No. 826,537. PATENTED JULY 24, 1906.

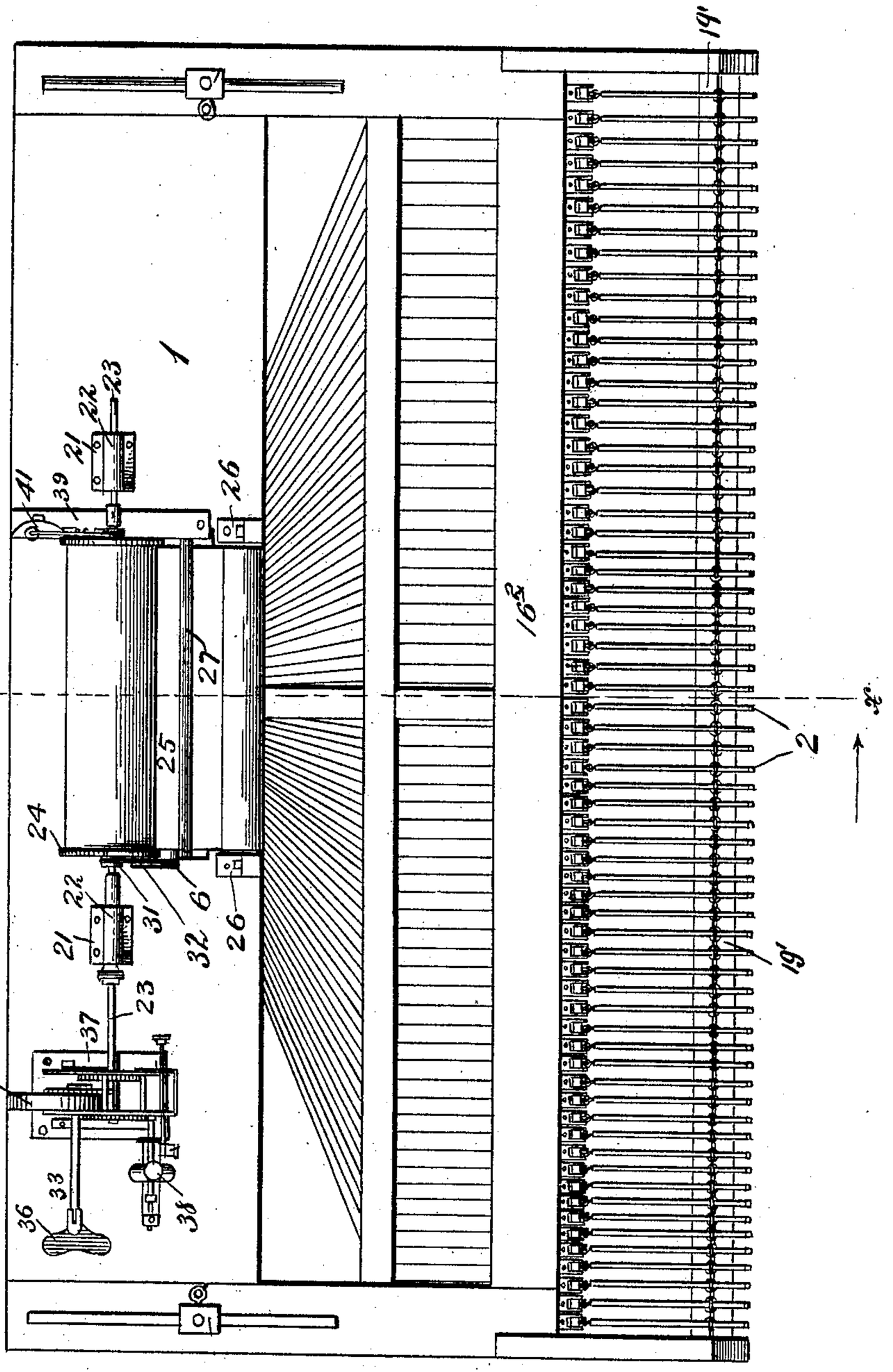
E. C. CALVIN.

MUSIC RECORDER.

APPLICATION FILED DEC. 27, 1905

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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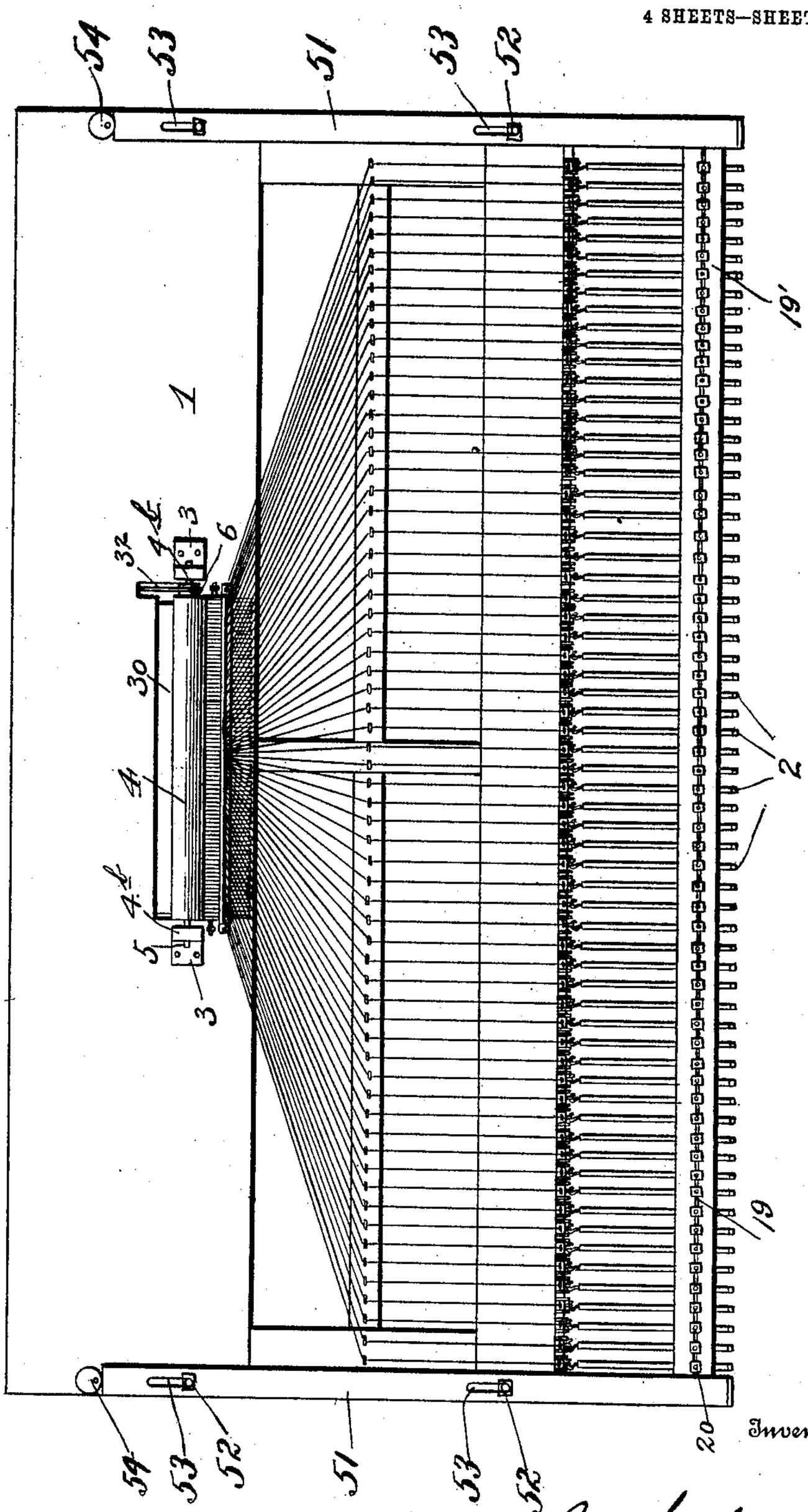
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3

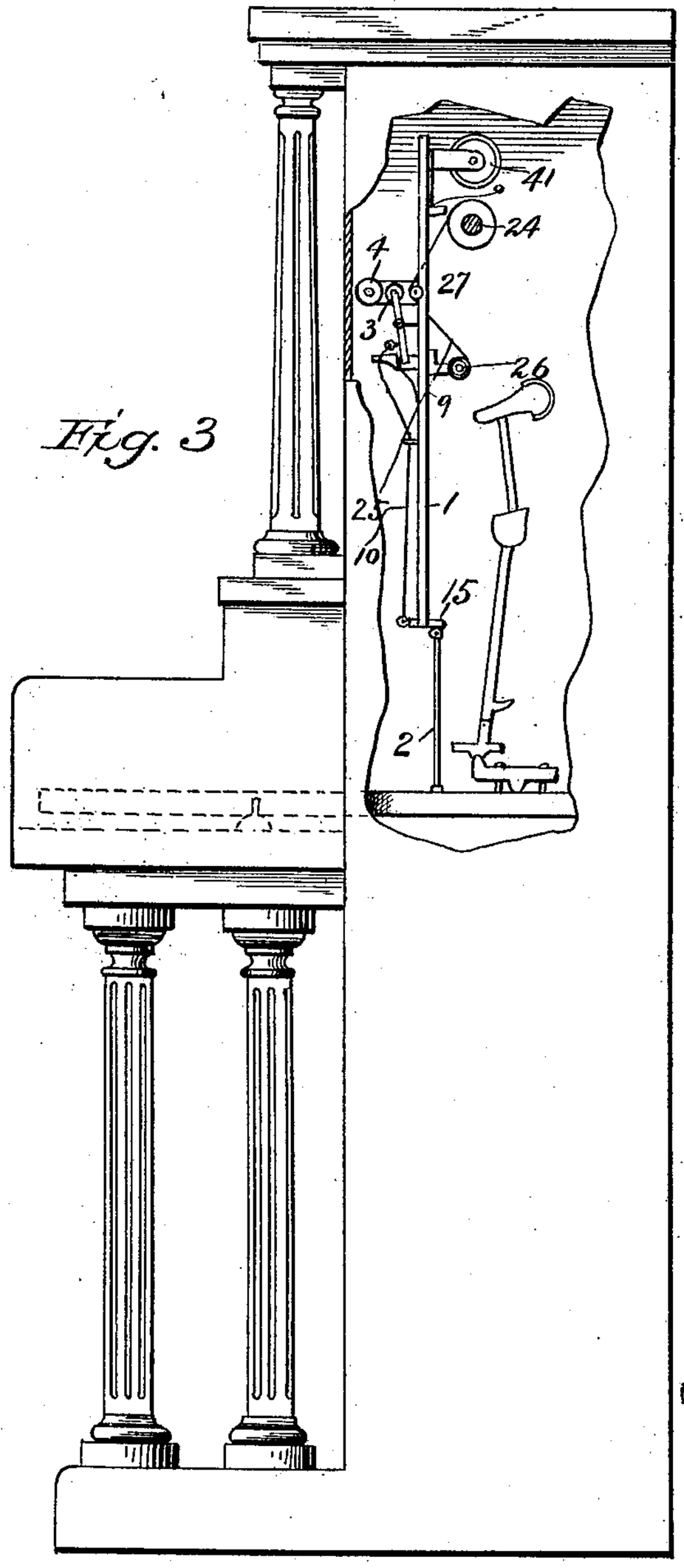

Fig. 4.

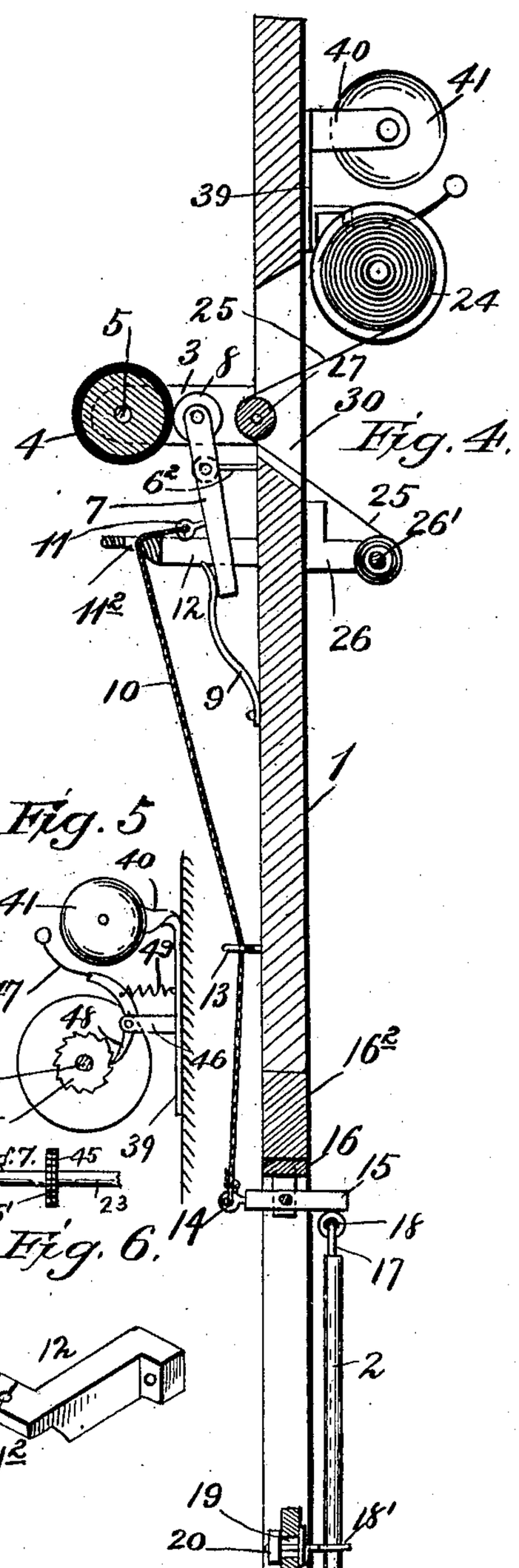

Fig. 5

Fig. 6.

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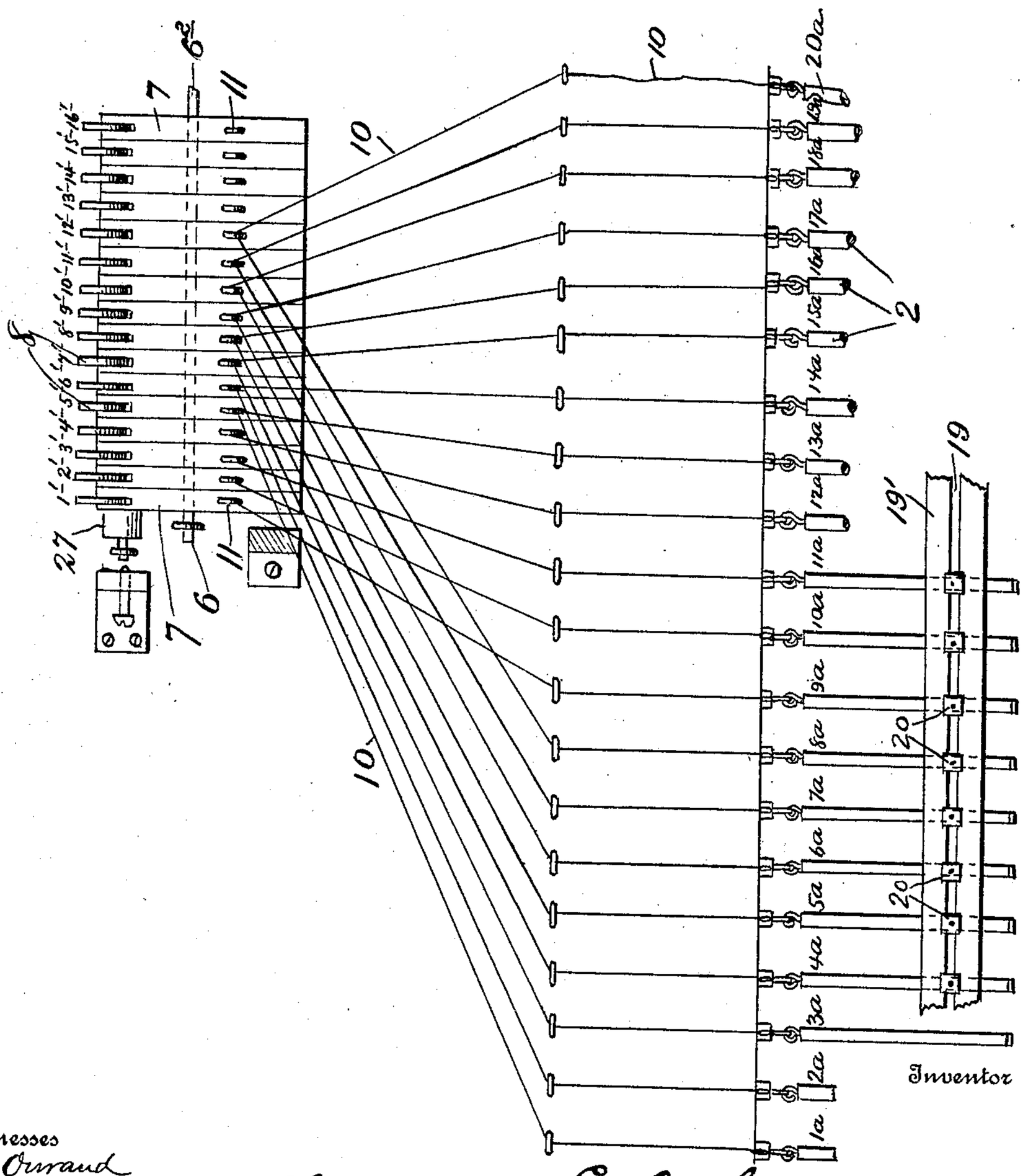
4 SHEETS—SHEET 4.

Fig. 8.



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UNITED STATES PATENT OFFICE.

ELBERT C. CALVIN, OF ST. JOHNSVILLE, NEW YORK.

MUSIC-RECORDER.

No. 826,537. Specification of Letters Patent. Patented July 24, 1906.

Application filed December 27, 1905. Serial No. 293,701.

To all whom it may concern:

Be it known that I, ELBERT C. CALVIN, a citizen of the United States, residing at St. Johnsville, in the county of Montgomery and State of New York, have invented new and useful Improvements in Music-Recorders, of which the following is a specification.

My invention has relation to new and useful improvements in music-recorders of that class that mark on a suitable surface the value and duration of the notes of a musical composition while the same is being performed on a piano, and thereby produce a permanent record which may at any time be transcribed afterward into the ordinary musical composition.

My improved music-recorder is purely mechanical in construction. The recording mechanism consists, essentially, of a series of marking-levers, one for each piano-key, in position to be brought in contact with a roll of paper movable at a determined rate of speed, which paper receives the impressions made by said levers.

In the accompanying drawings, in which like parts are designated by like characters throughout the several views, Figure 1 is a rear side elevation of my invention. Fig. 2 is a front side elevation of my invention. Fig. 3 is an end view of a piano, a portion of one of the end walls broken away to show the manner in which my recorder is located within the said piano when ready for operation. Fig. 4 is a cross-sectional view of my recorder. Fig. 5 is a detail view of a speed-estimating mechanism used in connection with my invention. Fig. 6 is a detail perspective view of a portion of a perforated guide-bracket. Fig. 7 is a detail view of a portion of my roller-axle with two ratchet-wheels rigidly connected thereto. Fig. 8 is a diagrammatic view showing an extension of the bass end of the recorder, which extension is not shown in Figs. 1 and 2 for want of room and to prevent confusion.

My invention is described as follows:

The numeral 1 represents the frame of my recorder, which frame is preferably rectangular in shape and may be made of any desired material. 2 indicates a series of plungers which rest on and are adapted to be raised by depressing the piano-keys. Secured to the front face at the central part and near the top of said frame-board 1 by means of right-angled plates 3 is an inked roller 4. Said roller is rigidly connected to a longitudinal axle 5, the extreme outer ends of which work in bearings 4^b in said plates 3. A band-wheel 6 is also rigidly secured to said axle near one end. Pivotally secured near their ends in parallel apposition to the front face of said frame by means of horizontal supports 6^2 is a series of marking-levers 7, preferably sixty-five in number, and secured to each of said marking-levers at its extreme upper end is a marking roller or wheel 8. When said levers are in their normal position, their extreme lower ends are contiguous with the upper ends of springs 9, secured at their extreme lower ends to the front face of said frame-board. Each of said levers is provided with a screw-eye 11. Cords 10, one provided for each lever, are secured at their upper ends in the eyes of said screw-eyes 11 and extend outwardly and downwardly through perforations 11^2 in a perforated guide-bracket 12, also secured to the front face of said frame-board. Said cords then pass through the eyes of outwardly-extending guide-screws 13, screwed to the front face of said frame-board, and are secured at their lower ends to screw-eyes 14, screwed in the front ends of horizontally-pivoted levers 15, pivoted between the forks of bifurcated vertical blocks 16, secured to the under face of a longitudinal beam 16^2 near the lower side of said frame-board.

While I preferably employ but sixty-five marking-levers, my arrangement of the cords and plungers 2 is such as to enable me to play an octave higher at either end of the piano and still have these notes recorded the same as if they were played within the sixty-five notes. This is accomplished by employing as many more plungers than marking-levers as will allow me to play an octave higher than the sixty-five notes at either the treble or bass end of the piano. The arrangement of the plungers 2 and cords 10 necessary to accomplish this is best explained by reference to the diagrammatic drawing Fig. 8, and for the purpose of explanation, starting with the left-hand side of the sheet, I have numbered the plungers 1^a 2^a 3^a 4^a 5^a 6^a 7^a 8^a, &c., up to 20^a and have shown sixteen marking-levers and marking-wheels and have numbered them 1′ 2′ 3′ 4′ 5′ 6′, &c., up to 16′. The cords 10, that are secured at their lower ends to the plungers numbered 9^a, 10^a, 11^a, and 12^a, are connected at their upper ends to the levers numbered 1′, 2′, 3′, and 4′. The cords connected to the plungers numbered 1^a, 2^a,

3ª, 4ª, 5ª, 6ª, 7ª, and 8ª, which represent an octave higher at the bass end of the recorder, are secured at their upper ends to the marking-levers numbered 5′, 6′, 7′, 8′, 9′, 10′, 11′, and 12′. These last-mentioned marking-levers are each provided with an additional cord 10, which connect with the plungers numbered 13ª, 14ª, 15ª, 16ª, 17ª, 18ª, 19ª, and 20ª. It will thus be seen that the marking-levers 5′, 6′, 7′, 8′, 9′, 10′, 11′, and 12′ are each provided with two cords and may be brought in contact with the traveling band or roll of paper 25 by depressing the plungers 1ª, 2ª, 3ª, 4ª, 5ª, 6ª, 7ª, and 8ª or plungers 13ª, 14ª, 15ª, 16ª, 17ª, 18ª, 19ª, and 20ª. Each of said plungers is provided at its upper end with a screw-eye 17, which is secured to a corresponding screw-eye 18, secured in the under face and near the rear end of a corresponding lever 15. The said plungers are provided near their lower ends with adjusting screw-eyes 18′, the front threaded ends of which pass through a longitudinal slot 19, cut in a horizontal brace-beam 19′, near the lower side of said frame-board, and are each provided with nut 20. This construction allows me to adjust said plungers 2 in a vertical position or at any desired angles. Secured to the rear face of said frame at its middle part and near its upper side are two bearings 21, (see Fig. 1,) provided with horizontally-perforated enlargements 22, in which perforations is journaled an axle 23, having rigidly secured near its middle part a roller 24, upon which there is wound a roll of paper 25 when the recorder is in operation. Removably journaled to said frame immediately below said roller 24 by means of bracket-bearings 26 is an axle 26′, upon which the paper is wound. Journaled to the front face of said frame-board between said roller 24 and axle 26′ is a guide-roller 27. To allow the paper to be unwound from the axle 26′, secured to the rear side of said frame-board, pass forward and upward over said roller 27, which serves to keep the paper sufficiently taut, and thence rearwardly and upwardly and wind around said roller 24, I have provided said frame with a substantially rectangular oblong slot 30. A band-wheel 31 is rigidly secured to one end of said axle 23, and passing around said band-wheel, through said slot 30, and around said band-wheel 6 is a band 32. Secured to the rear side of said frame-board near one corner is a motor 33. Said motor substantially consists of an actuating-spring 34, adapted to be wound up by means of a spring-arm 35 and key 36 and secured to a motor-frame 37. Said motor is also provided with a governor 38 and a series of gears so arranged in relation to each other as to be put in rotation by the said actuating-spring 34 and in turn effect the revolution of said axle 23. The said roller 24, rigidly connected to said axle 23, rotates with said axle, and the roll of paper 25 unwinds from said axle 26′ and is wound around the said roller 24. The roll of paper 25 in unwinding from said axle 26′ and winding around said roller 24 bears against and is kept sufficiently taut by said roller 27.

My improved recorder is also provided with a speed-estimating mechanism, (see Fig. 5,) which consists of a vertical bracket 39, provided at its extreme upper end with a rearwardly-extending integral arm 40, to the extreme rear end of which is secured a bell 41. Said bracket is also provided with an inwardly-extending arm 46, to which is pivoted a member made in the form of a hammer 47 at its upper end and a dog 48 at its lower end. Secured to said bracket 39 at its front end and near the middle of said member at its rear end is a coil-spring 49. Said axle 23 is provided near one end with two ratchet-wheels 45 and 45′, (see Fig. 7,) one having twenty and the other fourteen teeth. The twenty-tooth wheel is for fast music and the fourteen-tooth wheel for slow music. If the performer wishes to mark out a waltz, polka, march, or other fast piece, he will start the motor and bring the dog 48 in engagement with the twenty-tooth wheel 45 and regulate the motor to the tempo he wants, the bell striking each quarter-note or two beats in each measure of march-time. When the time is regulated, the motor will stay in regulation until changed. If the performer wishes to mark out slow music, the dog 48 is brought in engagement with the fourteen-tooth wheel 45′. The bell is to give a general idea of the speed of the motor; but the player need not confine himself to that speed. Sliding supports 51 are adjustably secured to the front face of said frame-board at its outer ends by means of screws 52, which screws work in vertical elongated slots 53, two provided in each support. When my recorder is not in operation, I raise said plungers 2 out of contact with the keys of the piano by sliding the said supports 51 downward as far as the slots 53 will allow and hold them in that position by means of eccentric buttons 54, secured to said frame-board immediately above the upper ends of said sliding supports.

The operation of my device is as follows: The spring 34 of the motor 33 having been wound up by means of the arm 35 and key 36, the potential energy of the spring will cause the gears of the motor to rotate and effect the revolution of the longitudinal axle 23 and likewise the roller 24, rigidly connected thereto, which operation causes the paper 25 to unwind from said axle 26′, pass forwardly and upwardly through said slot 30, over said roller 27, and under the said marking-wheels 8 of said marking-levers 7 and thence rearwardly and upwardly and wind around said roller 24, the band 32 causing the inked roller 4 to rotate and keep the marker-wheels con-

tinuously supplied with ink. When a piano-key is depressed, the plunger resting thereon is raised and by means of the pivoted lever 15 pulls down the cord or wire fastened thereto and forces the marking-wheel of the marking-lever secured thereto down on the paper 25, making an impression, and as the paper is moving the mark is made until the key is released. When the key is released, the said marking-wheel is forced back in contact with said inked roller 4 by the action of a corresponding spring of said springs 9 and the said plunger caused to resume its normal position. The speed-estimating mechanism 39 gives the performer an idea of how fast the paper is traveling, and he may regulate the speed accordingly by means of said governor 38.

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

1. In combination with a piano, a frame-board 1, provided near its upper edge and in its middle part with a slot 30; plates 3, secured to the front face of said frame-board; bearings 4^b, of said plates 3; longitudinal axle 5, working in said bearings; inking-roller 4, rigidly connected to said axle 5; bearings 21, secured to the rear face of said frame-board; axle 23, journaled in said bearings; roller 24, secured on said axle; bearings 26, secured to the rear face of said frame-board below said bearings 21; axle 26′, removably journaled in bearings 26; marking-levers 7, pivotally secured to said frame-board near its upper edge; marking-rollers 8, one journaled to the upper end of each of said marking-levers 7; springs 9, secured to the front side of said frame-board at the lower ends, their upper ends bearing against the lower ends of said levers 7; perforated guide-bracket 12, secured to the front face of said frame-board; longitudinal beams 16^2, located near the lower edge of said frame-board; vertical bifurcated blocks 16, secured to the under face of said beam; levers 15, pivoted between the forks of said blocks; longitudinal beam 19′, provided with a longitudinal slot 19, located near the lower edge of said frame and below said longitudinal beam 16^2; adjusting screw-eyes 18′, their front ends passing forwardly through the slot 19 of said longitudinal beam 19′; nuts 20, screwing on the threaded ends of said screws 18′; plungers 2, secured at their upper ends to the rear ends of said levers 15, their lower ends passing through the eyes of said adjusting-screws 18′ and resting on the piano-keys, and cords 10, secured at their upper ends to the lower ends of said levers 7, passing outwardly and downward through the perforations of said guide-bracket 12, and connected at their lower ends to the front ends of said levers 15, substantially as shown and described and for the purposes set forth.

2. In combination with a piano, a frame-board, provided near its upper edge and in its middle part with a slot; bearings, secured to the rear face of said frame-board adjacent the ends of said slot; an axle, journaled in said bearings; a roller, secured on said axle; an axle, journaled near the rear face of said frame-board below said roller; inking-roller, journaled near the front face and upper edge of said frame-board horizontally opposite said slot; levers, pivoted horizontally near the lower edge of said frame-board; plungers, secured to said levers at their upper ends, their lower ends resting on the piano-keys; marking-levers, pivotally secured near the upper edge and front face of said frame-board; marking-rollers, journaled to the upper ends of said marking-levers; means for connecting said marking-levers with said first-mentioned levers; a guide-roller, journaled near the upper edge and front face of said frame-board behind said inking-roller; means for throwing said marking-wheels of said marking-levers in contact with said inking-roller when the keys are released; sliding supports, adjustably secured to the front face and at the outer ends of said frame-board, and provided with vertical elongated slots; screws, adjustably securing said sliding supports to said frame-board; eccentric buttons, secured to said frame-board immediately above the upper ends of said sliding supports; the plungers of said recorder being raised out of contact with the keys of the piano by sliding said sliding supports downward as far as their slots will allow, and holding them in that position by said eccentric buttons, substantially as shown and described and for the purposes set forth.

3. In combination with a piano, a frame-board 1, provided near its upper edge and in its middle with a slot 30; plates 3, secured to the front face of said frame-board; bearings 4^b, of said plates 3; longitudinal axle 5, working in said bearings; inking-roller 4, rigidly connected to said axle 5; bearings 21, secured to the rear face of said frame-board; axle 23, journaled in said bearings; roller 24, secured on said axle; bearings 26, secured to the rear face of said frame-board below said bearings 21; axle 26′, removably journaled in bearings 26; marking-levers 7, pivotally secured to said frame-board; marking-rollers 8, one journaled to the upper end of each of said marking-levers; springs 9, secured to the front side of said frame-board at their lower ends, their upper ends bearing against the lower ends of said marking-levers; perforated guide-bracket 12, secured to the front side of said frame-board; longitudinal beam 16^2, located near the lower edge of said frame-board; vertical bifurcated blocks 16, secured to the under face of said last-mentioned beam; levers 15, pivoted between the forks of said blocks 16; plungers 2, secured at their upper ends to the rear ends of said levers 15, and cords 10, two secured at their upper ends

to the fifth, sixth, seventh, eighth, ninth, tenth, eleventh, twelfth, fifty-fourth, fifty-fifth, fifty-sixth, fifty-seventh, fifty-eighth, fifty-ninth, sixtieth, and sixty-first marking-levers 7 counting from the bass end of the recorder, one cord being secured to each of the remaining levers, said cords passing outwardly and downward through the perforations of said guide-bracket 12, and connected at their lower ends to corresponding levers 15, substantially as shown and described and for the purposes set forth.

4. In combination with a piano, a frame-board, provided near its upper edge and in its middle part with a slot; a roller, journaled near the rear face of said frame-board adjacent said slot; an axle, journaled near the rear face of said frame-board below said roller; inking roller, journaled near the front face and upper edge of said frame-board horizontally opposite said slot; levers, pivoted near the lower edge of said frame-board; plungers, secured at their upper ends to the rear ends of said levers, their lower ends resting on the piano-keys; marking-levers, pivotally secured near the upper edge and front face of said frame-board; marking-rollers, journaled to the upper ends of said marking-levers; cords, connecting said marking-levers with said first-mentioned levers; a guide-roller, journaled near the upper edge and front face of said frame-board behind said inking-roller; means for throwing said marking-wheels in contact with said inking-roller when the keys are released; a longitudinal beam, provided with a longitudinal slot, secured near the lower edge of said frame-board adjacent the lower ends of said plungers; adjusting screw-eyes, their front threaded ends passing forwardly through the slot of said longitudinal beam, their rear ends receiving the lower ends of said plungers, and nuts, screwing on the front threaded ends of said screw-eyes, substantially as shown and described and for the purposes set forth.

In testimony whereof I affix my signature in presence of two subscribing witnesses.

ELBERT C. CALVIN.

Witnesses:
EDWARD R. HALL,
JONATHAN VEDDER.