

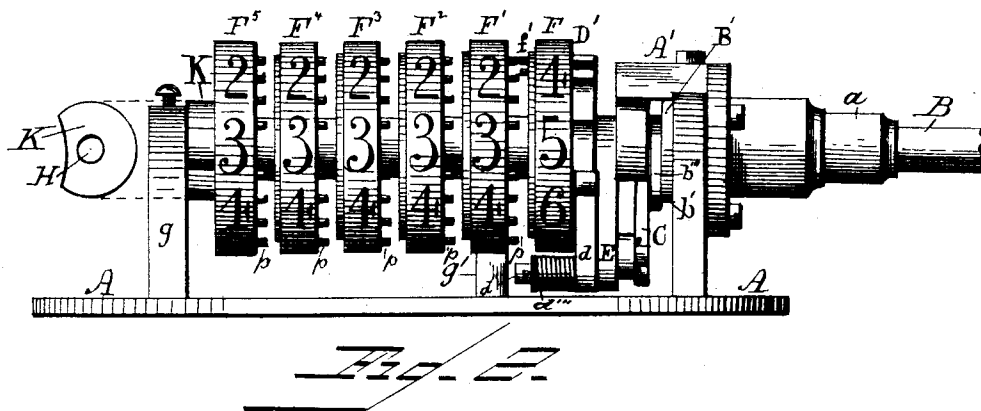
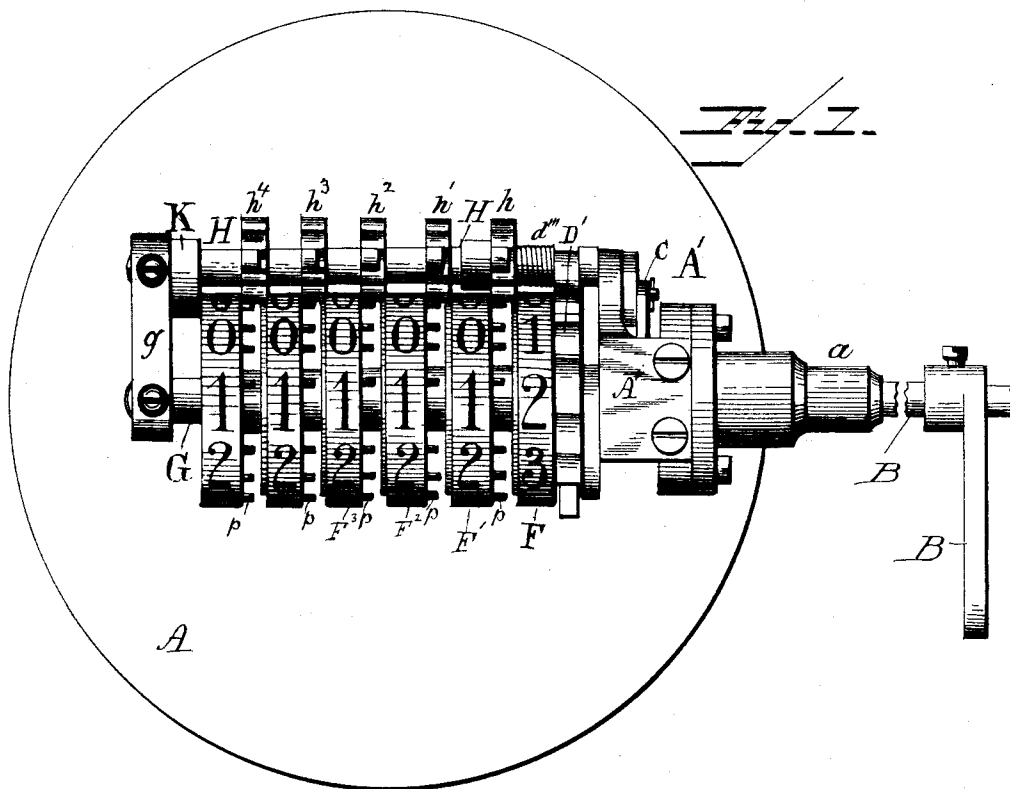
(No Model.)

3 Sheets—Sheet 1.

F. L. WOLFE.
ENGINE COUNTER OR REGISTER.

No. 540,888.

Patented June 11, 1895.



WITNESSES
F. L. Ouraud
Jos. Gregory

INVENTOR
Frank L. Wolfe
per W. H. Singleton
Attorney

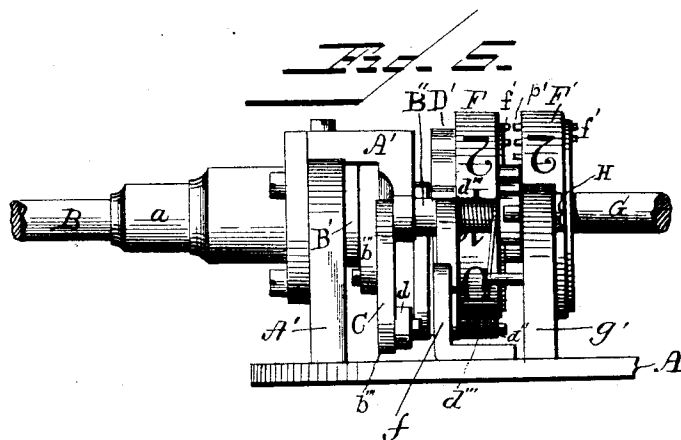
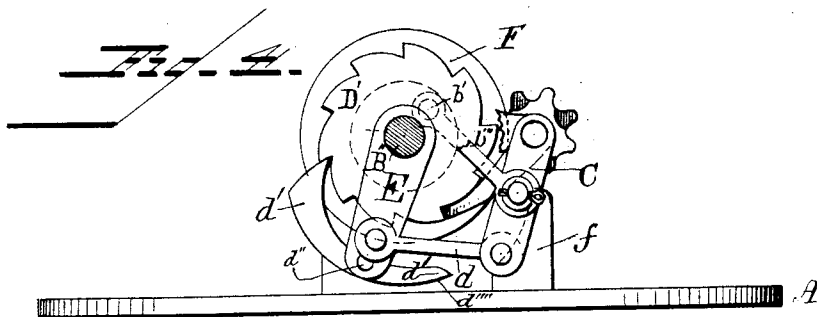
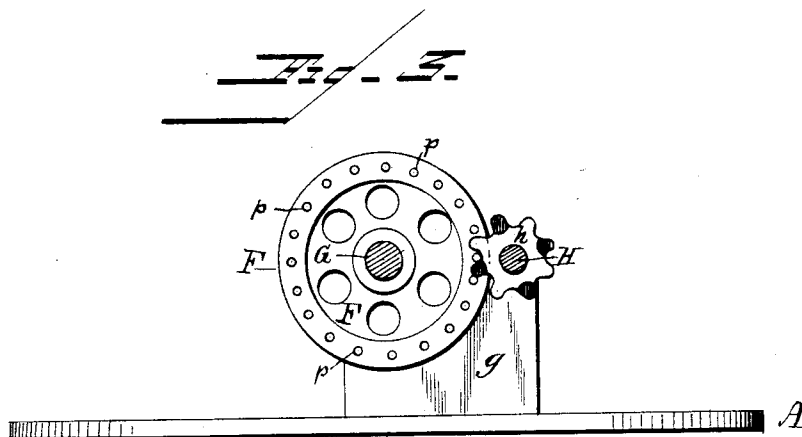
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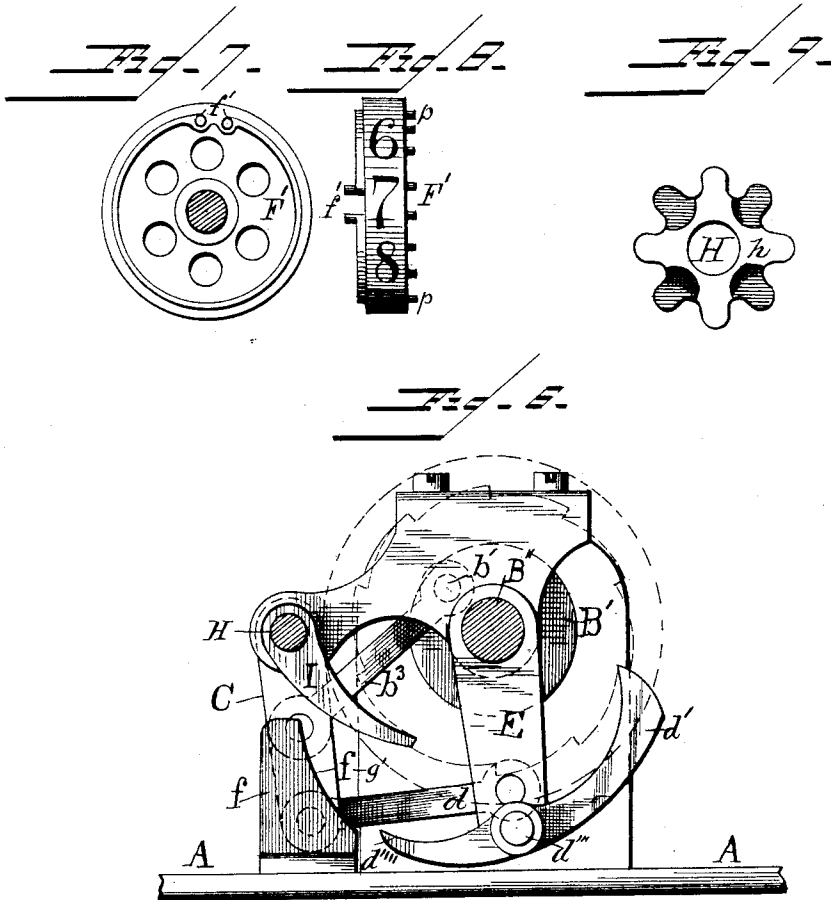
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3 Sheets—Sheet 3.

F. L. WOLFE.
ENGINE COUNTER OR REGISTER.

No. 540,888.

Patented June 11, 1895.



WITNESSES

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UNITED STATES PATENT OFFICE.

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

ENGINE COUNTER OR REGISTER.

SPECIFICATION forming part of Letters Patent No. 540,888, dated June 11, 1895.

Application filed March 15, 1895. Serial No. 541,898. (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 Engine-Registers; 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 improvements in registers which are used to indicate the number of strokes of a moving part of machinery, and particularly on the device patented to me October 2, 1894, numbered 526,885.

In the annexed drawings, Figure 1 represents a face view of the device on the bed-plate, the usual register-case being removed. Fig. 2 is a side view of the devices on the bed-plate. Fig. 3 is a side view of one of the registering wheels and pinion. Fig. 4 is an end view showing the ratchet-wheel, pawl, and bars. Fig. 5 is a side view showing the ratchet-wheel, pawl, and bars. Fig. 6 is an end view of the pawls and bars enlarged; Figs. 7 and 8, views of the registering-wheels; Fig. 9, a side view of a cog-wheel.

The special object of the present device is as follows: In my former patent above referred to the pawl bar, either through reciprocation or rotation of the driving shaft, did not move in the arc of the ratchet wheels a greater distance than was sufficient for the pawl to engage with a single tooth of the ratchet; also it has been found that, when the device was used only for registering the reciprocations of an engine, the reciprocations could not be made less than a certain portion of the full circumference of a circle. To reduce this amount, or the arc through which the pawl bar would travel in reciprocation, was essential. To do so without rearranging the levers in that device it would cause the pawl bar or operating pawl to pass through an arc greater than it should. To engage a single tooth would throw the ratchet wheel more than was required; and the only way in the patented device to limit the movement of the pawl was, that the crank, which is a disk attached to the end of the driving shaft,

should have the pitman shown as in said patent attached to it very near the axis of such shaft; and that the several levers which formed the frame-work for operating the pawl bar should be so connected that their throw would be limited. All this has the tendency to increase the force required to operate the register, as may be readily understood. Any attempt to increase the distance between the axis of the driving shaft, and the attachment of the pitman to it, or to arrange the levers for the easier movement would increase the motion of the pawl bar or the single pawl, as herein shown, to such an extent that the pawl would pass by, not only the single tooth of the ratchet wheel which it operates, but also by the next tooth, and thus engaging it by the rotation or reciprocation of the driving shaft, throw forward the registering wheel two units, and thus give a result double the number of revolutions made as above stated. To prevent the pawl from thus engaging the ratchet wheel, I have devised a mode of tripping it upon its movement beyond the tooth with which it should engage, so that it could not under any circumstances engage with the succeeding tooth.

A is the bed plate of a suitable case, which case is not shown in the drawings.

B is the driving shaft which is supported in a boxing, *a*, and enters on one side of the case and has on its inner end the disk, *B'*, provided with the crank pin, *b'*. Connected to this crank pin, *b'*, is a pitman, *b³*, which is pivoted to a vibrating bar, *C*, which bar is pivoted to the frame, *A'*. The other end of the vibrating bar, *C*, is pivoted to a connecting rod, *d*. Said rod, *d*, is pivoted to a pawl bar, *E*, which is attached to a short shaft, *B''*, supported on the frame. The short shaft, *B''*, has attached to it a ratchet wheel, *D'*, which is secured to the first registering or unit index wheel, *F*. Connected to the outer end of the pawl bar, *E*, is a pawl, *d'*, and on the pivot pin, *d''*, of the pawl, *d'*, is a controlling spring, *d'''*. The pawl, *d'*, extends backward in a circular form to the end, *d''''*, and as the pawl bar, *E*, moves backward, this end, *d''''*, engages with a curved guide, *f*, attached to the frame, *A*, and thereupon, sliding in such movement, is held from engaging with any tooth of the ratchet

wheel except the one that is necessary to move the ratchet wheel, as intended.

The disk crank B' b' attached to the driving shaft is very much larger than that shown in the patent referred to, and the pitmen, cranks, and bars are so segregated as to get the largest movement consistent with the frame-work of the instrument, thus insuring a greater use of operating than would have been the case with the old devices. It has been found that so complete is the guide for tripping the pawl that, no matter what the size of the disk, crank and parts may be, the pawl never could throw the units wheel more than one tooth.

In Figs. 1 and 2 are represented a series of wheels, F F' F² F³ F⁴ F⁵, arranged on a shaft, G, which is supported at the right hand end carrying the wheel, F, in the same bushing with the axis of the ratchet wheel, D'; and at the other end in a bracket, g, on the bed plate, A.

Parallel with shaft, G, is a second shaft, H, one end being supported in the bracket, g, and the other in a bracket, g', on the bed plate, A, near the guide, f. On shaft, H, are small cog wheels, h, h', h², h³, h⁴, there being one less in number than the registering wheels; i. e., one toothed or cog wheel between every two of the numbered wheels.

The numbering or registering wheels, except the units wheel, have each a series of cogs or pins p on their faces to the right, as shown in Figs. 1, 2, 3, and 8 and all of them, except the last one, to the left, have only two cogs or pins f' on the reverse or left-hand side. These wheels all rotate freely on shaft, G, and their hubs are so adjusted that, when they are placed in juxtaposition, the wheels can rotate independently. The distance between the wheels, F, F, &c., is nearly filled by the projecting cogs or pins p f'. The cog wheels, h, &c., on shaft, H, being placed between the wheels, F, &c., are arranged to mesh with the teeth or pins p, f', on the sides of the numbered wheels and they rotate freely on the shaft, H. The action of this arrangement is as follows: When, by the rotation of the shaft, B, the pawl, d', is caused to rotate and move the ratchet wheel and with it the units wheel one rotation, the two cogs, f', on the left hand side of the units wheel engage the teeth of wheel, h, and it is moved just one cog distance and carries with it the second wheel one cog, and, being released, it and that wheel remain stationary until the second full rotation of the units wheel, and so on until the second or tens wheel has rotated once around, when the

third wheel will be engaged in a similar manner by the wheel, h'. This will continue until all the wheels in the series have been rotated to their fullest extent.

To the left of the sixth or last wheel there is a small segmental roller, K, on the shaft, H, which serves as a stop to prevent the sliding of the register wheels on their shaft. This is called a resetting attachment, and is located on the shaft, H, with the small gears, h, &c., in the rear of the register wheels. By rotating it so that the recessed circular part, k, shall coincide with the circumference of the register wheels, the latter will slide upon their shaft, G, by it, and away from the gearing, thus permitting the register wheels to be reset. This roller, K, by its own weight will keep its position behind the register wheels to prevent their sliding.

I claim—

1. The combination of the rotating driving shaft, B, having on its end the disk and wrist pin, the pitman, vibrating bar, the connecting rod, pawl bar, E, pawl, d' for registering rotary or reciprocating motions, and ratchet wheel, D', substantially as described.

2. The combination of the driving shaft, B, having the disk and wrist pin, the pitman, vibrating bar, the connecting rod, pawl bar, E, pawl, d', ratchet wheel, D', having attached to it the units wheel supplied with two teeth on one side and the cogged wheel, h, on the shaft, H, substantially as and for the purpose set forth.

3. The combination of the driving shaft, B, having on its end the disk and wrist pin, the pitman, vibrating bar, the connecting rod, pawl, d', having a rear extension, d'', and a guide plate, f, for tripping the pawl, substantially as and for the purpose described.

4. The combination of the driving shaft having a disk and wrist pin on the end, the pitman, vibrating bar, the connecting rod, pawl bar and pawl, ratchet wheel, units wheel provided with two teeth on one side, a series of numbered wheels on one shaft having two teeth on one side except the last one in the series, and a full set of teeth on their opposite sides, and a series of intermediate pinions on a parallel shaft, and at the end of said shaft a stop cam, substantially as described.

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

FRANK LESLIE WOLFE.

Witnesses:

JOSHUA H. MILLETT,
ARTHUR L. BOWKER.