No. 877,198. PATENTED JAN. 21, 1908.

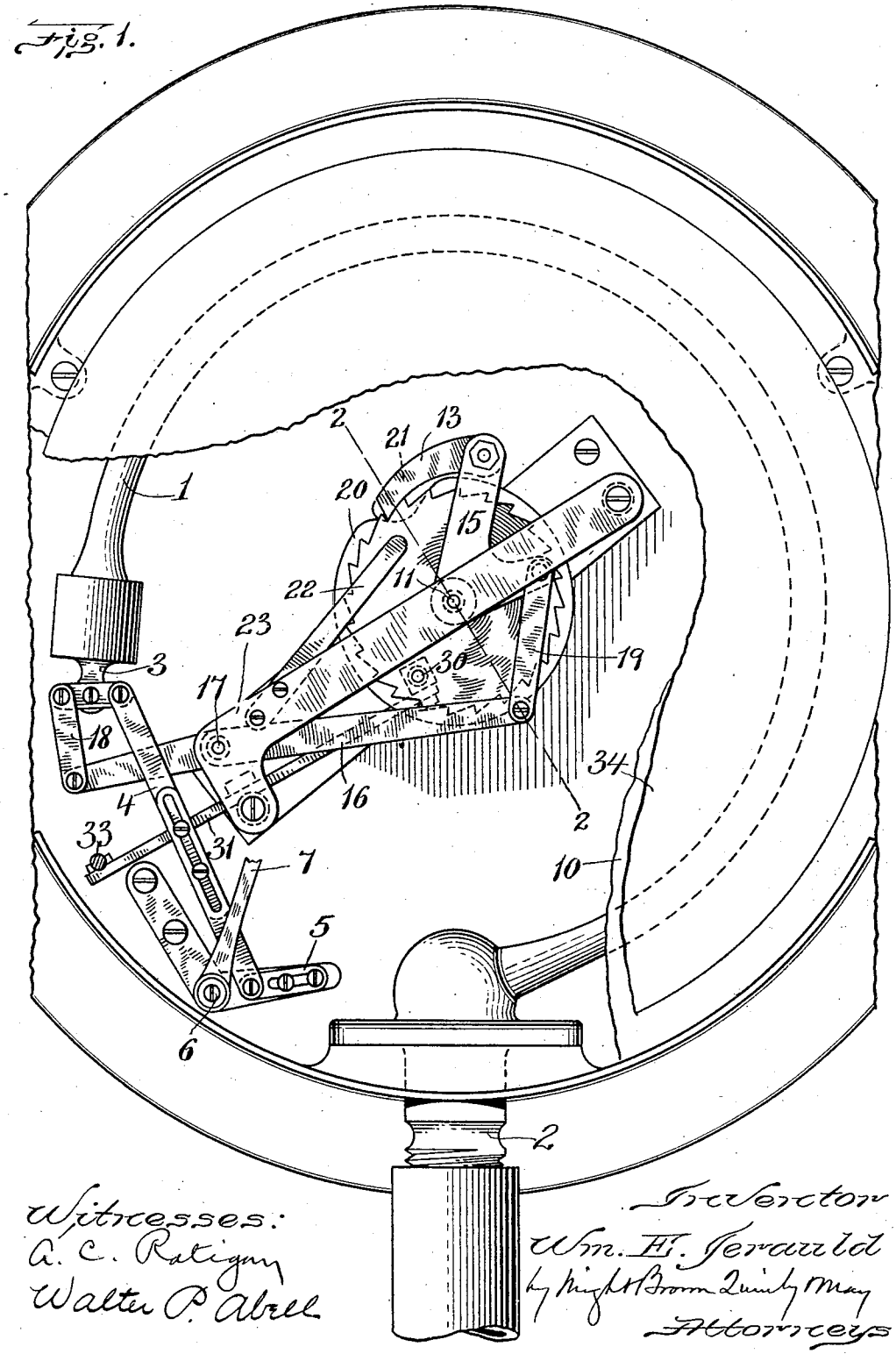
W. E. JERAULD.

AUTOMATIC RECORDING GAGE.

APPLICATION FILED DEC. 31, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
A. C. Ratigan
Walter P. Abell

Inventor
Wm. H. Jerauld
by Wright Brown Quinby & May
Attorneys

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 877,198. PATENTED JAN. 21, 1908.

W. E. JERAULD.

AUTOMATIC RECORDING GAGE.

APPLICATION FILED DEC. 31, 1906.

3 SHEETS—SHEET 2.

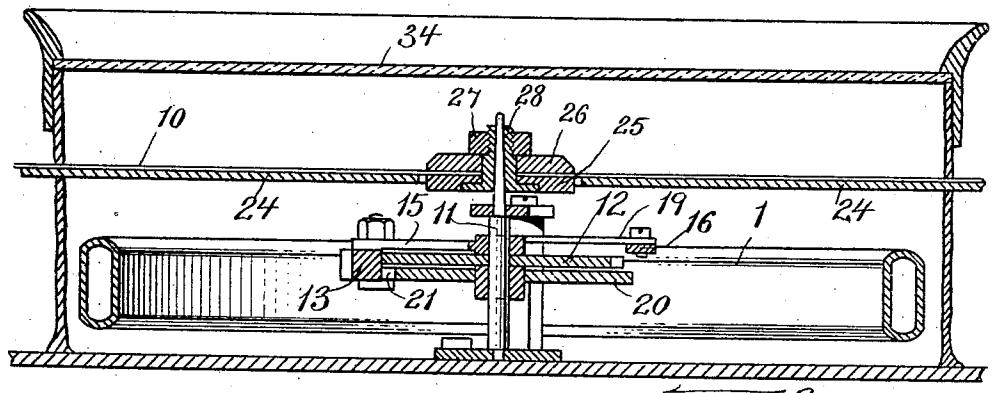


Fig. 2.

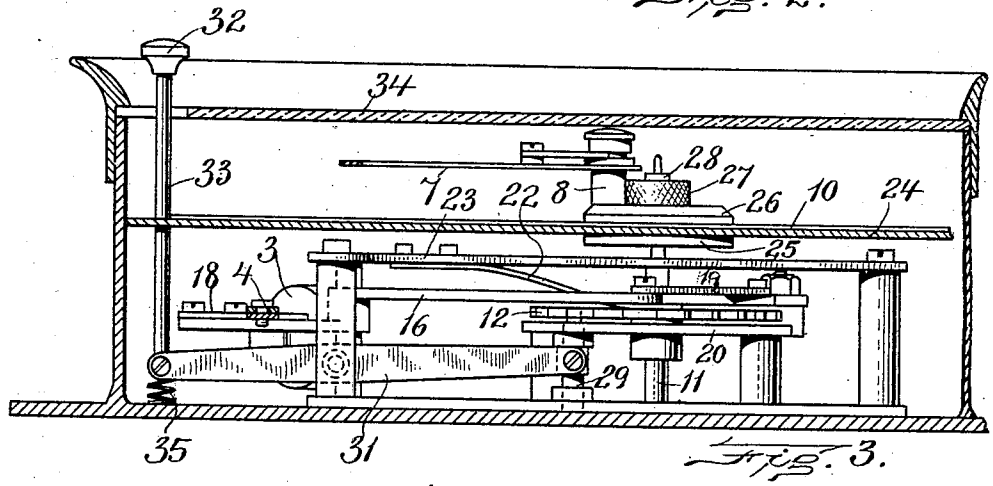


Fig. 3.

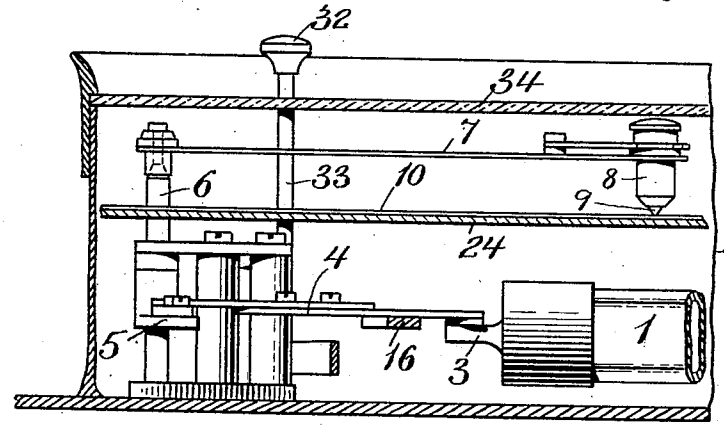


Fig. 4.

Witnesses:
A. C. Ratigan
Walter P. Akee

Inventor
Wm. E. Jerauld
by Wright Brown Quinby & May
Attorneys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

No. 877,198. PATENTED JAN. 21, 1908.

W. E. JERAULD.

AUTOMATIC RECORDING GAGE.

APPLICATION FILED DEC. 31, 1906.

3 SHEETS—SHEET 3.

Fig. 5

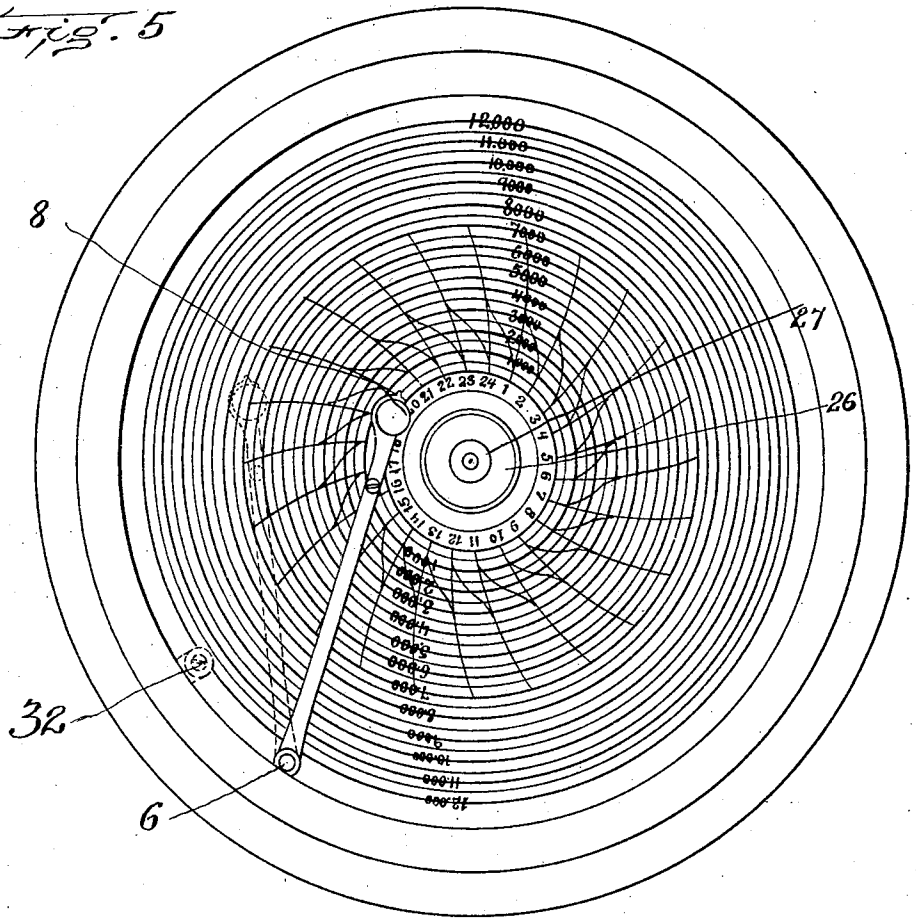
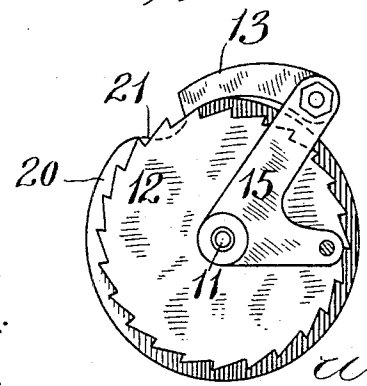


Fig. 6.



Witnesses:
A. C. Ratigan
Walter P. Abell

Inventor
Wm. E. Jerauld
by Wright Brown Quinby & May
Attorneys.

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM E. JERAULD, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO AMERICAN STEAM GAUGE & VALVE MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF NEW JERSEY.

AUTOMATIC RECORDING-GAGE.

No. 877,198. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed December 31, 1906. Serial No. 350,117.

To all whom it may concern:

Be it known that I, WILLIAM E. JERAULD, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Automatic Recording-Gages, of which the following is a specification.

This invention relates to pressure gages and its object is to provide such gages with devices for making permanent records of pressures, and for shifting one or more of the devices after each application of pressure, so that the several records will be separate and distinct from each other. The principal use of this gage is in recording pressures which fluctuate greatly, that is rise quickly from zero to the maximum and again quickly subside, and the essence of the invention consists in shifting the record receiving sheet after each subsidence of the pressure so that a fresh portion of the sheet will be at hand to receive a record of each new augmentation of the pressure.

In the accompanying drawing,—Figure 1 shows an elevation of the gage with the front parts partially broken away showing the principal parts of my invention. Fig. 2 represents a cross section on the line 2—2 of Fig. 1. Fig. 3 represents a section taken at right angles to that of Fig. 2 and at one side of the center. Fig. 4 represents a fragmentary sectional elevation showing the pressure recording devices. Fig. 5 represents an external elevation showing the character of dials used. Fig. 6 is a detail elevation of part of the dial shifting mechanism.

The gage constituting my invention consists of the usual curved Bourdon spring tube 1 which receives fluid under pressure from the inlet 2 whereby the free end 3 of the spring tube is deflected. This deflection acts through a link 4 and arm 5 to turn a rock shaft 6 carrying an arm 7 upon the end of which is supported an ink receptacle 8 having a marking point 9 in contact with the surface of a dial 10. These parts are common to very many well known forms of recording gages and which do not constitute any part of my invention.

In industrial manufacture, there are many operations where pressures are used for brief intervals of time and are frequently repeated, such as that of forcing the tires or rims of car wheels on the wheels by hydraulic pressure, and it is of importance that a record of the pressures employed in each operation should be preserved, and in order that the records should be accurately and properly identified with the several operations, they should be made automatically. Accordingly in addition to the usual mechanism for recording pressures, I provide additional devices for shifting the dial after each record is made, so that a fresh surface may be presented for the next record and that all of the records may be separate and distinct from each other.

The dial shifting devices consist of an arbor 11, to which the dial is detachably secured, a ratchet wheel 12 secured to the arbor, a pawl 13 adapted to co-act with the ratchet wheel, a pawl carrier 15, and the lever 16 pivoted at a fixed point 17 and connected with the end 3 of the tube by a link 18, and with the pawl carrier by a link 19.

It will be seen that when pressure is applied to the tube, the free end 3 of the latter is moved outward from the center of the gage, and acts to swing the pawl carrier in right hand rotation, thereby retracting the pawl and causing it to drop behind an adjacent tooth. When the pressure is relieved, the end of the tube returns to its normal position and causes the pawl to move in the opposite direction, engaging a ratchet tooth and pushing the ratchet and dial forward a step. As the ratchet and pawl form the only rotating power for moving the dial, it will be evident that the latter remains stationary while the pressure increases, so that the record of the increasing pressure consists of a single mark extending substantially radial in a curved line from said gage. On the return of the spring and marking point to zero position, the dial is moved one step.

In order to limit the feeding of the dial so that the distances through which it is advanced will be the same whether the pressure employed is great or small, I provide a shield 20 for preventing the pawl moving the ratchet more than the distance of one tooth at each actuation. This shield lies close beside the ratchet and has a circular periphery extending beyond the tooth of the ratchet,

so as to support the toe of the pawl and hold it out of engagement with the ratchet teeth. This shield has a single notch 21 with smoothly curved sides, which is of sufficient length to allow the pawl to engage one of the teeth, and then to lift it out of engagement with the tooth after the ratchet has been moved the required distance. Of course the notch may be made of any width and the ratchet turned as far as desired at each actuation, but preferably I construct it so that the distance through which it is turned is only that of one tooth.

22 represents a spring which is secured to a fixed bridge 23, and has its free end bearing frictionally against the ratchet wheel to act as a brake, stopping the wheel when the ratchet has been lifted out of engagement with it, and preventing the wheel being turned backward by the friction of the pawl on the inclined face of a tooth and the friction of the pawl carrier upon the arbor 11.

The dial, which is usually a sheet of flexible paper, is supported on a transverse plate 24, and secured to the arbor by a wide collar 25 on the latter, which has its outer surface flush with that of the plate, and by a clamping collar or washer 26. The latter is held tightly against the dial by a clamping nut 27 threaded upon a stem 28 which is frictionally secured to the arbor, and which also supports the collars. In order to remove the dial, the nut 27 is unscrewed and the outer collar 26 removed, the reverse of this step being performed in applying a new dial.

In order to prevent the arbor from rotating when the nut is turned, for the arbor is mounted so as to be freely rotatable, I provide a lock consisting of a bolt 29, behind the ratchet wheel, and adapted to be moved into and out of a hole 30 in the wheel. This lock is connected to a lever 31, which has a finger piece 32 on a rod 33 projecting through the glass covering 34 of the gage near one side of the casing. By pushing inward on the finger piece, the bolt is projected into the hole in the ratchet, being automatically withdrawn therefrom by the reaction of a spring 35 when pressure is removed from the finger piece. The character of the dial used with this gage is illustrated in Fig. 5. It has a number of concentric circles representing the distance from the center through which the marking point must move in registering certain pressures, while near the center it has a series of figures corresponding to the number of teeth on the ratchet wheel and capable of identifying the records.

I claim—

1. A gage for recording successive pressures, comprising in combination, a curved spring pressure tube, a dial-holding arbor, a ratchet secured to said arbor, a pawl carrier, a pawl mounted thereon, and connections joining the pawl carrier with the pressure tube for oscillating the same and turning this arbor step by step at each return of the tube to normal position; said ratchet, pawl-carrier and connections being approximately in the plane of the tube and within the space inclosed thereby.

2. The combination with the curved tube, dial holding arbor approximately at the center of curvature of the tube, and marking point of a recording pressure gage, of a ratchet secured to said arbor, a pawl-carrier oscillative about said arbor, a pawl pivoted to the carrier to engage the ratchet, and operating connections between the carrier and free end of the tube arranged to advance the ratchet as the tube returns to low pressure position.

3. The combination with the curved tube, dial holding arbor approximately at the center of curvature of the tube, and marking point of a recording pressure gage, of a ratchet secured to said arbor, a pawl-carrier oscillative about said arbor, a pawl pivoted to the carrier to engage the ratchet, and operating connections consisting of a pivoted lever linked respectively to the carrier and free end of the tube arranged to advance the ratchet as the tube returns to low pressure position.

4. The combination, in a pressure gage, of a Bourdon tube, an arm carrying a marking point and connected with the tube for actuation thereby, a holder carrying a dial adapted to be marked by said point, a ratchet to which said dial holder is connected, a pawl carrier movable in a plane parallel to that of the marking point, a pawl pivoted thereto adapted to drive the ratchet, and connections including a lever and connecting links between said pawl carrier and the free end of the Bourdon tube whereby the latter is caused to oscillate the carrier.

5. In a device of the character described, in combination with the pressure-indicating and recording mechanism, a freely rotatable arbor, a holding screw for detachably clamping a dial thereto, a ratchet secured to said arbor, a pawl for rotating said ratchet and dial, and a lock adapted for detachable engagement with the ratchet to hold it stationary while the dial-clamping screw is being turned.

6. In a device of the character described, in combination with the pressure-indicating and recording mechanism, a freely rotatable arbor, a holding screw for detachably clamping a dial thereto, a ratchet secured to said arbor, a pawl for rotating said ratchet and dial, a locking pin adapted to enter a recess in the ratchet, and a lever having an external finger-piece for projecting the pin into engagement with the ratchet to hold the latter stationary and permit releasing or securing of a dial.

7. In a device of the character described,

in combination with the pressure-indicating and recording means, a ratchet to which a record-receiving dial is adapted to be secured, a pawl driven by said pressure-indicating means for rotating the ratchet step by step, and a shield of greater diameter than the ratchet having a recess in its periphery located beside the ratchet for limiting the extent of engagement of the pawl with the ratchet.

In testimony whereof I have affixed my signature, in presence of two witnesses.

WILLIAM E. JERAULD.

Witnesses:

C. F. BROWN,

A. C. RATIGAN.