

J. W. MOTHERWELL.

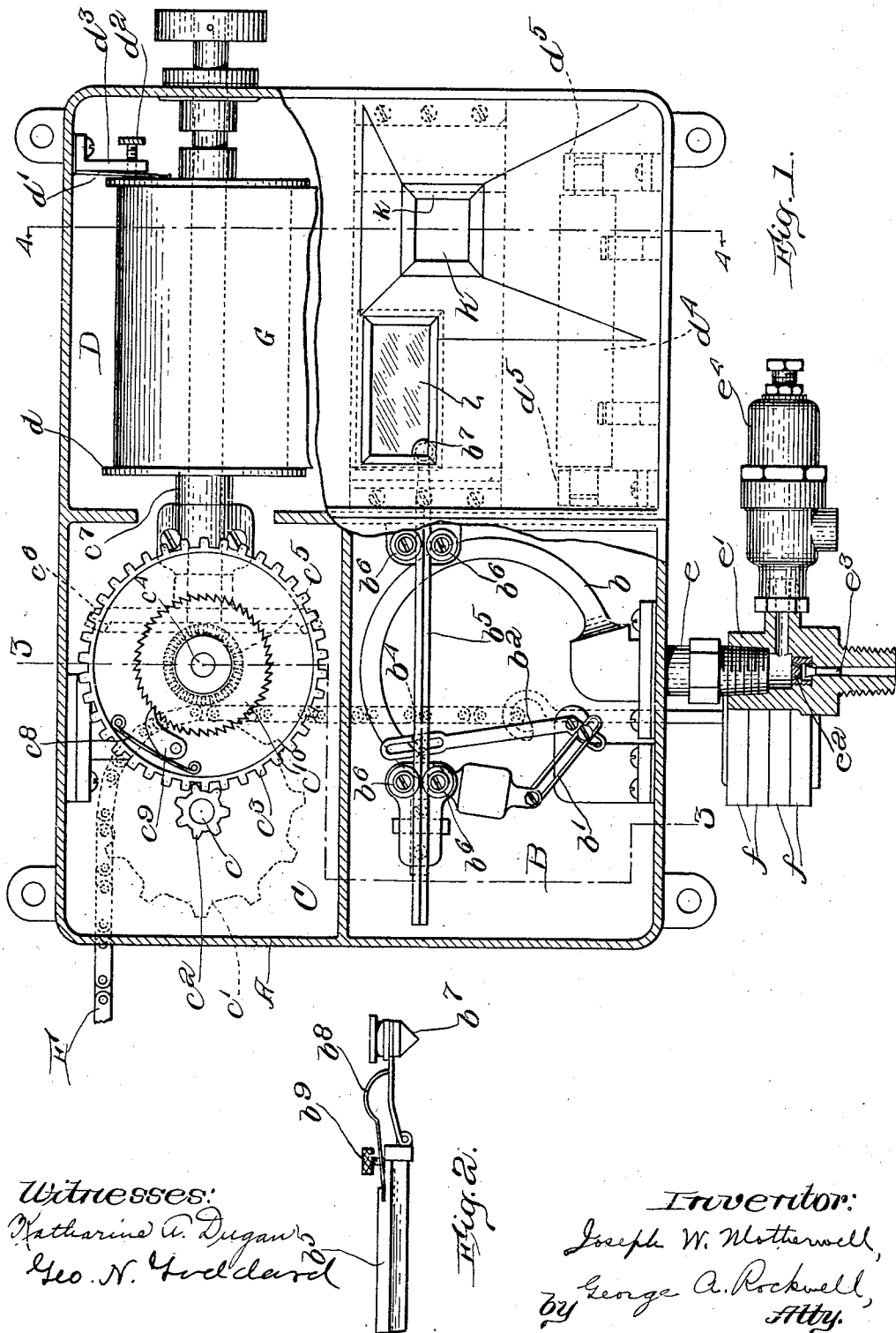
RECORDING GAGE.

APPLICATION FILED AUG. 7, 1909.

Patented June 3, 1913.

3 SHEETS—SHEET 1.

1,063,281.



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RECORDING GAGE.
APPLICATION FILED AUG. 7, 1909.

3 SHEETS—SHEET 2.

Fig. 3.

Fig. 4.

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Fig. 6.

Fig. 7.

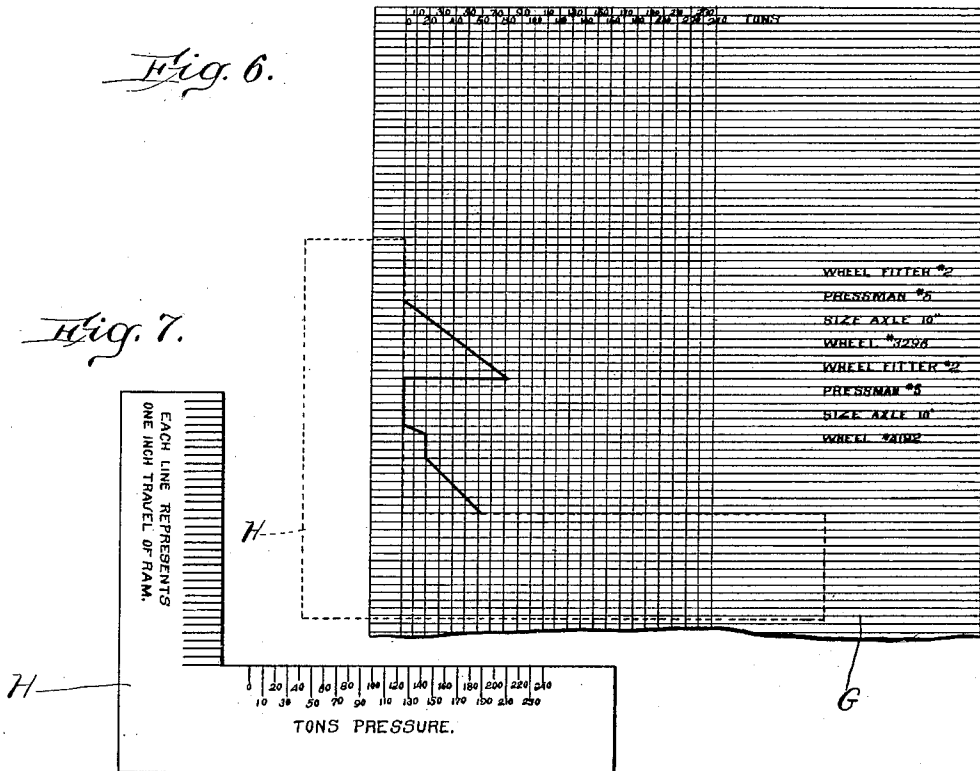
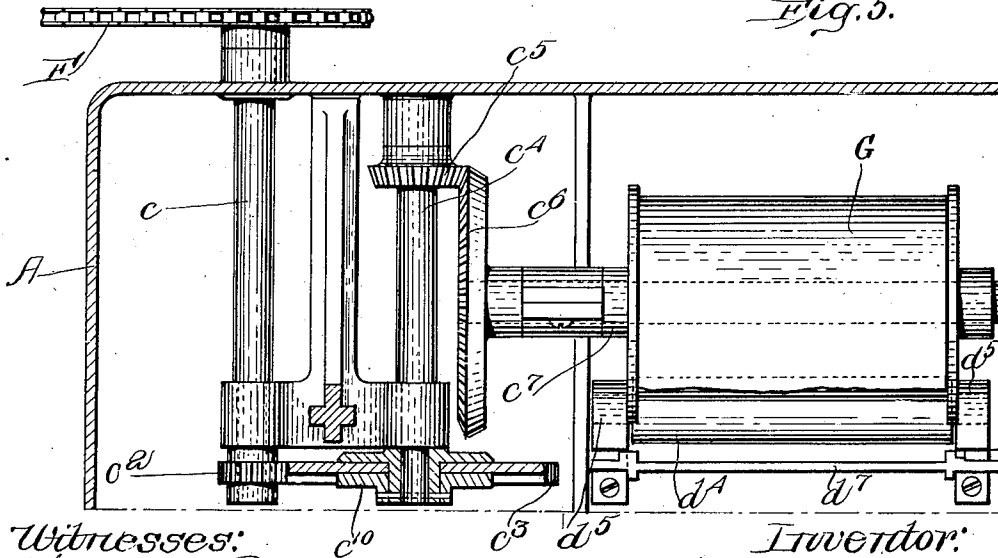


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH W. MOTHERWELL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ASHTON VALVE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF CONNECTICUT.

RECORDING-GAGE.

1,063,281.

Specification of Letters Patent.

Patented June 3, 1913.

Application filed August 7, 1909. Serial No. 511,783.

To all whom it may concern:

Be it known that I, JOSEPH W. MOTHERWELL, of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Recording-Gage, of which the following is a specification.

The main object of my invention is to record the pressure acting on the ram of a hydraulic wheel press per unit of travel of such ram but it will be clear that my invention is equally applicable to other machines in which it is desired to record the pressure acting on a moving member per unit of travel of such member.

My invention consists primarily in a device in which the recording sheet is advanced for the recording of a new diagram by means of the pressure operated member.

A feature of my invention consists in having the diagram after it has been made, inaccessible to the operator.

Another feature consists in having various information, hereinafter more fully described, recorded alongside the diagram in such a way that after the diagram has been made the record is inaccessible to the operator.

Still another feature of my invention is a graduated scale for interpreting the diagram and which is to be applied to the diagram after the latter has been made.

Other features of my invention will be hereinafter described.

In the drawings Figure 1 is an elevation of a gage embodying my invention, the casing being partly broken away; Fig. 2 is a detail of the marker; Fig. 3 is a section on line 3—3 of Fig. 1; Fig. 4 is a section on line 4—4 of Fig. 1; Fig. 5 is a plan with the upper portion of the casing removed; Fig. 6 is a detail showing a portion of the recording sheet; and Fig. 7 is a plan of the graduated square.

Casing A is to be mounted in any suitable way on the machine with which it is to be used and comprises chambers B, C and D. In chamber B is mounted a Bourdon spring *b* which is connected with pin *b*⁴ through link *b*¹ and slotted lever *b*². This pin is rigidly connected with arm *b*⁵ mounted to reciprocate between V-shaped friction rolls *b*⁶. Arm *b*⁵ is square in cross section but is mounted to reciprocate on one edge in engagement with the friction rolls. At the end of this arm is hinged the marker *b*⁷

which is normally held in operative position by spring *b*⁸ which is adjusted by screw *b*⁹ and which is anchored to arm *b*⁵.

In chamber C is mounted shaft *c* which extends at one end through the wall of box A and carries at that end toothed wheel *c*¹ and at the other end a pinion *c*² meshing with gear *c*³ which is loosely mounted at one end of shaft *c*⁴. Shaft *c*⁴ at its other end carries bevel pinion *c*⁵ meshing with bevel gear *c*⁶ mounted on shaft *c*⁷ which extends into chamber D. Gear *c*³ carries spring *c*⁸ which tends to hold pawl *c*⁹ in engagement with the ratchet *c*¹⁰ on shaft *c*⁴. Upon shaft *c*⁷ is rigidly mounted roll *d*, and tension on this roll is provided by spring *d*¹ which is adjusted by screw *d*² mounted in bracket *d*³. Roll *d*⁴ is mounted in bracket *d*⁵ and is held under the tension of spring *d*⁶. The recording sheet which may be of paper, cloth or other suitable material, is wound on roll *d*⁴, passes thence across plate *d*⁷ and is rewound on roll *d*.

The spring *b* is connected with pipe *e* which is threaded to engage one end of valve member *e*¹ the other end being threaded to engage the wheel press or other machine.

Spigot valve *e*², pulsative check valve *e*³, and hydraulic relief valve *e*⁴ are of ordinary construction.

Chain F is to be suitably connected with the ram of the wheel press or with the pressure-operated member of whatever machine my device may be used with.

To the end of the chain are attached the weights *f* *f*.

The recording sheet may have parallel lines to indicate units of travel and parallel lines at right angles thereto to indicate units of pressure. I may, however, use unlined paper in which case I use a square of paper or other suitable material having one rule marked to indicate units of pressure, and the other marked to indicate units of travel of the ram or other pressure-operated member. This square is placed in proper position with relation to the diagram which has been formed so that the latter may be readily interpreted even when the recording sheet itself is not lined.

I prefer to have in connection with the diagram showing the fit of the wheel on the axle a record of the wheel fitter, the pressman, the size of axle and the number of the wheel and I therefore provide an opening K in

casing A opposite the recording sheet so that this record may be made. I prefer to have the upper edge $\frac{1}{2}$ of this opening on substantially the same line crosswise of the recording sheet as the marker so that when the recording sheet has advanced far enough to complete a diagram the record made at the opening K will have passed upward within the casing and will be inaccessible to the operator. I prefer also to have an opening in the casing opposite that portion of the recording sheet where the diagrams are to be made but I prefer to have a mica or other transparent closure L for this opening so that while the operator may see the diagram which has been made he can not tamper with it.

I will now describe the operation of my device when applied to a wheel press.

Member e^3 is connected with the pressure chamber of the press, chain F is connected with the ram and the recording sheet is wound on roll d^4 , passed across plate d^7 and connected with roll d . When the test is to be started the names of the wheel fitter and pressman, the size of the axle and the number of the wheel are written on the recording sheet opposite the opening K. While the ram is making its forward stroke roll d is rotated through the above described mechanism. This rotation advances the recording sheet in accordance with the travel of the ram. While the ram is making its forward stroke the marker is moved across the recording sheet in accordance with the pressure with the result that a diagram showing the pressure per unit of travel of the ram is made on the recording sheet. When the ram has completed its forward stroke the diagram will be visible through the transparent closure but will be inaccessible to the operator. The advantage of this is that if the diagram shows a bad fit the remedy can be applied at once without waiting to examine the diagrams after the whole recording sheet has been used. When the diagram has been completed the portion of the recording sheet which was in front of opening K will have advanced above said opening so that it can not be reached by the operator. When the ram makes its return stroke the pawl will slip by the ratchet teeth, the chain being returned to the starting point by the weights $f f$. During this return movement the roll d and the recording sheet will remain stationary. The door of the casing is hinged thereto at a^{40} and locked closed by lock a^{50} .

I do not claim in this application the scale or square above described as I intend to make it the subject of a separate application.

What I claim is:

1. In a device of the character described

the combination of a movable recording sheet; means to advance the sheet; a marker to engage the sheet and make a diagram thereon as the sheet is advanced; and a casing with an opening through which a portion of the recording sheet is accessible from the outside of the casing for recording when the marker is at the initial point of said diagram but which becomes inaccessible from the outside of the casing before said diagram is completed.

2. In a device of the character described the combination of a movable recording sheet; means to advance the sheet; a marker to engage the sheet and make a diagram thereon as the sheet is advanced; a casing having an opening opposite said diagram with a transparent closure for the opening and a second opening through which a portion of the recording sheet is accessible from the outside of the casing for recording when the marker is at the initial point of said diagram but which becomes inaccessible from the outside of the casing before said diagram is completed.

3. In a device of the character described the combination of a movable recording sheet; means to advance the sheet; a marker to engage said sheet and make a diagram thereon; and a casing having an opening opposite that portion of the sheet where the diagram is made, a transparent closure for said opening and a second opening, the advance end of the second opening, being substantially on a line with said marker transversely to the direction of movement of the sheet.

4. In a device of the character described the combination of a marker; means to move the marker on a recording sheet and make a diagram thereon in accordance with the pressure; and reciprocating means which advances the sheet during one of the reciprocating movements but which leaves the sheet stationary during the other reciprocating movement; and a casing with an opening through which a portion of the recording sheet is accessible from the outside of the casing for recording when the marker is at the initial point of said diagram but which becomes inaccessible from the outside of the casing before said diagram is completed.

5. In a device of the character described the combination of a movable recording sheet; means to advance the sheet; a marker to engage one portion of the sheet and make a diagram thereon as the sheet is advanced; and a casing with an opening through which that portion of the sheet engaged by the marker is inaccessible but through which another portion of the sheet is accessible from the outside of the casing for recording when the marker is at the initial point of

said diagram but which becomes inaccessible from the outside of the casing before said diagram is completed.

5 6. In a device of the character described the combination of a marker; means to reciprocate the marker linearly across a recording sheet and make a diagram thereon; means to advance the sheet; and a casing for said means having an opening at one
10 side of the path of travel of said marker through which opening the recording sheet is accessible for recording, the advance end of said opening being substantially on a line with the path of travel of said marker.

15 7. In a device of the character described the combination of a marker; means to re-

ciprocate it on a recording sheet; and mechanism to advance the sheet during one of the reciprocating movements of the marker, said mechanism including a shaft carrying 20 a pinion, a second shaft carrying a ratchet and a bevel gear, a gear loosely mounted on the second shaft, engaging said pinion and carrying a pawl adapted to engage said ratchet, and a third shaft carrying a roll for 25 the recording sheet and a bevel gear in mesh with the bevel gear of the second shaft.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents
Washington, D. C."