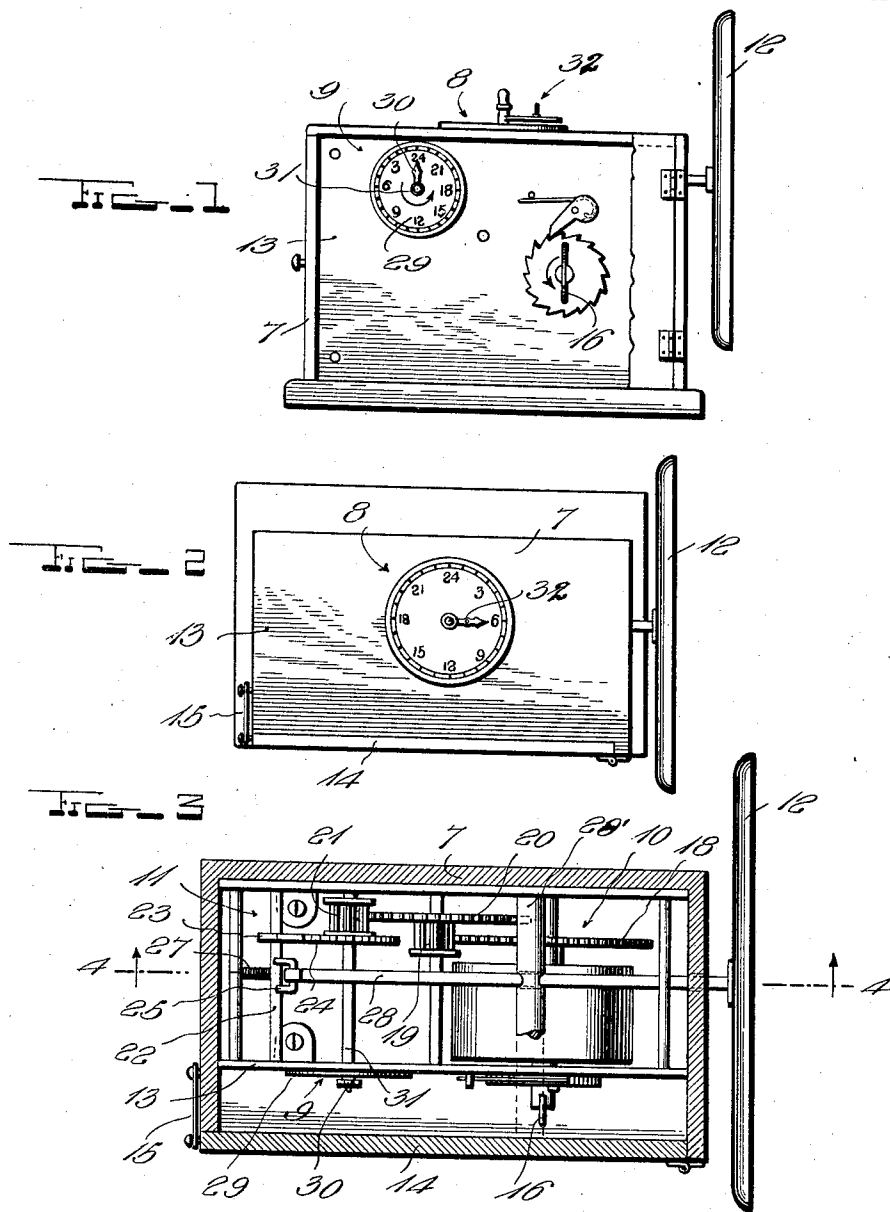


A. D. REESE.
 DEVICE FOR REGISTERING EXPLOSIONS.
 APPLICATION FILED JULY 22, 1918.

1,343,875.

Patented June 15, 1920.

2 SHEETS—SHEET 1.



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FIG. 5

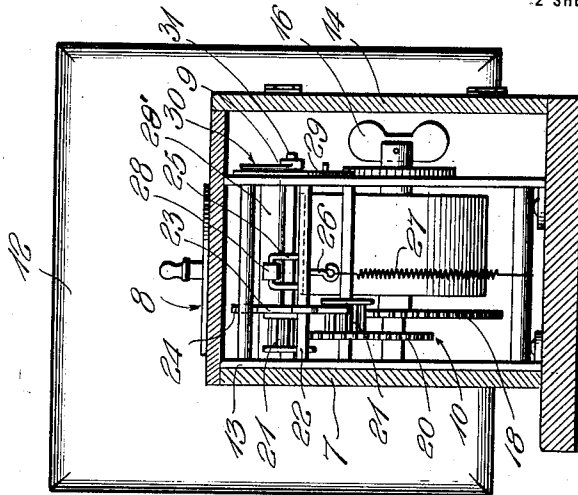
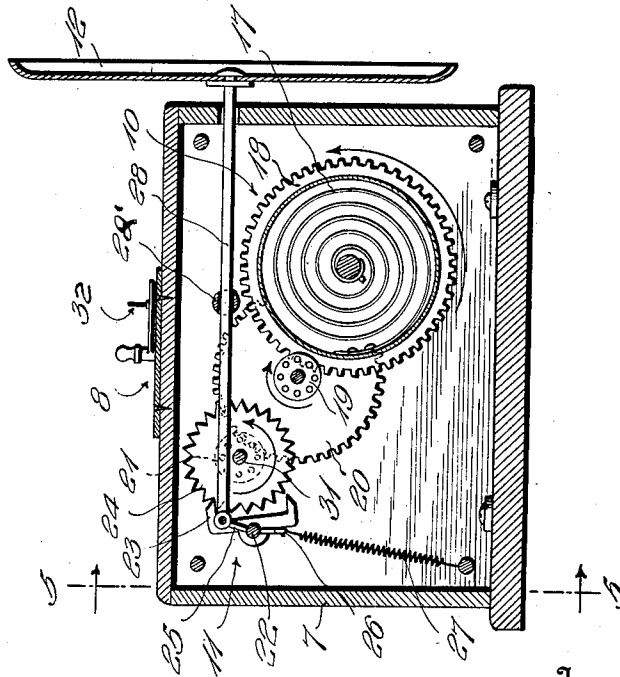


FIG. 4



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UNITED STATES PATENT OFFICE.

ALBA DAVID REESE, OF BISBEE, ARIZONA.

DEVICE FOR REGISTERING EXPLOSIONS.

1,343,875.

Specification of Letters Patent. Patented June 15, 1920.

Application filed July 22, 1918. Serial No. 246,172.

To all whom it may concern:

Be it known that I, ALBA DAVID REESE, a citizen of the United States, residing at Bisbee, in the county of Cochise and State of Arizona, have invented certain new and useful Improvements in Devices for Registering Explosions; and I do 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 improved device for registering explosions, and it relates more particularly to certain improvements over my device of this character which is described and claimed in my Patent No. 1,264,439, dated April 30, 1918. One object of this invention is to shorten the distance which it is necessary for the shock-receiving plate or vibrator to move in response to a shock, for effecting a registration of the shock;

Another object is to provide for shielding one side of the vibrator plate from a considerable portion of the reverberating shock forces, so as to avoid counter pressure, or resistance against the primary action of the shock;

Another object is to provide for registering the number of blast charges to be exploded, or the number of shocks which occur, as well as to register the number of explosions so that the two registers combine to indicate whether or not all of the charges have exploded;

Another object is to render the register controlling mechanism very sensitive, while eliminating very delicate elements by disposing the pallet-controlling spring transversely of the direction of movement of the detent or pallet.

Other objects and advantages will become apparent to persons who read the following details of description in connection with the accompanying drawings in which:

Figure 1 is a side elevation, a portion of the door being broken away so as to disclose the winding device and one of the register indicating devices;

Fig. 2 is a top plan view of my improved shock registering device, showing the indicator or registering device, which is set-

table to register the number of blasts or shocks which should occur;

Fig. 3 is a somewhat enlarged horizontal sectional view;

Fig. 4 is a vertical sectional view along the line 4—4 of Fig. 3, and

Fig. 5 is a vertical sectional view along the line 5—5 of Fig. 4.

Referring to those drawings in detail, in which similar reference characters correspond with similar parts throughout the several views, the device comprises a casing 7, registers 8 and 9, a register driving mechanism 10, a register controlling mechanism 11, a shock receiving plate 12, and correlated elements which will hereinafter be specified.

In this embodiment of my invention I preferably provide the case 7 with a frame 13 which is secured therein and carries the register and the mechanism for driving and controlling the register 9. The casing 7 is provided with a door 14 which normally protects the interior mechanism from dust and other foreign matter, and a latch or other suitable fastening element 15 is provided for keeping the door 14 closed. By opening the door, access may be had to a winding device 16 whereby a spring 17 may be wound. This spring constitutes a part of the register driving mechanism, as it transmits its motion to the register 9 through the medium of a train of gears 18, 19, 20, and 21, and shafts on which these gears rotate.

The register controlling device 11, comprises a shaft 22, a pallet 23 on the shaft, a toothed wheel 24, an arm 25 on the shaft 22, a second arm 26 on said shaft 22, a spring 27 connected to the arm 26 and to an element of the frame 13, and a reciprocative member or rod 28, the latter having one end pivotally connected to the arm 25 and having its other end secured to the central part of the plate 12 and supporting the latter. The intermediate portion of the rod 28 is slidable in a bearing element 28' which constitutes a part of the frame 13, the outer end portion of the rod 28 extending horizontally through an aperture in the casing 7. Although the indicator driving mechanism and a portion of the indicator controlling mechanism is identical with that of my former

patent, it is hereby described in detail to prevent the necessity for referring to said former patent in order to gain a perfect understanding of the construction and operation of this improved device.

Register 9 consists of a dial 29 provided with any desired number of graduations, which are indicated by the numerals thereon, and an indicator or indicating finger 30 which is mounted on a shaft 31, this being the shaft on which the gear wheels 21 and 24 are mounted; and it will be seen, therefore, that the spring 17 continually tends to turn the indicating finger 30 through the medium of the train of gearing and shafts; while the controlling device 11 prevents the turning of the finger 30 except when the pawl or pallet 23 is swung or rocked so as to disengage one of its detents with the wheel 24 and allow this wheel to move a step and then be stopped by the other detent of the pallet 23, such movement of the pallet being effected by means of a shock which forces the plate 12 toward the casing 7, thereby moving the rod 28 inward so as to rock the shaft 22 against the tension of the spring 27. As soon as the plate 12 is relieved from the force of the shock, the spring 27 returns it, through the medium of the elements 26, 22 and 25, to the normal position shown in Figs. 3 and 4. This combined inward and outward movement or reciprocation of the rod 28 has now caused the finger 30 to indicate that one shock or blast has occurred, and this movement or reciprocation is repeated with each subsequent blast or shock, so that the register 9 shows at a glance how many shocks have occurred.

The manually settable register 8 is similar to the register 9, except that it is not connected with any operating or controlling mechanism, and may be provided with any suitable means, for instance, such as indicated at 32 whereby its finger may be turned to register with the numeral which indicates the number of shocks which should occur; that is, the number of separate charges of a series which are to be exploded. Register 8 effectually prevents error which would otherwise result from forgetfulness and thereby prevents great danger and the loss of life which so often occurs because of the erroneous belief that all of the intended blasts have occurred. By carefully setting the register 8 to correspond with the number of shocks which should occur, and then properly locating and positioning this device with relation to the blasts, and afterward comparing the registration on the register 9 with that of the register 8, it may be determined at a glance whether or not all of the shocks or blasts which should have occurred, have occurred; and if it is found

that the number indicated by the register 9 is less than that which is indicated by the register 8, it is known that one of the blast charges has not yet exploded, and the workmen remain at a safe distance until such charge or charges have exploded, or until sufficient time has elapsed to assure the workmen that such blast charge or charges will not explode.

By the construction of the controlling mechanism which is clearly disclosed in Fig. 4, a considerable portion of the plate 12 is shielded by the adjacent surface of the casing 7, so that the reverberating shock force of one blast or shock will not counteract the effect of a subsequent shock in moving the plate 12 toward the casing. Moreover, because of the shortness of the arm 25, only a slight movement of the plate 12 is required to rock the pallet 23 sufficiently to effect the step by step movement of the wheel 24. The combined weight of the rod 28 and the plate 12 effects a frictional engagement of the rod with the bearing 28; and this prevents undue vibration of the pallet so that all danger of registering excessively is avoided.

Although the spring 27 is formed of wire sufficiently heavy to withstand the effects of damp air and gas of mines, tunnels, etc., it is sufficiently sensitive to yield under the comparatively slight pressure which results from explosions at a distance from the plate 12. This is true because of the position of the spring with relation to the shaft or locking member 22, as shown in Fig. 4, where it will be seen that this spring extends substantially radially with relation to the shaft 22 and pulls in the radial direction, that is, its pull is exerted along a line which extends transversely of the path of movement of the upper and lower detents of the pallet 23.

Although I have described this embodiment of my invention very specifically, it is not intended to limit my invention to these exact details of construction and arrangement of parts, but I am entitled to make changes without departing from the inventive idea disclosed in the foregoing description and following claims:

What I claim as my invention is:

1. In a device for registering shocks resulting from explosions, a plate mounted for movement and adapted to be moved by the shock forces and to control the registering operations, and shielding means to shield one side of said plate against at least a part of the shock forces so as to avoid counter pressure, substantially as described.

2. In a device for registering shocks resulting from explosions, a plate mounted for movement and adapted to be moved by the shock forces and to control the register-

ing operations, and a casing to inclose a register operating mechanism and support the said plate, said casing also constituting a shielding means to shield one side of said
5 plate against at least a part of the shock forces so as to avoid counter pressure, substantially as described.

In testimony whereof I have hereunto set my hand.

ALBA DAVID REESE.

Witnesses:

J. A. KEMPTON,
CHAS. G. BROOKS.