(No Model.) 2 Sheets—Sheet 1.

F. L. WOLFE.

REGISTER FOR COUNTING THE STROKES OF PISTONS, &c.

No. 526,884. Patented Oct. 2, 1894.

Fig. 1.

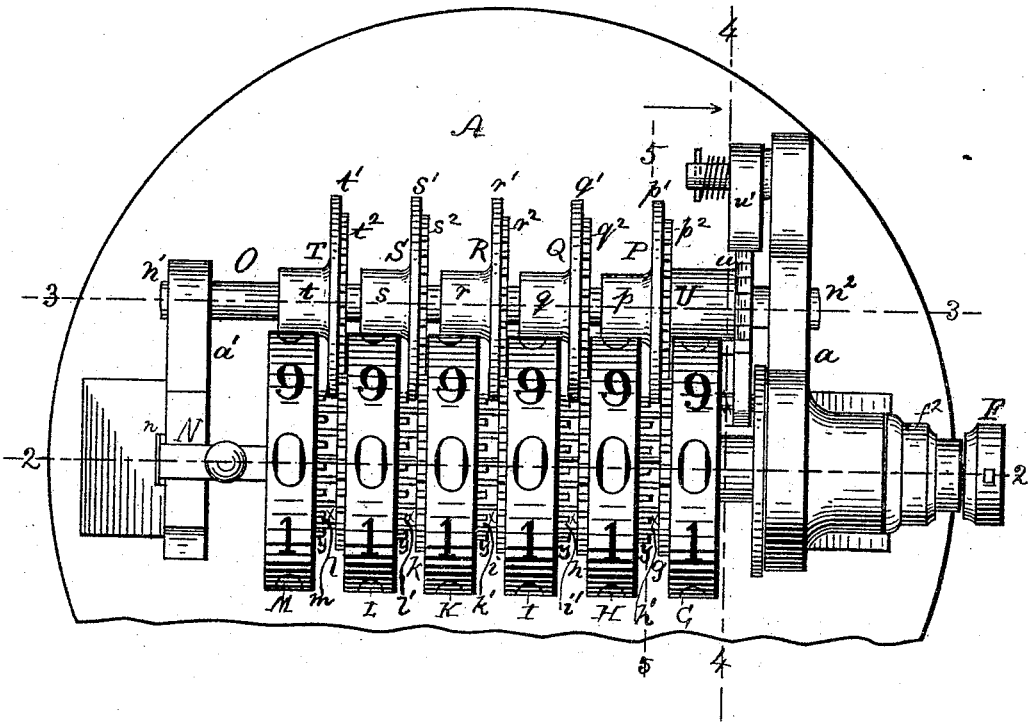
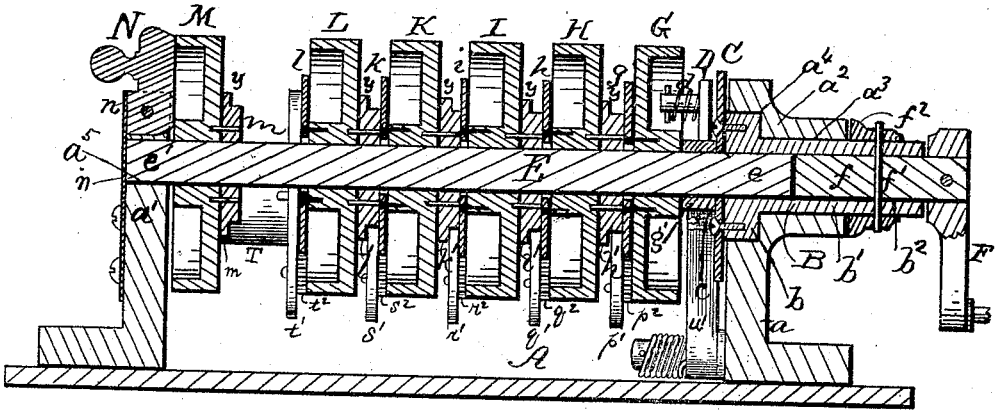


Fig. 2.



WITNESSES

F. L. Ouraud.
Joseph Gregory

INVENTOR

Frank L. Wolfe
per W. K. Singleton,
atty.

(No Model.) 2 Sheets—Sheet 2.

F. L. WOLFE.

REGISTER FOR COUNTING THE STROKES OF PISTONS, &c.

No. 526,884. Patented Oct. 2, 1894.

Fig. 3.

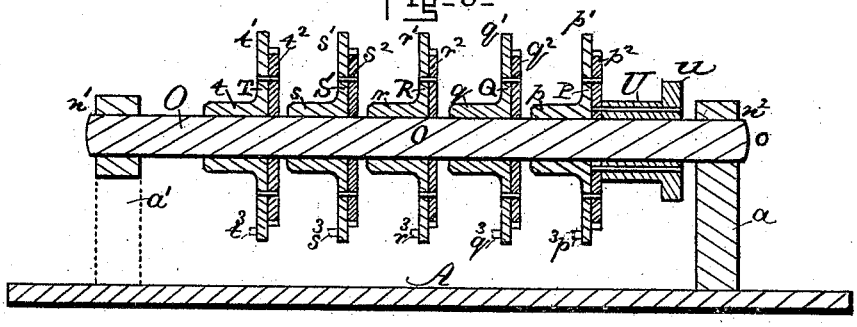


Fig. 4.

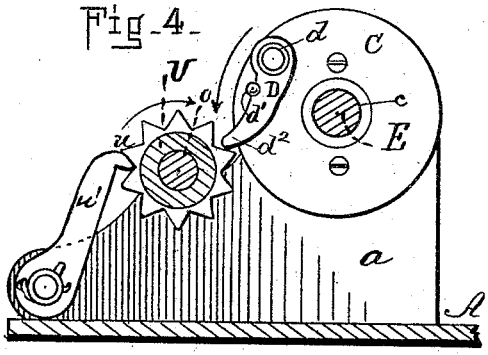


Fig. 5.

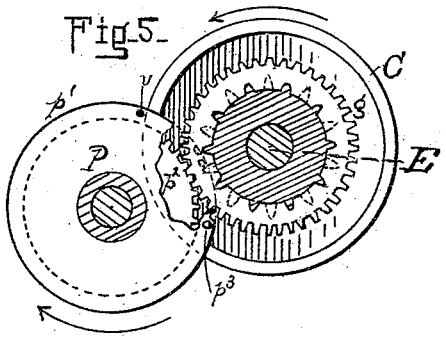


Fig. 6.

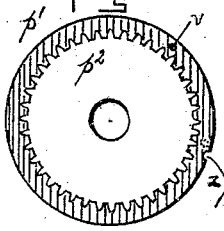


Fig. 7.

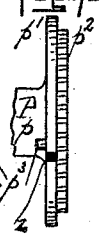


Fig. 8.

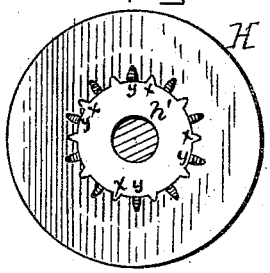


Fig. 9.

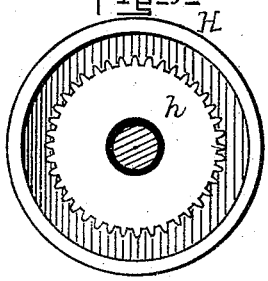
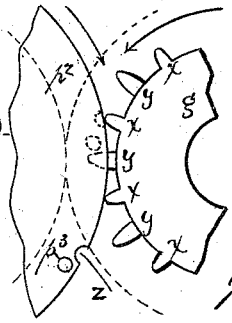


Fig. 10.



WITNESSES

F. L. Ourand.
Joseph Gregory

INVENTOR

Frank L. Wolfe.
per W. H. Singleton.
Atty.

UNITED STATES PATENT OFFICE.

FRANK LESLIE WOLFE, OF MEDFORD, ASSIGNOR TO THE CROSBY STEAM GAGE AND VALVE COMPANY, OF BOSTON, MASSACHUSETTS.

REGISTER FOR COUNTING THE STROKES OF PISTONS, &c.

SPECIFICATION forming part of Letters Patent No. 526,884, dated October 2, 1894.

Application filed January 25, 1892. Serial No. 419,176. (No model.)

To all whom it may concern:

Be it known that I, FRANK LESLIE WOLFE, a citizen of the United States, residing at Medford, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Registers for Registering the Strokes of Pistons or other Moving Parts of Machinery; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in registers for registering the strokes of a piston or other moving parts of machinery, and it consists in the device hereinafter pointed out in the claim.

In the drawings: Figure 1 represents a top view of the device; Fig. 2, a section on line 2—2, Fig. 1; Fig. 3, a section on line 3—3, Fig. 1; Fig. 4, a detail section on line 4—4, Fig. 1, looking in the direction of the arrow; Fig. 5, a similar section on line 5—5, Fig. 1. Figs. 6 and 7 are face and edge views of the intermediate gears. Figs. 8 and 9 show the two faces of the numbering wheels. Fig. 10 is an enlarged view showing the meshing of the numbering wheel with the intermediate wheel.

The letter A indicates a suitable plate or rest to which are secured the standards, $a\,a'$, spaced apart. In the standard, a, is a socket, a^2, having the bore, a^3, and circular rabbet, a^4. In this socket, a^2, is placed the sleeve, B, having a circular shoulder, b, which fits the rabbet, a^4, and a stem, b', which fits the bore, a^3. This sleeve, B, has the bore, b^2, through it. Secured to the inner face of the shouldered part of this sleeve, B, is a disk, C, having a central hole, c, coincident with the bore, b^2.

Pivoted to the exposed face of the disk, C, is a pawl, D, (Fig. 4) which has the spring, d, and the limiting stop, d', the end, d^2, of the pawl extending beyond the periphery of the disk. In the standard, a', there is a hole, a^5, which is aligned with the hole, c, and the bore, b^2. In this hole, a^5, and the hole, c, and inner end of the bore, b^2, are placed the ends, $e\,e'$, of the shaft, E, which carries the register wheels. Normally this shaft is loose in its bearings. In the outer end of the bore, b^2, is slipped a rod, f, having the crank, F. This rod, f, is held to the sleeve, B, by a pin, f', and there is on the outside of the sleeve a collar, f^2, to hold the sleeve B in position.

On the shaft, E, are loosely slipped side by side the register wheels of any desired number, in the present instance six, G, H, I, K, L, M. These wheels have on their peripheries the figures from 0 to 9. These wheels are made cup-shaped having the outer flange and a central hub. See Fig. 2. The first or units wheel, G, has secured to its flat face a geared disk, g, and it is put in place with its concavity toward the disk, C, the pivot pin of the pawl, D, coming into the concavity or cup of the wheel. The last wheel, M, has secured upon its flat side the toothed wheel, m, and is put into place with its concavity toward the standard, a'. The other or intermediate wheels, H, I, K, and L, have on their hubs geared disks, h, i, k, and l, similar to the geared disk, g, and on their flat faces the toothed wheels, h', i', k' and l', similar to the toothed wheel, m. The disks, g, h, i, k and l, are wheels having usual shaped teeth. The wheels, h', i', k', l', and m, have two sets of teeth, x and y, those of one set alternating with those of the other set. The teeth, x, are the full width of the wheel, but the alternate teeth, y, are only half the width of the wheel (Fig. 1.) The intermediate register wheels H, I, K, and L are put into place with their cups or concavities away from the disk, C. As shown in Fig. 2, the register wheels are arranged so that the toothed wheels h', i', k', l', m having the teeth of different sizes come against the toothed disks g, h, i, k, and l on the register wheels.

Between the wheel, G, and the disk, C, is placed, on the shaft, E, a spacing sleeve, g'.

Pivoted in the top of the bearing, a', is a lock catch, N, which, when turned down as in Fig. 1, inside of the bearing, a', and parallel with the shaft, E, bears against the wheel, M, and keeps all the register wheels in place, as they are all locked against or from movement along the shaft, E. A spring, n, bears against this catch, N, and prevents accidental dislodgment.

In bearings, n' n^2, of the standards, $a\,a'$, is placed a shaft, O, which is parallel with the shaft, E. On this shaft are loosely sleeved the

wheels P, Q, R, S, and T. These wheels have the hubs, p, q, r, s, and t, and the flanges, p', q', r', s', and t'. To these flanges are secured the disks, p^2, q^2, r^2, s^2, and t^2, having teeth corresponding with those of the disks, g, h, i, k, and l, with which they mesh. From the back of these flanges p', q', r', s', t' there project pins, p^3, q^3, r^3, s^3, and t^3.

In the edge of the flanges, p', q', r', s', and t', are made notches, z, see Fig. 10, these notches being near the pins, p^3, q^3, r^3, s^3, t^3. In the flanges are also the holes, v. As shown, there is a pin, a notch, and a hole to each flange.

On the end, o, of the shaft, O, is placed a spool, U, which is secured to the wheel, P, or the disk, p^2, thereon, so that the wheel, P, disk, p^2, and spool, U, are one structure. This spool, U, has the ratchet, u, formed thereon. To the standard, a, a spring detent pawl, u', is pivoted which engages the ratchet, u, and prevents back motion.

The several wheels, P, Q, R, S, and T, are spaced so that the ratchet, u, is aligned with the pawl, D, on the disk, C, the said pawl engaging the teeth of the ratchet u, and the flanges of these wheels and the disks thereon overlapping the register wheels, as shown in Fig. 1. The collocation of these various parts is such that the teeth of the disks, p^2, q^2, r^2, s^2, and t^2, mesh with the teeth of the disks, g, h, i, k, and l, respectively; the pins, p^3, q^3, r^3, s^3, and t^3, engage the teeth, y, of the toothed wheels, h', i', k', l' and m, and the edges of the flanges, p', q', r', s', and t', come between these teeth and the disks on the register wheels.

In use the device is set with all the zeros of the registering wheels in line and at the usual sight apertures. The moving part to be registered is connected with the crank, F. As this crank rotates or reciprocates, the disk, C, and its pawl, D, are moved and the ratcheted spool, U, and wheel, P, are turned one tooth of the ratchet, u, with each stroke of the pawl, D, upon said ratchet, u. The disk, p^2, meshing with the disk, g, moves the register wheel, G, so as to bring the figure 1 to the sight aperture. Another stroke brings the figure 2, and so on. When the pin, p^3, comes around so as to strike one of the teeth, y, of the register wheel, H, the notch, z, coming at one of the teeth, x, permits the rotation of the register wheel, H. As this register wheel, H, is given a partial rotation, it also partially rotates the wheel, Q, through the meshing of the teeth of the two disks, h and q^2. As this continues, the pin, q^3, is brought around and into engagement with one of the teeth, y, thereby turning the register wheel, I, for one number. This in turn partially rotates the wheel, R; this the wheel, K; this the wheel, S; this the wheel, L; this the wheel, T, and this the wheel, M. When all the register wheels have been turned so as to register the maximum number of the register, the lock, N, is turned back as shown in Fig. 2, and the various wheels separated, except wheels P and G, the ratchet u and disk p^2 preventing displacement. The register wheels are to be turned so as to bring the zeros in line at the sight apertures. The wheel, Q, is to be slipped into engagement with the wheel, H. The other wheels on the shaft, O, are put into proper relation by getting the holes, v, aligned just along the line where the peripheries of these wheels cut those of the register wheels, the holes, v, being in such place that they form indexes for this adjustment.

Having thus described my invention, what I claim is—

The combination of the shaft, E, the several register wheels thereon, each wheel except the last having on one face a toothed disk, and each wheel except the first having on the other face another toothed disk having two sets of teeth, one set of greater width than the other; a parallel shaft having wheels thereon, each wheel having on one side a toothed disk and on the other side a pin, the wheels on the parallel shaft overlapping the wheels on the shaft, E, and the toothed disks of the two sets of wheels intermeshing; a ratchet wheel on the parallel shaft, and a disk provided with a pawl to engage such ratchet wheel, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK LESLIE WOLFE.

Witnesses:

JOSHUA H. MILLETT,

RALPH W. FOSTER.