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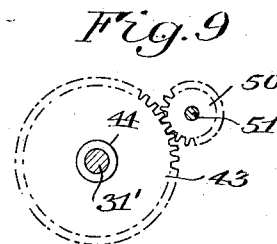
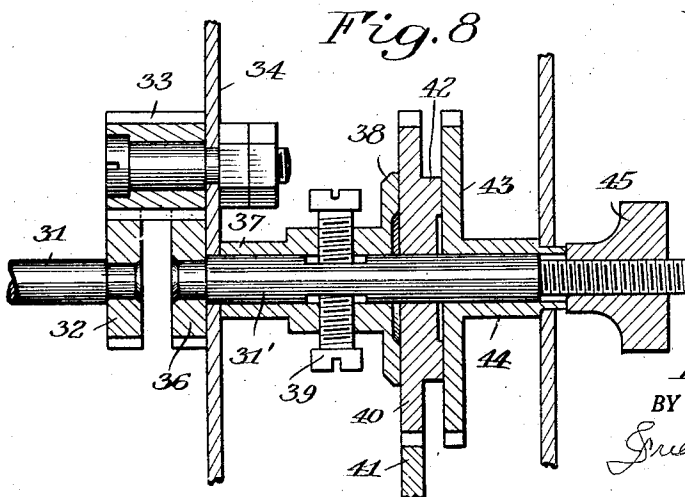
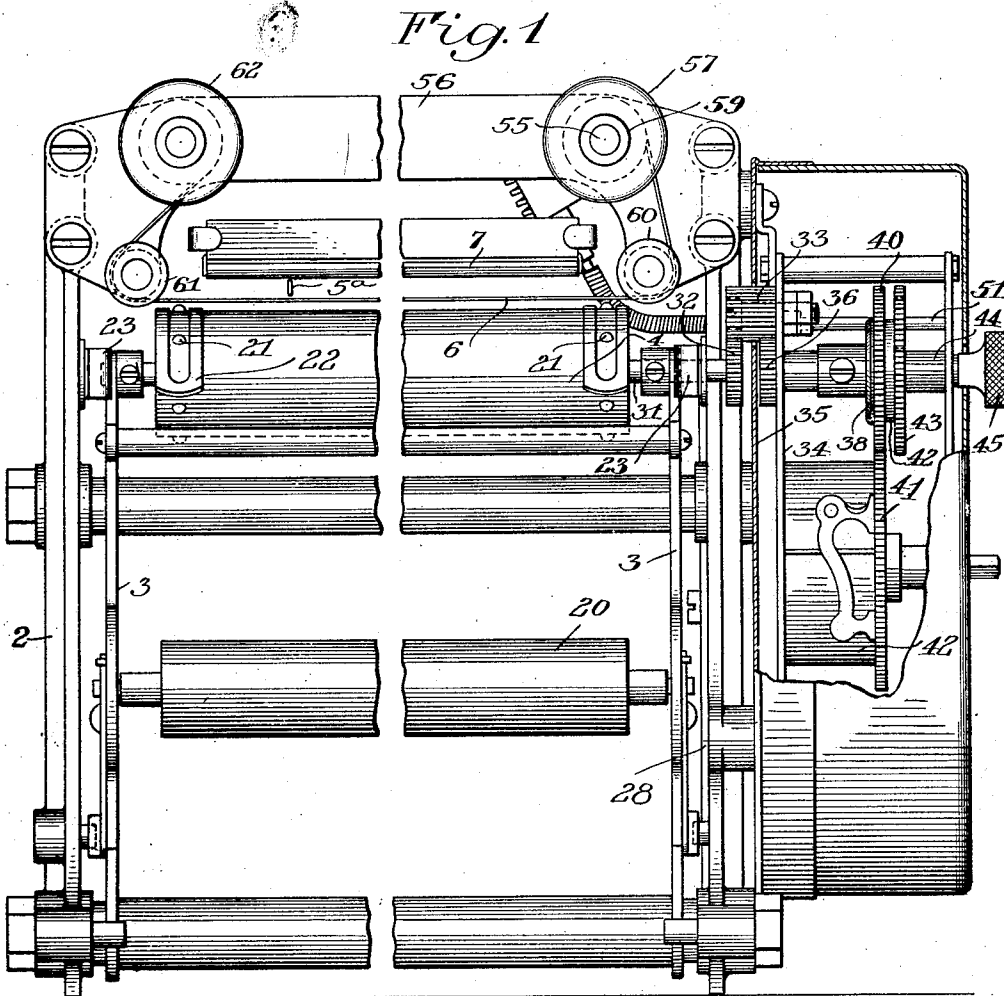
E. B. FOOTE

1,757,012

RECORDING MECHANISM

Filed July 23, 1923

3 Sheets-Sheet 1



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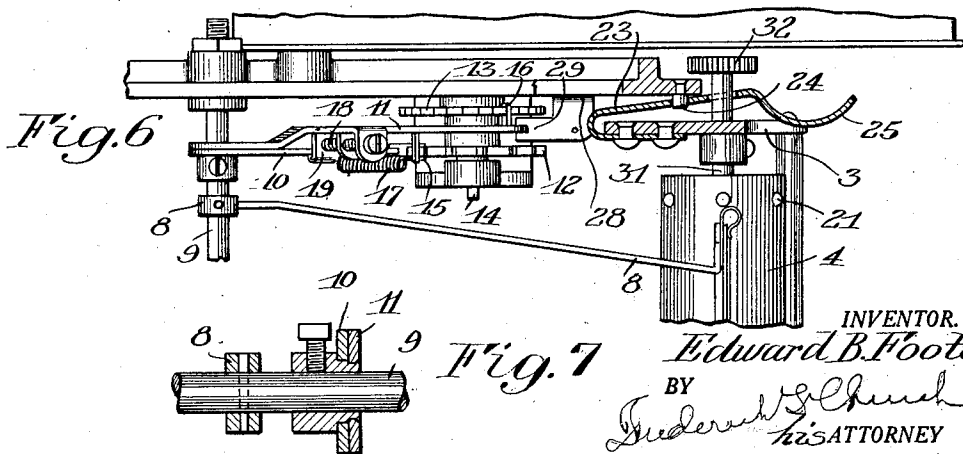
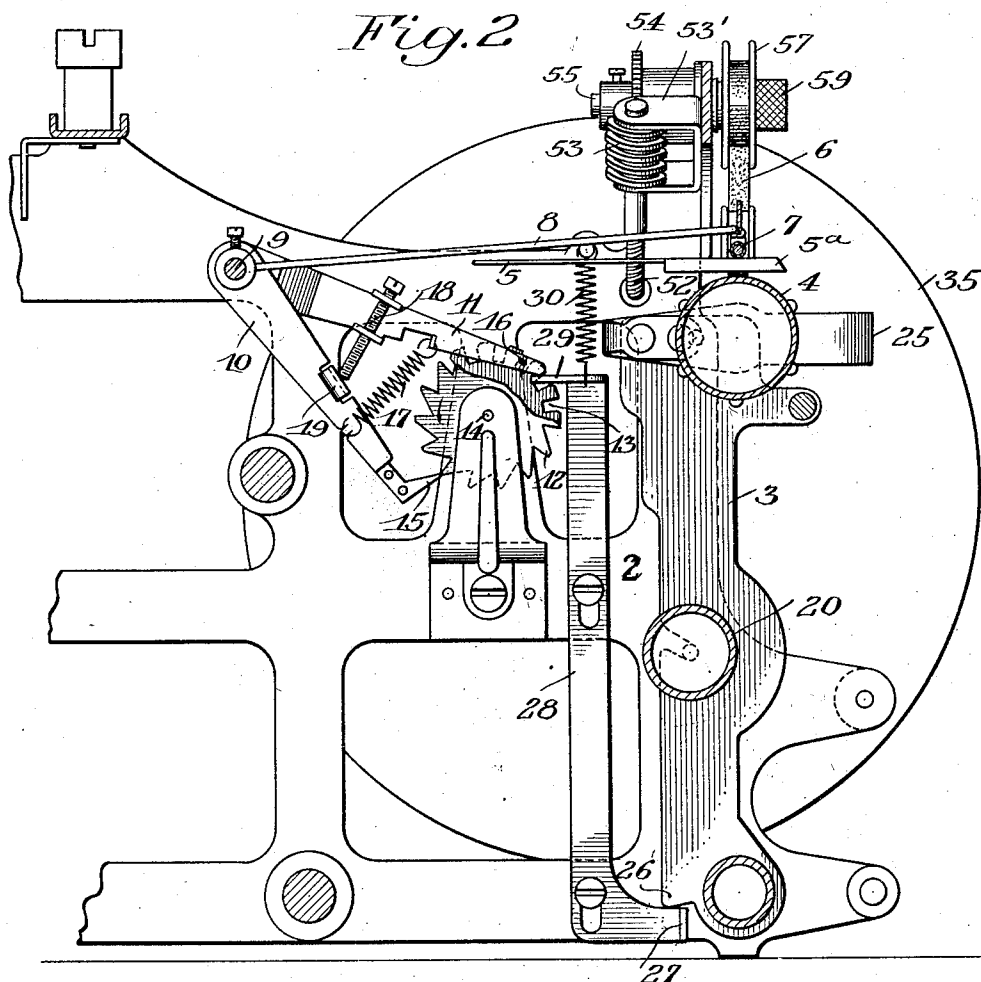
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3 Sheets-Sheet 3

Fig. 3

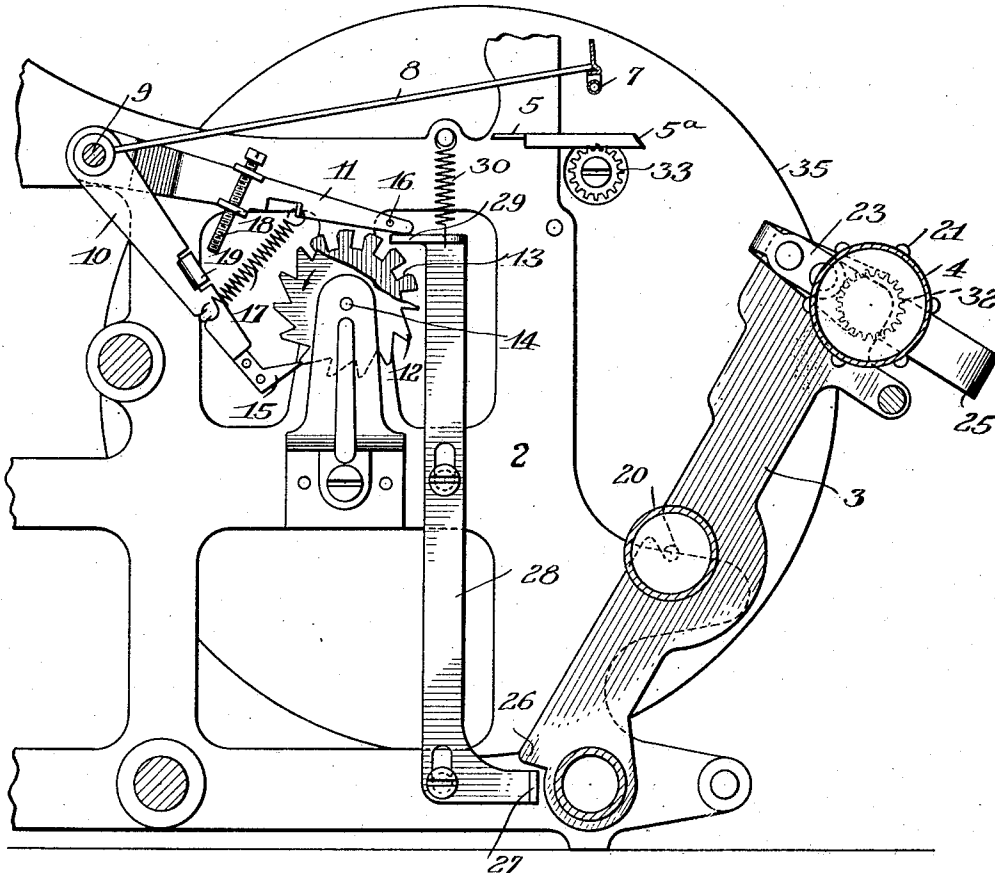


Fig. 4

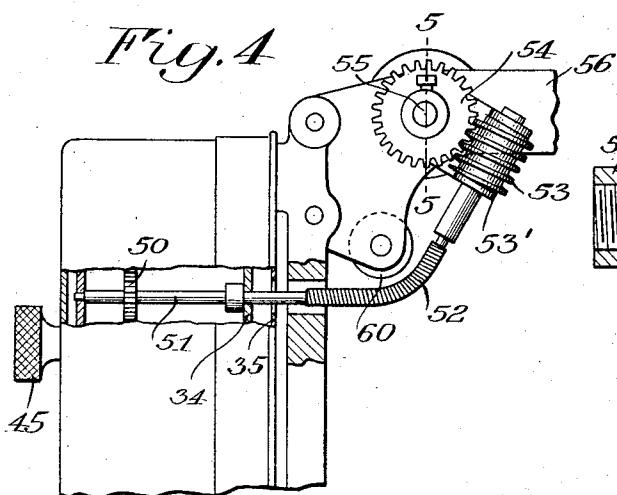
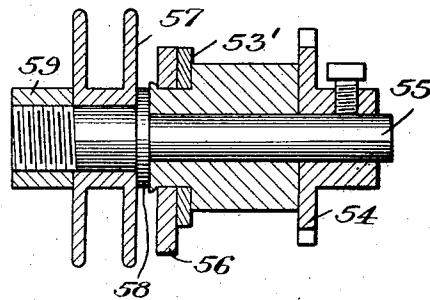


Fig. 5



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RECORDING MECHANISM

Application filed July 23, 1923. Serial No. 653,081.

My invention relates to recording mechanisms of the kind employed for making a record on a sheet at frequent intervals of a temperature or other existing condition in chamber, furnace or the like. The sheet may be moved continuously and the recording devices actuated intermittently by any suitable motor means as by means of a coiled spring with which cooperates a part adapted to be actuated by a thermostat or other condition responsive mechanism. The principal object of my invention is to provide a mechanism of this kind with means for feeding a continuous record strip from a roll on which a record is made by means of devices comprising a continuously moving inking strip or ribbon.

A further object of my invention is to provide convenient means for at will releasing the sheet feeding and inking device from the actuating mechanism when desired.

A more specific object of my invention is to mount the record strip on a pivoted frame movable to and from recording position for the purpose of inserting a new record strip, means being provided for moving the recording devices to an inoperative position when the record strip is moved from operative position.

To these and other ends my invention resides in certain combinations and improvements as will be hereinafter more fully described, the novel features being particularly pointed out in the claims at the end of this specification.

In the drawings:

Figure 1 is a front elevation of a recording mechanism constructed according to one embodiment of my invention;

Figure 2 is a side elevation of the same;

Figure 3 is a view similar to Figure 2 showing parts in different relations;

Figure 4 is a fragmentary view partly in section showing the inking strip feeding devices;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is a fragmentary view partly in section of one end of the record sheet frame;

Figure 7 is a fragmentary section illustrating a detail of construction;

Figure 8 is a longitudinal section of the clutch devices for releasing the inking devices and record sheet feeding devices from driving connection with the motor, and

Figure 9 is a diagrammatic view of the record sheet feeding gears.

Similar reference characters refer to the same parts in all the figures of the drawings.

In the embodiment of the invention illustrated in the drawings, I have shown a suitable frame comprising the upright members 2 between which a record sheet frame 3 is movably mounted for movement from an operative position shown in Figure 2, to the inoperative position shown in Figure 3. In its upper end the movable frame carries a revoluble roller 4 on which a suitable record sheet is supported. A pointer or indicating arm 5 is swung in a horizontal plane by means of a galvanometer or other suitable motor devices controlled by a thermocouple or other condition sensitive instrument located in the chamber or furnace whose conditions are to be recorded. It will be understood that the pointer 5 is normally free of the roller 4 or the record sheet thereon, but is sufficiently flexible to move into engagement therewith to make an impression thereon through the medium of a recording element in the form of an inking device, strip or ribbon 5 arranged between the pointer 5 or a knife edge 5^a provided thereon and the roller. The means for actuating the indicator or pointer into engagement with the record comprises a bar or strip 7 supported in the forward ends of a pair of swinging spaced arms 8. The bar 7 extends longitudinally of the roller 4 and is adapted to engage the pointer in all positions to which it may move. The arms 8 are carried on a rock shaft 9 supported in the main frame, and has mounted thereon a pair of downwardly and forwardly inclined arms 10 and 11 adapted to engage a pair of toothed wheels 12 and 13 respectively which are fixed on a shaft 14 which is continuously driven by the motor or spring drum previously referred to. The arm 10 is loosely mounted on the shaft and has a

pawl 15 at its free end adapted to engage the teeth of the ratchet wheel 12. The arm 11 is fixed on the shaft 9 and has a pin or projection 16 in its free end adapted to co-operate with teeth formed on the periphery of the wheel 13. The arms 10 and 11 are connected by the spring 17 and the arm 11 carries an adjustable stop 18 adapted to co-operate with a lug 19 on the arm 10. When the pawl 15 is engaged with the base of a tooth of the ratchet wheel the stop 18 engages the lug 19 and the pin 16 is held out of engagement with the teeth or notches of the wheel 13. As the shaft 14 is driven continuously by the motor in a counter clockwise direction as viewed in the drawings, the engagement of the pawl with the inclined surface of the tooth moves the arm 10 downwardly and the lug 19 away from the stop 18 and permits the pin 16 to move into contact with the periphery of one of the teeth of the wheel 13. As the shaft 14 continues to rotate the pin rides off the tooth and falls into one of the notches swinging the shaft 9 and the rod 7 into contact with the pointer 5^a to make an impression on the record. The above operation takes place just before the pawl 15 reaches the end of a tooth. As soon as the end of a tooth is reached, the pawl 15 moves into the depression between the teeth under the action of the spring 17 and the lug 19 strikes the stop 18 and the release of the tension on the spring 17 permits the parts to return into position to repeat the operation just described. I have provided novel means for supporting and feeding a continuous record sheet. Said means comprises a roller 20 detachably supported in the swinging frame 3 on which a continuous record strip may be wound. The free end of the strip is led upwardly and forwardly over the roller 4. In order to insure accurate feeding and positioning of the record strip, the roller 4 may be provided with studs or projections 21 adjacent its ends which take into openings provided therefor along the side margins of the strip. Paper fingers 22 mounted on a stationary part co-operate with the roller adjacent its ends and the projections 21 to retain the sheet thereon. Said fingers may be slotted if desired as shown to provide a clearance for the studs 21. The frame 3 is adapted to swing from normal operative position shown in Figure 2 to the position shown in Figure 3 for the purpose of inserting a new record strip when the old one becomes exhausted. Means are provided for retaining the frame in operative position. Said means comprises a pair of spring latches 23 on the swinging frame having openings therein adapted to co-operate with inwardly projecting studs 24 on the main frame. The arrangement of the parts is such that when the frame 3 is moved to operative position the latches or spring fingers 23 engage the studs 24 which engagement presses the spring fingers inwardly against their resiliency, until the roller 4 reaches the proper operative position when the openings in the spring fingers register with and automatically engage the projections 24. The spring fingers are extended forwardly and provided with finger pieces 25 by means of which they may be pressed inwardly to disengage the studs 24 and release the frame. I have also provided means for preventing the operation of the recording devices when the frame 3 is moved from operative position. To this end one of the side pieces of the frame 3 is provided at its lower end with a heel or rearward projecting portion 26 adapted to cooperate or engage a forwardly projecting portion or arm 27 on a bar or rod 28 having a limited vertical movement on the main frame. The upper end of the rod 28 is provided with a projection or arm 29, which when the parts are in normal position, occupies a position just below the free end of the arm 11 when the arm is in depressed position as seen in Figure 2. A spring 30 is connected with the rod 28 and anchored to the main frame and tends to move the bar 28 to engage the projection 29 thereon with the end of the arm 11 to hold the pin 16 out of operative engagement with the wheel 13 as shown in Figure 3 of the drawings. By releasing the spring fingers from engagement with the studs, the frame may be moved from the Figure 2 position to the inoperative position shown in Figure 3 during which movement the heel 26 moves away from the arm 27 and permits the rod 28 to rise under the action of its spring to swing the arm 11 to inoperative position.

The roller 4 is fixed to a shaft 31 on the end of which is fixed a wheel or gear 32 adapted to mesh with a wheel or gear 33 revolvably mounted on a fixed part. The arrangement of the gears 32 and 33 is such that when the movable frame moves to and from inoperative position, the gear 32 moves into and out of engagement with the gear 33. The gear 33 is mounted on the frame 34 of the motor and is elongated to project inwardly through an opening in the motor casing 35. The parts 34 and 35 are spaced from each other and a pinion 36 is arranged between them to engage the pinion 33 adjacent its outer end. The pinion 36 is fixed on a shaft 31' having bearings in the motor frame and adapted to be driven by the motor. Means are provided for disconnecting the operative driving connection between the shaft 31' and the motor. To this end a sleeve 37 is mounted on the shaft and has a flanged or cup-shaped portion 38 at its outer end adjacent to which is an enlarged portion which is tapped on opposite sides for the reception of the screws 39 which engage flattened portions of the shaft and secure the sleeve against rotation on the shaft. Loosely

mounted on the shaft adjacent the flange 38 is a wheel or gear 40 which is engaged with a gear 41 on the driving shaft of the motor 42. The gear 40 has a projecting annular flange or cup 42 on its outer side adapted to frictionally engage a wheel or gear 43 loosely mounted on the shaft 31' and having an outwardly projecting hub 44 extending through and having a bearing in the motor frame. The shaft 31' extends outwardly through the outer wall of the motor casing and is threaded at its outer end for the reception of a finger piece 45. The finger piece 45 engages the outer end of the hub 44 and is adapted to clamp the gears 43, and 40 into frictional engagement with each other and the flange 38, thereby securing them to the shaft to be rotated thereby. By loosening the finger piece the gears 40 and 43 are released from frictional engagement with the flange 38 and are free to revolve on the shaft without turning the latter or the record feed roll connected therewith.

The gear 43 is operatively connected with devices for feeding the pigment strip or inking ribbon 6, through which impressions are made on the record sheet. When the finger piece 45 is released to release the gear 43 from driving connection with the gear 40 and shaft 31', the ribbon feeding devices are also rendered inoperative. A gear 50 is fixed on a shaft 51 having a bearing in the motor frame and meshes with the gear 43. Referring to Figure 4 of the drawings, it will be noted that the shaft 51 extends inwardly through openings in the motor casing and frame and at its inner end is connected with a flexible shaft 52 which extends inwardly and upwardly and has connected therewith a worm gear 53 mounted in a bracket 53'. The gear 53 engages the teeth of a wheel or gear 54 fixed on a shaft 55 which has a bearing in a ribbon frame 56 mounted on the main frame. Mounted on the opposite end of the shaft 55 is a ribbon spool 57 frictionally connected with the shaft to be driven thereby to wind the ribbon but sufficiently loose to permit the rotation of the shaft independently of the spool if for any reason free movement of the ribbon is prevented, to avoid tearing or breaking the ribbon. To this end the spool is loosely mounted on a bearing on the shaft between a collar 58 and a sleeve or nut 59 having threaded engagement with the shaft and between which and the collar the ribbon spool is frictionally engaged. The ribbon extends from the spool 57 outwardly and downwardly over an idler 60 adjacent one end of the record roll thence over a similar idler 61 adjacent the opposite end of the roller to a spool 62 frictionally mounted on a shaft to permit rotation to unwind the ribbon as it is fed to the spool 57.

It is to be noted that disengagement of the drive for the recording element from the

drive for the record sheet roller, by unscrewing thumb nut 45, allows the roller to be adjusted and the record sheet carried thereby set at the proper time line, without moving the recording element, thereby eliminating any unnecessary feeding and waste of the recording element. While the latter has been referred to as a ribbon, it is to be understood, of course, that it may take the form of a thread, as well understood in the art, as in some cases, a thread is more convenient to manipulate than a ribbon. The word "ribbon" therefore when used is intended to be inclusive of the use of a thread.

I claim as my invention:

1. In a recording mechanism having a main frame, an auxiliary frame movably mounted thereon, a movable support for a record sheet on the auxiliary frame, a pointer movable in a plane spaced from said support, a recording element beneath the pointer and adjacent the record support, a rock shaft, and means on the rock shaft for moving the pointer into engagement with the recording element to move it into position to make an impression on a sheet carried by the support, an arm on the rock shaft, a continuously driven device engaged by the arm for rocking the shaft, and means controlled by the auxiliary frame for moving the arm out of engagement with said continuously driven device.

2. In a recording mechanism having a main frame, an auxiliary frame movably mounted thereon, a movable support for a record sheet on the auxiliary frame, a pointer movable in a plane spaced from said support, a recording element beneath the pointer and adjacent the record support, a rock shaft, and means on the rock shaft for moving the pointer into engagement with the recording element to move it into position to make an impression on a sheet carried by the support, an arm on the rock shaft, a continuously driven device engaged by the arm for rocking the shaft, a rod on the main frame adapted to engage said arm to move it out of engagement with said continuously driven device, and means on the auxiliary frame adapted to render said rod inoperative.

3. In a recording mechanism having a main frame, an auxiliary frame movably mounted thereon, a movable support for a record sheet on the auxiliary frame, a pointer movable in a plane spaced from said support, a recording element beneath the pointer and adjacent the record support, a rock shaft, and means on the rock shaft for moving the pointer into engagement with the recording element to move it into position to make an impression on a sheet carried by the support, an arm on the rock shaft, a continuously driven device engaged by the arm for rocking the shaft, a rod movable on the main frame and operative to engage the arm and

move it out of engagement with the continuously driven device, and a projection on the rod adapted to be engaged by the auxiliary frame to retain the rod in inoperative position.

5 4. In a recorder of the character described having a frame, a pointer thereon having movement in a definite plane and a bar for pressing the pointer against a record sheet,
10 the combination of an auxiliary frame normally disposed to support the record sheet in position to receive impressions from the pointer and movable toward and away from the said normal position, mechanism for inter-
15 mittently operating said bar, and means responsive to movement of the auxiliary frame away from its normal position for making the said mechanism inoperative.

5. In a recorder of the character described
20 having a frame, a pointer thereon having movement in a definite plane and a bar for pressing the pointer against a record sheet, the combination of an auxiliary frame normally disposed to support the record sheet
25 in position to receive impressions from the pointer and movable toward and away from the said normal position, mechanism for inter- mittently operating said bar, including an
30 arm and means for intermittently rocking the same, and means responsive to movement of the auxiliary frame away from its normal position for moving the arm out of the sphere of action of the means for rocking it.

6. In a recorder of the character described
35 having a frame, a pointer thereon having movement in a definite plane and a bar for pressing the pointer against a record sheet, the combination of an auxiliary frame normally disposed to support the record sheet
40 in position to receive impressions from the pointer and movable toward and away from the said normal position, mechanism for inter- mittently operating said bar, including an
45 arm and means for intermittently rocking the same, and means responsive to movement of the auxiliary frame away from its normal position for moving the arm out of the sphere of action of the means for rocking it, comprising a member movable into and
50 out of the path of motion of the said arm, spring means tending to move the said member in one direction and means on the auxiliary frame and the said member for inter- engagement to transmit movement of the
55 former to the latter in opposition to the spring means.

7. In a recorder of the character described having a frame, a pointer thereon having movement in a definite plane and a bar for
60 pressing the pointer against a record sheet, the combination of an auxiliary frame normally disposed to support the record sheet in position to receive impressions from the pointer and movable toward and away from
65 the said normal position, mechanism for in-

termittently operating said bar, including an arm and means for intermittently rocking the same, and means responsive to movement of the auxiliary frame away from its normal position for moving the arm out of the sphere of action of the means for rocking it, comprising a member movable into and out of the path of motion of the said arm, spring means tending to move the member in the direction for moving the arm out of the sphere of action of the rocking means and a connection between the auxiliary frame and the said member for moving the latter against the action of the spring when the auxiliary frame is moved into its normal position.

8. In a recorder having a frame, a pointer thereon having movement in a definite plane, the combination of an auxiliary frame for carrying a record sheet normally disposed to support the record sheet in a position to receive impressions from the pointer, the auxiliary frame being movable toward and away from said normal position, mechanism for periodically pressing upon the pointer and means responsive to movement of the auxiliary frame away from the said normal position for making said pressing mechanism inoperative, including a member movable into and out of the path of motion of the pressing mechanism, spring means tending to move the said member in one direction and means on the auxiliary frame and the said member for interengagement to transmit movement of the former to the latter in opposition to the spring means.

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