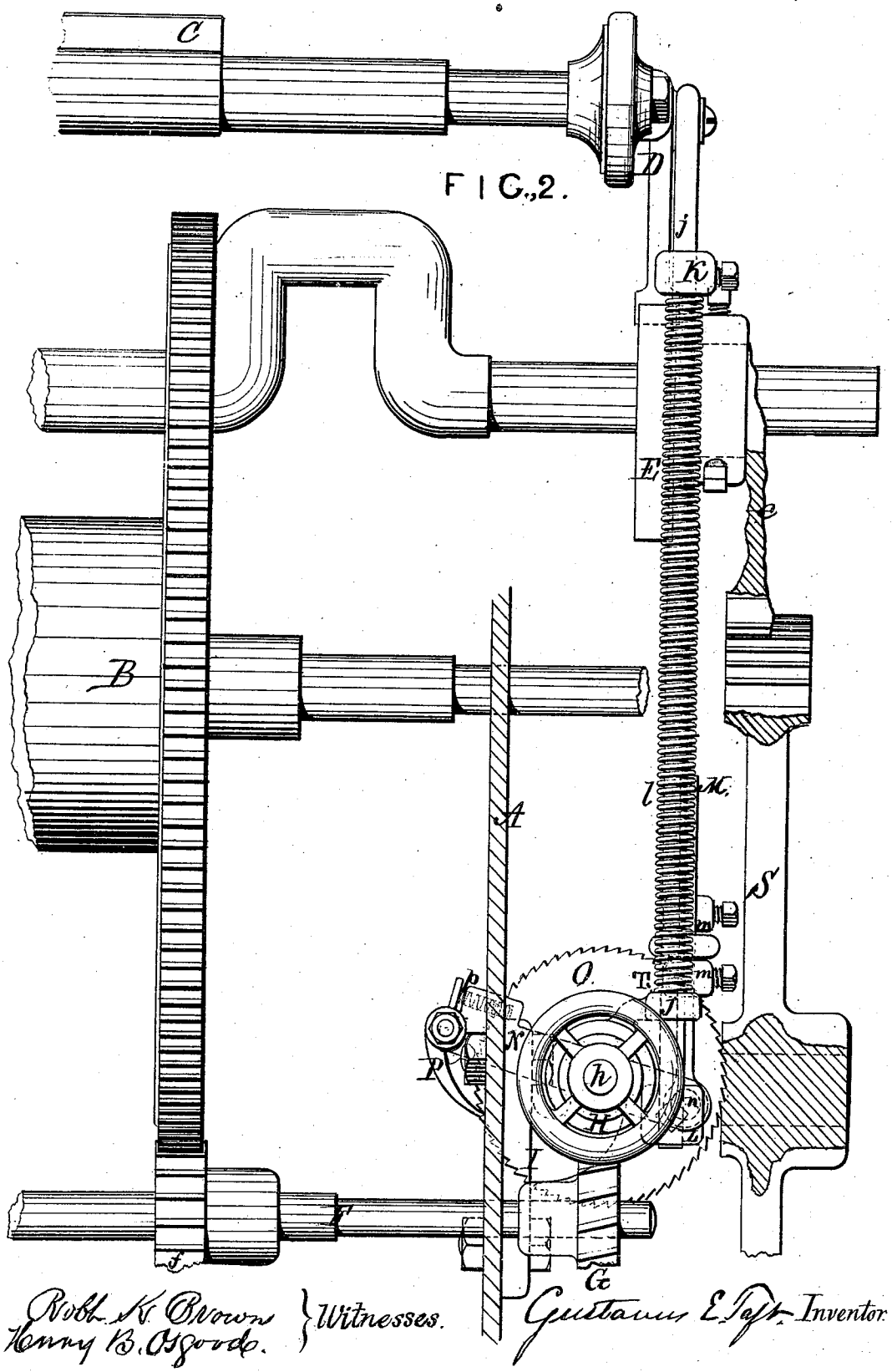
FIG. 2.




Robt. K. Brown
Henry B. Osgood. } Witnesses.

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# G. E. TAFT.

## LET-OFF MOTION FOR LOOMS.

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FIG. 5.

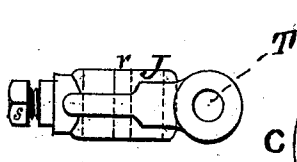



FIG. 7.

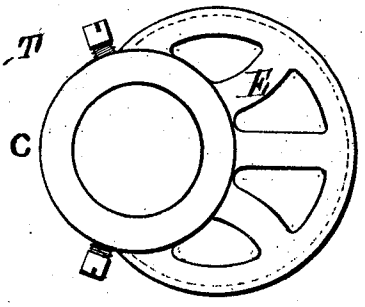



FIG. 6.

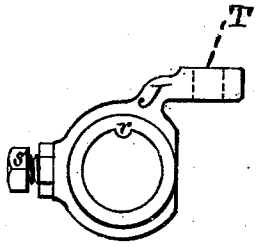



FIG. 8.

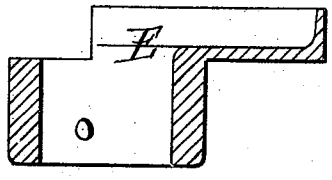



FIG. 3.

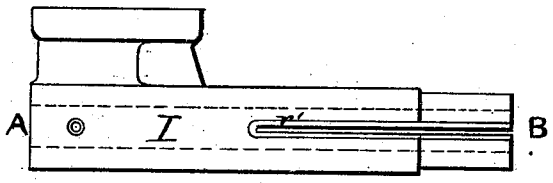
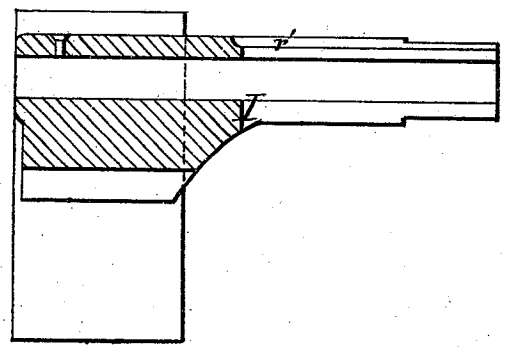



FIG. 4.




Witnesses: Robt. K. Brown, Henry B. Osgood

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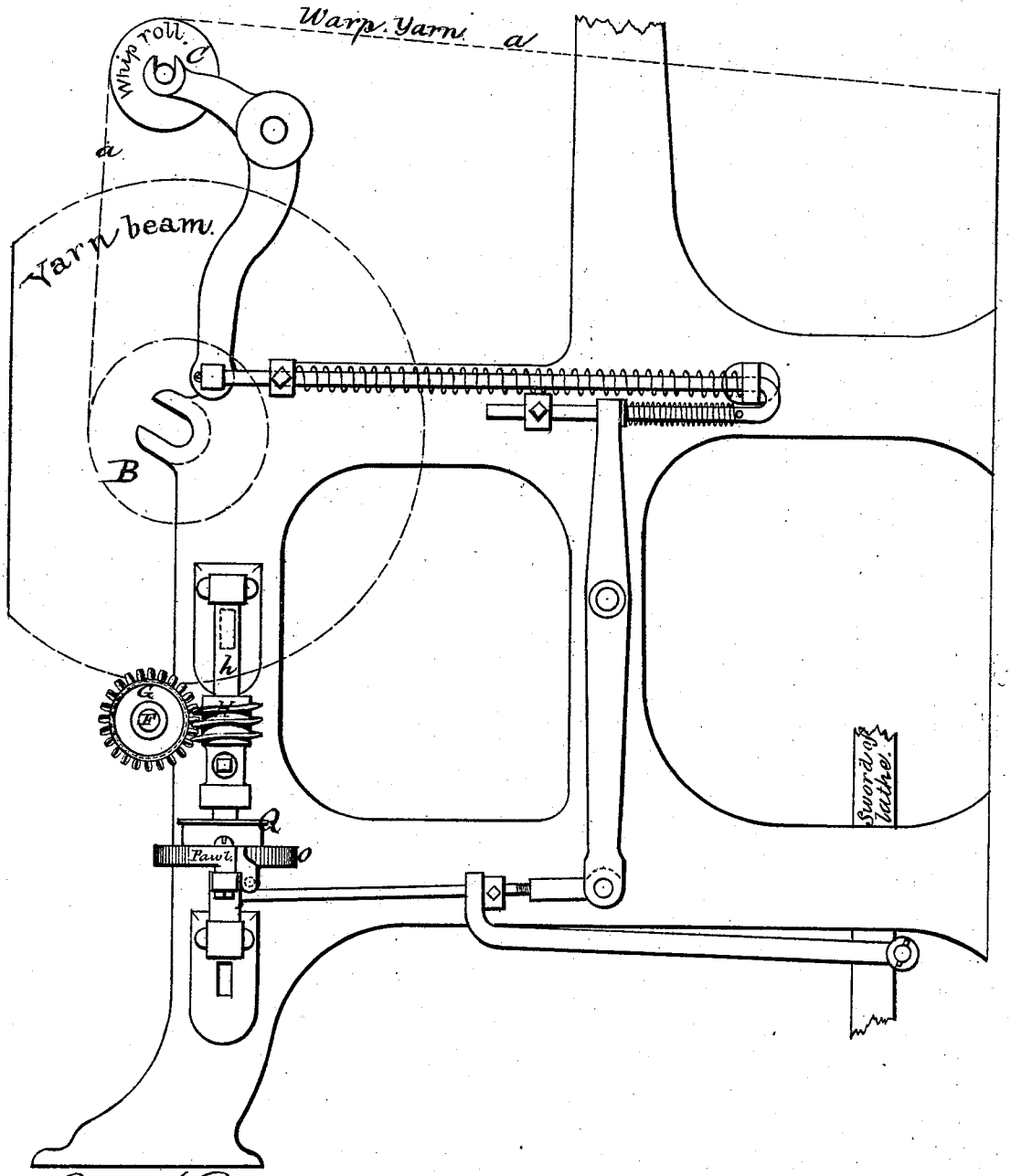
# G. E. TAFT.

## LET-OFF MOTION FOR LOOMS.

No. 172,833. Patented Feb. 1. 1876.

FIG, 9.




Robt. K. Brown
Henry B. Osgood. } Witnesses. Gustavus E. Taft. Inventor

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

GUSTAVUS E. TAFT, OF WHITINSVILLE, ASSIGNOR TO THE WHITIN MACHINE-WORKS, OF NORTHBRIDGE, MASSACHUSETTS.

## IMPROVEMENT IN LET-OFF MOTIONS FOR LOOMS.

Specification forming part of Letters Patent No. **172,833**, dated February 1, 1876; application filed December 6, 1875.

*To all whom it may concern:*

Be it known that I, GUSTAVUS E. TAFT, of Whitinsville, town of Northbridge, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Let-Off Motion for Looms, which is fully set forth in the following specification.

The "Bartlett" let-off motion for many years has been the most used, and in one of its simplest forms is shown in Fig. 9, by a scale of one-quarter of an inch to an inch; but additional parts have been connected with it for holding the let-off at certain intervals, for real or fancied usefulness, so as to cause a great many small parts to be used for controlling the let-off, causing loss of motion by the use of numerous joints and springs, so that for heavy goods the Bartlett motion refuses to act reliably.

To reduce the number of parts, to attain more direct action, and produce a let-off motion that is better, and more generally applicable for light and heavy goods, is the object of my invention.

Having given the nature and object of my invention, I will now describe its construction and operation, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

All the parts of looms to which this is applied can be as ordinarily constructed, except the let-off, and of this the pawl-wheel and pawl, worm and worm-wheel, of the Bartlett invention are retained.

Of the drawings, Figure 1 is a view of the let-off and parts connected with it, as seen from one end of the loom, without showing the loom-side. Fig. 2 is a side elevation of the same, showing at A a section through the plate or web of the loom-side. Fig. 3 is a plan of the slitted bearing of the worm-shaft. Fig. 4 is a section through axis of same. Fig. 5 is a plan of the guide or holder of the spring-rod, and is clamped on the outside of slitted stand I. Fig. 6 is a side elevation of same. Fig. 7 is a side view of the adjustable cam for operating the let-off at the desirable time. Fig. 8 is a section through axis of same. Fig. 9 is a side view of a loom with a simple form of Bartlett motion.

B is the yarn-beam; *a*, the yarn from a nearly empty beam passing over the whip-bar C on its way through the lay to the take-up. Experience has shown that the best let-off mechanism among the manifold kinds which have been used the last twenty years for regulating the supply of warp required by the lay when the filling is being beat in is an oscillating whip-bar, connected by means of rods and springs, ratchet and pawl, to a worm-shaft, and through the worm-wheel communicates motion to the yarn-beam, causing the yarn to let off according as the strain of yarn gives more or less motion to the oscillating whip-bar. D is an adjustable arm on the end of the whip-bar, the outer end of which is acted upon by the cam E, which is fixed upon the hub of the gear *e*, which is upon the crank-shaft. F is a small shaft, with a pinion, *f*, which gears into the gear-wheel on the head of the yarn-beam. This shaft F also has on it a worm-wheel, G, which is operated by the worm H upon the worm-shaft *h*. This worm-shaft is supported by the slitted stand I, which has secured to it the rod-guide J. The upper end of the rod *j* is pivoted to the whip-bar arm D. Near the upper part of the rod *j* is an adjustable collar, K. Near the lower end of the rod *j* is an adjustable arm, L. A spiral-wire spring, *l*, bears upon the fixed rod-guide J, and upon the under side of the collar K, tending constantly to raise the arm D. The upper portion of the part L has a hole to receive the short rod M. The short rod M has two adjustable set-collars, *m m*. The lower end of the rod M has an eye, which fits loosely over the spur *n* of the pawl-lever N. This pawl-lever has a hub, which fits loosely over the slitted stand I, and at the opposite end from the spur *n* is a pawl, P, which is kept up to its work by the socket-spring *p*. O is the pawl-wheel, which is on the end of the worm-shaft, which would turn loosely in the slitted stand I but for the following reasons: When the take-up draws hard on the warp-yarns the tendency to turn the yarn-beam is so great that it will turn the worm-shaft unless some-

thing is made to resist it. Formerly a weight attached to a leathern strap running over a friction-pulley on the yarn-beam was used, but in the Bartlett motion a small pulley (Q, Fig. 9) on a vertical shaft, with a spring and strap, is made use of; but these pulleys and straps detract from simplicity, are unreliable from oils and atmospheric influences, and are inconvenient to keep clean from the dust and waste of the weave-room. The friction I produce by simply turning the screw *s* in the hub of J. This springs in the sides of the slitted end of the bearing-stand I, hugging the worm-shaft *h*, and producing the requisite friction, which can be adjusted to a nicety. The projection *r* in the hole of the hub of part J fits in a corresponding groove, *r'*, over the slit in stand I, and prevents the part J from turning. The groove and slit help to convey oil thoroughly to the worm-shaft. The gear S is on the cam-shaft, and is only drawn to show its relative position.

The operation is as follows: When the take-up draws hard upon the yarns *a*, the arm D of the whip-bar C is forced down, carrying with it the spring-rod *j*. The hub of part L, being fixed to lower part of rod *j*, is also carried down, and with it the short arm of the pawl-lever N, which raises the other arm of the pawl-lever, and with it the pawl, and sets it ready to turn the pawl-wheel, which is fixed to the worm-shaft. When the largest part of the cam E throws the arm D up, and with it the spring-rod J, and parts connected with it, as described, it throws the pawl end of N down, and the pawl catches in the teeth, and turns, through the ratchet-wheel and worm, the worm-wheel and the pinion on the worm-wheel shaft, which works into the wheel at the periphery of the head of the yarn-beam, and lets off the yarn as desired. When the yarn-beam is full, and the diameter of it large, a small part of a revolution lets off the requisite warp, and during a beat of the lay the strain of the yarn on the whip-bar does not cause the pawl to set over so many teeth of the ratchet as when the beam is nearly empty, and revolves the quickest.

Having described its construction and operation, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The worm-shaft holder I, provided with a slit and groove, in combination with the arm J, provided with a set-screw, S, projection *r*, and guide-eye T, whereby the rod *j* is maintained in position, all being constructed to operate as shown and described.

2. The combination of the whip-bar arm D, rod *j*, arm L, rod-guide and friction-clamp J, slitted stand I, pawl-lever N, ratchet-wheel O, worm-wheel G, worm H, worm-shaft *h*, shaft F, with the pinion which gears into the spur-gear on the beam-head, essentially as described.

GUSTAVUS E. TAFT.

Witnesses:

ROBT. K. BROWN,

HENRY B. OSGOOD.