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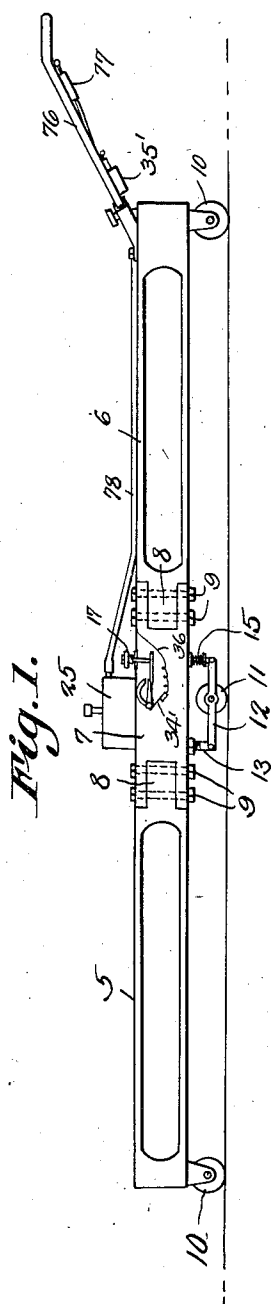
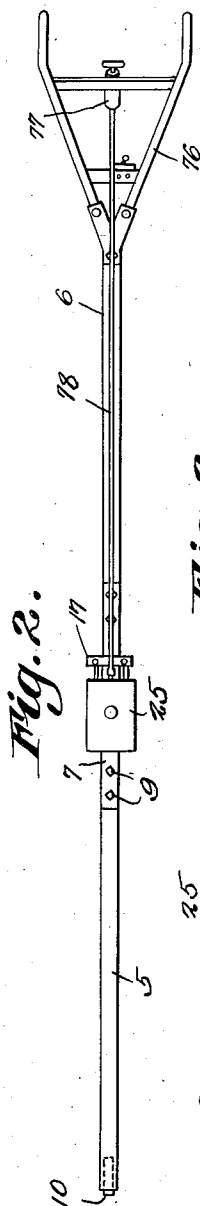
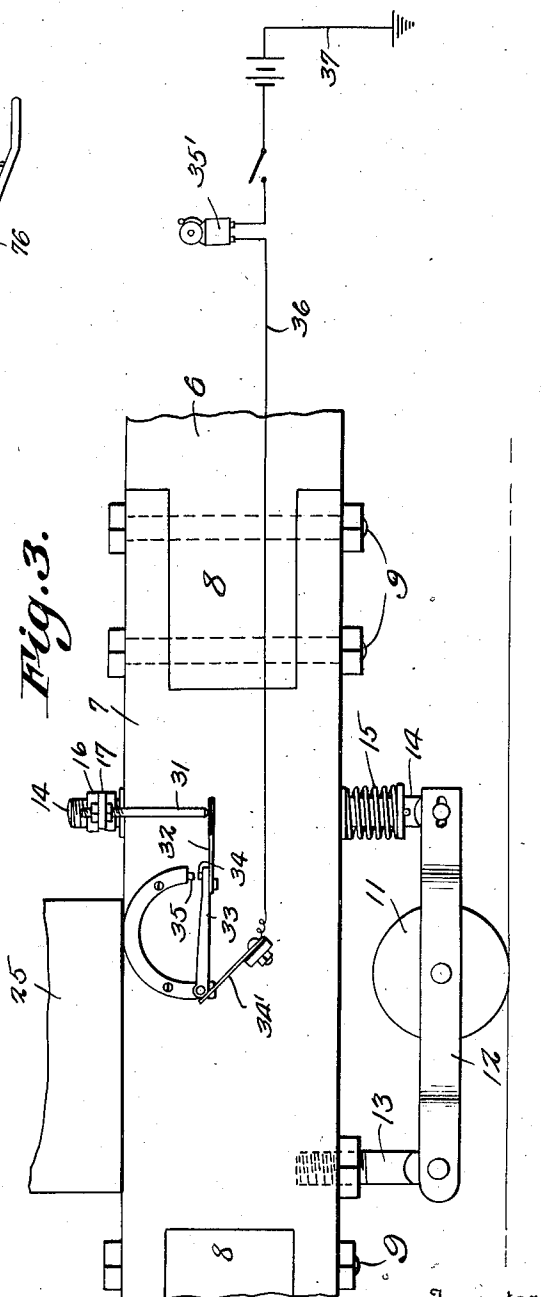
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2,045,563

SURFACE GAUGE AND MARKER

Filed March 26, 1935

3 Sheets-Sheet 1



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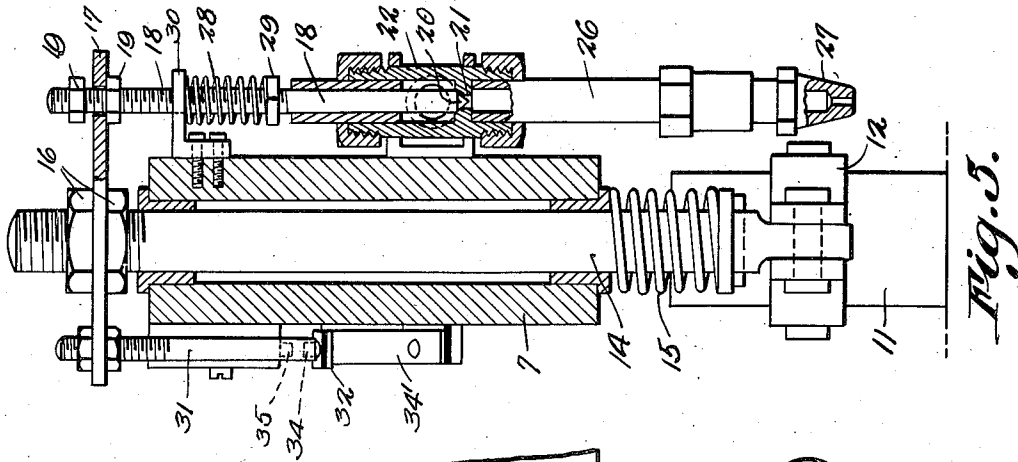


Fig. 3.

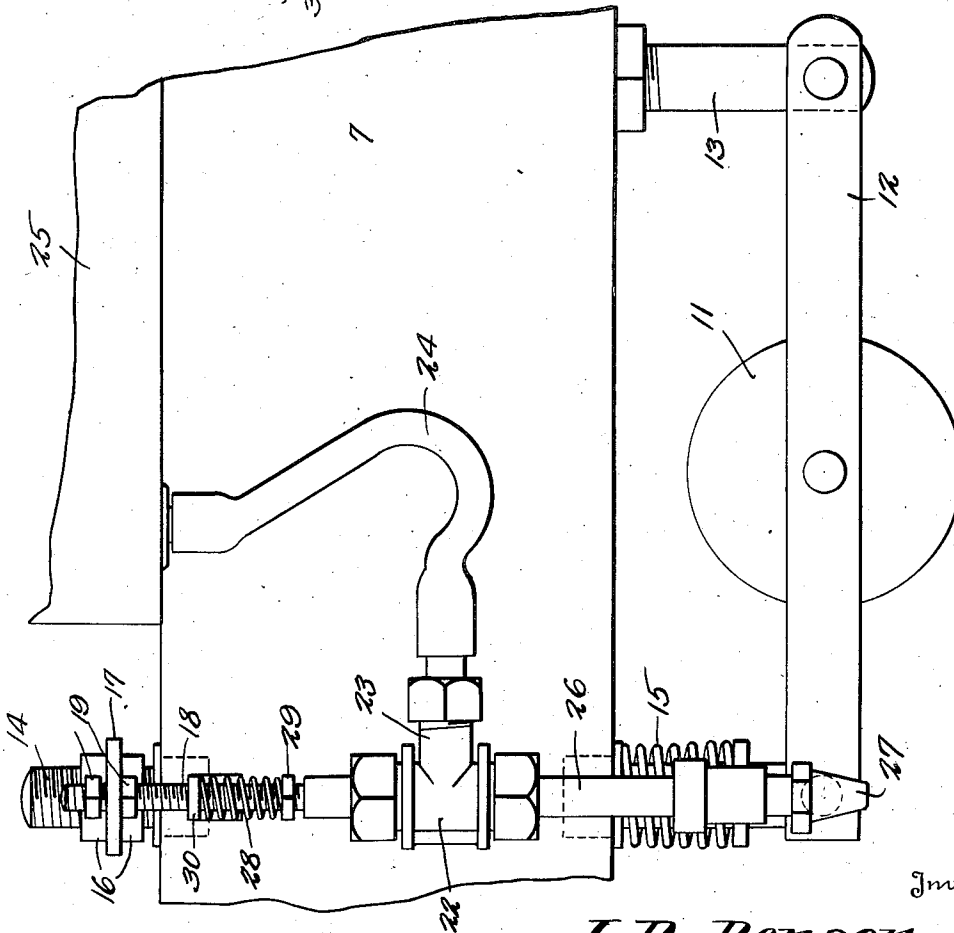


Fig. 4.

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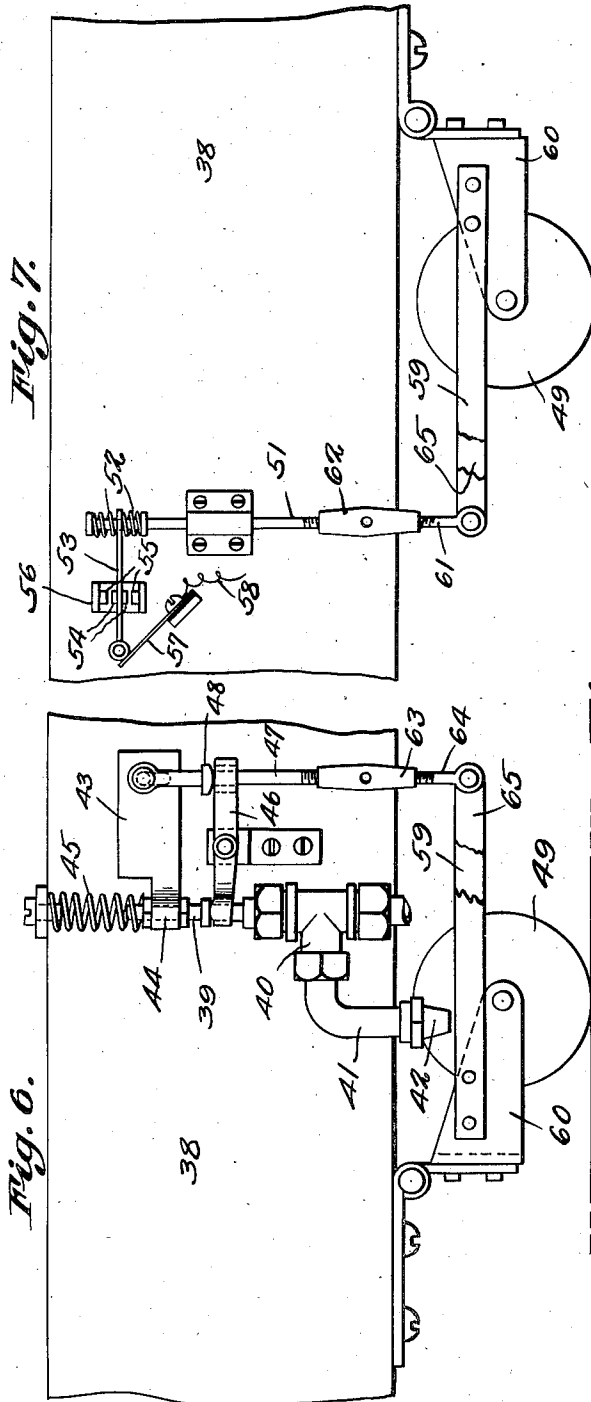
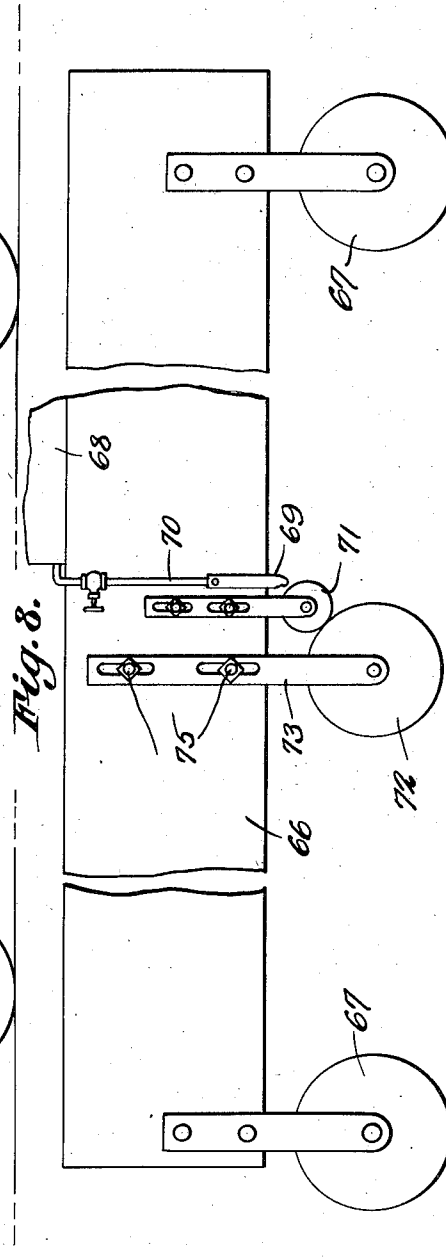
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SURFACE GAUGE AND MARKER

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,045,563

SURFACE GAUGE AND MARKER

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Application March 26, 1935, Serial No. 13,157

1 Claim. (Cl. 33—174)

This invention has reference to a machine designed for use in testing paved surfaces to detect and locate the irregularities and uneven portions of the surfaces.

5 An important object of the invention is the provision of means whereby the irregular or uneven portions of the surface will be marked, to the end that the condition of the surface may readily be determined.

10 A further object of the invention is to provide a machine having means whereby an audible signal will be made simultaneously with the operation of the marking mechanism, as the machine passes over an irregularity in the paved surface.

15 With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

In said drawings

20 Figure 1 is a side elevational view of a machine constructed in accordance with the invention.

Figure 2 is a plan view thereof.

Figure 3 is an enlarged detail view illustrating the central section of the machine.

25 Figure 4 is an enlarged elevational view illustrating the marking material discharge nozzle.

Figure 5 is a vertical sectional view taken through the machine directly in front of the valve housing.

30 Figure 6 is a side elevational view illustrating another modified form of the invention wherein the marking wheel operates the marking mechanism for marking depressions in the surface as well as elevations on the surface.

40 Figure 7 is a side elevational view illustrating a signalling mechanism controlled by the marking wheel.

Figure 8 is a side elevational view illustrating a still further modified form of the invention.

45 Referring to the drawings in detail, the body portion includes a front section 5, rear section 6, and an intermediate section 7.

50 As clearly shown by the drawings the sections 5 and 6 are provided with extensions 8 that are fitted in recesses formed in the ends of the intermediate section 7, where they are bolted, by means of the bolts 9.

At the front and rear ends of the body portion are supporting wheels 10, while at the central portion of the body portion, is a marking wheel

or roller indicated by the reference character 11. This marking wheel 11 is supported on the bar 12 that is pivotally mounted at the lower end of the hanger 13, the opposite end of the bar 12 having pivotal connection with the rod 14 which extends vertically through the body portion, as clearly shown by Figure 5 of the drawings, the rod 14 being held in its normal position, by the action of the coiled spring 15.

The upper end of the rod 14 is threaded to accommodate the nuts 16 which are positioned on opposite sides of the plate 17 that is formed with openings at its ends. Extending through the opening at one end of the plate 17, is a valve stem 18, the valve stem being formed with threads to accommodate the nuts 19, which nuts are spaced apart to permit sliding movement of the rod 14, independently of the valve stem 18.

The lower end of the valve stem 18 is tapered to provide a valve 20 which seats against the valve seat 21 formed within the valve housing 22. A lateral extension 23 is formed integral with the valve housing 22, and provides means whereby the flexible pipe 24 may be connected to the valve housing. One end of the flexible pipe 24 connects with the tank 25, so that marking liquid may pass from the tank 25 into the valve housing 22, where the marking liquid is released, by the action of the valve 20. Communicating with the valve housing is a pipe 26 that carries the nozzle 27 at its lower end. In order that the valve 20 will be normally held in its closed position, a coiled spring 28 is mounted on the valve stem 18, the lower end of the spring engaging the nut 29, while the upper end of the spring engages the bracket 30 through which the valve stem 18 extends. Thus it will be seen that due to this construction, vertical movement of the valve stem, caused by the marking wheel moving vertically, will result in a quantity of marking fluid being deposited by the nozzle 27.

At the opposite side of the body portion and connected with the plate 17, is a rod 31, which rod extends downwardly and contacts with the arm 32 connected with the contact arm 33, which carries the contact point 34 that engages the contact point 35 when the rod 31 moves upwardly. The contact arm 33 engages the contact arm 34 which is in circuit with the bell or buzzer 35' through the wire 36, the bell or buzzer 35' being grounded through the wire 37. It will, of course, be understood that the return circuit is made through the frame of the machine in the usual and well known manner.

From the foregoing it will be obvious that upon vertical movement of the marking wheel caused

by contact of the marking wheel with the surface over which the device is moving, will cause an audible signal to be made, simultaneously with the discharge of a marking fluid on the irregular portion of the surface.

In the form of the invention as illustrated by Figures 6 and 7 of the drawings, the body portion of the machine is indicated by the reference character 38, and in this form of the invention the valve stem is indicated by the reference character 39 which operates in the valve housing 40 to control the passage of marking fluid through the pipe 41 and nozzle 42. Secured to the body portion 38 and supported above the valve housing 40, is a bracket 43 that has an extension 44 through which the valve stem 39 extends, the valve stem 39 being normally urged downwardly by means of the coiled spring 45. The reference character 46 designates an arm which is pivotally connected to the body portion 38, at a point intermediate the ends of the arm 46, one end of the arm 46 being connected with the valve stem 39, while the opposite end thereof is formed with an opening through which the rod 47 extends, the rod 47 having a stop 48 thereon, to engage the upper surface of the arm 46, moving the arm and causing the arm to tilt when the marking wheel 49 moves into a recess in the paved surface over which the machine is moving. As the arm 46 moves, the valve stem 39 is operated to release material through the nozzle 42. It will also be seen that when the wheel 49 moves upwardly due to its contact with an elevation on the surface, the member 46 will move downwardly under the action of the spring 45' operating the valve stem 39 to release the marking fluid.

In this form of the invention the signal is operated by means of the vertical movement of the wheel 49, and comprises an arm 53 which has an opening through which the rod 51 extends, the rod 51 carrying springs 52 at its upper end, between which one end of the arm 53 is supported and held in its normal position. Contact points 54 are carried by the arm 53 and are adapted to engage contact members 55 on the bracket 56. A contact arm 57 is supported by the body portion and engages the arm 53, so that when the arm 53 moves into engagement with the contact members 55 and 56, a circuit to the bell or buzzer will be made through the wire 58. When the wheel 49 moves upwardly, the circuit will be completed between the uppermost contact points, and when the wheel 49 moves downwardly, the circuit will be made through the lowermost contact points. An arm 59 has connection with the vertically movable support 60 for the wheel 49, and has its forward end connected with the rod 61 which in turn is adjustable with respect to the rod 51, by means of the turnbuckle 62.

It will of course be understood that the operation of the valve stem 39 may be controlled by the turnbuckle 63 that is threaded over the rod 64, which in turn is pivotally connected to the arm 65, extending from the support 60.

In the form of the invention as shown by Figure 8 of the drawings, the body portion of the machine is indicated by the reference character 66, and the body portion is supported by the wheels 67 arranged near the front and rear ends of the body portion.

The reference character 68 indicates a tank supported by the body portion, which tank is adapted to supply marking fluid to the nozzle 69, through the pipe 70. A roller indicated by the reference character 71 is adjustably supported on the body portion and is adapted to receive marking fluid from the nozzle 69, supported adjacent thereto.

The roller 71 contacts with the marking wheel 72 which is adjustably supported with respect to the body portion 66, by means of the bars 73, which are formed with elongated openings through which the adjusting bolts 75 extend.

When the machine moves over a paved surface and the marking wheel 72 engages an enlargement on the paved surface, the contact of the wheel 72 and enlarged surface will cause the wheel 72 to rotate, depositing a quantity of marking fluid on the enlargement. It will of course be understood that the marking liquid used in marking the road surface, is of such a thick consistency that it does not flow freely but is pulled from the nozzle by the action of the roller 71. Thus it will be seen that the marking liquid is transferred to the wheel 72 only when the wheel 72 contacts with the road surface and is rotated.

In order that the device may be conveniently operated, handles 76 are provided at one end of the body portion.

It might be further stated that the marking fluid is held within the tank under pressure of air forced into the tank, by means of the hand pump 77, located on the handles 76, air from the pump 77 being directed to the tank, through the pipe 78.

Having thus described the invention, what is claimed is:

A machine of the class described comprises a body portion, a tank on the body portion, a valve housing mounted on the body portion, a pipe extending from the valve housing, a nozzle at the lower end of the pipe, a pipe establishing communication between the tank and valve housing and adapted to direct marking material to the valve housing, a bar pivotally mounted under the body portion, a roller mounted on the bar and adapted to contact with the road surface over which the body portion moves, a vertically movable rod, pivotally connected to one end of the bar and adapted to move vertically with said bar, yieldable means for normally urging the rod to its inactive position, a plate mounted on the upper end of the rod, a valve stem, adjustable means connecting the valve stem to the plate whereby movement of the rod and plate produces a relative movement of the valve stem releasing a quantity of marking material.

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