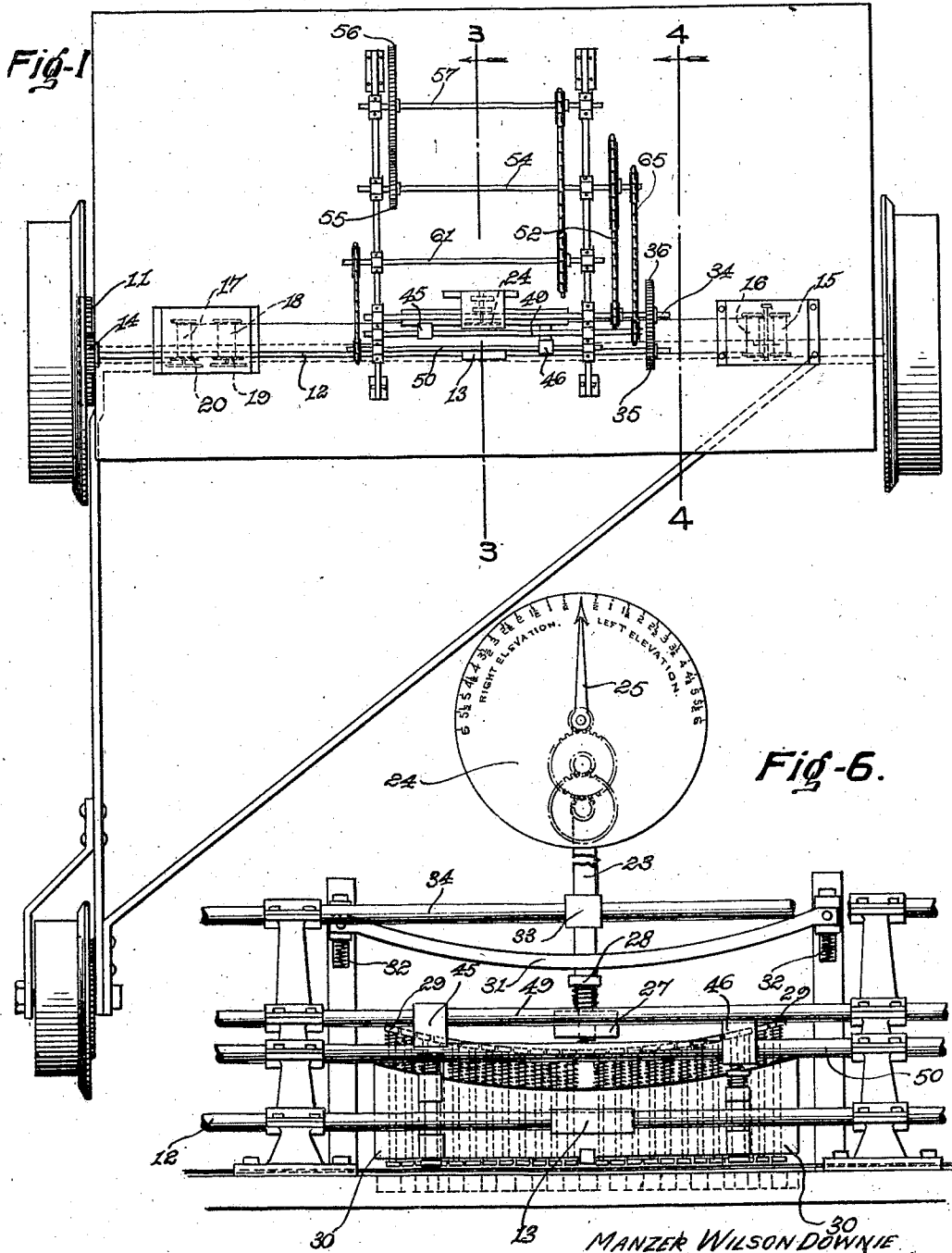


M. W. DOWNIE.
COMBINATION TRACK GAGE AND RECORDER.
APPLICATION FILED JAN. 22, 1912.

1,066,188.

Patented July 1, 1913.

4 SHEETS—SHEET 1.



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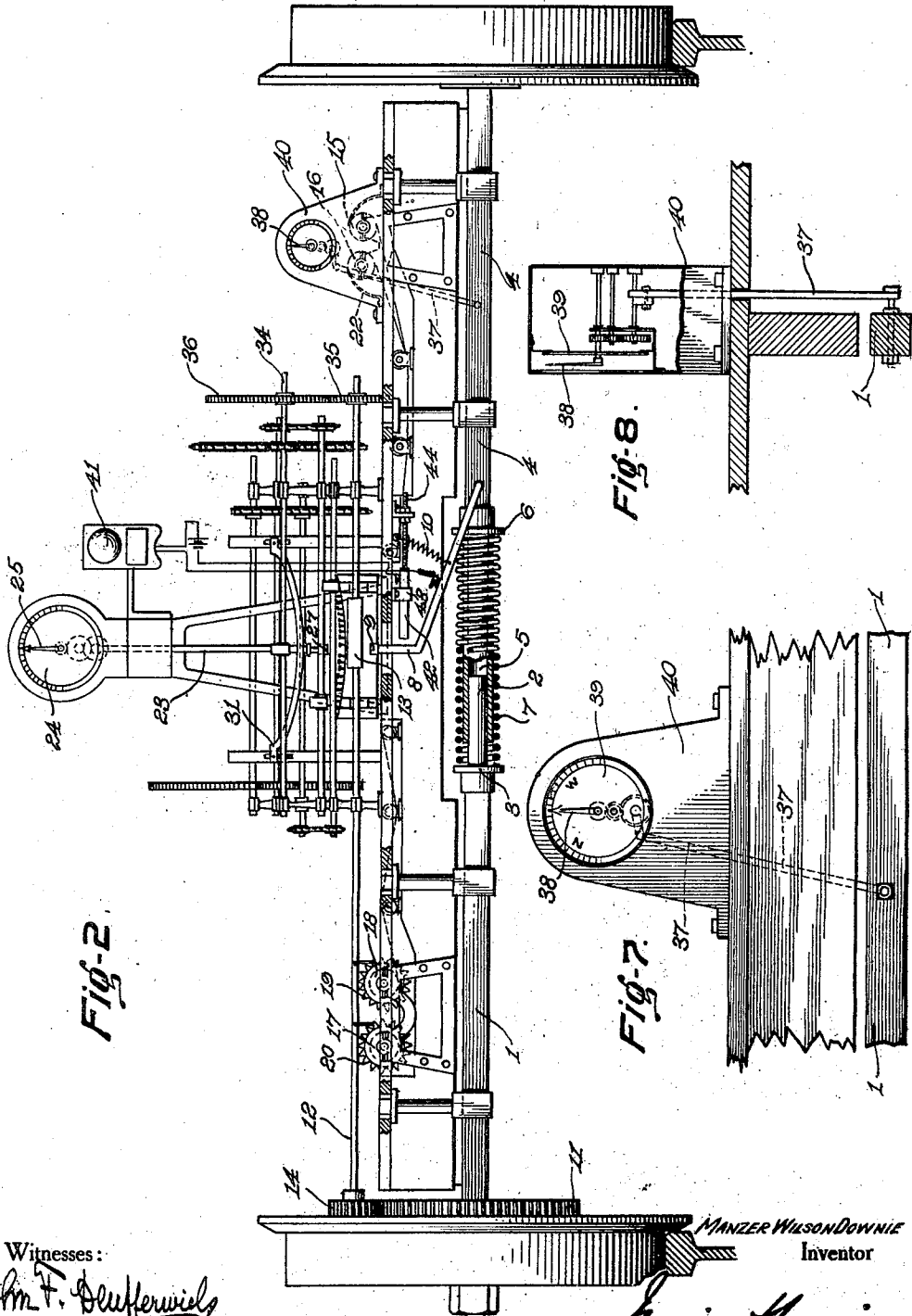
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4 SHEETS—SHEET 2.



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4 SHEETS-SHEET 3.

Fig-4.

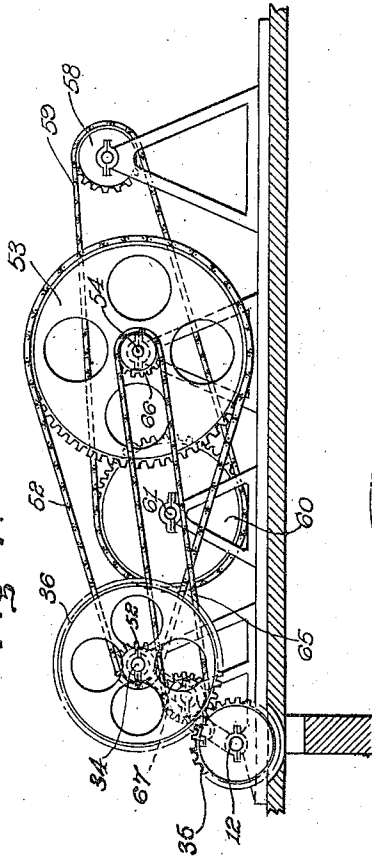


Fig-5.

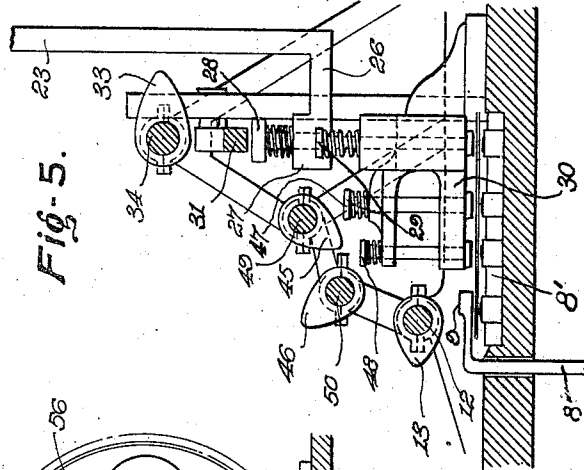
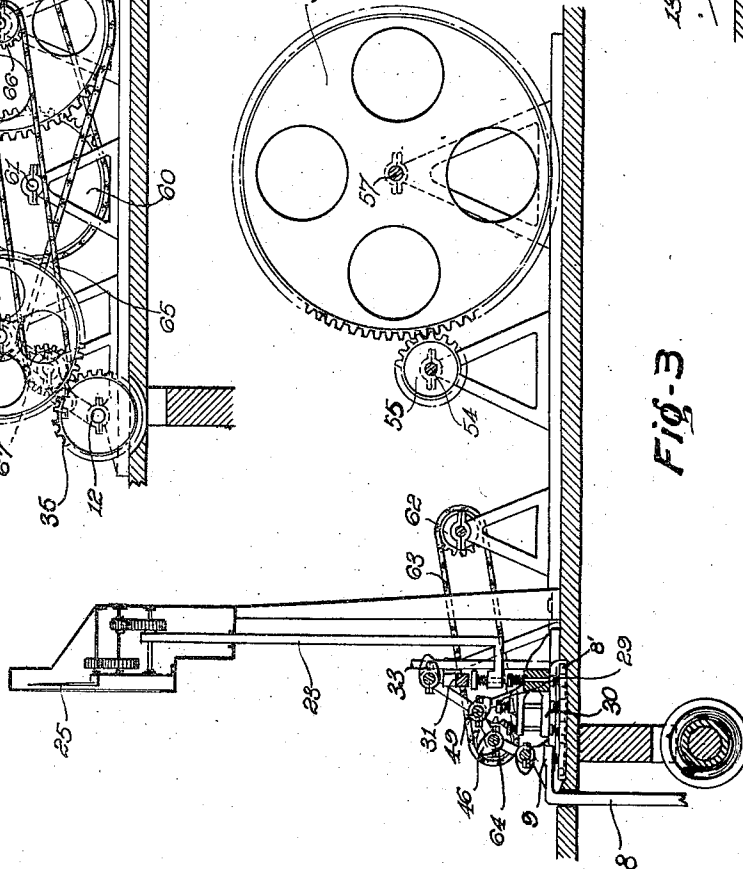


Fig-3.



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4 SHEETS—SHEET 4.

Fig-9.

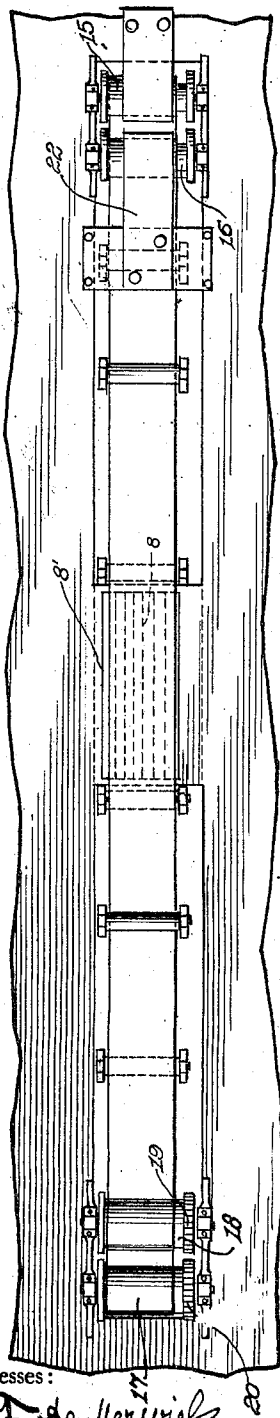


Fig-10.

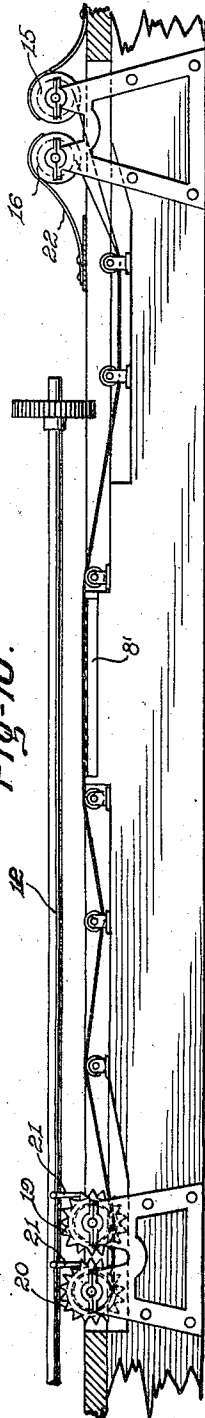


Fig-11.

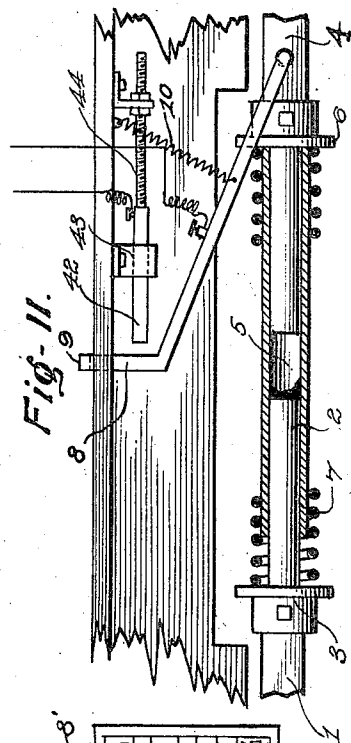


Fig-12.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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UNITED STATES PATENT OFFICE.

MANZER WILSON DOWNIE, OF PRESQUE ISLE, MAINE, ASSIGNOR OF ONE-THIRD TO FRANK H. McNAUGHT, OF WOODSTOCK, CANADA, AND ONE-THIRD TO FREEMAN E. BENNETT, OF PRESQUE ISLE, MAINE.

COMBINATION TRACK-GAGE AND RECORDER.

1,066,188.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed January 22, 1912. Serial No. 672,725.

To all whom it may concern:

Be it known that I, MANZER WILSON DOWNIE, a subject of the King of Great Britain, residing at Presque Isle, Maine, United States of America, have invented certain new and useful Improvements in Combination Track-Gages and Recorders; and I do hereby declare that the following is 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.

The invention to be hereinafter described relates to a combination track gage and recorder.

In order to more clearly disclose the construction, operation, and use of the invention, reference should be had to the accompanying drawings forming part of the present application.

Throughout the several figures of the drawings like reference characters designate the same parts.

In the drawings: Figure 1 is a top plan view of the invention, as applied; Fig. 2 is a rear end elevation, with some details in section; Fig. 3 is a vertical cross section on line 3—3 of Fig. 1, looking in the direction of the arrow; Fig. 4 is a vertical cross section on line 4—4 of Fig. 1, looking in the direction of the arrow; Fig. 5 is an enlarged, detail, side elevation of the stamping mechanism; Fig. 6 is an enlarged front view of the elevation indicator, and the devices for recording the elevations; Fig. 7 is an enlarged rear view of the width gage; Fig. 8 is a side elevation of the same; Fig. 9 is a top plan view of the mechanism for feeding the record strip; Fig. 10 is a side elevation of the same; Fig. 11 is an enlarged front view of the alarm actuating devices; and Fig. 12 is a top plan view of the type frame and type.

The main objects of the invention are to provide a machine which will not only measure and indicate variations in height and spacing of the track rails, but one which will also accurately record such measurements.

The machine may be mounted upon and carried by the frame work of an ordinary hand car or velocipede car. As shown in the drawings, the invention is applied to a velocipede car. In this construction, the car

platform is supported by a sectional axle comprising a stationary or fixed section 1 provided with an inner cylindrical end 2 with surrounding collar or flange 3; and a laterally sliding and non-rotatable section 4 provided with a tubular inner end 5 to slidably receive the end 2, and having a collar or flange 6 similar to the flange 3. Between the flanges 3 and 6 is arranged a coil spring 7 which tends to force the collars 3 and 6 apart and thus keep the section 4 in its outermost position. To the outer end of each axle is secured the usual supporting flanged wheel. The spreading action of the spring 7 tends to make the laterally movable wheel of axle section 4 follow accurately all irregularities in the widths or the spread of the rails.

Beaded in the center of the forward part of the platform of the car is a type frame 8' in which are arranged two rows of type, one for recording variations in height and the other for recording variations in width. Each of these rows is arranged in two sections, each section reading from the longitudinal center of the frame toward the end of the frame. One section of the row for recording variations in height has each type bar headed with the letter R (right hand rail) and the other section has each type bar headed with the letter L (left hand rail). One section of the row for recording variations in width or spacing has each type bar headed with the letter N (narrower than the required standard) and the other section has each type bar headed with the letter W (wider than the required standard).

Pivotally connected to the movable axle section 4 is an elbow arm 8 the upper end of which is off set to form a stamping head 9. The upper part of the arm 8 extends through an elongated slot in the platform and running parallel with the rear part of the type frame. Thus, the stamping head 9 will fall directly above one or another of the type bars of the row of type for recording variations in width or spacing. A spring 10 acts to hold the arm 8, normally, in such position that the stamping head will be slightly above and not in contact with the type bars. The slot in the platform permits the arm 8 to move toward or from the center of the platform, from either side of the center, in accordance with the movements of the axle

section 4. Thus, in order to record the variations in width, it is only necessary to have a paper or other surface between the type bars and stamping head 9, and then drive the head down into operative position. The paper feeding devices will be later described.

The stamping devices comprise a gear wheel 11 fixed to the flanged wheel of the axle section 1, a shaft 12 journaled in suitable bearings on the platform and provided with an actuating cam 13 and a gear 14 which intermeshes with and is driven by the gear 11. The cam 13 is arranged directly above the row of type for recording variations in width, and extends from end to end of the type frame. Thus, as it is rotated, it will engage and depress the stamping head 9, at whatever point the head may be. As the stamping head is depressed, it will record the particular measurement of the type bar over which it happens to be. The gears 11 and 14 are so proportioned, of course, as to actuate the stamping head at frequent and regular intervals or distances, as the car travels on the rails. It is desirable, of course, to effect a regular and uniform traveling of the record strip on which the figures are marked, so that the various figures or measurements will be clearly and uniformly spaced. Thus, a carbon strip or ribbon and a recording strip or ribbon are led from supply drums 15 and 16 respectively, at one side of the platform, about suitable guide pulleys, across the type frame, and rewound upon suitable receiving drums 17 and 18, at the opposite side of the frame. In order to rotate the receiving drums 17 and 18 to cause travel of the strips, ratchet wheels 19 and 20 are secured to them and the teeth of these wheels are engaged by fingers 21 projecting from the shaft 12 and acting upon the teeth as pawls to cause step by step rotation of the drums. Suitable tension devices such as leaf springs 22 may be used to hold the paper and carbon strips taut against sagging.

In order to record the variations in height, a pendulum, cam, and plungers are used. The pendulum 23 is suspended directly above the longitudinal center of the type frame and adapted to swing freely toward and from the rails of the track. Any movement from an exact vertical position will represent an unevenness in the elevations of the two rails. In order to give a visible indication of such variations, an indicator dial 24 and needle 25 may be used. The needle is worked from the pendulum by means of clock train gearing, the normal position of the needle indicating an exact evenness in the elevations of the two rails. The graduations read increasingly from this point in opposite directions around the dial, one side showing elevations of the

right hand rail, and the other side showing elevations of the left hand rail, as in Fig. 6. The lower end of this pendulum is off set to form an arm 26 provided with a head 27 having a bore in which is slidably mounted a spring supported selector plunger 28. The lower end of this plunger is always above one or another of a line of spring supported stamping plungers 29 slidably mounted in a block 30 suitably supported in the frame work of the machine a slight distance above the type frame and in such position that the plungers 29 will come directly above the row of type for recording variations in elevation.

In order to actuate the selector plunger 28 an arcuate presser bar 31 is provided. This bar is slidably supported in posts or brackets and has its opposite ends off set and set upon coil supporting springs 32. This presser bar over lies the top of the selector plunger throughout the entire swing of the pendulum. Therefore, depression of the presser bar will effect operation of the selector plunger, at whatever position the plunger may be. Likewise, the upper ends of the stamping plungers are arranged in an arc parallel to the presser bar 31. In order to actuate the presser bar 31, a cam 33 is provided. This cam is carried by a shaft 34 journaled in the frame work of the machine and driven by means of intermeshing pinions 35 and 36 on the ends of shafts 12 and 34 respectively. These pinions may be proportioned so as to cause operation of the selector and stamping plungers at the same time as the stamping head is operated by its cam 13, thus causing the variations in width or spacing, and the variations in elevation, to be recorded for the same point of the track at the same time. Or, other proportioning of the gears may be used, if desired.

From the above, it will be seen that the variations in elevations of the rails will be both indicated and recorded at the same time. The graduations on the dial correspond, of course, to the characters on the recording types. Thus, the indicated variations may be made to correspond exactly with the recorded variations. It is, of course, desirable to render visible the variations of width or spacing of the rails. To this end, an actuating rod 37 is pivotally connected to one end of the movable section 4 of the axle and has its opposite end made fast to the rod or axle of one member of a clock train gearing for operating an index needle 38 which coöperates with a dial 39 in a casing 40. The casing 40 also incloses and protects the supply drums for the carbon and paper ribbons. The normal or zero position of the needle corresponds to normal width or spacing of the rails. The graduations read increasingly in opposite directions from this point, the graduations

on one side indicating increase and those on the other side indicating decrease. These graduations on the dial, of course, correspond to the graduations or characters of the types in the row for recording variations in width or space. Thus, such variations are simultaneously indicated and recorded.

One important feature of the invention is the provision of means for giving a signal or alarm when the space or width exceeds a certain predetermined amount. This comprises an electric bell 41 included in a normally open electric circuit, one wire of the circuit being connected to the elbow arm 8 and the other wire being connected to a bar 42 provided with a screw threaded end 44 and slidably mounted in a strap 43 secured to the under side of the platform of the car. The screw threaded end extends through a perforated ear and the bar may be adjusted longitudinally in its bracket toward or from the arm 8, as desired. As soon as the arm 8 touches the end of bar 42, the circuit will be closed and the bell will ring. As previously explained, the outward movement of axle section 4 carries with it the arm 8, thus, moving the arm toward the end of rod 42. The engagement between the two may be so timed or arranged as to give the alarm or signal at the instant that any desired width or spacing has been exceeded. A similar rod and electrical connections may be arranged on the other side of the car platform to give an alarm or signal at the instant that a minimum width or spacing has been reached, as will be obvious.

In order to make a complete record so that the variations shown on the record may be easily found on the track, a distance recorder has been devised and is arranged to mark or record each 1/20 or other fraction of a mile and each complete mile, such marks being made directly on the record strip and, preferably, between the sets of measurements indicating variations in elevation and width. These distances are recorded by spring supported stamping plungers 47 and 48, actuated by cams 45 and 46, on shafts 49 and 50, suitably journaled in the frame. The cam 45 actuates plunger 47 for recording each 1/20 or other fraction of a mile, and the cam 46 actuates the plunger 48 for recording each complete mile. To the shaft 34 is fixed a sprocket wheel 51 which engages and drives a sprocket chain 52 which, in turn, passes about and drives a large sprocket wheel 53 fixed to a counter shaft 54. On this counter shaft is fixed a pinion 55 which meshes with and drives a gear wheel 56 fixed on a second counter shaft 57. On the shaft 57 is fixed a small sprocket 58 which drives a sprocket chain 59. This sprocket chain, in turn, drives a larger sprocket wheel 60 fixed to a third

counter shaft 61. To the end of the shaft 61 is fixed a small sprocket wheel 62 which drives a sprocket chain 63, the sprocket chain 63, in turn, passing about and driving a small sprocket wheel 64 fixed to the end of shaft 50 for driving the cam 46 which operates the spring supported stamping plungers 48 for recording each complete mile.

For recording each 1/20 or other fraction of a mile, a sprocket chain 65 and sprocket wheels 66 and 67 are used. This connection causes rotation of shaft 49, of course. Thus, the cam 45 will be rotated to actuate the spring supported stamping plunger 47 for recording each 1/20 or other fraction of a mile. The wheels of the car are provided with specially off set flanges to facilitate passing of switches, frogs, and the like.

It is thought that the operation and use of the invention will be clear from the preceding detailed description.

Changes may be made in the construction, arrangement, and disposition of the several parts of the invention without in any way departing from the field and scope of the same, and it is meant to include all such within this application wherein only a preferred form has been disclosed.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a track gage, a type frame containing type for recording measurements relating to the distances between the rails, a record strip above said type, a movable axle section adapted to follow all variations in the distances between the rails, an arm carried by said axle section and provided with a stamping head overlying said type, and means for operating said stamping head.

2. In a track gage, a type frame containing a set of type bearing measurements for recording variations in elevations of the rails, a record strip above said type, a plurality of stamping plungers adapted to operate upon said type, a pendulum swinging above said plungers, a selector plunger in said pendulum, and means for actuating said selector plunger.

3. In a track gage, a type frame containing a set of type bearing measurements for recording variations in elevations of the rails, a record strip above said type, a plurality of stamping flanges adapted to operate upon said type, a pendulum swinging above said plungers, a selector plunger in said pendulum, means for actuating said selector plunger, and an indicator actuated by said pendulum.

4. In a track gage, a type frame containing a set of type bearing measurements for recording variations in elevations of the rails; a record strip above said type, a block above said type, a plurality of spring sup-

ported stamping plungers slidably mounted
in said block, a pendulum suspended above
said block, a selector plunger slidably
mounted in said pendulum, a presser bar
5 slidably mounted above said selector plun-
ger, and means for actuating said presser
bar.

In witness whereof I have hereunto set
my hand in the presence of two witnesses.

MANZER WILSON DOWNIE.

Witnesses:

T. MYNARD,
E. J. GAUVIN.