M. BENON.

RECORDING MECHANISM.

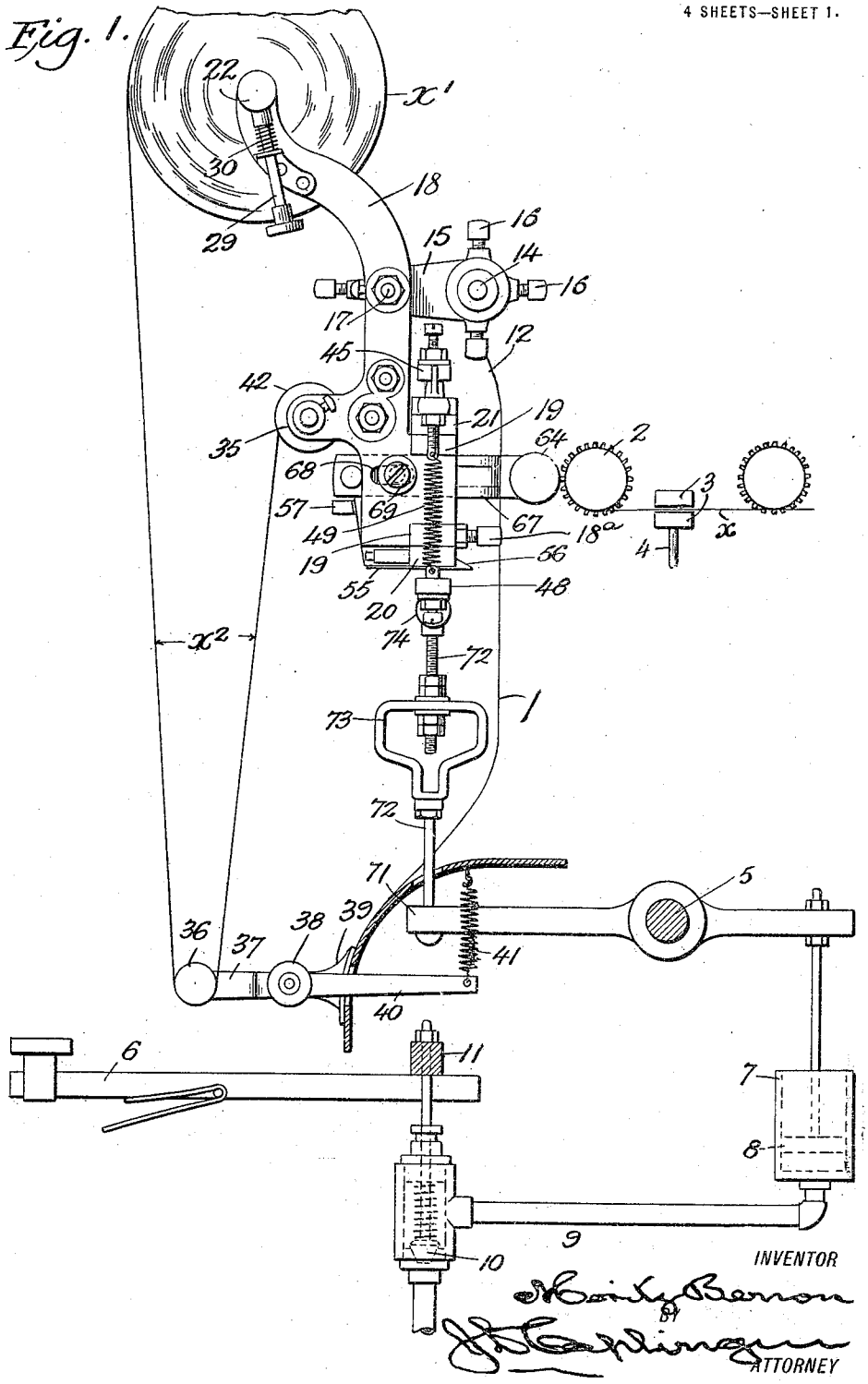
APPLICATION FILED JULY 28, 1917.

1,297,637.

Patented Mar. 18, 1919.

4 SHEETS—SHEET 1.

Fig. 1.



THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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4 SHEETS—SHEET 2.

Fig. 2.

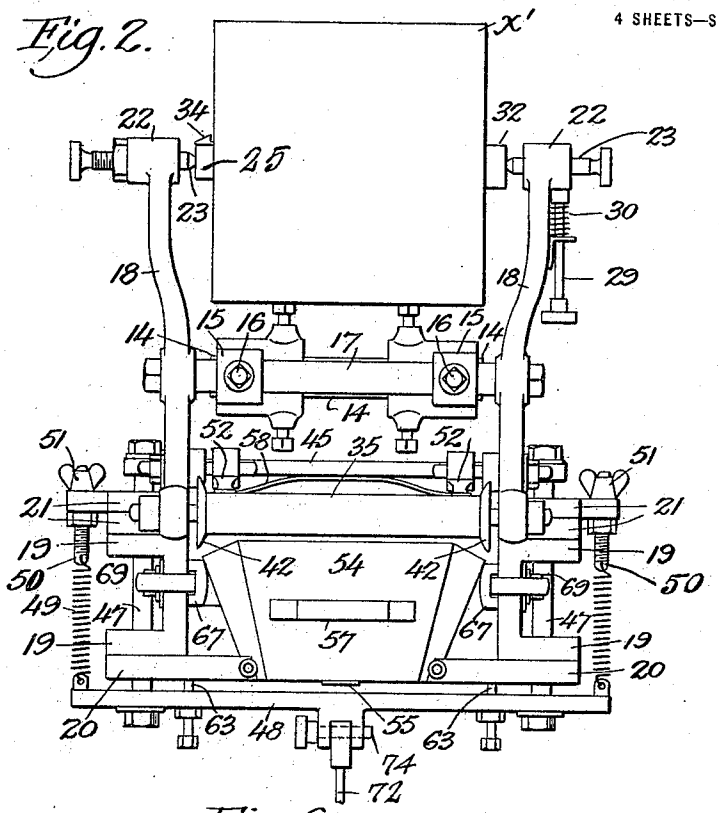


Fig. 6.

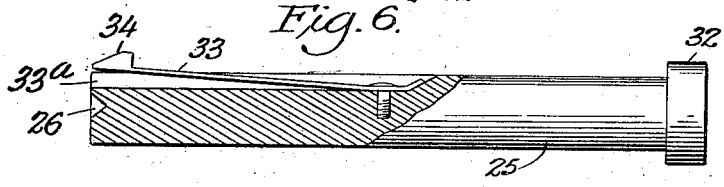


Fig. 7

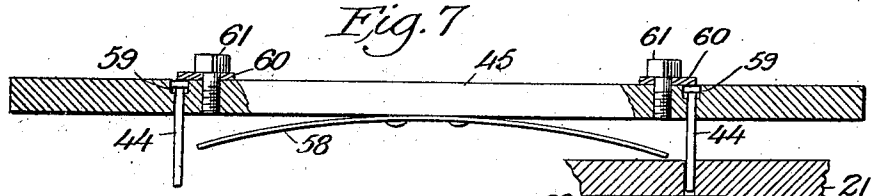
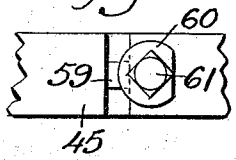


Fig. 8.



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4 SHEETS—SHEET 3.

Fig. 3.

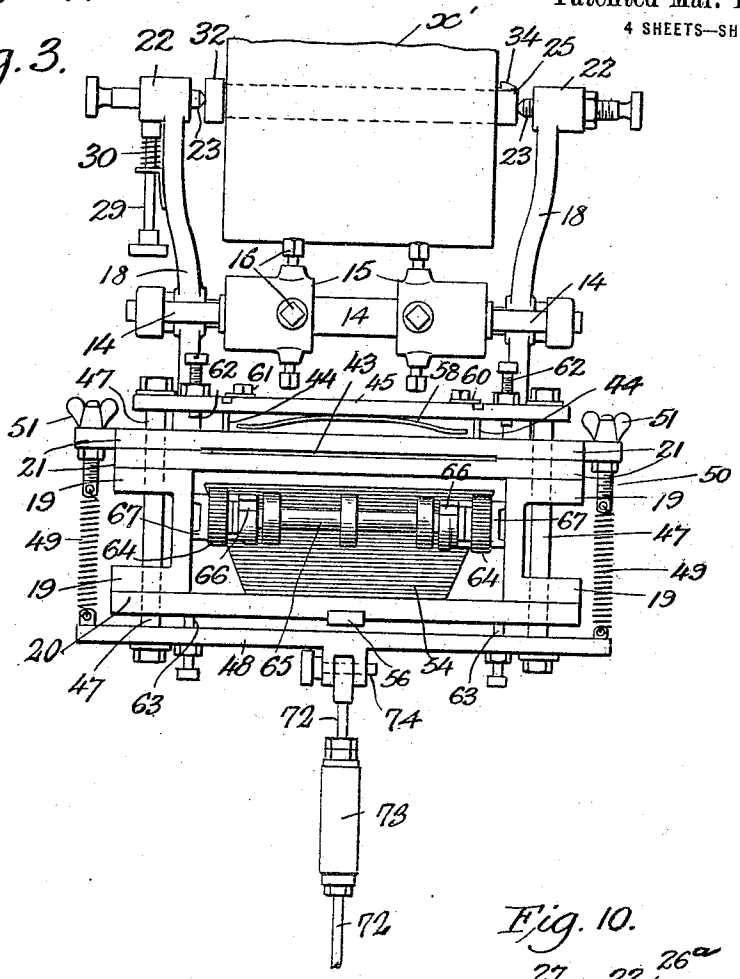


Fig. 10.

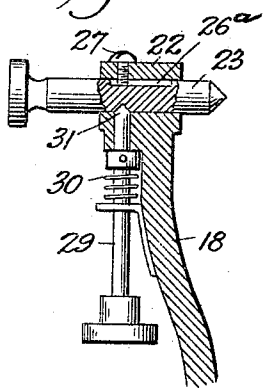
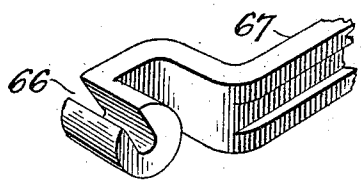


Fig. 9.



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4 SHEETS—SHEET 4.

Fig. 4.

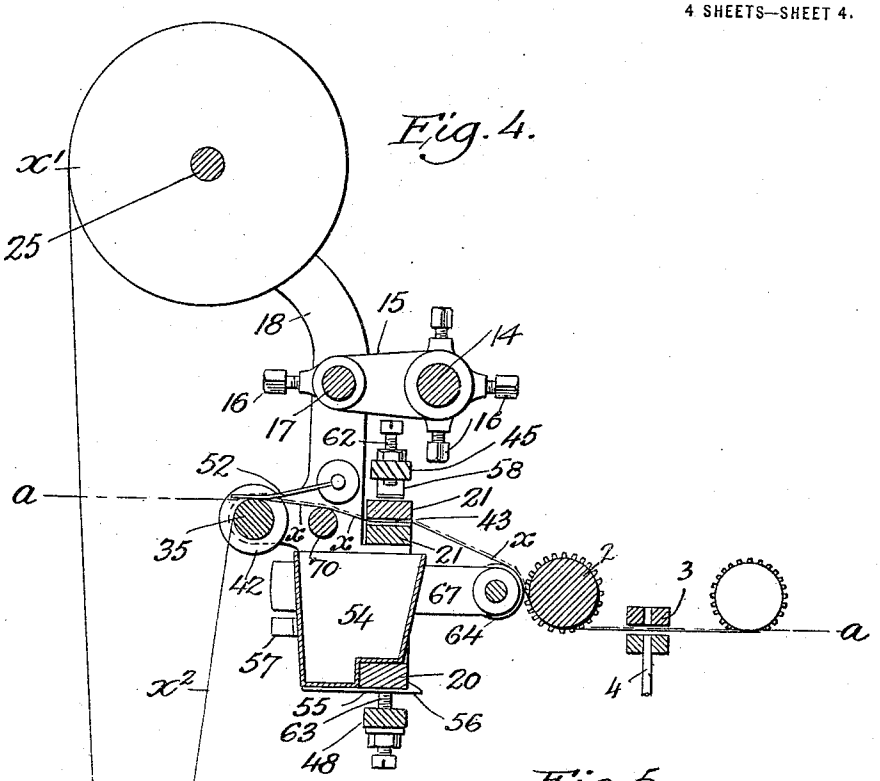
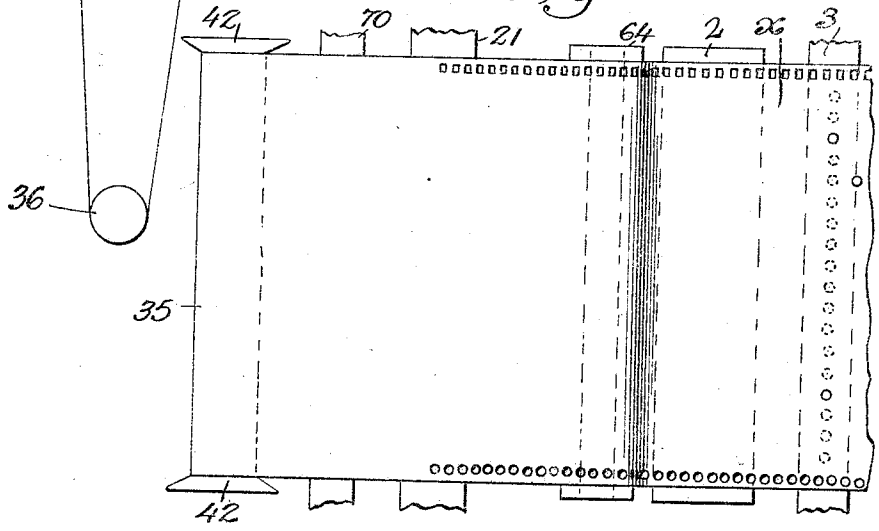


Fig. 5.



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UNITED STATES PATENT OFFICE.

MORITZ BENON, OF NEW YORK, N. Y., ASSIGNOR TO EMIL EKSTROM, OF GOTTENBORG, SWEDEN.

RECORDING MECHANISM.

1,297,637. Specification of Letters Patent. **Patented Mar. 18, 1919.**

Application filed July 28, 1917. Serial No. 183,233.

To all whom it may concern:

Be it known that I, MORITZ BENON, a citizen of the United States, and a resident of the city and State of New York, have invented certain Improvements in Recording Mechanisms, of which the following is a specification.

This invention relates to certain improvements in recording mechanisms, and more particularly in that class or type of such mechanisms which are more especially designed and adapted for employment in the production of successive records upon record sheets or strips such as are commonly used in connection with monotype type casting machines and the like, and the object of the invention is, in part, to provide a mechanism of this general character having means of a novel and improved description for assuring the uniform and regulated supply of the record sheet or strip to the recording means where such sheet or strip, as is customary, is supplied in roll form, whereby injury to the sheet or strip resulting from irregular or non-uniform unwinding of the same from the roll, and improper presentation thereof to the recording means, resulting in destruction of the feed apertures ordinarily provided, or insufficient spacing of the successive records, are effectively prevented; in part to provide feed aperture producing means of a novel and improved description, for use in connection with recording mechanisms such as are provided with feeding means engageable with feed apertures in the record strip or sheet, whereby such feed apertures may be produced in the previously unperforated strip or sheet in advance of such feeding devices or means to assure substantially perfect or absolute registry therewith and avoid not only loss of registry such as sometimes arises through expansion, contraction, or drying out of the previously perforated or apertured sheets or strips commonly employed, but also the increased cost arising from the expense involved in previously operating upon the sheet or strip for the production of the feed apertures therein, and in part, to a special embodiment of my improvements as an attachment capable of ready and convenient application to recording mechanisms commonly in use, so as to enable such mechanisms to be improved by the addition of either the improved regulating or supplying means, or said improved feed aperture producing means, or both, without material change or alteration of the mechanisms as at present in use.

The invention consists in certain novel features of the construction, and combinations and arrangements of the several parts of the improved recording mechanism, whereby certain important advantages are attained, and the mechanism is rendered simpler, less expensive, and otherwise better adapted and more convenient and effective for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In order that my improvements may be the better understood, I will now proceed to describe the invention with reference to the accompanying drawings, wherein—

Figure 1 is a side elevation of a recording mechanism embodying my invention, showing the application of my improvements to a monotype or similar recording machine by way of example, my said improvements being herein shown constructed as an attachment for such a recording machine, and certain of the operative parts commonly provided in such machines being represented diagraphically;

Fig. 2 is an elevation of the parts shown in Fig. 1, as viewed from the rear, the supply regulating or equalizing means being omitted;

Fig. 3 is a view somewhat similar to Fig. 2, but illustrating the attachment as viewed from the side opposite to that shown in Fig. 2;

Fig. 4 is a sectional view taken vertically and centrally through the improved recording mechanism showing certain features of the same which will be hereinafter described;

Fig. 5 is a sectional plan view taken horizontally through the improved recording attachment, showing features of construction to be hereinafter referred to, the plane of

the section being broken, as indicated by the line *a*—*a* in Fig. 4, so as to indicate the path of the record strip or sheet;

Fig. 6 is a detached detail view also partly in section, showing features of construction of the roll holder which will be hereinafter referred to;

Fig. 7 is a detached detail view also partly in section, illustrating features of the perforating means which will be hereinafter described;

Fig. 8 is a fragmentary detail view showing the means for holding the perforators removably in place upon the carrier of the perforating means;

Fig. 9 is a fragmentary perspective view showing features of construction of the bearings for the delivery roll of the attachment, and

Fig. 10 is a fragmentary sectional view showing features of construction of the detent provided for retaining the removable roll holder in position in the attachment.

In these views I have shown my improvements embodied in an attachment especially designed and adapted for use in connection with the recording mechanism of monotype type casting machines, but it will be apparent that the invention, while presenting important advantages when embodied in such an attachment, is not limited to this special application exclusively, but may with good results be constructed as an attachment for use in connection with machines of various other and different kinds or if desired, may be embodied as an integral part of the machine to which the improved perforating device is to be applied.

The recording mechanism to which my improvements are herein shown applied for use comprises a frame having spaced uprights, as 1, between which is supported for turning movement a driven feed sprocket 2, adapted for positive driving engagement with a record strip or sheet *x*, usually of paper, which in the machine to which I have herein shown my improvements applied is fed from a roll, ordinarily provided along and adjacent to its opposite lateral edges with parallel series of alined feed perforations, primarily formed in the strip before its application, in rolled form, to the recording machine, and adapted for engagement by the teeth of the driven spcoket wheel 2 in such a manner as to permit the latter to feed said strip accurately and intermittently to and between guides 3, 3, having alined vertically directed apertures adapted to be traversed by a series of punches, as 4, which are selectively operated as will be hereinafter explained, to produce along the central part of said strip *x*, between its oppositely arranged series of feed perforations, a perforated record conforming with the matter to be cast, so that after the completion of such record, said strip may be removed from the recording machine and applied to a casting machine having matrix shifting and casting devices adapted for operation in a substantially automatic manner under control of said record, to cast the desired matter in type form.

As herein shown, a chamber is provided between the frame uprights 1, adjacent to their lower parts, across which is extended a rock shaft 5 adapted to be rocked in any preferred manner at each depression of any one of the individual keys 6 of a key board which, in such machines as ordinarily constructed, comprises keys corresponding to the individual characters to be recorded, together with space controlling keys. The particular means employed for actuating the shaft 5 upon the depression of the several keys 6 is obviously immaterial to my invention. As herein shown, the desired operation is assured by the employment of a pneumatic cylinder 7, wherein is movable a piston 8, the stem of which is coupled with an arm on shaft 5 at one side of the frame, air under pressure being supplied to said cylinder from a supply pipe 9, under control of a valve 10, coupled with a universal bar 11 operable upon depression of either one of the several keys 6 at the key board to open said valve and admit air under pressure to said cylinder beneath the piston 8 so as to elevate the latter and rock the shaft 5 each time one of said keys 6 is manipulated, a spring or the like being provided for retracting the parts prior to the depression of the next succeeding key.

The recording punches 4, are operated selectively from or in unison with the rocking of shaft 5 under control of the individual keys 6 at the key board so as to produce the desired record in accordance with the order in which the individual keys are depressed, and the means for accomplishing this result are also immaterial to my present invention and may be such as are ordinarily employed in monotype recording machines, operable upon the depression of any particular key 6 to actuate the corresponding punch 4 exclusively from the rock shaft 5 in such a manner as to produce the desired record perforation in the strip *x* at an arbitrary point in the width thereof, as clearly indicated in Fig. 5 of the drawings. The feed sprocket wheel 2 will also be driven intermittently in unison or time with the depression of the keys 6 by any preferred means, in such a manner that a feeding impulse will be imparted to the strip *x* after the depression of each key 6, and corresponding operation of the related perforating punch 4, so as to present an unperforated part of said strip in position to be perforated upon the next succeeding operation of one of said series of punches 4.

In recording machines of this general character as heretofore constructed, the upper parts of the frame uprights have ordinarily been provided with alined bearings 12, adapted to receive a detachable roll support, whereon is replaceably mounted a roll of paper provided for the production of the record, said roll having been previously prepared with feed perforations parallel with its opposite lateral edges for engagement by the teeth of the feed sprocket 2, but in actual practice, certain disadvantages have arisen from the employment of such previously formed perforations, either on account of their lack of registry with the teeth of the feed sprocket through inaccuracy in the formation of said perforations as originally produced, or through expansion or contraction of the paper after their production, or from other causes, besides which the production of the feed perforations in the paper prior to its introduction into the machine is obviously a matter of greater or less expense, the avoidance of which assures an important economy and advantage in the operation of such machines.

In carrying out my invention, in order to avoid these disadvantages, I dispense with the preliminary perforation of the strip and supply an unperforated roll in lieu of the previously perforated roll commonly employed, said unperforated roll being supported in such a manner as to permit the unperforated strip or web of paper to be fed therefrom to a perforating device or means operable under control or in time with the key and feed mechanisms in such a way as to assure perforation of the strip for the production of one or more feed perforations upon the depression of each key of the key board or upon each successive operation of the recording punches 4, or of the intermittently driven feed sprocket, the perforating device employed for the production of such feed perforations being so constructed and arranged that the perforations are produced in the strip in accurate registry with the teeth of the feed sprocket so as to avoid tearing or injury to the strip due to insufficient registry, and said perforations being produced during the operation of the recording mechanism, so as to avoid loss of registry due to expansion or contraction of the paper, and the increased cost heretofore arising from separately operating upon the paper for the preliminary production of the feed perforations.

In the embodiment of my invention herein shown, the improved perforating device is constructed as an attachment capable of application to monotype recording machines as at present in use, for which purpose the attachment is provided with a transverse shaft or support 14, the ends of which afford journals removably engageable in the alined bearings 12, ordinarily provided for the reception of the roll support, so that the attachment may readily be applied to the machine without substantial or material modification of the latter. This method of connection of the attachment to the recording machine is obviously not material to my invention.

Between its journals, the shaft or support 14 is provided with alined arms 15, 15 adjustably mounted thereon and having at their extremities alined bearings, in which is adjustably held by means of set screws 16, or the like, a shaft or journal 17, extended transversely across the attachment between the spaced side frames 18, 18 thereof, to which said shaft or journal is fixedly secured at its extremities, by which means it will be apparent that the attachment is capable of a certain extent of adjustment vertically so as to position its operative parts in any desired relation to the feed sprocket 2 of the recording machine, it being apparent that angular adjustment of the arms 15 with regard to the shafts 14 and 17 is possible by proper manipulation of these parts and their set screws in such a manner as to raise or lower the attachment. The journals of the shaft or support 14 may be secured against movement in the bearings 12, of the recording machine in any preferred way, if this be desired as, for example, by means of nuts applied upon the ends of said shaft or support, and upon the spaced side frames 18, 18 of the attachment I have provided adjusting screws 18^a engageable with the spaced frame uprights 1, to position the attachment in a horizontal direction, it being apparent that by turning said screws they may be caused to project to a greater or less extent from the side frames 18 so as to position the operative parts of the improved perforating attachment farther from or nearer to the feed sprocket 2 of the recording machine, as may be desired.

The outer sides of the side frames 18, 18 of the improved attachment are provided at their lower parts with integral laterally projecting offset lugs or shoulders 19, 19 vertically alined and spaced apart from each other, cross bars or tie members 20 and 21 being attached at their opposite ends thereto so as to extend transversely across the frame of the attachment at its lower part one above the other, the uppermost of said bars or members, as 21, being as herein shown formed in upper and lower sections for convenience in the production between them of a narrow elongated passage 43 adapted to be traversed by the record strip x as will be hereinafter explained.

At their upper ends the side frames 18, 18 of the improved perforating attachment are provided with alined bearings 22 22 wherein are mounted adjustable pintles 23,

23 having tapered or conical extremities detachably engageable in axially alined recesses 26 at the opposite ends of a removable roll support 25 whereon the unperforated paper roll x^1 is removably supported, as clearly indicated in the drawings, so that the strip x may be withdrawn from said roll support gradually during the operation of the improved perforating device.

For convenience and as herein shown, the roll support 25 is provided at one end with a head or enlargement 32 affording an abutment against which one end of the paper roll x^1 is adapted to bear when applied upon said support, the other reduced end of said support being provided in one side with a longitudinal channel 33^a wherein is secured a spring retainer 33, the free extremity 34 of which is adjacent to the end of the roll support and is normally held by the tension of the spring material from which the retainer is produced, pressed outwardly from and beyond the side of said support, so that an inclined or beveled surface upon said extremity 34 is presented for contact with the paper roll when the same is being applied to the support, in order that the roll may readily be slipped in place upon the support over said beveled surface, while a shoulder upon said extremity 34 of the retainer at its side opposite to said beveled or inclined surface operates by engagement with the paper roll when the latter is in place upon the support, to prevent withdrawal of the roll therefrom except the extremity of the retainer be first pressed down into the channel 33^a as is permitted by its inherent elasticity.

One of the pintles 23 as herein shown is in the form of a screw longitudinally adjustable in the bearing 22 of the corresponding side frame of the attachment, so as to permit of being adjusted for positioning the roll support and unperforated paper roll carried thereby laterally of the attachment if this be desired, a lock nut being provided upon said screw for holding the same in adjusted position, and the other of said pintles 23 is formed as an endwise movable bolt having at one side a slot or recess 26^a extended lengthwise in it, engaged by a screw or pin 27 upon the bearing 22 of the related side frame 18, said pin or screw 27 operating as a stop to limit the endwise movement of the bolt and to prevent withdrawal of the same from the bearing. 29 represents a locking pin or detent pressed by a spring 30 endwise along an aperture in the bearing 22 and having a pointed extremity 31 engageable with a conical recess in the side of the bolt or pintle 23 so as to hold the latter against endwise movement when in position to engage the roll support 25, as clearly shown in Fig. 10. By withdrawing the detent 29 against the tension of its spring, the bolt 23 may be disengaged from the roll support to permit withdrawal of the latter from the attachment when one paper roll is exhausted and requires to be replaced.

As herein shown, the lugs 19, 19 project laterally from the side frames 18, 18 at that side of the attachment which in operation is nearer to the feed sprocket 2 of the recording machine, while at the opposite or rear side of the attachment said side frames 18, 18 are provided with integral alined bearings wherein is supported for free rotation a guide roll 35 over which the unperforated paper strip x is adapted to be supplied, and in order to equalize the tension upon said strip during its withdrawal from the roll x^1 and delivery to said guide roll 35 despite the intermittent operation of the feed sprocket 2 and the varying resistance offered by the paper roll on account of its gradually diminishing diameter, which is liable to tear the strip or its feed perforations, and to interfere with its gradual and regulated delivery from the roll x^1, I provide an equilizing means interposed between said roll x^1 and the guide roll 35 which as herein shown includes an equalizing roll 36 mounted to turn freely in the ends of arms 37 pivotally supported at 38 upon brackets 39 secured to the lower part of the spaced uprights 1, of the recording machine below the improved perforating attachment, or otherwise supported in such a manner that the strip from the paper roll x^1 may be drawn downwardly beneath said equalizing roll 36 and thence be led upwardly to and over the guide roll 35 in such a manner as to form a loop as indicated at x^2 in the drawings, the roll 36 being capable of a certain extent of vertical movement in such a manner as to tend to equalize the movement of the strip as the same is withdrawn from the roll x^1, and to compensate for the intermittent feeding impulses imparted thereto by the operation of the feed sprocket 2 while at the same time equalizing the strain and pull upon said strip as the same is drawn intermittently through the improved perforating attachment so as to avoid tearing of the feed perforations or breakage of the strip itself, as well as avoiding the unwinding from the roll x^1 of an excessive length of the strip such as would be likely to occur were the sharp and sudden intermittent feeding impulses imparted directly to the roll x^1 itself instead of being taken up by the loop x^2. The length of the loop x^2 and the precise manner in which the same is formed are, of course, immaterial to my present invention. As herein shown, one or both of the arms 37 which afford pivotal supports for the equalizing roll 36 have extensions 40 with which are coupled springs 41 the tension of which is exerted to

hold the roll normally depressed with an elastic pressure nicely calculated to compensate for the intermittent feeding impulses during which the strip is drawn through the attachment.

As herein shown, the guide roll 35 is provided adjacent to its opposite ends with circumferential flanges or projections 42, 42 the inner surfaces of which are beveled or tapered in such a manner as to be adapted, by engagement with the opposite lateral edges of the strip x, to guide and center the same with relation to the feed sprockets of the recording machine and the perforating means of the improved attachment as will be hereinafter explained, and 52, 52 represent springs which bear upon the lateral or edge portions of said strip opposite to the guide roll 35 in such a manner as to retard the travel of the strip x through the attachment and to place a desirable tension upon the same between said guide roll 35 and the feed sprocket 2, in such a manner as to eliminate the likelihood of occurrence of any slack or looseness of said strip such as might result in improper positioning or spacing of the feed perforations produced in said strip by the perforating means which in the embodiment of the invention herein shown, operates upon the strip during its travel from the guide roll 35 to said feed sprocket 2. An idler roll 70 is also positioned in the attachment adjacent to the guide roll 35 to assist in directing the strip therefrom to the perforating means which latter will presently be described. If desired, this roll 70 may be replaced by a fixed rounded bar or equivalent member, or may be dispensed with altogether.

From the roll or member 70 the strip x passes through the aperture 43 hereinabove referred to between the upper and lower sections of the uppermost tie member 21, which aperture is made of dimensions sufficient to accommodate the free passage of said strip so that in its travel through the attachment the strip will be held flush against the upper surface of the lower section of said tie member by reason of the tension exerted upon the strip by the operation of the leaf springs 52 hereinbefore referred to, and above said uppermost tie member 21 and also extended transversely of the attachment and of the strip x traversing the same is positioned a vertically movable punch carrier or support 45, alined with and normally spaced apart from said tie member 21, its opposite end portions being provided with separately formed detachably mounted punches 44, 44 the lower ends of which are pendent parallel with each other beneath said carrier 45 and are adapted to traverse vertical bores or passages 46 provided in alinement with each other through the spaced upper and lower sections of said tie member 21 when said carrier or support is depressed, in such a manner as to penetrate the strip x within the aperture 43 and adjacent to its opposite lateral edges for the production of the feed perforations therein.

The proportions and arrangement of the parts, as herein shown, are such that when in their normal inactive or elevated positions, the lower ends of the punches 44, 44, are engaged within the bores 46, 46 of the upper section of the tie member 21, and stand above and out of position for contact with the surface of the paper strip x traversing the aperture 43, said upper section of the tie bar 21 acting as a stripper to compel disengagement of the punches from said strip when the punches are retracted upwardly, so that said punches offer no interference to the feeding movement of said strip during the intervals intervening between successive depressions of said punches, the alinement of the bores 46 of the lower section of the member 21 with said punches assuring penetration of the strip lying flush upon said lower section when said punches are depressed, for the production of the feed perforations in said strip and being traversed by the particles of paper removed from said strip by said punches in the production of said perforations, which particles are thus discharged at the underside of the tie member 21.

54 represents a receptacle or drawer removably positioned between the tie members 20 and 21, open at its top to receive the particles punched from the strip and discharged at the underside of the upper member 21, said drawer being provided at its lower part with a spring retainer 55 having a shouldered extremity 56 engaged beneath the lower tie bar 20 in such a manner as to lock the receptacle or drawer securely thereto when inserted between the members 20 and 21. Upon depressing the shouldered end of the retainer 55 to disengage it from beneath the member 20, the drawer or receptacle may be removed from the attachment to permit of being emptied whenever necessary. A handle 57 is provided upon the rear side of said drawer to facilitate its removal.

47, 47 represent parallel guides connected with the opposite ends of the punch support or carrier and pendent beneath the same, their lower parts traversing alined apertures in the lugs or projections 19, 19 of the respective side frames of the improved attachment, so as to be adapted for endwise movement therethrough, and being connected below the lowermost tie member 20 with the opposite ends of a cross head 48 which is adapted for operation from or in time with the operation of the actuating means for the recording punches 4 of the monotype recording machine, by means which will be

presently described, in such a manner as to depress the punch support or carrier 45 in order that its punches 44, 44 may penetrate the strip x for the production of feed perforations therein at or for each individual actuation of the recording means, and 49, 49 represent springs whose lower ends have connection with the opposite extremities of said cross head and whose upper ends are adjustably connected with the extremities of the uppermost tie member 21 in such a way that the tension of said springs is exerted to elevate the cross head and punch support or carrier after each operation of the punches and to retain these parts normally in raised position with the lower ends of the punches 44, 44 free from the paper strip x and housed within the bores 46 of the upper section of said member 21 to permit free feeding movement of said strip after each punching operation. As herein shown each of said springs has its upper end coupled with the lower end of a screw 50 which is passed through an aperture in the end of the tie member 21 and is engaged with a wing nut 51 above said tie member by turning which wing nuts the screws may be moved vertically to adjust or regulate the tension of said springs individually or jointly.

58 represents an auxiliary retracting spring secured at its central part to the underside of the punch support or carrier 45, and having its arms bent downwardly in position to engage the uppermost tie member 21 when the punches are depressed for the production of the feed perforations in the strip, whereby the upward retraction of said punches and their disengagement from the strip is assured prior to the feeding movement of the latter. 62, 62 represent adjustable stops, herein shown in the form of screws mounted adjacent to the opposite ends of the punch carrier or support 45, with their tips projecting beneath the same and adapted for engagement with the upper tie member 21 of the attachment frame in such a way as to limit the descent of said punches when the cross head 48 is actuated, and 63, 63 represent similar adjustable stops also in the form of screws carried adjacent to opposite ends of said cross head and having their tips projecting above the same in position for engagement against the underside of the lower tie member 20 of the attachment frame in such a way as to limit the upward retracting movement of the parts and prevent the punches from being withdrawn completely from the bores 46 of the upper section of the upper tie member 21 upon upward movement of the punch support or carrier. By adjustment of these screws 62 and 63 the vertical movements of the punches may be regulated at will.

As herein shown, the respective punches 44, 44 and their bores or passages 46, 46 in the tie member 21 are distinctively formed or shaped, so as to be adapted for the production of distinctively different series of feed perforations along the opposite sides of the record strip x, and for convenience in replacing or substituting said punches, I have herein shown them detachably secured to the carrier or support 45, for which purpose the said carrier or support has its upper part provided with transverse grooves or recesses intersecting the passages for the shanks of said punches and adapted for the reception of squared or otherwise shaped heads or enlargements 59 at the upper ends of the latter, retainers 60 eccentrically pivoted upon the support or carrier 25 as indicated at 61 being adapted when turned to one position, to permit the free removal of the punches, and when differently turned, to engage the head 59 of the punch so as to hold the latter securely in place.

The means for operating the cross head 48 in time or synchronism with the keys 6 of the recording machine key board and their related record-making punches 4, may obviously be of any preferred kind, but as herein shown this means includes an adjustable connection pendent below the central part of the cross head and adapted for connection at its lower end with an arm 71 projecting rearwardly from the rock shaft 5, so that at each rocking movement imparted to said shaft upon the operation of one of the keys 6, the cross head is drawn downwardly and the punches 44, 44 are caused to penetrate the paper strip x for the production of the feed perforations therein. As herein shown, the actuating connection employed includes upper and lower members or stems 72, 72, alined with each other, one of said stems or members being apertured at its upper end for the passage of a removable pin or bolt 74, which traverses spaced apertured lugs centrally produced upon the underside of the cross head so as to afford detachable connection therewith, while the lower of said stems or members 72 is provided with a head or the like engaged beneath the arm 71 of the rock shaft 5 so that when said arm is depressed upon the rocking shaft ensuing upon depression of either of the keys 6 at the key board, the cross head 48 is also drawn downwardly, together with the punch carrier or support 45, to cause the punches 44, 44 thereof to penetrate the record strip for the production of the feed perforations therein. The actuating connection also includes a central member 73 with which each of said stems or members 72, 72 has jointed or universal connection, nuts being provided upon said members or stems 72, 72 engageable above and below the central member 73 by

which means the connection may be adjusted lengthwise to assure proper operation of the improved perforating attachment.

By this construction and arrangement of the parts it will be apparent that whenever a key 6 at the key board of the recording machine is depressed, the mechanical or other suitable connection of the punch actuating cross head 48 of the improved attachment with the recording mechanism will assure the operation of the punches 44, 44, to produce feed perforations in the record strip x immediately in advance of the feed sprocket 2, and said punches being alined with the teeth of said sprocket and the strip held with a uniform tension during the production of said feed perforations, it will be apparent that absolute registry of the feed perforations with the sprocket teeth will be assured and the possibility of loss of such registry due to expansion or contraction of the strip will be entirely done away with, while at the same time a material economy is attained by reason of the avoidance of any separate operations such as have heretofore been necessary for the preliminary perforation of the record strip.

After the depression of each key 6 at the key board of the recording machine, the feed sprocket 2 being actuated in the ordinary manner, serves to feed or draw the record strip not only past the record forming punches 4, but also to draw or feed said strip to exactly the necessary extent past the punches 44, 44 of the perforating attachment, so that the spacing of the feed perforations produced upon successive operations of the punches 44, 44 will conform accurately to the toothing of the feed sprocket in order that the likelihood of subsequent tearing of the feed perforations may be avoided, while at the same time the employment of the equalizing means including the looping roll 36 between the paper roll x^1 and the guide roll 35 avoids excessive unwinding or jerking of the strip from the paper roll incident to the intermittent character of the feed, as well as such pull or draft upon the strip as might interfere with uniform operation of the tensioning means 52 or result in tearing of the feed perforations.

The employment of the equalizing means including said looping roll 36 also permits of using in the recording machine a paper roll of considerably greater diameter than is possible of employment where such equalizing means are omitted, it being apparent that where the strip is unwound from said roll in a graduated and regular or comparatively continuous manner, irrespective of the intermittent character of the feed, the roll may be of much greater size than is possible of employment where, as heretofore, the feeding impulses are imposed directly upon the roll to unwind the same intermittently. It will thus be apparent that the equalizing means is possessed of advantages and functions which may in some cases render the same desirable for employment independently of the improved perforating means, and for this reason I do not desire to be understood as limiting myself to the use of said equalizing means exclusively in connection with the perforating means herein shown.

In order to deliver the perforated strip accurately to the feed sprocket 2 of the recording machine from the perforating means including the punches 44, 44, I have herein shown the improved attachment provided with a delivery roll or member 65 herein shown provided with spaced plural rubber or other surfaced enlargements 64, 64, over which the perforated strip x is adapted to pass to the feed sprocket 2, said enlargements being alined and adapted for contact with or pressure upon the toothed parts of the sprocket wheel so as to assure the delivery of the newly perforated strip or web thereto. The rubber surfaced enlargements 64, 64 are spaced to engage the strip x in line with the feed perforations thereof and their yielding surfaces permit the penetration of the teeth of the feed sprocket slightly thereinto to assure registry of said teeth with the feed perforations of said strip.

As herein shown the delivery member has reduced portions affording journals which are mounted to turn freely in open bearings 66, 66 upon the bent forward ends of carriers 67, 67, mounted upon the respective spaced side frames 18, 18 of the attachment, and capable of adjustment lengthwise or toward and from the feed sprocket to permit of positioning the delivery roll or member at a greater or less distance beyond the frame of the attachment and thus assure proper delivery of the newly perforated strip to said sprocket. The side frames 18, 18 are herein shown provided with slots 68, 68 traversed by bolts or screws 69 on the carriers 67, 67, which screws or bolts may be loosened to permit endwise adjustment of the carriers or tightened to hold them in adjusted position. The adjustability of the delivery roll, and the various adjustments hereinbefore referred to whereby the attachment frame may be desirably positioned upon the frame of the recording machine are features of material importance in the embodiment of the invention herein shown, since they permit the delivery roll or equivalent part of the attachment to be positioned in any desired relation to the feed sprocket 2 to assure accurate delivery of the newly perforated record strip thereto.

From the above description of my inven-

tion it will be apparent that the improved perforating device constructed according to my invention is of an extremely simple and comparatively inexpensive nature, and is particularly well adapted for use by reason not only of the economy attained by dispensing with the employment of previously perforated paper rolls for the production of records, but also by reason of the accuracy with which the perforations are produced in the record strip without liability of loss of registry through expansion or contraction of the paper, and the avoidance of liability of tearing or otherwise impairing the feed perforations or breaking the strip due to the employment of the improved equalizing and tensioning means, and it will also be obvious from the above description of my invention that the device is susceptible of considerable modification without material departure from the principles and spirit of the invention, as defined in the appended claims, and for this reason I do not desire to be understood as limiting myself to the precise formation and arrangement of the several parts of the device as herein set forth in carrying out my invention in practice.

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

1. In recording mechanism, the combination of recording means, driven feeding means for impelling a record sheet past said recording means and including a member engageable with feed apertures in said sheet, and means actuated simultaneously with said recording means, operable to produce said feed apertures in said sheet.

2. In recording mechanism, the combination of distinctively actuated recording means operable to produce successive distinctive records in a record sheet, feeding means engageable with feed apertures in the record sheet to feed the same past the recording means, and means actuated concurrently with said recording means operable to produce feed apertures in said record sheet.

3. In recording mechanism, the combination of distinctively actuated recording means operable to produce successive distinctive records in a record sheet, means actuated in concomitant relation to the recording means, operable to produce feed apertures in said record sheet, and feeding means engageable with said feed apertures of the record sheet and operable to move said sheet past the recording means and also past said feed aperture producing means.

4. In recording mechanism, the combination of distinctively actuated recording means operable to produce successive distinctive records in a record sheet, a support for said sheet in roll form, feeding means engageable with said sheet to move the same from said roll past the recording means, and equalizing means operable upon the record sheet below both said feeding means and said roll support to compensate for irregularity in advance of the feeding action of said feeding means.

5. In recording mechanism, the combination of distinctively actuated recording means operable to produce successive distinctive records in a record sheet, a support for said sheet in roll form, feeding means engageable with said record sheet to move the same past the recording means, and tensioning means composed of fixed and movable members engageable with said record sheet between the recording means and said roll support, and operable to place the record sheet under a pre-determined tension during its movement past the recording means.

6. In recording mechanism, the combination of distinctively actuated recording means operable to produce successive distinctive records in a record sheet, a support for said sheet in roll form, feeding means engageable with said record sheet to move the same past the recording means, equalizing means operable upon the record sheet remotely from said feeding means and the roll support to compensate for irregularity in the feeding action of the feeding means, and tensioning means engageable with said sheet above said equalizing means and the feeding means and operable to place the record sheet under a pre-determined tension during its movement past the recording means.

7. In recording mechanism, the combination of distinctively actuated recording means operable to produce distinctive successive records in a record sheet, a support for said sheet in roll form, feeding means engageable with feed apertures in the record sheet to move said sheet past the recording means, means actuated contemporaneously with the recording means operable on said sheet between the feeding means and said roll support to produce feed apertures in said sheet, and equalizing means operable upon the record sheet between said feed aperture producing means and the roll support to compensate for irregularity in the feeding action of said feeding means.

8. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, a support for the record in roll form, feeding means engageable with feed apertures in the record sheet to move the same past the recording means, means operable upon said sheet between said feeding means and the roll support to produce feed apertures in said sheet, while said records are being formed therein and equalizing means operable upon the sheet, remotely from both said feed aperture producing means and the

roll support to compensate for irregularity in the feeding action of said feeding means.

9. In recording mechanism, the combination of distinctively actuated recording means operable to produce distinctive successive records upon a record sheet, a support for said sheet in roll form, feeding means engageable with feed apertures in the record sheet to move the same past the recording means, means actuated in timed relation to the recording means operable on said sheet between the feeding means and said roll support to produce feed apertures in said sheet, tensioning means engageable with the sheet between the feed aperture producing means and the roll support, operable to place said sheet under a pre-determined tension during its movement past said feed aperture producing means, said tensioning means consisting of a fixed element combined with a movable member, and equalizing means operable upon the record sheet below said member and the roll support to compensate for irregularity in the feeding action of the feeding means.

10. In recording mechanism, the combination of distinctively actuated recording means operable to produce successive distinctive records upon a record sheet, a support for said sheet in roll form, feeding means engageable with feed apertures in the record sheet to move the same past the recording means, means actuated concomitantly with the recording means operable to produce feed apertures in said sheet between the feeding means and the roll support, and equalizing means operable upon the record sheet to compensate for irregularity in the action of said feeding means including a yieldingly supported equalizing roll engageable in a loop of said record sheet extending downwardly from the support thereof a considerable distance below said feed aperture producing means.

11. In recording mechanism the combination of recording means operable to produce successive distinctive records upon a record sheet, a support for the record sheet in roll form, feeding means engageable with feed apertures in the record sheet to move the same past the recording means, means actuated simultaneously with the recording means operable upon the margins of said sheet between said feeding means and the roll support to produce feed apertures in said sheet, and tensioning means engageable with said sheet between the roll support and said feed aperture producing means and operable to place the record sheet under a pre-determined tension during its movement past said feed aperture producing means.

12. In recording mechanism the combination of distinctively actuated recording means operable to produce distinctive successive records upon a record sheet, a support for the record sheet in roll form, feeding means engageable with feed apertures in the record sheet to move the same past the recording means, means actuated in timed relation to the recording means operable upon the record sheet between the roll support and said feeding means to produce feed apertures in said sheet, and tensioning means consisting of stationary elements bearing upon the edges of said sheet and coacting with a rotatable member thereunder; between the roll support and said feed aperture producing means and operable to place the record sheet under a pre-determined tension during its movement past said feed aperture producing means.

13. In recording mechanism the combination of distinctively actuated recording means operable to produce distinctive successive records upon a record sheet, a support for the record sheet in roll form, feeding means engageable with feed apertures in the record sheet to move the same past the recording means, means actuated in timed relation to the recording means operable upon the record sheet between the roll support and said feeding means to produce feed apertures in said sheet, tensioning means engageable with said sheet between the roll support and said feed aperture producing means and operable to place the record sheet under a pre-determined tension during its movement past said feed aperture producing means, said tensioning means including a curved member under said sheet coacting with resilient elements bearing flatwise upon the edges of the latter, and equalizing means operable upon the record sheet between said member and the roll support to compensate for irregularity in the action of the feeding means.

14. In recording mechanism the combination of recording means operable upon a record sheet to produce successive distinctive records therein, and alternately actuated devices, one of which is operable simultaneously with said recording means and adapted to produce feed apertures in said record sheet and the other of which is engageable with the feed apertures produced in said sheet to feed the latter past the recording means whereby said mechanism is caused to perform its several functions during a two-step operation.

15. In recording mechanism, the combination of recording means operable upon a record sheet to produce successive distinctive records therein, two devices, one of which is operable to produce feed apertures in the record sheet and the other of which is engageable with the feed apertures in said sheet to move the latter past the recording means, and means for actuating said devices first to produce feed apertures in the sheet and afterward to feed the sheet past said

recording means, said actuating means being functioned to operate said aperture producing device simultaneously with the recording means and said feeding device alternately therewith.

16. In recording mechanism, the combination of recording means operable upon a record sheet to produce successive distinctive records therein, two devices, one of which is operable concurrently with said recording means and adapted to produce feed apertures in the record sheet and the other of which is engageable with the feed apertures in said sheet to move the latter past the recording means, and intermittently operable means for actuating said devices alternately first to produce said feed apertures and said records simultaneously in the record sheet and afterward to feed said sheet past the recording means.

17. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, and devices operable upon the record sheet at different points and levels in its travel, operable first to produce a series of feed apertures in the sheet contemporaneously with said records and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means.

18. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, devices operable upon the record sheet at different points in its travel, operable first to produce a series of feed apertures in the sheet simultaneously with the production of said records and afterward by engagement with the feed apertures so produced, to move said sheet past the recording means, a support for the record sheet in roll form, elevated above said devices and equalizing means located below the latter and in substantial alinement with said support operable upon the sheet between the roll support and said feeding device to compensate for irregularity in the operation of the latter.

19. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, devices operable upon the record sheet at different points in its travel, operable first to produce a series of feed apertures in the sheet simultaneously with the production of the records therein and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means, a support for the record sheet in roll form, and tensioning means operable upon the sheet oppositely to the direction of movement thereof between the roll support and the feeding means to place said sheet under a pre-determined tension during its travel past the feed aperture producing device.

20. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, devices engageable with the record at different points in its travel, operable first to produce a series of feed apertures in the sheet and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means, a support for the record sheet in roll form, tensioning means operable upon the sheet to smooth down the edges thereof between the roll support and the feeding device while placing said sheet under a pre-determined tension during its travel past the feed aperture producing means, and equalizing means operable upon opposite stretches of the sheet between the roll support and the tensioning means to compensate for irregularity in the action of the feeding device.

21. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, and devices controlled from said key actuated means operable upon the record sheet at different points in its travel, first to produce a series of feed apertures in said sheet contemporaneously with the production of the records therein and afterward, by engagement with the feed apertures so produced to move the record strip past the recording means.

22. In recording mechanism, the combination of recording means operable to produce successive distinctive records in a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable at different points in the travel of said sheet first to produce feed apertures therein concurrently with the production of said records and afterward, by engagement with the feed apertures so produced, to move the record sheet past said recording means, a support for the record sheet in roll form, and equalizing means operable upon stretches of the record sheet below both the roll support and the feeding means to compensate for irregularity in the movement of said sheet.

23. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable at different points in the travel of said sheet first to produce a series of feed apertures simultaneously with the production of the records therein and afterward, by engagement with the feed apertures so produced, to move the record sheet

past said recording means, a support for the record sheet in roll form, and tensioning means operable by engagement with said sheet between the roll support and above said feeding device to place said sheet under a pre-determined tension during its travel past the feed aperture producing device.

24. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable at different points in the travel of said sheet first to produce a series of feed apertures concomitantly with the records in said sheet and afterward, by engagement with the feed apertures so produced, to move the record sheet past said recording means, a support for the record sheet in roll form, tensioning means operable by engagement with said sheet between the roll support and said feeding device to place said sheet under a pre-determined tension during its movement past the feed aperture producing device, and equalizing means engageable with the sheet below both said roll support and the tensioning means to compensate for irregularity in the action of the feeding device.

25. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, and intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel first to produce a series of feed apertures in said sheet concomitantly with said records and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means, said key actuated means controlling the operation of the feed aperture producing device simultaneously with that of the recording means and alternately with relation to the feeding device.

26. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel first to produce a series of feed apertures concurrently with the records in said sheet and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means, whereby the production of the feed apertures and records and the feeding of the sheet are effected in a two-step operation, a roll support, and equalizing means operable upon said sheet between the roll support and said feeding device to compensate for irregularity in the action of the latter.

27. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel first to produce a series of feed apertures contemporaneously with the records in said sheet and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means, a roll support, and tensioning means located forwardly below the latter operable by engagement with the record sheet between the roll support and said feeding device to place said sheet under a pre-determined tension and smooth down the edges thereof prior to conducting the same past said feed aperture producing device.

28. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel first to produce a series of feed apertures simultaneously with the records in said sheet and afterward, by engagement with the feed apertures so produced, to move said sheet past the recording means, a support for the record sheet in roll form, tensioning means operable upon the sheet beneath the roll support and above the feeding device to place said sheet under a pre-determined tension during its travel past the feed aperture producing means, and equalizing means operable upon the sheet below both the roll support and the tensioning means to compensate for irregularity in the action of the feeding device.

29. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable upon the record sheet at different points in its travel first to produce feed apertures therein simultaneously with the operation of the recording means, and afterward, by engagement with the feed apertures so produced in said sheet, to move the latter past the recording means and also past said feed aperture producing means, and a member interposed between the feed aperture producing device and the sheet feeding device serving to carry the record sheet from the former against the latter.

30. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable upon the record sheet at different points in its travel first to produce feed apertures therein conjointly with the operation of the recording means, and afterward, by engagement with the feed apertures so produced in the sheet, to move the latter past the recording means and also past said feed aperture producing means, a support for the record sheet in roll form, equalizing means operable upon the record sheet between the roll support and the feeding means to compensate for irregularity in the movement of said sheet, and a delivery member between the feed aperture producing device and the sheet feeding device operating to guide the record sheet from one to the other of said devices.

31. In recording mechanism, the combination of the recording means operable to produce uccessive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable upon the record sheet at different points in its travel first to produce feed apertures therein simultaneously with the operation of the recording means, and afterward, by engagement with the feed apertures so produced in the sheet, to move the latter past the recording means and also past said feed aperture producing means, a support for the record sheet in roll form, tensioning means operable by engagement with the sheet to place the same under a pre-determined pressure during its movement, and a rotatable delivery member adjustably positioned between the feed aperture producing device and the sheet feeding device and operating to guide the apertured edges of the sheet against the latter named device.

32. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, devices controlled from said key actuated means operable upon the record sheet at different points in its travel first to produce feed apertures therein, and afterward, by engagement with the feed apertures so produced in the sheet, to move the latter past the recording means and also past the feed aperture producing means, a support for the record sheet in roll form, tensioning means operable by engagement with the record sheet between the roll support and said feed aperture producing device, to place said sheet under a pre-determined tension, equalizing means engageable with the sheet between the roll support and the tensioning means to compensate for irregularity in the action of the feeding device, a delivery roller between said devices operating to guide the sheet from the feed aperture producing device onto the sheet feeding device, and means for regulating the pressure of said roller against the device last mentioned.

33. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel first to produce feed apertures therein, and afterward, by engagement with the feed apertures so produced in the sheet, to move the same past the recording means and also past the feed aperture producing device, and an intermediate member operating to guide and deliver the apertured sheet from the feed aperture producing device onto the sheet feeding device.

34. In recording mechanism, the combination of recording means operable to produce successive distinctive records in a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel first to produce feed apertures therein simultaneously with the operation of the recording means, and afterward, by engagement with the feed apertures so produced in the sheet, to move the latter past the recording means and also past the feed-aperture producing device a support for the record sheet in roll form, equalizing means operable upon the record sheet between the roll support and the feeding device to compensate for irregularity in the action of the latter, and a roller between said intermittently actuated devices operating to deliver the record sheet from the feed aperture producing device onto the sheet feeding device.

35. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel, first to produce feed apertures therein, and afterward, by engagement with the feed apertures so produced in the sheet, to move the latter past the recording means and also past the feed aperture producing device, a support for the record sheet in roll form, tensioning means operable by engagement with the sheet located to one side of

the feed aperture producing device and serving to place the record sheet under a predetermined tension during its movement, and a delivery roller positioned at the other side of the latter named device operating to guide the sheet therefrom onto the sheet feeding device.

36. In recording mechanism, the combination of recording means operable to produce successive distinctive records upon a record sheet, key actuated means in controlling relation to said recording means, intermittently actuated devices controlled from said key actuated means and operable alternately upon the record sheet at different points in its travel, first to produce feed apertures therein, and afterward, by engagement with the feed apertures so produced in the sheet, to move the latter past the recording means and also past the feed aperture producing device a support for the record sheet in roll form, tensioning means operable by engagement with the record sheet between the roll support and said feed aperture producing device, to place said sheet under a predetermined tension, equalizing means engageable with the sheet between said roll support and the tensioning means to compensate for irregularity in the action of the feeding device, a yielding roller between said intermittently actuated devices operating to deliver the record sheet from the feed aperture producing device onto the sheet feeding device, and means for regulating the pressure of said roller against said sheet feeding device so as to insure registry of the sheet therewith.

37. An attachment applicable to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms of the latter, frame elements, a support for the record strip in roll form carried thereby, a feed aperture producing device maintained in operative position relatively to said elements, and adjustable means sustaining the elements from said members with respect to said mechanisms to accommodate the delivery of the strip thereto.

38. An attachment applied to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms pertaining thereto, frame elements including a support for the record strip, a feed aperture producing device operatively positioned on said elements, means for sustaining the latter in offset relation to said members, and means for adjusting the elements to accommodate said device with respect to the feeding mechanism.

39. An attachment to the frame work of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements including a support for the record strip, a feed aperture producing device operatively guided from said elements, arms adjustably carrying the latter from said framework, and means coacting with said arms to locate the elements for accommodating said device with respect to the feeding mechanism.

40. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, a support disposed transversely of said members, a pair of arms adjustably held by their inner ends from said support, spaced frame elements suspended from the outer ends of said arms, a feed aperture producing device operatively guided by said elements, and means acting upon the latter beyond their point of suspension so as to place them in position to accommodate said device to the feeding mechanism.

41. An attachment to the framework of a recording machine, comprising in combination with the recording and strip feeding mechanisms pertaining thereto, a transversely disposed support at the upper end of said framework, a pair of arms having individual adjustment on said support at their inner ends, a distance-piece extending between the outer ends of said arms, vertically adjustably frame elements suspended from said piece, a feed aperture producing device operatively mounted on said elements, and means serving to space one end of the latter from the framework to accommodate said device to the feeding mechanism.

42. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms pertaining thereto, frame elements sustained from said members, a feed aperture producing device guided by said elements, an equalizing appliance carried to one side of said device, and a support for the record strip in roll form overhung from the frame elements in substantial alinement with said appliance, whereby the strip unreeled from said support is conveyed to the feed aperture producing device in a loop extending beyond the latter.

43. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements adjustably held in offset relation to said members, a support for the record strip in roll form overhung in the same direction as said elements from the frame members, a feed aperture producing device operatively guided in the frame elements to the side thereof adjacent to the members, and an equalizing appliance located in substantial alinement with said support at the opposite side of the frame elements, the arrangement being such that said device can be accommodated to said mechanisms without

affecting the course of the unreeled strip to the same from the roll support and said appliance.

44. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements held in offset relation to said members, a feed aperture producing device operatively guided by said elements at one side thereof, a support for the record strip in roll form overhanging the latter on the opposite side, a tensioning means for the strip disposed at the same side of the elements, and an equalizing appliance below both said roll support and said means acting intermediately upon the strip passing therebetween.

45. An attachment to the frame members of a recording mechine, comprising in combination with the recording and strip feeding mechanisms thereof, vertically adjustable frame elements held in offset relation to said members, a feed aperture producing device guided by said elements between the latter and the frame members, a support for the record strip in roll form overhung from the frame elements on the side thereof remote from said device, tensioning means located at the same side of the elements beneath said support, an equalizing appliance disposed below said means conveying the unreeled strip thereto from the roll support, and means acting to space the elements from the members thereby accommodating the delivery of the strip from the feed aperture producing device to said mechanisms without affecting the operative relation of the support, the tensioning means, and said appliance.

46. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements held from said members, a feed aperture producing device guided by said elements, a yieldably faced delivery roller arranged to receive the recording strip from said device, and means for adjusting said roller relatively to the feeding mechanism.

47. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a feed aperture producing device guided by said elements, arms extending from the latter, a double-faced roller journaled in said arms in position to engage the edges of the record strip perforated by said device, and means for individually adjusting the arms with relation to the frame elements to accommodate either face of the roller to a corresponding part of the feeding mechanism.

48. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements adjustably suspended from said members, a feed aperture producing device operatively mounted on said elements, individually adjustable arms carried by the latter, a roller journaled in said arms and having yielding portions adapted to contact with corresponding parts of said feeding mechanism, and means for adjusting the elements relatively to the frame members, whereby said portions of the roller may accommodate the record strip perforated by said device to the feeding mechanism independently of the adjustment of the arms.

49. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms pertaining thereto, frame elements sustained from said members, a feed aperture producing device guided by said elements to one side thereof, a support for the record strip in roll form overhanging the opposite side of the frame elements, an equalizing appliance under which the strip passes remotely from said support, and tensioning means located between the latter and said appliance, said means including a flanged roller on the same side of the elements adapted to guide the strip passing thereover from the equalizing appliance and a pair of flat springs bearing on the edges of the strip prior to their being perforated by said device.

50. An attachment to the framework of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from the upper part of said framework, said elements including at one side a support for the record strip in roll form, a feed aperture producing device on the opposite side, a tensioning means for the strip, and an equalizing appliance located in substantial alinement with said support remotely below it and said means, said appliance consisting of a lever fulcrumed at the lower portion of the framework, said lever carrying a roller under which the unreeled strip passes from the roll support to the tensioning means and being provided with a spring designed to augment the pressure of said roller upon the strip.

51. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a feed aperture producing device guided by said elements, a tensioning means disposed substantially opposite said device on the frame elements, an equalizing appliance located remotely below said means, and a support for the strip in roll form extending up from the elements above the tensioning means, the arrange-

ment being such that the unreeled strip from the roll passes to the means under said appliance, said support including retaining means for holding the roll thereon and pintles detachably engaging the ends of the roll support.

52. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a support for the record sheet in roll form extending from said elements, and a feed aperture producing device arranged for simultaneous operation with the recording mechanism, said device including guides movable in the frame elements, a carrier joining said guides, punches held from said carrier in position to perforate the edges of the strip for engagement by the feeding mechanism.

53. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a support for the record strip in roll form extending from said elements, a feed aperture producing device including guides movable in said elements, carriers joining said guides, and punches depending from one of said carriers in position to perforate the edges of the strip for engagement with the feeding mechanism, and means connecting up the other one of said carriers so as to operate said device in timed relation with the recording mechanism.

54. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a support for the record strip in roll form extending from said elements, a feed aperture producing device guided by the latter and including a carrier for the strip perforating punches, connections actuating said carrier in one direction simultaneously with the operation of the recording mechanism, and resilient means restoring the carrier after each actuation so that the strip may subsequently be delivered to the feeding mechanism.

55. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms pertaining thereto, frame elements sustained from said members, a support for the record strip in roll form, a feed aperture producing device guided by the latter and operated in timed relation with the recording mechanism, said device including a carrier holding the punches adapted to perforate the edges of the strip, connections positively actuating said carrier in one direction, and springs acting to reset the carrier after each actuation, one of said springs being adustable so as to enable the return movement of the carrier to be regulated.

56. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms pertaining thereto, frame elements sustained from said members, a support for the record strip in roll form, a feed aperture producing device yieldingly connected to operate in timed relation to the recording mechanism, said device including a carrier with perforating punches for the edges of the strip, a tie between the frame elements affording a guide for said punches, and means for limiting the movement of said carrier relatively to said tie.

57. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained by said members, a feed aperture producing device including a carrier frame reciprocable in said elements, punches operated by said carrier frame to perforate the edges of the record strip, a tie across the frame elements affording a passageway for the strip and guides for said punches, yielding means for reciprocating the carrier frame, and adjustable stops serving to limit the reciprocation of the latter with respect to said tie.

58. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a feed aperture producing device including a reciprocable punch carrier, a guide for the punches of the latter affording a passageway for the strip, a tensioning means located at one side of said guide above the passageway therein, and a roller receiving the strip from said passageway below the same on the opposite side of the guide in position to deliver the perforated strip to the feeding mechanism.

59. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a feed aperture producing device including a reciprocable carrier mounted on said elements, punches for perforating the edges of the strip operated in a downward direction by said carrier, a guide for said punches affording a discharge for the punchings from the strip, and a receptacle arranged to receive the punchings from said guide.

60. An attachment to the frame members of a recording machine, comprising in combination with the recording and strip feeding mechanisms thereof, frame elements sustained from said members, a feed aperture producing device guided by said elements

and including a guideway for the strip, a tensioning means for the latter located at one side of said guideway, and a supporting member arranged to guide the strip on an incline intermediately of said means and said device.

In witness whereof I have hereunto signed my name this 2d day of April, 1917, in the presence of two subscribing witnesses.

MORITZ BENON.

Witnesses:
CHARLES K. JOHANSEN,
WILHELM BERGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."