C. E. BROWN.

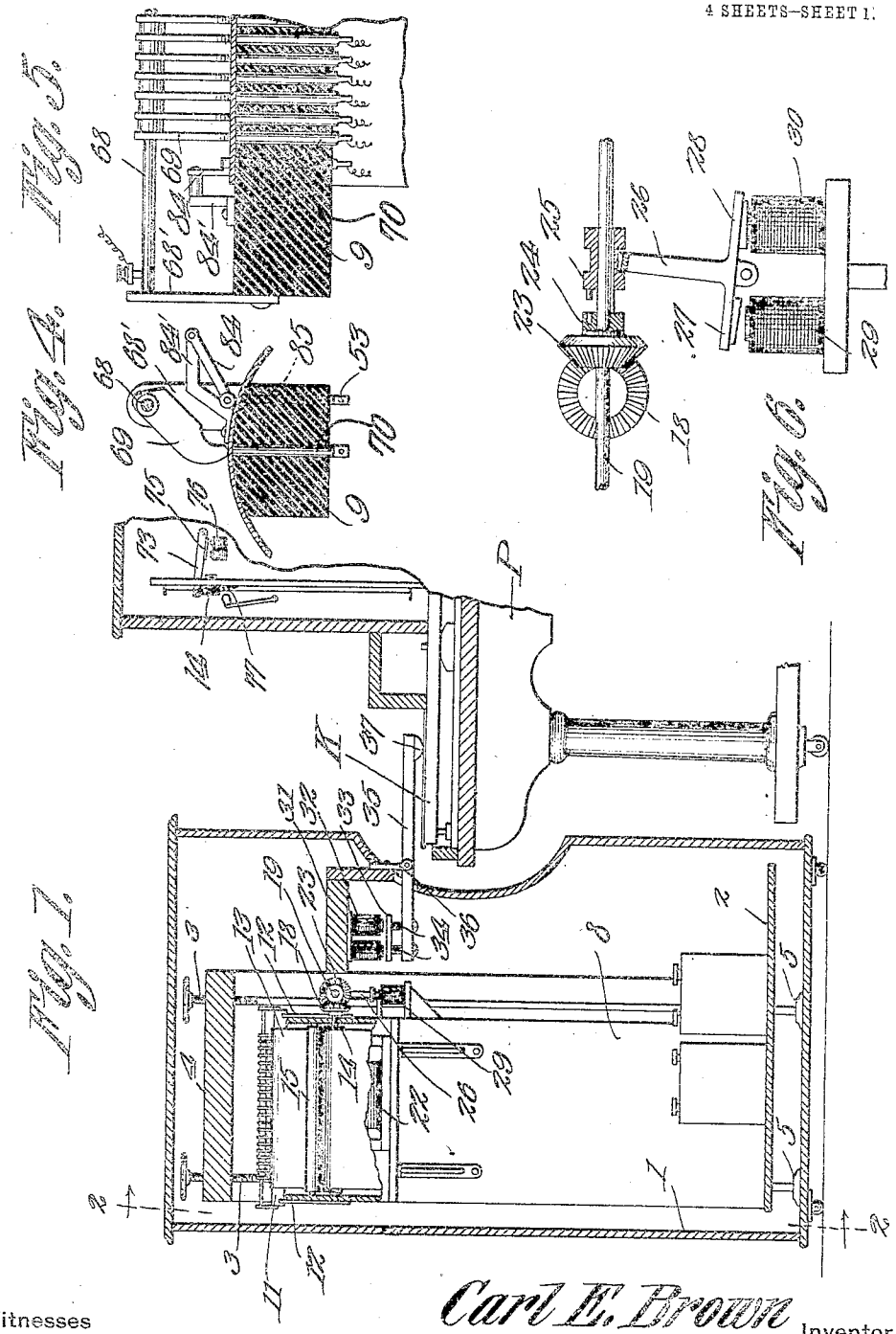
ELECTRICAL PIANO PLAYER.

APPLICATION FILED SEPT. 2, 1913.

1,122,468.

Patented Dec. 29, 1914.

4 SHEETS—SHEET 1.



Witnesses

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4 SHEETS—SHEET 2.

Fig. 2.

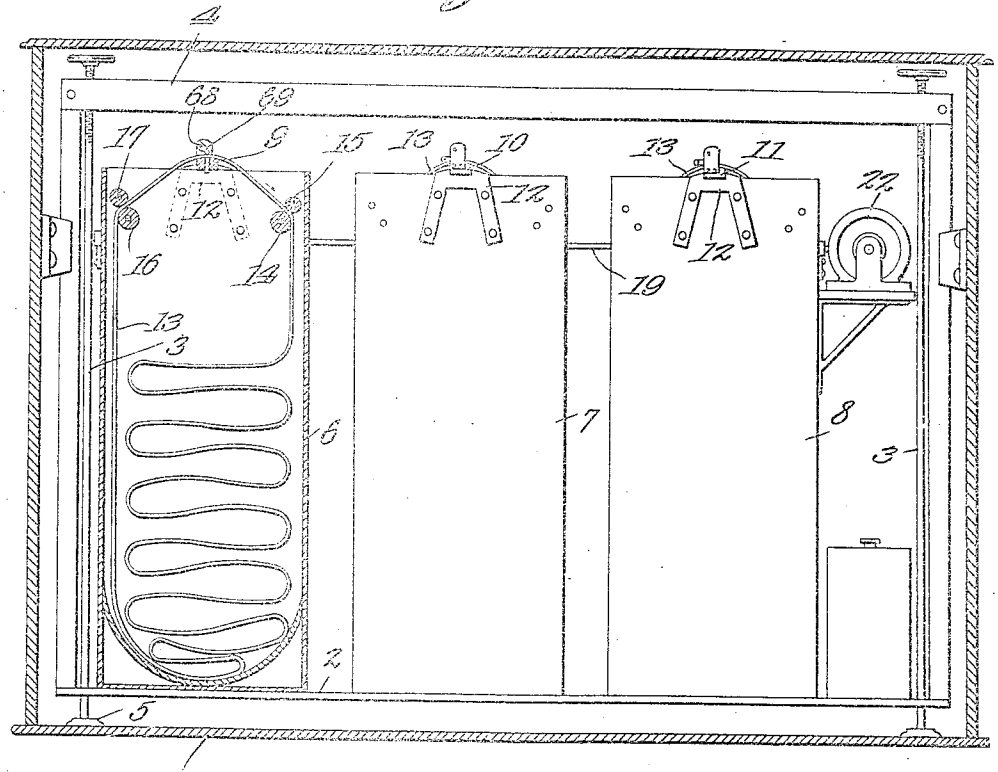
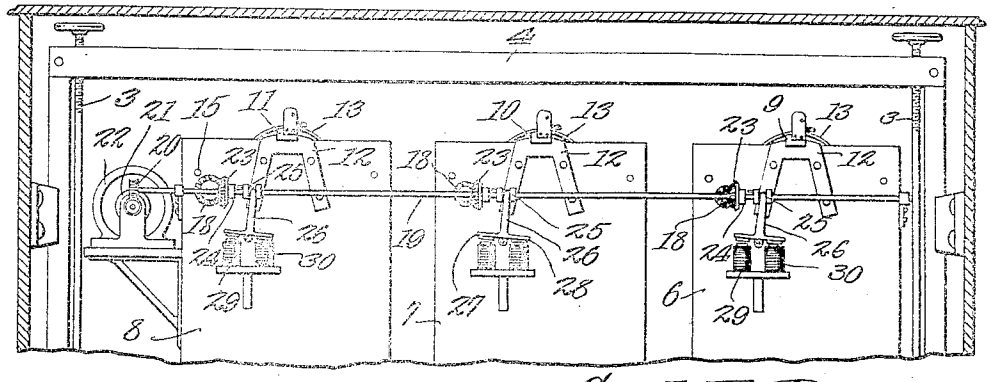


Fig. 3.



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4 SHEETS—SHEET 3.

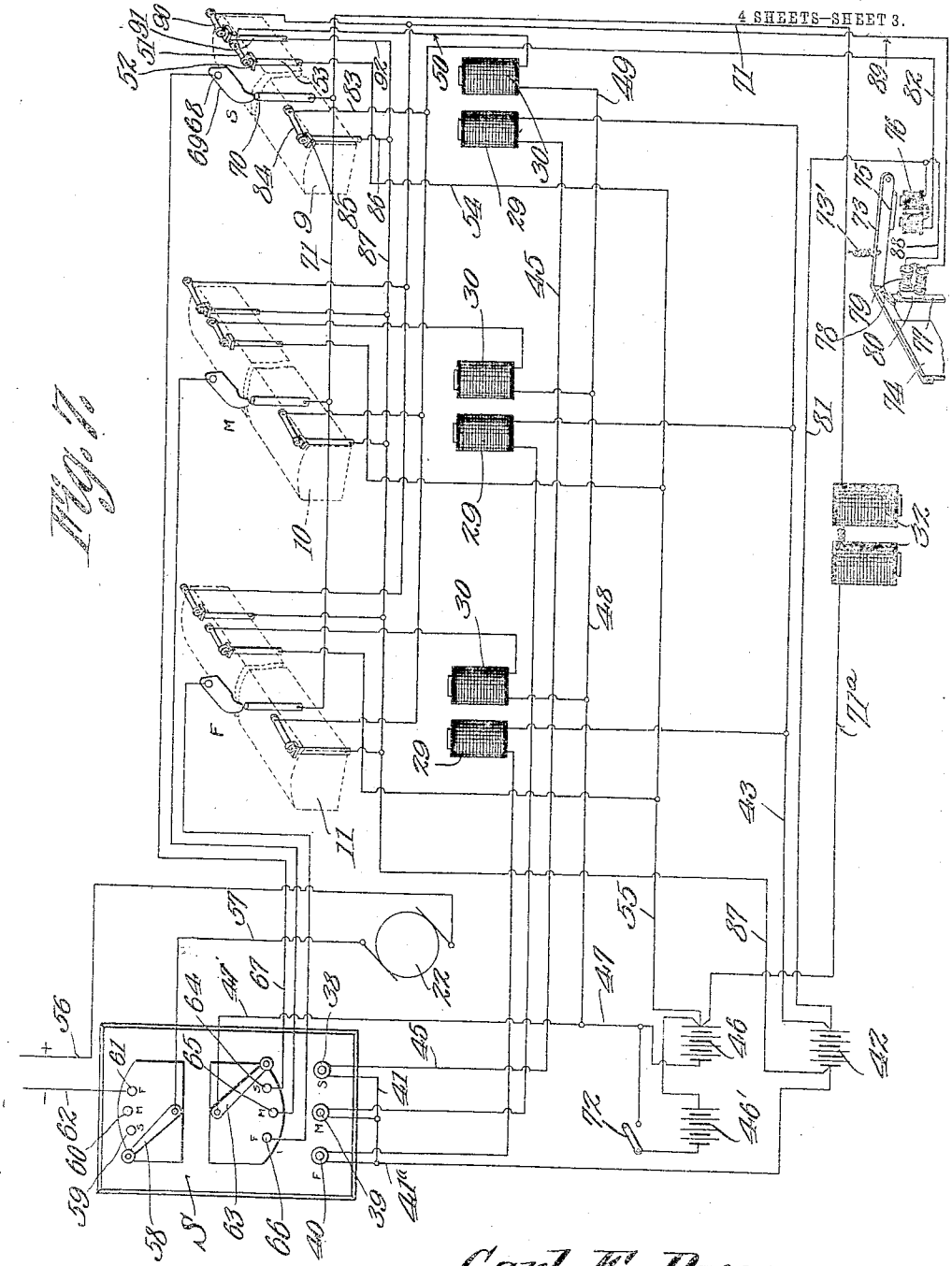


Fig. 3.

Witnesses

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4 SHEETS—SHEET 4.

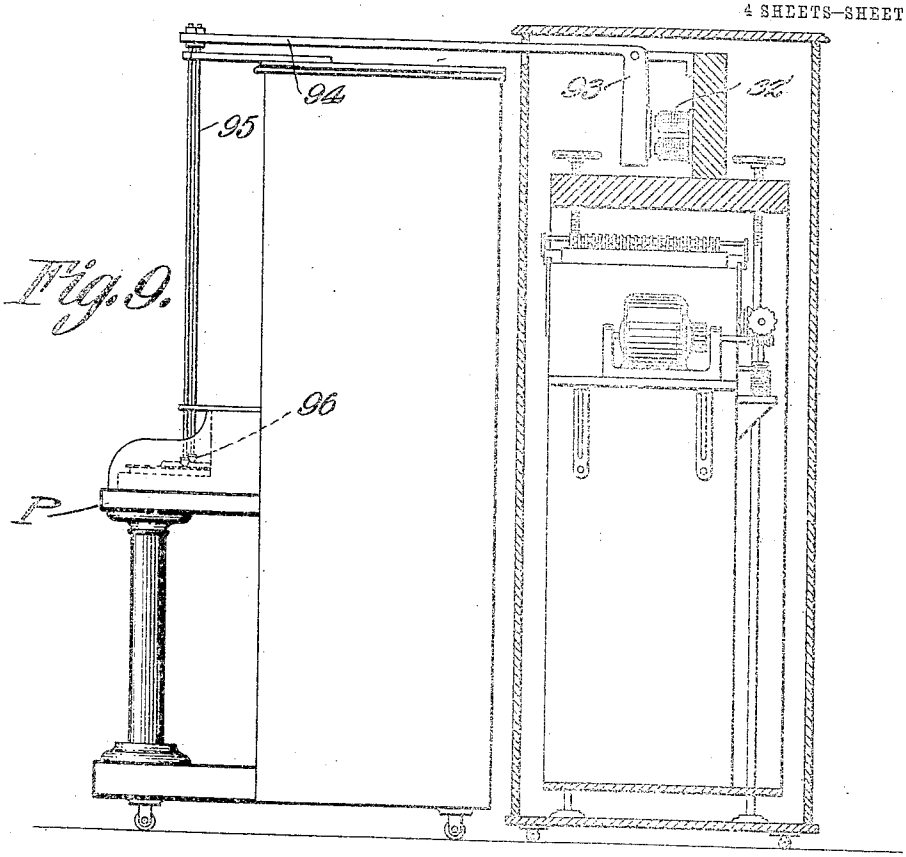


Fig. 9.

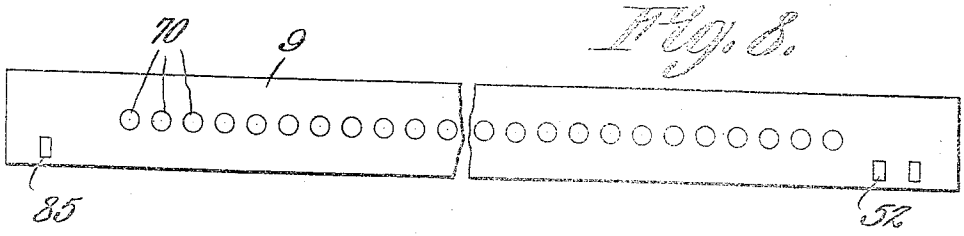


Fig. 8.

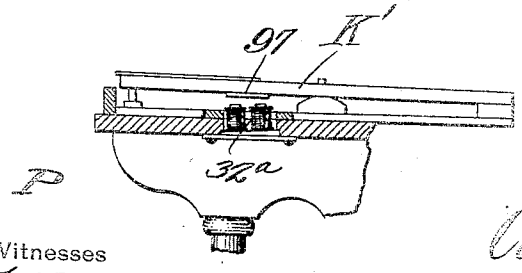


Fig. 10.

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UNITED STATES PATENT OFFICE.

CARL ERNEST BROWN, OF COLUMBUS, OHIO.

ELECTRICAL PIANO-PLAYER.

1,122,468. Specification of Letters Patent. Patented Dec. 29, 1914.

Application filed September 2, 1913. Serial No. 787,735.

To all whom it may concern:

Be it known that I, CARL E. BROWN, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a new and useful Electrical Piano-Player, of which the following is a specification.

The present invention relates to improvements in electrical piano players, one object of the invention being the provision of a player adapted to be used in connection with pianos, and by means of which the control both as to the selection to be played and the playing thereof is entirely automatic and placed selectively under the control of a person at a distant point, the present device being especially adapted for use in connection with entertainments, as for instance in moving picture theaters, the present device dispensing with the person playing the piano and placing the control of the music directly under the operator in the booth.

A further object of the present invention is the provision of an electrical piano player in which a plurality of tracker boards are provided, in the present instance preferably three, whereby slow, medium and rapid music may be played according to the pictures shown upon the screen, and also whereby the music may be played loud, moderately loud or soft, as desired.

A still further object of the present invention, is the provision of a novel tracker board, in which the perforated music sheet or record passing thereover covers and uncovers stationary electrical contacts and properly separates or permits the contact therewith of pivoted selective members, each one of which is connected in an electrical circuit for operating a selected key of the piano.

A still further object of the invention is the provision of means controlled by the operator at a distant point, for selecting the desired tracker board for operation, the music record at the end of any piece automatically disconnecting the operating mechanism for the music record and opening the circuits so that although the motor for operating the various music records may continue to operate, none of the music records will be operated.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a view in cross section of a portion of a piano with the present playing device also in cross section and connected operably thereto. Fig. 2 is a section taken on line 2—2 of Fig. 1 of the complete player device. Fig. 3 is a similar view to Fig. 2 taken from the opposite side of the tracker board and music record carrying members. Figs. 4 and 5 are enlarged detail views of the tracker board mechanism. Fig. 6 is an enlarged detail view of the clutch device for selectively connecting one of the music roll operating mechanisms for operation and for disconnecting the same. Fig. 7 is an electrical diagram of one installation of circuits for controlling the various mechanisms of the present device. Fig. 8 is a top plan view of a tracker board showing the position of the various stationary electrical contacts carried thereby. Fig. 9 is a view illustrating the present player when disposed at the rear of the piano to permit of free access to the key board of the piano for manual manipulation. Fig. 10 is a detail view showing a method of controlling each individual key of the piano directly by an electromagnet.

Referring to the drawings, the numeral 1 designates the main casing of the player mechanism, which has mounted therein, the main carrying frame 2, which is adjustably and properly supported within the casing 1, by means of the adjusting screws and supports 3, which are properly mounted in the upper structure 4 of the frame, and have their lower ends seated within the sockets 5 carried by the casing 1. By this means, the frame 2 may be adjusted to present the key actuating members 35, as will presently appear, in the proper alinement for position upon the keys K of the piano P. Thus, the present device may be operated in connection with key boards that vary in height from the floor.

Mounted within the frame 2, and as clearly shown in Figs. 2 and 3, are three receptacles 6, 7 and 8, each one of which constitutes a music record carrying member and has its individual tracker-board 9 10 or 11, respectively. Each tracker board is constructed similarly, but each is adapted to operate the keys at a different speed, the tracker board 9 and its mechanism being controlled for the slowest speed, while the tracker board 10 is the medium speed, with the tracker board 11, the greatest speed. By this means and as will presently appear, when either one of the respective tracker boards are elected or selected, the musical effect produced upon the piano, will be produced according to the desires of the operator and particularly as is found necessary with the pictures presented upon the screen. In the present instance, the tracker board 9 will control the keys as before stated, for a slower time music, being used in connection with dramas or pathetic scenes, the other tracker boards being used in connection with livelier and comedy scenes.

The brackets 12, which are carried by the respective receptacles properly support the tracker board which as shown, is composed of an insulating material, and has disposed thereupon the perforated music record 13, which is of the usual structure as used in connection with pneumatically operated piano players. The drive rollers 14 of the present device are assisted by the compression roller 15 to cause the movement of the record 13 in the direction of the arrows, as shown in Fig. 2, while the guide rollers 16 and 17 produce the desired tension upon the music record so that the same will be held with the proper tautness across the upper curved surface of the tracker board 9, 10 or 11.

In order that the drive rollers 14 may be operated, upon one end thereof exteriorly of its respective receptacle, is mounted a beveled pinion 18, while extending longitudinally of the frame 2, is the shaft 19, having upon one end, the worm gear 20, which meshes with the worm gear 21 of the electric motor 22. It will be noted in Fig. 2 that the three gears 18 are of different sizes, the one at the extreme right being smaller, while the center one is of the intermediate size, thus permitting of the varying speeds controlled through a uniformly rotated shaft 19. By this means, the shaft 19 is continuously rotated. A bevel pinion 23 is mounted freely upon the shaft 19, there being one to each playing mechanism and is in mesh at all times with its respective beveled pinion 18, said bevel pinion 23 constituting a freely rotatable clutch member upon the shaft 19, for coaction with the keyed and slidably mounted clutch member 25, as clearly shown in Fig. 6. The yoke 26 is adapted to operate the sliding clutch member 25, and is provided with the oppositely disposed armature members 27 and 28, which as will presently appear, are actuated electrically for connecting and disconnecting the sliding clutch member 25. By this means, when the clutch member 25 is connected to the clutch member 24, the gears 23 and 18 are operated by the shaft 19, and consequently the music record operating roller 14 is operated to feed the music record 13 in the direction of the arrow, as shown in Fig. 2. The two electromagnets 29 and 30 constitute the actuating means for operating the clutch throwing lever 26, the electromagnet 30 being operated to disconnect the clutch member 25, while the electromagnet 29 is operated to connect the same. The operation of the electromagnet 29 is selective, while the operation of the electromagnet 30 is automatic, as will presently appear.

Carried by the frame 2 at the key board side of the casing, is a supporting plate 31, which has depending therefrom the electromagnet 32, which actuates the armature 33 which as shown clearly in Fig. 1, is adjustably connected by means of the screws 34 to the key actuating striker 35, said striker being pivoted at 36 so as to present the key contact portion 37, thereof, to the keys K of the piano. By means of the adjusting screws 34, the throw of the armature controlled striker 35 may be adjusted and consequently, the "touch" thereof as regards the key.

In the electrical diagram, as shown in Fig. 7, there is disposed in the booth of the operator, a switch board or support S, which is provided with a plurality of push buttons 38, 39 and 40, which control, as will presently appear, the electromagnets 29 which as before described, are the electromagnets for operating the various clutch throwing levers 26 to connect selectively, the proper playing mechanism for operation from the shaft 19.

As one circuit will suffice for all, a single circuit will be traced to show the method of energizing the electromagnet 29. This circuit includes the conductors 41—41ª, the battery 42, which is indicative of any source of electrical energy, the conductor 43, the electromagnet 29, in the present instance, the one at the extreme right of the figure, the conductor 45, and the button 38. The other buttons 39 and 40 and the other two electromagnets 29 are in branch connections with the same circuit and thus permit the selection by the operator of the particular electromagnet 29 to be energized.

The circuit for controlling the automatic actuation of the electromagnet 30, and consequently the movement of the clutch member 25, to the position as shown in Fig. 6, includes the battery 46, the conductors 47 and 48, the conductor 49, the electromagnet

30, the conductor 50, a pivoted contact finger 51, the stationary contact 52, the pin 53 mounted in the tracker board, the conductor 54, the conductor 55 and the battery 46. Thus, it will be seen that when the music record has operated the predetermined distance desired, the perforation as before stated being disposed upon the paper and preferably near the marginal edge thereof, so that when the same is disposed above the stationary contact 52, in the surface of the tracker board, the terminal of the finger 51 will pass through the perforation and contact the button 52 and thus close the circuit to energize the particular electromagnet 30, which being energized will throw out the clutch member 25, and thus disconnect the playing roller 14 from the shaft 19.

The motor 22 is operated in the present instance, from an electrical power or lighting circuit (not shown), which includes the conductor 56, which leads to the motor 22, the conductor 57 leading therefrom to the manually controlled switch member 58, which in reality is a part of the rheostat carried upon the board S. This rheostat is disposed for positioning with the slow, medium and fast buttons 59, 60 and 61, whereby the speed of the motor 22 is controlled, the conductor 62 being the other lead from the power circuit. By this means, the operator has at his disposal, the control of the motor 22, and can regulate the speed from the rheostats 59, 60, and 61.

In order to provide a means for selecting the electrical mechanism for actuating any one of the respective tracker boards 9, 10 or 11, as may be desired, and for the purpose particularly mentioned, a switch arm 63 is mounted upon the switch board S, and is disposed to coöperate with the respective contact buttons 64, 65 and 66, which are connected respectively for controlling the tracker boards 9, 10 and 11 respectively. As the description of one circuit will suffice for all, the circuit controlling the tracker board 9, which is the slowest operating mechanism will be set forth. This circuit includes the battery 46, the conductors 47 and 47′, the switch arm or lever 63, the contact button 64, the conductor 67, the rod 68 which is supported from the bracket 68′ by the tracker board 9, one or more of the pivoted contact members 69 mounted upon the rod 68, one of the stationary contact pins 70 mounted in the tracker board, the conductor 71, the electromagnet 32, and the conductor 71ª.

The contact pins 70 are disposed as clearly shown in Fig. 8, one to each key K of the piano, and therefore one to each electromagnet 32, the pivoted contact 69 being held from electrical contact with the upper end of the pin 70 by the music record 13, and only brought into contact therewith when one of the perforations of the paper exposes the upper end of the contact pin 70 to permit the lower reduced end of the pivoted contact 69 to engage the same. Thus, the perforated music record as is ordinarily used with pneumatic piano players may be used with the present mechanism.

In order to provide a means for increasing the battery force if so desired to accelerate the action of the electromagnets 32, an auxiliary battery 46′ is provided and is connected in multiple through the switch controlled connections 72, as clearly shown in Fig. 7, with the battery 46 and the conductor 47. This switch 72 is disposed in the booth with the operator, and under his direct control.

In order to produce a pianissimo effect upon any one of the mechanisms, the pivoted frame 73 is provided. The frame 73 is mounted within the piano P, and has connected thereto the strip 74 of felt or other material which is adapted to be placed between the hammers and the strings of the piano. Connected to the frame 73 is the armature 75 controlled by the electromagnet 76. By this means the frame 73 can be moved downwardly against the action of the spring 73′, to permit the pivoted catch member 77 to engage the prong 78 of the damping device to place and hold the strip 74 interposed between the strings and hammers. This action takes place upon the energization of the electromagnet 76, which is only for an instant and sufficiently long to depress the frame 73. The electromagnet 79, is operated, as will presently appear, to release the catch 77 which is provided with the armature 80.

The circuit for controlling the energization of the electromagnet 76, and consequently the placing of the damping strip 74 between the hammers and strings of the piano, comprises the battery 42, the conductor 81, the electromagnet 76, the conductor 82, the conductor 83, the pivoted finger 84, the stationary contact 85 carried by and at one side of the tracker board 9, and the conductors 86 and 87. The finger 84 is mounted upon the arm 84′. Thus, at the proper time, at a point in the record, and which is represented by the perforation in the record 13 at the extreme side thereof, the free end of the contact member 84 is permitted to engage the contact 85 and consequently close the circuit to energize the electromagnet 76. This action causes the armature 75 to be pulled downwardly, and move the frame 73 so that the damping sheet 74 is placed between the strings and the hammers of the piano, the catch member 78 being disposed in engagement with the pivoted catch 77 so that the frame 73 is locked downwardly and against the tension of the spring 73′. In order to provide an

automatic release for the frame 73 and to consequently energize the electromagnet 79, the following circuit is automatically energized due to a selected perforation within the music roll and is as follows: the battery 42, the conductors 81 and 88, the electromagnet 79, the conductor 89, the pivoted contact 90 mounted upon an arm as 84′ (not shown) and at the opposite side of the tracker board, the conductors 92 and 87 and the battery 42. Thus the same source of electrical energy is used to the electromagnet 79 that will energize the electromagnet 76, this being permissible, as only one of the switches 84—85 or 90—91 will be energized at a time.

The mechanism for operating the keys heretofore described, includes the casing adapted to be placed at the front of the piano, but when it is desired to place the casing out of sight, it is positioned at the rear of the piano, as viewed in Fig. 9. Thus this arrangement permits manual operation of the keys of the piano in the usual manner, and yet permits the same to be operated automatically by the present playing device. The electromagnets 32′ which are constructed similarly to and are operated by the identical circuits as the electromagnets 32 heretofore described, control each an armature lever 93, which is made in the form of a bell crank lever, and has ite outwardly extending end 94 disposed above the piano and connected to the vertical rod 95. The rod 95 depends at the front of the piano and carries the key engaging button 96. By this means, the bell crank lever 93, due to the energization of its electro-magnet 32′ will operate the selected button 96 to depress the key similar to the operation of the key actuating lever 35 heretofore described.

In the mechanism shown in Fig. 10, the electromagnet 32^a one to each key K′ of the piano, is mounted within the casing of the piano and is separate entirely from the tracker board controlled mechanism heretofore described. In this particular instance, upon the under side of each of the respective keys K′ is disposed a metal plate 97 which constitutes the armature of the electromagnet 32^a, which when such electromagnet 32^a is energized, will cause the proper depression of the key K′ and the actuation of the piano. By this means, as before stated, the electromagnet mechanism may be disposed within the piano casing, and the tracker boards heretofore described for controlling the energization thereof may be placed at a distant point, as for instance within the booth and adjacent the switch board S, such installation being at the discretion of the operator.

From the foregoing description, taken in connection with the drawings, it is evident that with an electrical player attachment as herein set forth that the operator in the booth may control the selection and operation of the music for the motion pictures, the manipulation of the members mounted upon the switch board S, being directly under his control and being readily manipulated so that either one of the tracker boards 9, 10 or 11 is placed in operation and therefore the desired selection of music made. It is also evident that the music record electrically controls the stoppage of its tracker board mechanism, and that the same also controls the damping mechanism to produce the loud and soft effect according to the markings upon the record.

It is apparent that by means of the switch 63, the operator may select the various tracker boards regardless of which is then being operated and without awaiting the completion of the playing by the one in operation, as the movement of the switch 63, as for instance from contact 64 to contact 65, will open the circuit to tracker board 9 and close that to tracker board 10. As the circuit to tracker board 9 is then opened, even though the music roll thereover is operating, no effect will be produced thereby.

By this arrangement, the change can be made quickly to accord with the scene or act being presented.

What is claimed is:

1. A piano player including a cabinet, a plurality of music sheet containers mounted therein, a plurality of tracker boards, one to each container, two pairs of paper guide and feed rollers mounted in each container, one pair upon each side of its tracker board, one pair of rollers being the driving pair, a continuously rotating driving shaft journaled longitudinally of the cabinet, a plurality of clutches carried by the shaft, one to each container, coöperable means carried by each clutch and its adjacent pair of driving rollers for connecting the rollers to be operated from the driving shaft, and a plurality of selective clutch operating means for throwing in one clutch at a time.

2. A piano player including a cabinet, a plurality of music sheet containers mounted therein, a plurality of tracker boards, one to each container, two pairs of paper guide and feed rollers mounted in each container, one pair upon each side of its tracker board, one pair of rollers being the driving pair, a plurality of endless sheets of music, one mounted in each container and fed between the respective pairs of guide and feed rollers, a continuously rotating driving shaft journaled longitudinally of the cabinet, a plurality of clutches carried by the shaft, one to each container, coöperable means carried by each clutch and its adjacent pair of driving rollers for connecting the rollers to be operated from the driving

shaft, and a plurality of selective clutch operating means for throwing in one clutch at a time.

3. In a piano player, the combination of a casing, a plurality of tracker boards disposed side by side within the casing, a music roll actuating mechanism for each tracker board, a longitudinally disposed driven shaft mounted in the casing, a plurality of clutches one to each music roll actuating mechanism carried upon the shaft, and means controlled from a distant point for selecting and actuating one clutch at a time.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CARL ERNEST BROWN.

Witnesses:
MINNIE T. CLARK,
L. G. LATHAM.