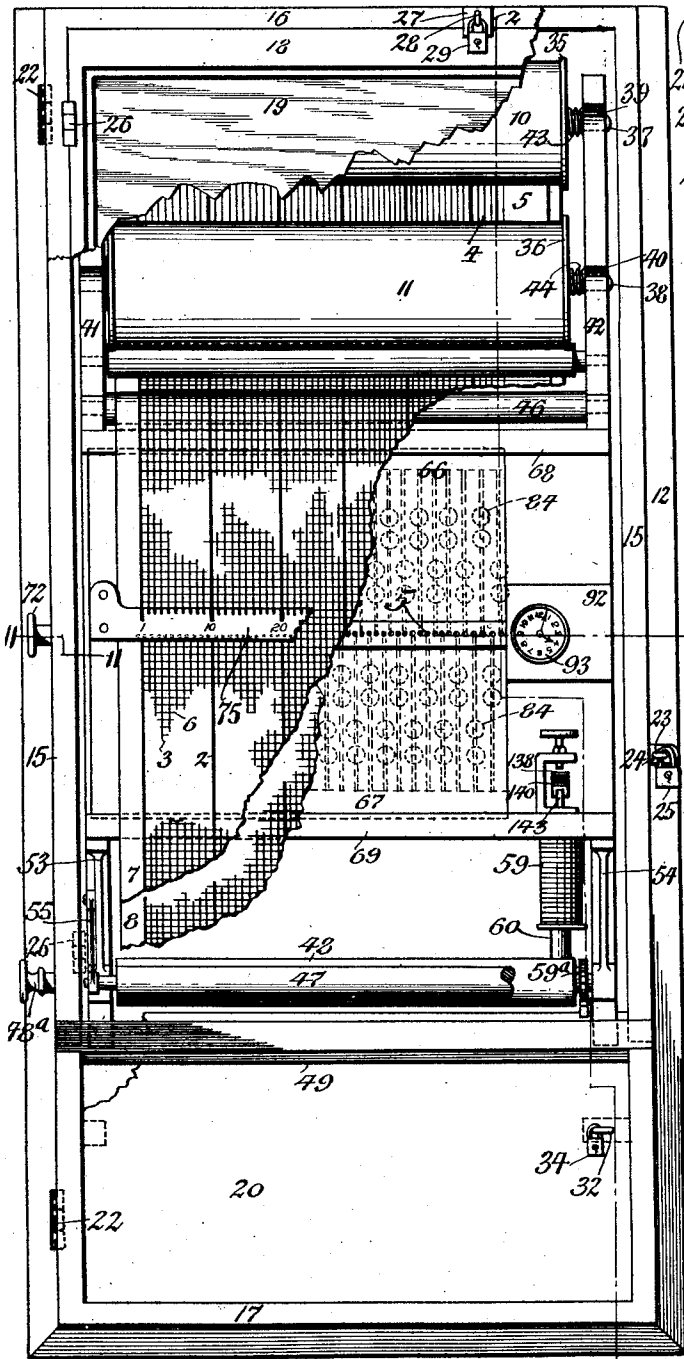


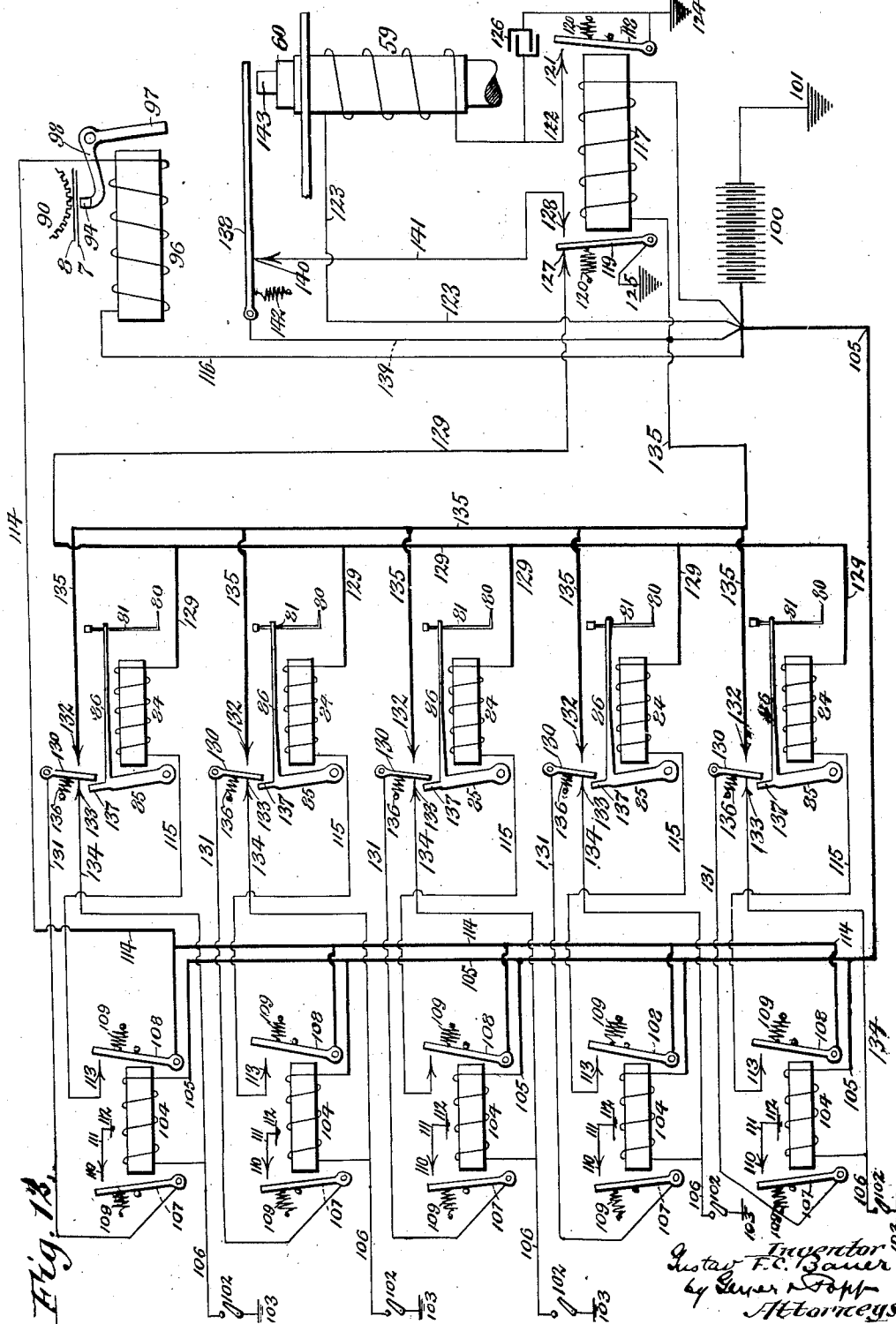
G. F. C. BAUER.
RECORDING APPARATUS.
APPLICATION FILED SEPT. 23, 1916.

1,315,201.

Patented Sept. 9, 1919.
3 SHEETS—SHEET 1.



1,315,201.



UNITED STATES PATENT OFFICE.

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RECORDING APPARATUS.

1,315,201.

Specification of Letters Patent.

Patented Sept. 9, 1919.

Application filed September 23, 1916. Serial No. 121,731.

To all whom it may concern:

Be it known that I, GUSTAV F. C. BAUER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Recording Apparatus, of which the following is a specification.

This invention relates to a recording apparatus which is more particularly designed for use in connection with a police system for the purpose of obtaining a record of the time when different policemen call at different stations of their posts and thereby enable the chief officers to determine whether or not the subordinates are attending to their duties and also to produce a record of any manipulation which may occur from time to time of the recording mechanism and associated parts so as to enable the chief officers to detect any attempt which may be made to tamper with the records of the patrolmen resulting from calls or reports sent in from different points of their posts. Although this recording apparatus is more particularly designed for use in police service it is equally useful for keeping a record of other events or operations which require periodical attention, such for instance as recording the time when one or more watchmen call at different parts of a plant or building under their supervision, or for recording the time when different workmen arrive at a definite place for work and leave the same and the same may also be used for keeping track of the operations of machines in which the time element occurs.

The object of this invention is to provide a recording apparatus for the purpose set forth which is comparatively simple in construction, efficient in operation and not liable to get out of order and one which will permit of producing either a single or a duplicate record of the time and place when and where different persons are performing certain duties, and to accomplish this in such manner that a perfectly trustworthy record is obtained which cannot be altered without detection.

In the accompanying drawings:

Figure 1 is a front elevation, partly broken away, of the recording devices forming a part of this invention. Fig. 2 is a vertical section of the same taken substan-

tially on line 2—2, Fig. 1. Fig. 3 is a detached view of part of the means whereby backward movement of the duplicate record sheet is prevented. Fig. 4 is a fragmentary face view of a record sheet suitable for use in this apparatus. Fig. 5 is a fragmentary horizontal section, on an enlarged scale, taken on line 5—5, Fig. 1. Fig. 6 is a fragmentary vertical section taken on the correspondingly numbered line in Fig. 5. Fig. 7 is a fragmentary sectional view showing the primary electric circuit which is opened and closed upon moving the upper front door of the cabinet which incloses a recording mechanism into its opened and closed position. Fig. 8 is a similar view showing the electric circuit which is opened and closed upon opening and closing the lower front door which affords access to the compartment containing that part of the duplicate record sheet on which a record has been made. Fig. 9 is a similar view showing the electric circuit which is opened and closed upon shifting the cabinet of the recording apparatus so that the same is accessible from the rear side. Fig. 10 is a fragmentary front elevation of the inclosing cabinet of the recording apparatus. Fig. 11 is a fragmentary horizontal section taken on line 11—11, Fig. 1. Fig. 12 is a diagrammatic view showing the different electric circuits embodied in this system when the same is installed.

Similar characters of reference indicate corresponding parts throughout the several views.

Although the member upon which the record is marked may be supplied in various forms and the record may be produced thereon in various ways it is preferable to construct this sheet in the form of a long band or tape 1 which is wound up in the form of a roll for use in the apparatus and unwound from this roll as successive record markings are produced on the surface of the sheet. The face or front surface of this sheet may also be ruled or spaced in various ways to receive the record but, as shown in Fig. 4, the same is preferably divided into a plurality of longitudinal sections by heavy lines 2 which are preferably arranged adjacent to the left hand edge of the sheet, each of these sections representing the territory or post covered by one patrolman,

watchman or the like, and each section being sub-divided by a plurality of longitudinal lines 3 which are lighter compared with the main division lines, so that they are readily distinguishable. As shown in the drawings, each main section is divided into ten sub-divisions which represent ten different stations at different points in the post or territory of a policeman although this number may be varied to suit the particular conditions where this system is installed. The sub-divisions of the several sections are preferably numbered at intervals to correspond with certain stations in the posts or territories of the patrolmen, these numbers extending preferably in a line across the sheet from 1 upward and the repetition of these numbers occurring every tenth line across the record sheet so as to make it an easy matter to locate the proper number of any particular record appearing on the sheet.

At the right hand of the longitudinal station columns are arranged a plurality of longitudinal apparatus recording columns which are produced by fine lines 4 compared with the main divisions of the patrolmen sections which apparatus columns are intended to receive the records which indicate the movement or the opening and closing of particular parts of the apparatus.

The apparatus recording columns contain the names of the different parts of the apparatus of which a record is to be made as to when these parts are manipulated in opening the machine for the purpose of inspection, adjustment or repairs and for other purposes. The names of the parts of the machine of which a record is to be made in this manner are printed in the corresponding apparatus columns and these names are repeated as often as may be necessary to permit of easily locating the names of a particular column, it being satisfactory to reproduce these names approximately every twentieth cross line, as shown in Fig. 4.

Adjacent to the right hand side of the apparatus columns is arranged a time column 5 in which a record is made of the time when the recording apparatus is operated from different stations in the posts or territories of different policemen or the parts of the apparatus are operated of which a record is desirable.

The space on the front side of the record sheet is also provided at regular intervals with horizontal or transverse lines 6 which preferably correspond to the forward steps or spaces at which the record sheet is fed by each feeding operation of the machine, these horizontal lines merely serving as guide lines which permit of conveniently tracing a record crosswise of the sheet at any particular time of the day.

The record may be produced in any one

of the longitudinal columns by a mark thereon of any suitable character but the apparatus shown in the drawings is designed to produce the marks in the different columns relating to the patrolmen's stations and the columns associated with movable parts of the apparatus by perforating these columns at intervals, while the record of the time at which such perforations are made is produced in the time column by means of stamping or printing the time in the last mentioned column simultaneously with the operation of perforating the station and apparatus columns. Furthermore, this apparatus is so organized that the record perforations are produced from the inner or rear side of the record sheet while the stamping or printing record is made from the front side of the sheet.

This apparatus can be used with a single record sheet but it is preferable to use two sheets, as shown in Figs. 1, 2, 5 and 6, and original front outer or main sheet 7 and an inner rear duplicate sheet 8 which are so mounted that the records are produced on the same simultaneously. That part of the rear or duplicate sheet bearing the record is retained within the inclosing casing or cabinet of the apparatus where the same cannot be reached by unauthorized persons while the record bearing portion of the front or main sheet is capable of being removed at will by any one. The operative stretches of these two record sheets are therefore adapted to lie one over the other and while in this position the record perforations are made in the same from the rear side of the duplicate or inner sheet forwardly through both sheets by suitable perforating members. By this means the duplicate record sheet which is retained in the inclosing cabinet is always perforated first while the main record sheet is perforated last. There can therefore be no entry of call or report perforations on the main record sheet after the same is removed from the apparatus inasmuch as a corresponding perforation would necessarily have to be present in the duplicate or stored record sheet because the perforating member would necessarily have to pass through the duplicate sheet before it could operate upon the main record sheet. The time stamp is preferably effected on the front side of the main record sheet by means of a suitable clock controlled stamp or printing device which produces an impression on the front side of the time column of the outer or main sheet, a duplicate impression of this stamp being produced in the corresponding column of the inner or duplicate record sheet by means of a coating of carbon 9 applied to the rear side of the main record sheet in line with the time column thereof.

A feed mechanism is provided which operates to automatically feed the two record

sheets simultaneously from supply rolls 10, 11 one step at a time, the operation of this feed mechanism being so determined that the record sheets are advanced one step after each recording operation on the same has been performed.

Various means may be employed for effecting the feeding of the record sheets and producing the perforating and stamping record marks on the same but the construction shown in Figs 1-10 is preferred and as there shown the same are constructed as follows:

12 represents a back board or base which is adapted to be secured to an upright wall, partition or support in any suitable manner and form a closure for the rear side of a cabinet or casing which supports and incloses those parts of the recording apparatus which are arranged at the headquarters or main station of the police department or other system in which the same may be installed. This inclosing casing preferably comprises a rear wall 13 which is adapted to be normally arranged close to the base board or plate 12 and provided with an opening 14 which is normally closed by said back board or base, as shown in Fig. 2. From the opposite vertical edges of this back wall two upright side walls 15 project forwardly and from the upper and lower horizontal edges of this back wall top and bottom walls 16, 17 project forwardly and connect with the adjacent parts of the side walls. Extending across the upper front part of the casing and engaging with the adjacent parts of the side walls and the top wall is an upper front door 18 which is provided with a pane 19 of glass or other transparent material and across the lower front part of this casing is arranged a lower front door 20 which fits with its lower edge against the bottom of the casing and with its vertical edges against the side walls thereof while its upper edge extends upwardly in rear of the lower edge of the upper door and is separated therefrom by an intervening space forming a throat or passageway 21. The inclosing casing is pivotally mounted to swing horizontally on the base board for instance, by means of hinges 22 connecting the rear left hand corner thereof with the base board, as shown in Fig. 9, so that by swinging the casing backwardly against the base board the opening in the rear of the casing will be closed, as shown in Figs. 2 and 9, while upon swinging the casing forwardly the opening will be uncovered and permit access to the mechanism within the casing from the rear of the latter when this is necessary for inspection, adjustment or repairs. The casing is retained in its rearward or normal position against the back board by means of a fastening device which can only be opened by an authorized person, such

for instance as a hasp 23 secured to the back board and passing through an eye 24 on the casing, and a padlock 25 passing through this hasp in front of said eye, as shown in Fig. 9. The upper front door is preferably mounted on the front part of the casing so as to swing horizontally into its opened and closed position for which purpose the same is preferably connected at its left hand edge with the front edge of the left hand side wall by means of hinges 26. This upper front door is also secured in its operative position by means which are incapable of being operated by unauthorized persons such for instance as an eye 27 arranged on the upper edge of the upper front door and receiving a hasp 28 on the front edge of the top wall, and a lock 29 passing through the eye 27 in front of the hasp 28, as shown in Figs. 1 and 2.

The throat between the lower edge of the upper door and the upper edge of the lower door forms a passageway through which the record bearing portion of the main record sheet moves from the interior to the exterior of the casing while the space 30 in the lower part of the casing between the lower door and the adjacent walls of the casing forms a compartment or receptacle which receives the record bearing portion of the duplicate record sheet which is to be retained within the casing where the same is not accessible to any person excepting those in authority to reach the same. For the purpose of enabling the compartment 30 to be reached when desired the lower door is pivotally connected at its lower edge with the bottom of the casing by means of hinges 31 so that this door may be swung forwardly and downwardly after the upper door has been swung open. This lower door is held in its upright operative position by means of an eye 32 mounted on the body of the casing within the compartment and passing forwardly through an opening 33 in the lower door, and a lock 34 passing through the eye 32 on the outer side of the lower door, as shown in Figs. 1 and 2.

The supply roll 10 from which the duplicate record sheet is drawn is preferably supported on a spool or drum 35 which is mounted transversely and horizontally in the upper part of the inclosing casing, and the supply spool 11 from which the main record sheet is drawn is carried by a spool or drum 36 which is mounted in the upper part of the casing below the duplicate record supply roll. These two supply spools are pivotally supported so that they may turn freely as the record sheets are unwound therefrom for which purpose the trunnions or arbors 37, 38 at opposite ends of these spools are journaled in upwardly opening bearings 39, 40 formed on upper brackets 41, 42 which are secured to the rear wall of the

casing and project forwardly therefrom at opposite ends of the supply rolls. By constructing the bearings of upwardly opening form the spools or drums may be readily introduced into the same and removed therefrom whenever this becomes necessary for replenishing the supply of record sheets. For the purpose of always keeping the record sheets in a definite position relative to the devices which produce record marks thereon it is desirable to constantly hold the supply spools at one end of the possible longitudinal movement of the same parallel with the axis thereof for which purpose springs 43, 44 are preferably employed each of which surrounds the right hand trunnion of each supply spool and bears at its opposite ends against the right head of the spool and the adjacent right hand bracket 42 and thereby presses the left hand head of this spool yieldingly against the left hand bracket 41, as shown in Fig. 1.

The record sheets pass from the rear sides of the supply rolls 10, 11 downwardly and forwardly around a rear guide roller 45 in an overlying position which rear guide roller is journaled horizontally and transversely in suitable bearings on adjacent parts of the upper brackets, thence downwardly around an upper front guide roller 46 which is journaled horizontally and transversely in bearings on the front parts of the upper brackets, thence downwardly between the front and rear rollers 47, 48 of a feed mechanism which are arranged adjacent to the lower part of the front door and the upper part of the rear door. Those positions of the record sheets between the upper front guide roller and the lower feed rollers form the operative stretches of these sheets which are arranged substantially parallel with the upper door and while in this position the sheets are operated on by the devices which produce record perforations and stampings thereon. The upper edge of the lower door is arranged vertically in line with and below the bight between the two feed rollers so that when the two record sheets issue downwardly from between these rollers the lower end of the front or main sheet passes downwardly through the throat between the upper and lower doors to the exterior of the apparatus while the rear or duplicate record sheet passes into the compartment within the lower part of the casing. That part of the main record sheet projecting below the lower edge of the front door of the casing may be torn off at any desired point by tearing the same against a cutter or tearing blade 49 arranged on the inner side of the lower end of the upper door, as shown in Figs. 1 and 2, thereby permitting any person who desires to obtain possession of the record bearing portion of the main sheet, such for instance as the clerk of the police

station who checks up the service records of the patrolmen or other person whose services or duties have been recorded. The record bearing portion of the duplicate record sheet upon entering the storing compartment 30 is preferably wound upon the take-up or receiving spool or drum 50 which is journaled in suitable bearings 51 mounted on the casing within said compartment. No automatic means are deemed necessary for winding the slack or record bearing portion of the duplicate record sheet on this spool, it being sufficient for this purpose to turn the receiving spool by means of the crank or handle 52 applied to one end of the arbor or shaft of this spool which extends to the exterior of the casing, as shown in Fig. 1.

The feed mechanism of which the front and rear rollers 47, 48 form a part may be of any suitable character but, as shown in the drawings the rear roller 48 which engages with the rear side of the duplicate record sheet is automatically actuated and serves as a driving roller while the front feed roller 47 which engages with the front side of the main record sheet serves as a tension roller to produce sufficient frictional contact between the record sheets and the power operated driven roller 48 so as to insure positive movement of the record sheets. The rear driven feed roller is journaled at its opposite ends in lower brackets 53, 54 projecting forwardly from the lower part of the back wall of the casing and the front or tension roller 47 is journaled at its opposite ends in bearings formed on the lower ends of links 55 which are pivoted at their upper ends on the lower brackets and are drawn rearwardly by means of springs 56 connecting the same with these brackets, so that the front roller bears yieldingly against the record sheets between the same and the rear feed roller. The driven rear feed roller is turned intermittently one step at a time by means of a vertically swinging rock arm or lever 57 which is pivoted at its front end concentrically with the axis of the rear feed roller and provided with a feed or actuating pawl 58 which engages with a ratchet wheel 59 secured to one end of the rear feed roller. The forward movement of the feed pawl and the lever on which the same is mounted is preferably effected by an electro-motor which comprises a solenoid coil or winding 59 mounted vertically on the adjacent lower bracket 54 and a solenoid core 60 arranged within this coil and connected at its lower end with the rear end of a ratchet arm, as shown in Fig. 2. Upon energizing the coil 59 its core will be raised and the ratchet arm will be lifted so that its feed pawl will turn the driven feed roller forwardly one step while upon deenergizing this coil the solenoid core will be permitted to drop and move the actuating pawl backwardly suffi-

ciently to take up a new tooth. Backward movement of the feed roller is prevented by means of a detent pawl 61 secured to the adjacent part of the bracket 54 and engaging with the lower side of the ratchet wheel, as shown in Fig. 2.

When it is desired to tear off the lower record bearing portion of the main sheet both sheets are first moved downwardly independently of the automatic feed mechanism by means of a knob or handle 48^a arranged on the exterior of the inclosing casing and connected with one end of the driven feed roller 48, as shown in Fig. 1. This permits the main sheet to be advanced quickly until its record bearing part is below the tearing blade 49 preparatory to severing its main sheet.

Between the rear or driven feed roller and the rear wall of the inclosing casing a partition 62 is mounted on the underside of the lower bracket 54 which partition forms a top or cover for the compartment 30 which receives the record bearing part of the duplicate record sheet.

In order to prevent the withdrawal of the recording bearing portion of the duplicate sheet from the receiving spool or from the receiving compartment by introducing a wire or instrument upwardly through the throat 21 means are provided which preferably comprise an abutment 63 mounted on the upper part of the inner side of the lower door and bearing against the front side of the duplicate record sheet within the compartment 30 and a spring detent plate 64 secured at its rear end to the underside of the partition 62 while its front end is bent or curved downwardly and is provided with a longitudinal row of gripping or detent teeth 65 which bear against the rear side of the duplicate record sheet opposite to where the same is engaged by the abutment 63, as shown in Fig. 2. By this means the duplicate record sheet is free to enter the compartment 30 but backward movement of the same is prevented, thereby preventing withdrawal of the record bearing part of this sheet and falsifying the same.

That portion of the mechanism which is arranged within the inclosing cabinet for producing the record perforations in the record sheets is constructed as follows:

Arranged between the upper and lower brackets and in rear of the central or operative stretch of the record sheets where the same pass from the upper front guide roller to the lower feed rollers is a carriage which is movable horizontally and transversely and which preferably comprises upper and lower vertical plates 66, 67 guided at their extreme upper and lower edges in horizontal transverse tracks or rails 68, 69 mounted on the front parts of the upper and lower

brackets while their opposing edges are separated by an intervening slot and their opposite ends are connected with each other in any suitable manner, so that these plates are compelled to move together. The transverse movement of this carriage permits of adapting the perforating mechanism thereon accurately to the perforating columns of the record sheets. This movement of the carriage is preferably effected by means of an adjusting screw 70 rotatably mounted in a bearing in the left hand side wall of the inclosing casing and engaging its inner threaded end with an internally threaded lug 71 on the adjacent part of the carriage and provided outside of the casing with a handle or fingerpiece 72 whereby this screw may be turned for adjusting the carriage to the desired position. Between the opposing inner edges of the upper and lower plates of the carriage is mounted an intermediate guide bar 73 which is provided with a horizontal transverse row of guide openings 74 which are spaced apart equal to the distance between the perforating columns of the record sheets. In front of the intermediate guide bar is arranged a front guide or abutment bar 75 which is connected at its left hand end with the carriage plate so as to move with the same. On its rear side this front guide bar is provided with a plurality of recesses or openings 76 which are arranged in a horizontal transverse row and spaced apart, so that each of these recesses is lengthwise in line with one of the guide openings in the intermediate guide bar, as shown in Figs. 2 and 5. The right hand end of the front guide bar is adjustably connected with a supporting bracket or plate 77 on the adjacent part of the front edge of the right hand casing side wall by means of a screw 78 secured to the right hand end of the front guide bar and working in a horizontal slot 79 in the supporting plate 77, as shown in Fig. 5. By this means the right hand end of the front bar is supported without interfering with the fixed time stamping mechanism arranged at the right hand thereof which will be hereinafter explained. The main and duplicate record sheets pass downwardly between the front and intermediate guide bars, as shown in Figs. 2 and 5 and while these sheets are at rest between these bars record perforations are produced in the perforating columns thereon in accordance with the stations from which calls or reports are sent in by different patrolmen while located at different stations of their posts. That portion of the mechanism for producing these record perforations which is arranged within the inclosing casing is preferably constructed as follows:

80 represents a plurality of needles or perforating members which are arranged in a horizontal transverse row and each of which

while in its retracted position has its front end arranged in a guide opening of the intermediate guide bar and is adapted to be moved forward through both record sheets and into the companion opening or recess of the front guide or abutment bar and then moved backwardly again so as to be withdrawn from the front guide bar and the record sheets. Each of these perforating needles is mounted on the free end of an upright needle bar 81 which is preferably constructed of spring metal, such as steel, and mounted on the carriage so as to support the needle in its proper position relative to the guide openings in the front and rear guide bars. In order to permit of arranging the needles as closely together as possible and still permit of properly mounting the needle arms without unduly cramping or crowding the several needle bars the latter project alternately upwardly and downwardly from the perforating line whereby these needle arms are staggered and form an upper group and a lower group. The several needle arms of the upper group are mounted at their upper ends on a supporting block 82 which is secured to the upper part of the rear side of the upper carriage plate while the lower ends of the lower group or set of needle arms are attached to a lower supporting block 83 which is secured to the lower part of the rear side of the lower carriage plate, as shown in Fig. 2. By this means the needles can be arranged very close together and permit of producing a compact record on the record sheets and still enable the needles to be supported without making the parts unduly small or interfering with one another.

The backward movement of each needle bar and its needle is preferably effected by the resilience of this bar itself but the forward movement of the same is effected by means of an electromotor which is rendered operative by the closing of a circuit either at a certain station in the post of a patrolman or by the closing of a circuit associated with some part of the recording apparatus of which a record is to be kept. For this purpose a plurality of electro-magnets 84 are preferably employed which magnets are arranged in two groups disposed respectively above and below the perforating line in rear of the carriage and the electro-magnets of each group being staggered so that they may be arranged compactly and still permit of operatively associating each of these electro-magnets with one of the needle arms, as shown in Figs. 1 and 2. The several electro-magnets 84 are mounted on the rear sides of the carriage plates so that the poles of the same project rearwardly. The armature 85 cooperating with the poles of each of these electro-magnets is arranged vertically and is pivotally mounted on the

rear end of the companion electro-magnet so as to be capable of swinging forwardly and backwardly in a vertical plane. At its free end each armature is provided with a forwardly extending finger 86 which engages at its front end with the rear side of one of the needle arms adjacent to the needle thereof. When the coil of one of the electro-magnets 84 becomes energized its armature is drawn forwardly whereby the finger thereof by engaging with the companion needle arm moves the latter forwardly and projects the respective needle forwardly through the record sheets. When the coil 84 is deenergized the resilience of the needle arm not only withdraws the perforating needle from the record sheets but also moves the companion armature into its rearward inoperative position. If desired, the return movement of each armature 85 may be aided by a spring 87. The armatures of those electro-magnets which are arranged above the perforating line project downwardly while the armatures of those electro-magnets which are arranged below the perforating line project upwardly, as shown in Fig. 2. The armatures of the several electro-magnets also vary in length depending upon the distance at which the particular electro-magnet is arranged from the perforation line but the effect of the same for operating the needle arms to produce the record perforations on the record sheets is practically the same.

For convenience in reading the record on the main sheet adjacent to the marking line the front side of the front guide or abutment bar is graduated or marked off and numbered corresponding to the perforating columns of the record sheet, as shown in Fig. 1.

In order to further guide the needles during their forward and backward movement a rear guide bar 88 is mounted on the carriage immediately in rear of the slot between the plates thereof which rear guide bar is provided on its front side with a plurality of guide grooves 89 arranged in a horizontal transverse row in the form of a comb. Each of the slots in the rear guide bar is horizontally in line with one of the guide openings in the intermediate guide bar and one of the guide recesses in the front guide bar and each of the guide slots receives the rear part of one of the perforating needles and the adjacent part of the companion needle arm, as shown in Figs. 2 and 5.

That portion of the mechanism for producing the printed or stamped record in the time column which is associated with the inclosing casing and which operates to produce a duplicate record of the time when each perforating record is produced may be constructed in any suitable manner but the

mechanism for this purpose which is shown in the drawings is satisfactory and as there shown the same is constructed as follows:

90 represents a plurality of printing wheels arranged in a horizontal transverse row and provided on their peripheries with different types or impression surfaces which permit of printing the year, the month, the day of the month, the hour of the day and the minute of the hour in proper sequence in the time column. For this purpose these printing wheels are arranged with their rearmost peripheral portions opposite the time column of the main record sheet and horizontally in line with the perforating needles. These several printing wheels are mounted on an arbor shaft 91 which is supported in suitable bearings on the supporting plate 77, and are inclosed by means of a housing 92 and the same are adapted to be turned relatively to each other in accordance with the time of the day, week, month and year or any other division of time by means of a clock mechanism 93 of any suitable construction. This clock mechanism is diagrammatically represented in Figs. 1, 4, 5 and 6 and the same is so constructed that the printing wheels are shifted in accordance with the time of the day, the day of the week, the month and the year or otherwise as required. This clock operated shifting mechanism may be of any suitable and well known construction such as now commonly found on the market and as the same forms no part of this invention further illustration and description of the same is deemed unnecessary. In order to produce an impression of the rearmost parts of the peripheries of the printing wheels at any particular time and in line with the perforating needles both record sheets are pressed forwardly against the rearmost parts of the printing wheels, this being preferably effected by a platen or pressure plate 94 arranged in rear of the duplicate record sheet in line with the time columns of both record sheets. Normally this printing platen is retracted so as not to interfere with the free downward movement of the record sheets between the printing wheels and the platen but previous to each downward step of these record sheets the platen is moved forwardly or outwardly whereby a direct impression of the printing wheels is produced in the time column of the main record sheet and a similar indirect impression is produced in the time column of the duplicate record sheet by means of the carbon surface 9 arranged on the rear side of the main record sheet in line with the time column of the duplicate record sheet. The inking of the type surfaces of the printing wheels to enable them to produce a printing impression on the main record sheet may be effected in any suitable manner, for instance by means of an ink ribbon 95 arranged

between the record sheets and the type surfaces of these wheels, as shown in Fig. 6.

The forward movement of the platen is preferably effected by an electro-motor which comprises an electro-magnet 96 mounted on the inner side of the casing, an armature 97 pivoted on the inner side of the inclosing casing and adapted to be attracted by the pole of the electro-magnet 96 and presser arm 98 formed integrally with the armature 97 and carrying the printing platen, as shown in Fig. 6. When the electro-magnet 96 is energized the platen is thrown forwardly to produce an impression on both record sheets and when this electro-magnet is deenergized the weight of the armature retracts the printing platen from the record sheets and printing wheels, which movement of the armature may be aided by means of a spring 99, as shown in Fig. 6.

In the operation of this recording apparatus when installed in a complete system the perforating record is made at the same instant when the corresponding time record is made and the record sheets are at rest while marks are produced on the same and thereafter the record sheets are moved forwardly approximately one space or step preparatory to making the next record thereon. The operation of this recording apparatus is dependent upon the closing of the electrical circuits at different points which may be either adjacent to or remote from the inclosing casing of the marking members and associated parts which electrical circuits are so constructed electrically and mechanically that if one of the originating circuits is closed and the recording apparatus begins its operation in response to such closure, then all of the remaining originating circuits will be temporarily cut off from the registering device proper until the originating circuit having control of the apparatus has performed its complete function, after which the following originating circuits which may be active will be permitted to obtain control of the recording devices and in turn effect a record according to the stations represented by the same.

In order to enable the clock mechanism, printing wheels, etc., of that part of the time stamping mechanism and the housing inclosing the same to project forwardly from the main part of the casing which incloses the remainder of the recording apparatus and still permit the upper front door of the latter to be opened and closed freely without interfering with this time stamping mechanism, said upper front door is preferably pivotally connected with the main casing at the left hand side thereof and the right hand free edge of the upper front door is provided with a notch or recess 92^a which receives the forwardly projecting part of the time stamping mechanism.

nism in the closed position of this door, as shown in Fig. 10, thereby permitting of producing a compact construction and one which permits of readily adjusting the clock of the time stamping mechanism without interfering with other parts of the apparatus.

In a completely equipped police signaling or recording system embodying the registering mechanism just described the various electric circuits and other parts associated therewith may be constructed and arranged, as shown in the diagrammatic representation in Fig. 12, the same being as follows:

100 represents a battery or other electric generator forming the electrical source, one side of which in this particular instance may be grounded, as shown at 101.

102 represents a plurality of primary or originating switches which are arranged at different stations or places from which signals or calls are to be sent for operating the recording mechanism, as for instance the different stations or call boxes arranged in different localities of the posts of patrolmen and on certain relatively movable parts of which a record is to be kept. One side of each of these primary switches by which a record report is originated or produced at some particular place may either be grounded, as shown at 103 or the same may be directly connected by a wire or line with the grounded side of the battery.

A plurality of primary locking-in or holding electro-motors are employed for the several stations or places of which a reporting or signaling record is to be periodically produced by the recording apparatus. These primary locking-in electro-motors may be arranged in any suitable place which is not accessible to unauthorized persons so that they cannot be tampered with and each of these electro-motors comprises an electro-magnet 104 having one end of its coil connected by a wire or line 105 with the ungrounded side of the battery while the opposite end of this coil is connected by a wire or line 106 with the other side of the primary switch 102 above referred to, and an armature composed of two sections 107, 108 which are adapted to be drawn toward opposite poles of the electro-magnet 104 when the latter is energized and to be moved away from these poles by means of springs 109 or the like when the coil 104 is deenergized. Each armature 107 preferably forms part of a locking-in or holding switch by forming the movable contact thereof, the companion stationary contact 110 with which the armature 107 is adapted to engage when the coil 104 is energized and vice versa, being connected by a wire or line 111 with the ground 112 or the other side of the battery. The armature 108 forms part of a marking switch which is arranged in a circuit containing the coil of one of the

needle operating electro-motors and the electro-magnet coil of the printing electro-motor associated with the time stamping mechanism. The armature 108 operates as the movable contact of a marking switch and is adapted when the primary locking-in coil 104 is energized to engage a companion fixed contact 113 and to be disengaged therefrom when the coil 104 is deenergized. All of the armatures 108 of the several locking-in coils 104 are connected by lines 114 with one end of the electro-magnet coil 96 of the time recording electro-motor but the fixed contact 113 of the marking switch of each holding coil 104 is connected by an individual wire 115 with one end of the coil 84 of the corresponding needle operating electro-magnet. The opposite end of the time recording electro-magnet is connected by a line or wire 116 with the battery opposite to its grounded side.

A single secondary locking-in or controlling electro-motor is used in the system and so located that the same is not accessible to any one without authority. This secondary locking-in electro motor comprises an electro-magnet 117 having one end of its coil connected with one side of the battery and an armature composed of two sections 118, 119 which are adapted to be attracted by and moved toward opposite poles of the magnet 117 when the latter is energized and to be moved from these poles by means of springs 120, 120 or the like when this magnet is deenergized. The armature 118 forms the movable member of a controlling switch which is adapted to engage with a companion fixed switch contact 121 when the coil 117 is energized and to move away from said fixed contact 121 when this coil is deenergized. The fixed contact 121 is connected on a wire or line 122 with one end of the coil of the electro-magnet 59 forming part of the electro-motor which operates the paper feed mechanism of the recording apparatus, the opposite end of the coil of the last mentioned electro-magnet being connected by a wire 123 with the ungrounded side of the battery. The armatures 118, 119 are both grounded, as shown at 124, 125. A condenser 126 is also connected across with the circuit of the coil 59 between the contact 121 and the ground so as to prevent undue sparking between the contacts of the switch formed by the armature 118 and the contact 121. The armature 119 also forms the movable contact of a secondary locking-in or holding switch which is adapted to engage with either of two stationary contacts 127, 128, the armature contact 119 being engaged with the stationary contact 128 when the electro-magnet 117 is energized and with the stationary contact 127 when said magnet is deenergized. The contact 127 is connected

by a line or wire 129 with the opposite ends of the coils 84 of the several perforating electro-magnets.

A releasing electric circuit is associated with each perforating electro-magnet and the time recording magnet and record sheet feed magnet which circuit includes a primary releasing switch under the control of each perforating electro-motor and the secondary releasing switch which is under the control of the record sheet feeding electro-motor. Each of the primary releasing switches comprises a movable contact 130 which is connected by a line or wire 131 with the contact armature 107 and is adapted to be shifted into engagement either with a fixed contact 132 or a fixed contact 133. The contact 133 is connected by a line or wire 134 with that side of the electro-motor coil 104 opposite to that which is connected with the battery and the contact 132 is connected by a line or wire 135 with that end of the secondary locking-in coil 117 opposite to that end which is connected with the battery. The movable contact 130 is normally held in engagement with the fixed contact 133 by means of a spring 136 and the same is adapted to be moved out of engagement from the contact 133 and into engagement with the contact 132 whenever the companion perforating electro-magnet 84 is energized, this being effected, for instance, by providing the armature 85 of each perforating electro-magnet 84 with a lug 137 which is adapted to engage the contact 130 and shift the latter out of engagement from the contact 133 and into engagement with the contact 132 whenever the respective electro-magnet 84 is energized, and vice versa. The secondary releasing switch comprises a movable contact 138 which is connected by a line or wire 139 to that end of the electro-motor coil 117 opposite to that which is connected with the battery and a fixed contact 140 which is adapted to be engaged by the movable contact 139 and is connected by wire 141 with the fixed contact 128 forming part of the secondary locking-in switch. The movable contact 138 is normally held in engagement with the fixed contact 140 by means of a spring 142 or the like and the same is moved out of contact therewith whenever the record sheet feed electro-magnet 59 is energized by means of a tail, lug or finger 143 arranged on the solenoid core of the sheet feed mechanism in position to engage the contact 138 for this purpose.

When a primary or originating switch 102 is closed temporarily the corresponding primary circuit of which the same forms a part is completed so that the electric current from the battery passes through a circuit comprising the line 105, coil 104, line 106 and the switch 102. This causes the armature of the magnet 104 to be pulled up,

thereby attracting both armature sections 107, 108 and engaging the same respectively with the contact 110, 113, so that the circuits of which these armatures form a part are closed at these points. The closing of the switch formed by the armature 107 and the contact 110 causes the battery current to flow through a circuit comprising the line 105, coil 104, line 134, switch contacts 133, 130, line 131, contacts 107, 110, and line 111, thereby causing the electro-magnet 104 to remain energized and to continue the attraction of the armatures 107, 108 even though the primary or originating switch 102 may be opened immediately after the same has been closed upon calling or sending in a recording signal or report. Each electro-magnet 104 therefore locks itself in or holds itself in a shunt or local battery circuit until a subsequent train of operations associated with this circuit have been completed and until this shunt or local battery circuit is again opened by disengagement of the movable contact 130 from the fixed contact 131 of the primary releasing switch by means of the companion perforating magnet as will be hereinafter described.

At the same time that the switch contacts 107, 110 are engaged the switch contacts 108, 113 are also engaged so that the current from the battery flows through a marking or recording circuit comprising a line 116, coil 96, line 114, contacts 108, 113, line 115, perforating electro-magnet coil 84, line 129 and contacts 127, 119. The current from the battery will flow in the circuit just described if at this time the secondary locking electro-magnet 117 is in its non-operating position, thereby causing the electro-magnet 84 to operate and produce a record perforation in the corresponding column of the record sheet, and at the same time the electro-magnet 96 will operate to produce an impression of the printing wheel of the time stamp in the time columns of the record sheets transversely in line with the perforation record. During the last part of the stroke of the armature of the respective perforating electro-magnet and after the perforating of the record sheets has been accomplished, the finger or lug 137 on the respective perforating armature 85 causes the movable contact 130 to be shifted out of engagement from the fixed contact 133 and into engagement with the fixed contact 132. This operation cuts out the battery from the primary electro-magnet 104 and permits the latter to be restored to its normal condition for opening the primary locking in switch contacts 107, 110 and the contacts 108, 113 of the marking switch. The electro-magnet 104 is, however, so constructed that the same remains energized for a certain period of time after the same has been cut off from the battery, whereby the switches 107, 110 and

108, 113 are not immediately opened and the circuits connected therewith not broken at these points the instant the finger 137 of the perforating electro-magnet 84 shifts the movable contact 130 out of engagement from the fixed contact 133 and into engagement with the fixed contact 132. The instant, however, that the movable contact 130 engages the fixed contact 132 the current from the battery will flow over a circuit comprising the line 111, contacts 110, 107, line 131, contacts 133, 132, line 135, secondary locking electro-magnet 117 and battery. Each of the perforating electro-magnets 84 is also constructed to release slowly and to remain energized for a sufficient period of time after the current supplied to the same has been cut off so as to insure retaining engagement of the contacts 130 and 132 to enable the electro-magnet 117 to operate and effectively attract the armatures 118, 119, so that they engage the fixed contacts 121 and 128, respectively.

As soon as the electro-magnet 117 is energized and closes the contacts 118, 121 and 119, 128 but breaks engagement between the contacts 119 and 127 the current of the battery flows over a circuit comprising the magnet coil 117, line 139, contacts 138, 140, line 141 and contacts 128, 119. This causes the closing of the local battery circuit which includes the secondary locking-in electro-magnet 117, whereby the latter is retained in an energized condition until this circuit is subsequently opened between the contacts 138, 140 by the operation of the record sheet feeding electro-magnet 59. During the period that the electro-magnet 117 is energized the circuit which includes the line 129 is opened between the contacts 119, 127, and inasmuch as the line 129 is common to all of the perforating electro-magnets 84 any subsequently operated call which may come in by the operation of any one of the primary originating switches 102 will be held back by the companion primary electro-magnet 104 until engagement of the contacts 119, 127 is again reestablished by reason of the secondary locking-in coil 117 being deenergized and restored to its normal inoperative condition. When the electro-magnet coil 117 is closed the current for the battery is also caused to flow over the circuit including the contacts 118, 121, line 122, record sheet feed electro-magnet 59, line 123 and battery, whereby the paper feed electro-magnet 59 is energized and the mechanism operated thereby is caused to advance the record sheets one step. The paper feed electro-magnet 59 is preferably constructed in the form of a solenoid and it serves to feed the record sheets in connection with each one of the perforating magnets and primary locking-in magnets. After the core of the paper feed magnet has moved sufficiently to feed the record sheets

forwardly one step the lug, finger or tail 143 moving in unison with this core engages with the contact 138 and shifts the same out of engagement from the fixed contact 140. This causes the current of the battery which is supplied to the secondary locking-in magnet 117 to be cut off, thereby permitting the latter to return to its normal condition and again separating the contacts 118, 121, whereby the current supplied to the paper feed magnet is also cut off and the paper feed magnet is restored to its normal inoperative condition. At the same time that a separation is effected between the contacts 118, 121, a separation is also effected between contacts 119 and 127 and contact is again reestablished between contacts 119 and 127. If during the period that the electro-magnet 59 is energized any other of the primary electro-magnets 104 in one or the other of the primary circuits becomes energized by reason of a call or report being set over the same, the recording operation of the particular electro-magnet 104 and the companion perforating electro-magnet 84 will not be carried through but will be detained until the previous cycle of operations relating to the call then in transit has been completed and a record of the same has been effected on the record sheets.

When the switch 138, 140 has been opened by the paper feed electro-magnet and the secondary locking-in electromagnet 117 has been deenergized all of the parts are again restored to their normal position preparatory to receiving the next call. If in the meantime a call has been sent in from another station so as to energize the corresponding electro-magnet 104 the latter will lock itself in and remain energized by reason of the closure of the contacts 107, 110 and the same also holds the switch 108, 113 closed so that the same is in readiness to complete the cycle of operations for effecting a record of that particular line the instant the remaining circuits are restored to their normal condition.

If two or more calls or reports are sent in at exactly the same time a plurality of record perforations will be produced simultaneously on the record sheets corresponding to the several stations but only one stamping impression will be produced in line with the plurality of simultaneous perforations, and the same is true if two or more calls are detained while a previous call is being registered.

As before explained the primary circuits which have their primary switches 102 arranged at a distance from the registering apparatus, such for instance as the calling stations at different points of a patrolman's post, are recorded or marked in the columns appearing on the left hand part of the record sheets which are preferably num-

bered consecutively from 1 up but the primary circuits which are utilized in connection with manipulations of different parts of the record apparatus itself are recorded by perforations in the apparatus columns between the lines 4. The several circuits associated with the apparatus are identical with those associated with the patrolman or similar circuits and are adapted to be controlled by primary switches which are operated upon shifting some particular part of the apparatus. For instance, the primary circuit associated with the upper front door of the recording apparatus is provided with a primary switch consisting for instance of the movable contact 144 arranged on this door and adapted to engage with a fixed contact 145 within the casing both when opening this door and also when closing the same, as shown in Fig. 7, so that a record of these movements of the door will be produced by perforations in the upper front door apparatus column in connection with the time stamp.

A similar record is produced in the apparatus column for the lower door leading to the compartment 30 which receives the record bearing part of the duplicate sheet. The primary switch for the last mentioned door may be constructed, as shown in Fig. 8, the same comprising a movable contact 146 mounted on the lower front door and adapted to engage with a fixed contact 147 in the respective primary circuit both when opening and closing this door.

When swinging the main casing forwardly or backwardly on the main base or supporting plate for the purpose of inspecting the rear part of the recording apparatus a record of such opening and closing and the time when this occurred may be effected by a primary switch shown in Fig. 9 and arranged in a primary circuit and comprising a movable contact 148 arranged on the inner side of the casing and adapted to engage a fixed contact 149 on the adjacent part of the base or back board both when moving the casing forwardly and also when moving the same rearwardly.

By means of this apparatus a positive operation of all of the perforating devices and the time stamping mechanism is assured and permits of producing a reliable record in every instance; furthermore each circuit and the working parts associated therewith are capable of performing their assigned functions without one interfering with the other, thereby insuring a record of the calls from the different stations or other points where the calls originate in the proper sequence and also at uniform distances apart between successive operations.

This apparatus taken as a whole is comparatively simple in construction considering the work it is designed to perform, the

same can be installed at comparatively low cost and the same is not liable to get out of order, thereby enabling the system to be used without undue interruption. It also provides a means for keeping perfect records of the movements of different patrolmen while on duty, it prevents falsifying of any of the records and if tampering with the records is attempted it is possible to readily detect the same.

I claim as my invention:

1. A recording apparatus comprising means for supplying a record sheet, means for producing a record on said sheet, means for feeding said sheet, and a carriage supporting said record producing means and adjustable transversely relatively to said sheet supplying and feeding means.

2. A recording apparatus comprising means for supplying a record sheet, means for producing a record on said sheet, means for feeding said sheet, and a carriage supporting said record producing means and adjustable transversely relatively to said sheet supplying and feeding means, a guide-way for said carriage, and an adjusting screw connecting said carriage with a relatively stationary part.

3. A recording apparatus comprising means for supplying and feeding a plurality of record sheets so that one is arranged in front of the other, and means for producing record perforations on said sheets from the rear or inner side of the inner sheet outwardly through the inner and outer sheets so that the record is visible on the outer side of said sheet.

4. A recording apparatus comprising means for automatically and intermittently supplying and feeding a plurality of overlying record sheets, means for producing multiple record impressions on one part of said sheets from one side thereof, and means for producing multiple record perforations on another part of said sheets from the opposite side thereof.

5. A recording apparatus comprising means for automatically and intermittently supplying and feeding a plurality of overlying record sheets, means for producing multiple record impressions on one part of said sheets from the front side thereof, and means for producing multiple record perforations on another part of said sheets from the rear side thereof.

6. A recording apparatus comprising means for automatically and intermittently supplying and feeding record sheets, means for producing impression records on one part of said sheet from one side thereof, and means for producing perforation records on another part of said sheet from the opposite side thereof.

7. A recording apparatus comprising means for automatically and intermittently

supplying and feeding record sheets, means for producing impression records on one part of said sheet from the front side thereof, and means for producing perforation records on another part of said sheet from the rear side thereof.

8. A recording apparatus comprising means for automatically and intermittently supplying and feeding record sheets, means for producing impression records on one part of said sheet from the front side thereof, means for producing perforation records on another part of said sheet from the rear side thereof and an inclosing casing for said sheet supplying and feeding means and provided with a front door having a notch which receives part of said means for producing impression records on said sheet.

9. A recording apparatus comprising means for presenting a recording sheet, a marking member for producing a mark on said sheet, a marking electro-motor for actuating said marking member, a locking switch arranged in a secondary electric circuit containing said marking electro-motor, a primary electric circuit containing a primary switch and a locking electro-motor which controls said locking switch, and means whereby the locking electro-motor of the primary circuit is retained in its operative condition and the opening of the primary circuit is prevented while the record sheet presenting means are in operation.

10. A recording apparatus comprising means for presenting a recording sheet, a marking member for producing a mark on said sheet, a marking electro-motor for actuating said marking member; a locking switch arranged in a secondary electric circuit containing said marking electro-motor, a primary electric circuit containing a primary switch and a locking electro-motor which controls said locking switch, a releasing electric circuit arranged around said primary circuit and containing a switch which is controlled by said marking electro-motor, and means whereby the locking electro-motor of the primary circuit is retained in its operative condition and the opening of the primary circuit is prevented while the record sheet presenting means are in operation.

11. A recording apparatus comprising a means for presenting a record sheet, a perforating member for producing a record perforation in said sheet, a stamping member for producing a record stamp on said sheet, a perforating electro-motor for operating said perforating member, a stamping electro-motor for operating said stamping member, a locking-in electric circuit containing a locking-in switch which is controlled by said primary electro-motor, a marking circuit containing said perforating and stamping electro-motors, and a releasing switch arranged in said locking-in

circuit and controlled by said perforating electro-motor.

12. A recording apparatus comprising a means for presenting a record sheet, a perforating member for producing a record perforation in said sheet, a stamping member for producing a record stamp on said sheet, a perforating electro-motor for operating said perforating member, a stamping electro-motor for operating said stamping member, a locking-in electric circuit containing a locking-in switch which is controlled by said primary electro-motor, a marking circuit containing said perforating and stamping electro-motor, and a releasing switch arranged in said locking-in circuit and controlled by said perforating electro-motor, a controlling electro-motor, an electric circuit containing said controlling electro-motor and said switch which is operated by the perforating electro-motor, a feed mechanism for feeding said record sheet having a feeding electro-motor for actuating said feed mechanism, and an electric circuit containing said feeding electro-motor and a switch which is operated by said controlling electro-motor.

13. A recording apparatus comprising a means for presenting a record sheet, a perforating member for producing a record perforation in said sheet, a stamping member for producing a record stamp on said sheet, a perforating electro-motor for operating said perforating member, a stamping electro-motor for operating said stamping member, a locking-in electric circuit containing a locking-in switch which is controlled by said primary electro-motor, a marking circuit containing said perforating and stamping electro-motors, and a releasing switch arranged in said locking-in circuit and controlled by said perforating electro-motor, a controlling electro-motor, an electric circuit containing said controlling electro-motor and said switch which is operated by the perforating electro-motor, a feed mechanism for feeding said record sheet having a feeding electro-motor for actuating said feed mechanism, an electric circuit containing said feeding electro-motor and a switch which is operated by said controlling electro-motor, a locking-in switch arranged in circuit with said perforating electro-motor and operated by said controlling electro-motor, and a releasing switch arranged in circuit with said controlling electro-motor and operated by said feeding electro-motor.

14. A recording apparatus comprising a primary main electric circuit containing a primary switch, an electric source and a primary locking-in electro-motor, a secondary main electric circuit containing a secondary locking-in electro-motor, a primary locking-in circuit extending across the primary

main circuit and containing a primary locking-in switch which is operated by said primary locking-in electro-motor, a secondary locking-in circuit extending across the
5 secondary main circuit and containing a secondary locking-in switch which is controlled by the secondary locking-in electro-motor, a marking member, a marking electro-motor for operating said marking member, a primary releasing switch arranged in
10 the primary locking-in circuit and operated by said marking electro-motor, a feed device for feeding a record sheet adapted to be operated upon by said marking member, a feeding electro-motor for actuating said
15 feed mechanism, a feeding electric circuit containing said feeding electro-motor and a switch which is operated by said secondary locking-in electro-motor, and a releasing
20 switch, operated by said feeding electro-motor and arranged in circuit with said secondary locking-in electro-motor.

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