

R. MOE.

PEDAL ACTION.

APPLICATION FILED APR. 15, 1904.

3 SHEETS—SHEET 1.

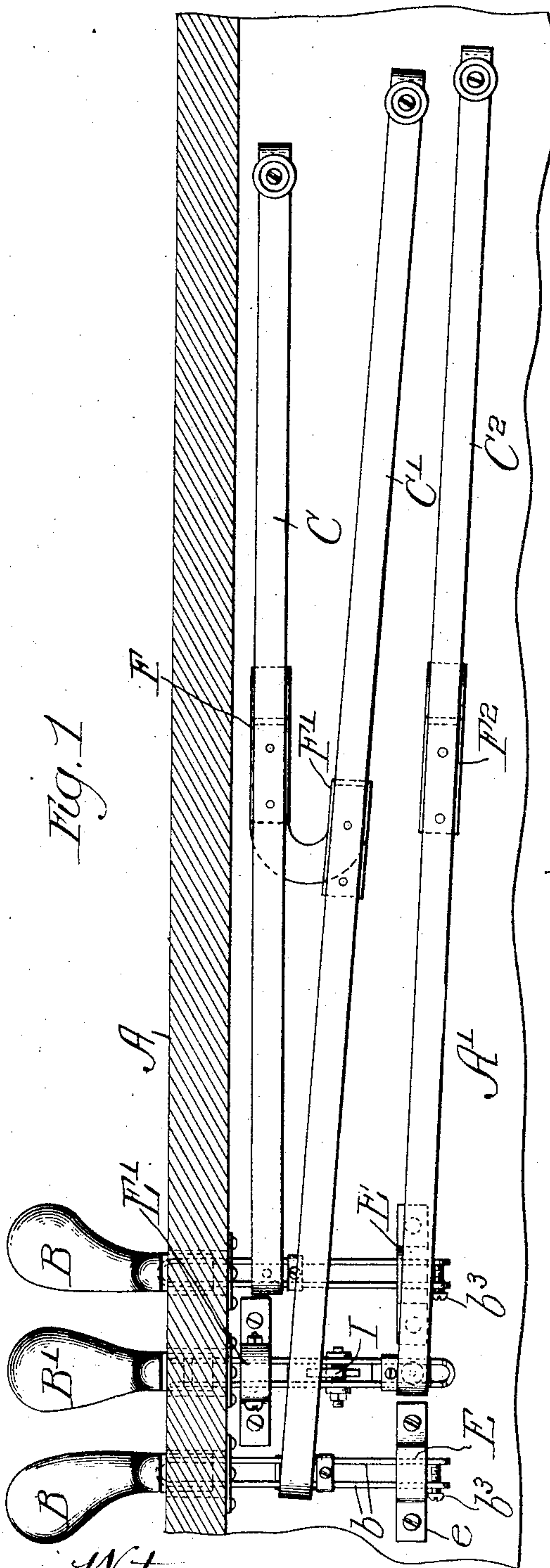


Fig. 1

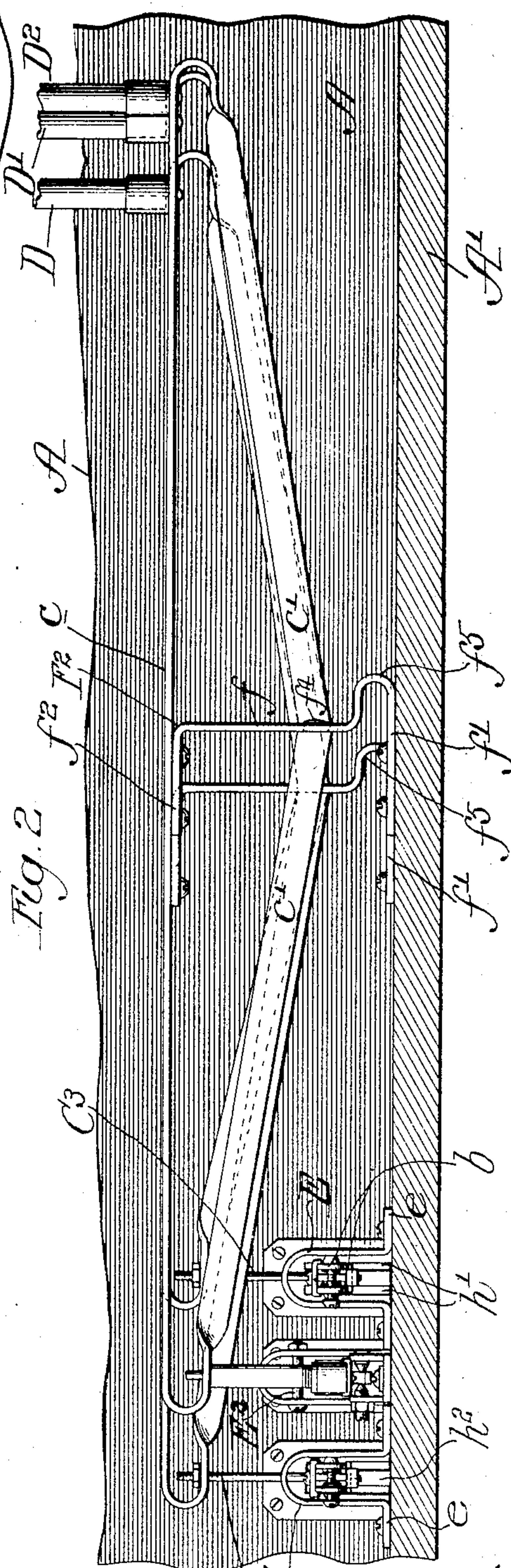


Fig. 2

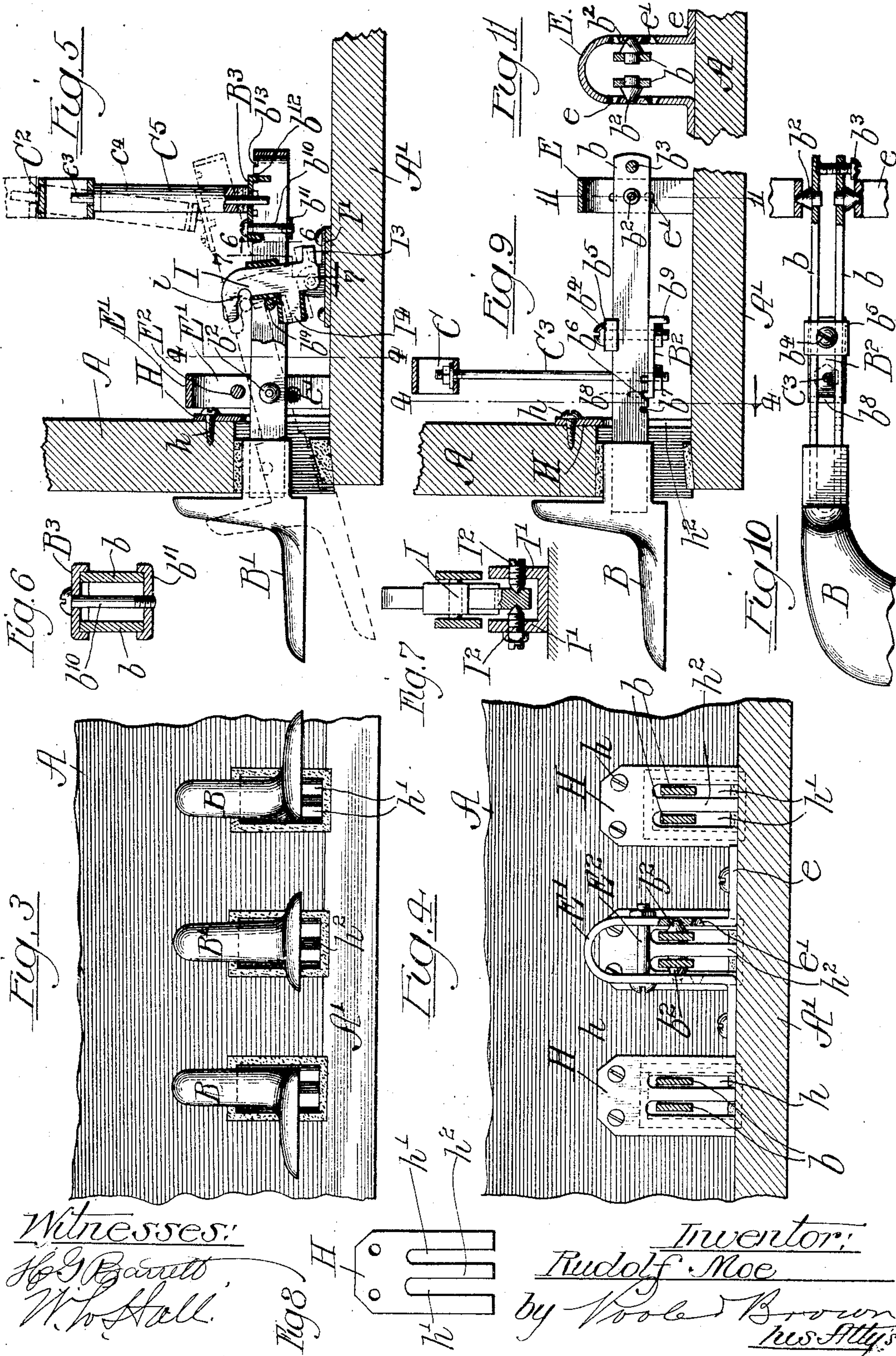
Witnesses:
H. G. Barrett
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3 SHEETS—SHEET 2.



Witnesses:
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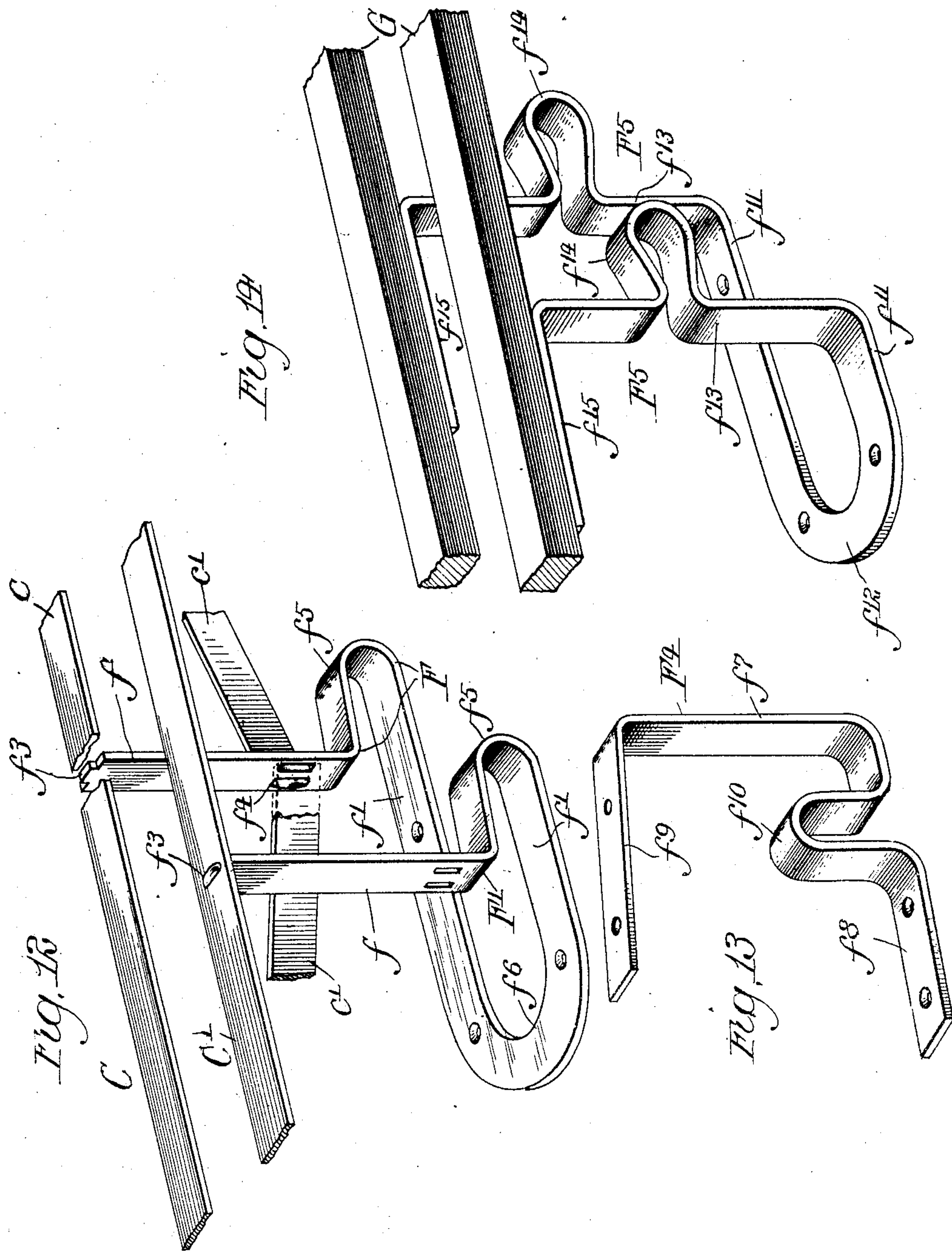
Fig. 8. H

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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

RUDOLF MOE, OF CHICAGO, ILLINOIS, ASSIGNOR TO AMERICAN INDUSTRIAL COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PEDAL-ACTION.

SPECIFICATION forming part of Letters Patent No. 785,969, dated March 28, 1905.

Application filed April 15, 1904. Serial No. 203,381.

To all whom it may concern:

Be it known that I, RUDOLF MOE, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pedal-Actions; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in pedal-actions for pianos; and the invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

Among the objects of the invention is to provide an improved pedal and pedal mounting and attachment for connecting the pedals with the levers of the action.

Another object of the invention is to provide a mouse-guard at the openings in the toe-rail through which extend the pedals, such guards being provided to prevent mice entering the piano at these points, and in this phase of the invention a peculiar type of pedal-shank may coöperate with a particular form of guard to provide a simple and effective mouse-guard.

A further object of the invention is to provide a strong and light construction of the levers by which motion is transmitted from the pedals to the mechanism of the instrument, the action of which is to be controlled by the pedals.

A still further object of the invention is to provide an improved spring which coöperates with the intermediate or motion-transmitting levers and acts at once as the pivot for said levers and as means for restoring the levers to their normal positions after pressure is released from the pedals.

A yet further object of the invention is to combine with a peculiar form of lever a spring which restores to its normal position its associated lever and constitutes its pivot.

Another object of the invention is to provide an improved pedal-locking device con-

structed to lock the pedal in a depressed position and to be automatically released through power applied to the same pedal.

The invention has for its objects other improvements in the pedal-action, as will hereinafter more fully appear.

In the drawings, Figure 1 is a plan view of a pedal-action embodying my invention, showing a portion of the base and toe-rail. Fig. 2 is a rear view of the parts shown in Fig. 1. Fig. 3 is a fragmentary front view of the toe-rail and pedals and showing also the mouse-guard. Fig. 4 is a vertical section taken on line 4 4 of Fig. 5. Fig. 5 is a transverse section taken through the toe-rail on the piano-base, showing the central pedal and its mounting, parts being shown in section. Fig. 6 is a detail section taken on line 6 6 of Fig. 5 looking in the direction indicated by the arrow. Fig. 7 is a detail section taken on line 7 7 of Fig. 5 looking in the direction indicated by the arrow. Fig. 8 is a detached view of one of the mouse-guards. Fig. 9 is a vertical section taken through the toe-rail and the piano-base, showing one of the side pedals. Fig. 10 is a top plan view of one of the side pedals and its mounting. Fig. 11 is a transverse section taken on line 11 11 of Fig. 9. Fig. 12 is a perspective view of a modified form of combined lever fulcrum and spring shown in connection with the form of levers illustrated in Figs. 1 and 2. Fig. 13 illustrates another modification of the lever-spring. Fig. 14 illustrates a further modified form of combined fulcrum and spring shown in connection with another form of lever.

As shown in the drawings, A designates the toe-rail, and A' the base or bottom of the piano-case.

B, B, and B' designate the three pedals, Figs. 1 and 3, which extend through openings in the toe-rail and are pivotally mounted on brackets attached to the base or bottom A'.

C C' C² designate levers which are operatively connected at the center of the piano with the several pedals and at their other ends with connecting rods or links D D' D², which reach to the mechanisms (not shown)

adapted for control by the pedal action. As herein shown the levers extend all in one direction from the pedals; but either of them may extend in the opposite or other direction, if desired. If desired, the said levers may be located and suitably supported in a position higher than herein shown.

The side pedals B B are fulcrumed at their rear ends in arch-shaped brackets E E, rising from the base or bottom of the piano, and the levers C C' are connected with the shanks of the pedals B B through the medium of rods or links C³ C³, whereby the inner ends of the levers are depressed and their outer ends elevated when the pedals are depressed. The central pedal B' is pivotally mounted in an arch-shaped bracket E', located adjacent to the toe-rail, and is connected with the lever C² through the medium of a connecting device C⁵, as shown more clearly in Fig. 5, whereby the rear end of the pedal-shank and the adjacent end of the lever C² are raised when the pedal B' is depressed.

A preferred form of the levers C C' C² is that of a general truss form, each consisting of an upper tension member *c*, arranged horizontally, and a lower compression member *c'*, arranged vertically edgewise. Each of said levers is preferably made of a single strip of metal, the ends of which are folded toward each other to constitute together the compression member and the central portion the tension member. The strip is twisted at its folded portions or ends of the lever, so as to bring the compression and tension members in planes at right angles to each other. The tension and compression members are connected at the longitudinal center of the lever by a strut which preferably and as herein shown comprises a part of a spring which restores the lever and the mechanism which it operates and constitutes the fulcrum about which the lever swings. It will be understood, however, that so far as is concerned the particular construction of the lever the springs may be of other form and connected with the levers in a different manner. Referring now to the construction of the springs and the manner of their embodiment in the levers, said parts are made as follows: The springs, which are designated by the reference-letters F F' F², are of peculiar form, each comprising a vertical shank *f*, a horizontal foot *f'*, by which the spring is fastened to the base A', and an upper laterally-directed part *f''*, tending in the same direction as the foot *f'* and to which the tension member of the lever is attached. Instead of being provided with laterally-directed parts *f''* at their upper ends the shanks of the springs may be fastened to the tension members of the levers by being provided at their upper ends with lugs or reductions *f''*, as shown in Fig. 12, adapted to extend through openings in the tension members and to be upset or riveted thereon. The shanks *f* of said

springs constitute the strut portions of the truss-levers, they being fastened at their upper ends to the tension members and fastened near their lower ends to the parts constituting the compression members. The manner of fastening the parts of the compression members to the shanks of the springs is shown more clearly in Figs. 2 and 12 and consists in providing the ends of the strips constituting the levers with lugs or projections *f''*, which extend through openings in the shanks and attached thereto by riveting. The shanks of said springs flex relatively to the feet thereof when the levers are oscillated, thus constituting the fulcrum of the levers, and the resiliency of the springs restores the levers and connected parts when pressure on the pedals is released. The shanks and feet of the springs shown in Figs. 2 and 12 are joined by outwardly-curved or auxiliary spring portions *f''*, which enhance the resiliency and activity of the springs. Preferably two of the three springs F F' F² (the springs F and F', as shown in Figs. 1 and 12) are made from a single strip of metal, the feet of said springs being joined by an integral curved part *f''*. The advantage of thus making two springs of a single strip of metal is that less time is required in fitting two integral springs in place than is required to fit two separate springs, as will be obvious. The multiple form of spring, as the two joined springs F F', is furthermore advantageous, inasmuch as it strengthens the device as a whole and reduces the liability of the parts becoming loosened during use. The spring F² is of single form. The combination of the springs with the levers is for a like reason of considerable practical advantage inasmuch as liability of the parts becoming loose and rattling is thereby greatly decreased. Moreover, the interbuilding of the springs with the levers produces a much stronger construction than where the completed springs are merely attached to the levers. Should the parts become loose, it would result not only in rattling, but in a derangement of the action of the mechanisms the pedal action is designed to control.

In Fig. 13 is shown a single form of spring F⁴ of a slightly-modified construction, comprising a shank *f''*, a horizontal foot *f''*, and an upper laterally-directed part *f''*, to which is adapted to be attached a lever and which tends in the same direction as the foot *f''*. In this form of spring the auxiliary curved spring portion *f''* is located in the foot portion of the spring.

In Fig. 14 I have shown two connected springs F⁵ F⁵, formed from a single strip of metal and the feet *f''* of which are joined by an integral part *f''*. The shanks *f''* of these springs are provided with auxiliary curved spring portions *f''*, located intermediate the upper and lower ends of the shanks. The upper ends of the shanks are provided with lat-

erally-directed parts f^{15} , tending in the same direction as do the feet f^{11} , and said laterally-directed parts are herein shown as attached to plain or wooden levers G.

5 The pedals B B' are provided with two-part shanks, each made of two flat bars b , located in parallel vertical planes. The two parts of each shank are preferably made from a single strip of wrought metal and embedded in the
10 cast foot portion proper of the pedal when the latter is cast, in the manner indicated in Figs. 5, 9, and 10. The strips constituting the two parts of the shank of the pedals B B are located with their curved connecting parts em-
15 bedded in the feet of said pedals and the rear ends of said strips are separated, while the reverse construction obtains in the construction of the pedal B'.

The brackets E E and E', the latter of which
20 is located near the toe-rail, each consists of a single strip of metal, as herein shown, and bent up in arch form and provided with feet e , by which it is attached to the base A'. The parallel members of said arch-shaped brackets
25 are provided with a plurality of sets of oppositely-located countersunk bearing-sockets e' , which are engaged by cone-shaped bearing-studs b^2 , extending laterally from the members of the two-part shanks, as more clearly shown
30 in Figs. 4, 10, and 11, and attached to the members of the shanks in any suitable manner. In some instances the reverse construction—viz., the location of the studs in the bracket to en-
35 gage sockets in the shank members—may be employed and the form of the bracket may be varied. The plurality of sets of bearing-sock-
40 ets e' are provided to permit of vertical adjustment of the pedals. The two members of the shanks of the pedals B are adapted to be
45 adjusted toward and from each other to bring into proper bearing relation the studs b^2 with their sockets. This is accomplished in the
50 present instance by means of adjusting-screws b^3 , each of which extends through a screw-threaded aperture of one member of its asso-
55 ciated shank and bears at its end against the inner face of the other member of said shank, as clearly shown in Fig. 10, whereby when said
60 screw is turned inwardly the members of the shank are spread apart to spread the bearing-studs b^2 into proper bearing engagement with their sockets. Preferably the inner ends of the adjusting-screws b^3 are let slightly into the
65 inner faces of the members of the shanks through which they do not pass, so as to provide a firm connection between said parts. Inasmuch as the two members of the shank of the central pedal cannot be separated at the fulcrum of said shank in the same manner as the members of the shank of the other pedals, owing to the adjacency of said fulcrum to the connection of said members with the pedal B' proper, the bearing-studs b^2 of the shank of the central pedal are adjusted to their sockets by moving inwardly the side members of the

bracket E', and this is effected by means of the bolt E², Figs. 2 and 4.

The connections between the shanks of the outer pedals B and the levers C C' through the medium of the links C³ are made as fol- 70
lows: The rods or links C³, which are attached at their upper ends to said levers, extend at their lower ends through plates B², fitted to the lower margins of the laterally-separated members of the shanks of the pedals. The
75 plates B² are attached to the shanks by means of bolts b^4 , extending downwardly through said plates and through transverse bars b^5 , which latter extend across and are fitted to the upper margins of the two members of the
80 shank, as clearly shown in Figs. 9 and 10. In order to provide for adjustment of the connection between the pedals and adjacent ends of the lever to the end that said connections shall be maintained approximately vertical, 85
the plates B² are shown as movable endwise of the shanks. For this purpose each plate B² is provided at one end with lugs b^6 , Fig. 9, which enter downwardly-opening notches
90 b^7 in the lower margins of the side members of the shank, and the backward and forward adjustment is effected by loosening the plate B² and moving it so as to allow the lugs b^6 to enter the notches b^7 desired and thereafter
95 tighten the bolt b^4 . In order to further prevent the plate from twisting on the two-part shank, the forward end of the plate is provided between the members of the shank with an upwardly-projecting flange b^8 , as shown in
100 Fig. 10 and in dotted lines in Fig. 9. The rear end of the plate B² is provided with a downturned lug b^9 , which engages the nut of the bolt b^4 in a manner to prevent the same from turning, thereby constituting a lock for
105 said nut. The bolt b^4 is inserted in place by being screwed downwardly into the nut and for this purpose is provided with a slotted head. The connection C⁵ between the shank of said central pedal and its associated lever
110 C² consists of a rod c^3 , Fig. 5, which is fitted in a sleeve c^4 , that is interposed between the lever C² and a plate B³, extending across and fitted on the upper margins of the members of the central shank. Said rod or stem c^3
115 extends into openings in the lever and said plate, and is thereby held laterally in place, and the sleeve c^4 serves to transmit by endwise thrust the upward motion of the pedal-shank to the lever. The plate B³ is secured
120 to the shank of the pedal B' in much the same manner as is the plate B², it being attached to said shank by means of a bolt b^{10} , extending downwardly through the plate and having screw-threaded connection with a bar b^{11} , ex-
125 tending transversely across and fitting the lower margins of the members of said shank, Fig. 6. This plate is also shown as adjustable endwise of the shank to admit of accurate adjustment of the parts, and to this end
130 is provided at its rear margin with down-

turned lugs b^{12} , adapted to enter either one of a series of upwardly-opening notches b^{13} in the upper margins of the shank members, as more clearly shown in Fig. 5. Lugs b^{16} on the ends of said plate B^3 enter the space between the shank members and additionally hold the plate from twisting on the shank.

The peculiar construction of the pedal-shanks enables me to provide a novel and effective form of mouse-guard at the openings in the toe-rail A, through which extend the pedal-shanks. A convenient form of mouse-guard, which is herein shown, consists of a thin sheet-metal plate H, Figs. 4, 5, 8, and 9, attached by means of screws h or the like to the inner face of the toe-rail and extending across the openings through which the pedals pass. Said plate is cut to form two vertical parallel downwardly-opening notches h' , which are made of sufficient width to permit the vertically-disposed members of the associated shank to extend freely therethrough, and said notches are separated by an intermediate portion h^2 , which extends through the opening in the shank between the side members thereof. The notches h' are open at their lower ends to permit the plates to be secured in place after the pedals are mounted. It will thus be seen that the openings through which extend the pedal-shanks, while wide enough to permit free movement of the shank, are so narrow as to effectually close the openings in the toe-rail against the entrance of mice to the interior of the piano. Heretofore it has been the common practice to construct piano-pedals with single-piece solid shanks and necessarily made considerably larger than either of the members of the two-part shank herein shown, and considerable ingenuity has been exercised to provide means for closing the inevitably large openings required to receive such pedal-shanks while permitting their unhampered oscillation. The method here employed produces an effective guard and with an eminently practical construction. It will be observed that the effective parts of the guards consist of the central bars or strips h^2 and the parts of the plates which extend inwardly past the side margins of the openings. So far as is concerned the effective parts of the guards, therefore, such parts may be otherwise formed—as, for instance, wires or rods may be substituted therefor. Moreover, so far as is concerned the mouse-guard construction in its broader aspect the central bars h^2 , however formed, may extend through vertical openings in the pedals made otherwise than herein shown. The present construction is desirable, however, inasmuch as it provides an economical device and one which is readily fastened in place. It may be here noted, however, that the form of pedal-shank herein employed is of considerable value regardless of its cooperation with the mouse-guard, inasmuch

as the shank is economical in its construction and light and at the same time is strong and durable and is capable of accurate adjustment in its mounting. The construction of the pedals shown and the manner of mounting them in place admits of their being readily withdrawn from place and without deranging the other parts of the action except so far as necessary to disconnect the shanks thereof from their brackets and from the levers C C' C^2 . After such disconnection the pedals may be withdrawn endwise from the openings in the toe-rail.

In the particular construction shown it may be assumed that the side pedals B B are appropriated to the mechanisms which produce, respectively, the pianissimo and fortissimo effects and the central pedal B^2 is designed to operate what is known as the "muffler," or device for muffling the tones of the piano. Such muffling device is often required, as in practice work, to be permanently locked or set for a considerable time. I have provided a device for locking the central pedal in its depressed position, and thereby locking the muffling device or mechanism set, which locking device is adapted to be automatically released through force applied to said pedal. Said locking device or latch consists of a vertically-swinging member I, Figs. 1, 5, and 7, which, as herein shown, extends upwardly between the members of the shank of the pedal B' (though it may occupy other relation to the pedal) and is pivotally supported on the base or bottom A' through the medium of a bracket I' , the vertical arms of which bracket are provided with conical pointed bearing-studs I^2 , extending toward each other and which engage at their inner ends conical countersunk notches or sockets on the opposite side faces of the lower end of said latch I. Said latch is provided near its upper end with a forwardly-opening notch i , and the shank is provided with a horizontal locking-pin b^{14} , which extends transversely between the side members thereof and is adapted when the rear end of the shank is elevated, as shown in dotted lines in Fig. 5, to enter said notch i . In the normal position of the parts the latch I is slightly overbalanced forwardly and rests with its forward margin against the pin b^{14} , and when the shank is raised said latch falls automatically forwardly, with the notch i in engagement with said pin. In this position of the parts (indicated in dotted lines in Fig. 5) the pedal is locked in its depressed position and is prevented from being restored by the spring of the lever C^2 until the latch is released therefrom. When it is desired to release the latch and restore the parts, a quick downward pressure on the pedal B' acts through the pin b^{14} to throw the latch rearwardly, with the notch i out of engagement with said pin. The shank of the pedal is now

free to drop into its lowermost or normal position. The latch is provided at the rear margin of its lower end with a stop-arm I^3 , which limits the rearward movement of the latch when thrown backwardly in the manner described to release the same from the lock-pin of the shank. The latch is also provided at its forward margin with a forwardly-extending arm I^4 , which is engaged by the pin b^{14} to restore the latch to its normal or forwardly-inclined position when the pedal is restored.

The several parts of the device which have impact engagement with each other are provided with cushioning-strips of felt or the like to render the action of the part noiseless.

It is obvious that many of the structural details shown may be varied without departing from the spirit of my invention, and I do not wish to be limited to such details except as hereinafter made the subject of specific claims.

I claim as my invention—

1. In a piano pedal-action, a pedal comprising a foot portion and a multipart shank, the members of which are disposed vertically edgewise.

2. In a piano pedal-action, a pedal comprising a solid foot portion and a metal multipart shank, the members of which are fastened in the foot portion.

3. In a piano pedal-action, a pedal comprising a foot portion, and a shank made from a single strip of wrought metal bent between its ends to constitute two parallel shank members, said strip being fastened to the foot portion at one end of the shank.

4. In a piano pedal-action, the combination with a pedal comprising a foot portion and a multipart shank the members of which are arranged vertically edgewise, of a fulcrum therefor comprising a stationary part, bearing-studs on one of the parts adapted to engage sockets in the other part, and means for laterally adjusting the bearings toward and from each other.

5. In a piano pedal-action, the combination with a pedal provided with a multipart shank, the members of which are arranged vertically edgewise, of a fulcrum therefor comprising a bracket the arms of which are located laterally outside of said shank members, conical bearing-studs on one of said parts adapted to enter corresponding sockets in the other part, and screw-threaded means for adjusting the parts of the bearings toward and from each other.

6. In a piano pedal-action, the combination with a pedal provided with a multipart shank, the members of which are arranged vertically edgewise, of a fulcrum-mounting therefor comprising laterally-extending, conical bearing-studs on said members, and parts located laterally outside of said members and provided with tapered sockets adapted to receive

said bearing-studs, and means acting on said shank members for pressing the bearing-studs outwardly into bearing relation with said sockets.

7. In a piano pedal-action, the combination with a pedal provided with a multipart shank, the members of which are arranged vertically edgewise, of a fulcrum-mounting therefor comprising laterally-extending, conical bearing-studs on said members, and parts located laterally outside of said members provided with tapered sockets adapted to receive said bearing-studs, and a spreading-screw extending through one of the members of said shank and bearing at its end against the other member for spreading said shank members apart.

8. In a piano pedal-action, a pedal comprising a solid portion, and a shank foot portion made of a single strip of metal and bent to form two parallel shank members disposed vertically edgewise, the curved or looped part of the strip being embedded in the foot portion, and means for spreading the free ends of said shank members apart.

9. In a pedal-action for pianos, the combination with a pedal provided with a multipart shank, the members of which are arranged vertically edgewise, a lever adapted for connection at one end with the mechanism which is controlled by the pedal, and means for connecting the lever with said pedal comprising a rod or link connected at its upper end with the lever, a plate extending across and engaging the margins of the shank members, and means for clamping said plate in place.

10. In a pedal-action for pianos, the combination with a pedal provided with a multipart shank, the members of which are arranged vertically edgewise, a lever adapted for connection at one end with the mechanism which is controlled by the pedal, and means for connecting the lever with said pedal comprising a rod or link connected at its upper end with the lever, a plate extending across and engaging the margins of the shank members, said rod or link being connected with said plate, means for clamping said plate in place, and interfitting connections between the plate and the margins of the shank members.

11. In a pedal-action for pianos, the combination with a pedal having a multipart shank, the members of which are arranged vertically edgewise, a lever adapted for connection at one end with the mechanism which the pedal controls, of connections between said lever and pedal, comprising a rod or link connected at its upper end with one end of the lever, a plate engaged by said rod or link and extending across the members of the pedal-shank and engaging the margins thereof, means for clamping said plate on said shank members comprising a bar extending across and engaging the margins of the said members, and a bolt extending through said bar and the plate,

and a lug on said plate adapted to engage the nut of said bolt to prevent the same from turning on the bolt.

12. In a piano-action, the combination with the toe-rail having a pedal-opening and a pedal, the shank of which extends therethrough, of a mouse-guard comprising a plurality of vertical, laterally-separated members extending across the said pedal-opening, and forming spaces between the same to receive the parts of the pedal-shank.

13. In a piano pedal-action, the combination with a pedal, the shank of which has a vertical opening, of a mouse-guard for the opening in the toe-rail for the pedal, embracing a part which extends across said opening and through the opening of the shank.

14. In a pedal-action for pianos, the combination with a pedal having a multipart shank, the members of which are arranged edgewise vertically, of a mouse-guard embracing a part which extends vertically through the space between said shank members.

15. In a pedal-action for pianos, the combination with a toe-rail provided with a pedal-opening and a pedal provided with a shank extending through said opening, comprising two members arranged vertically edgewise, of a mouse-guard attached to the toe-rail comprising two side parts located one at each side of the shank, and a central part located between the shank members.

16. In a pedal-action for pianos, the combination with a toe-rail provided with a pedal-opening and a pedal provided with a multipart shank extending through said opening, the members of which are arranged vertically edgewise, of a plate affixed to the inner face of the toe-rail at the opening through which the pedal extends and provided with notches which receive the members of the shank.

17. In a pedal-action for pianos, the combination with a pedal, of a lever adapted for connection with the part which the pedal controls, and at its other part with the pedal, said lever being made of truss shape, and the longitudinal members thereof being made of a single strip of metal.

18. In a pedal-action for pianos, the combination with a pedal, of a lever adapted for connection at one end with the pedal and at its other end with the mechanism which the pedal controls, and said lever comprising an upper tension member and a lower compression member and fulcrumed near the lowest part of its compression member.

19. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which is controlled by the pedal, said lever comprising an upper tension member and a lower compression member and fulcrumed at the lower part of said compression member, the tension member being arranged horizontally edgewise

and the compression member vertically edgewise.

20. In a pedal-action, the combination with a pedal, of a lever connected at one end with a pedal and adapted for connection at its other end with the mechanism which the pedal controls, said lever being made of truss shape, and embodying a strut which constitutes an integral portion of the fulcrum of the lever.

21. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, said lever being made of truss shape, comprising an upper tension member and a lower compression member, and a strut extending between the compression and tension members and comprising an integral part of the fulcrum of the lever.

22. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, said lever being made of truss shape, and comprising a single strip of metal which is bent to form at its central part a tension member and at its end parts a compression member, and a strut connecting the tension and compression members and comprising an integral part of a combined restoring-spring and fulcrum for the lever.

23. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, of a restoring-spring for the lever provided with a shank which constitutes a structural part of said lever.

24. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, of a restoring and fulcrum spring for the lever, said spring being provided at its lower end with a foot and at its upper end with a laterally-turned part by which it is attached to the lever and extending in the same direction as the foot.

25. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, and a spring embracing a shank which is attached to the lever, and a lower foot portion, one of said parts of the spring being provided with an auxiliary curved portion by which is enhanced the resiliency of the spring.

26. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, of a restoring and fulcrum spring for the lever, said spring being provided at its lower end with a foot and at its

upper end with a laterally-turned part by which it is attached to the lever and extending in the same direction as the foot, and the spring embracing as a part of one of its members an auxiliary curved portion acting to enhance the resiliency of the spring.

27. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the pedal controls, said lever comprising an upper tension member and a lower compression member, and a restoring-spring constituting also the fulcrum for the lever comprising a shank which is provided at its lower end with an attaching-foot, and at its other end with a laterally-turned part extending in the same direction as the foot and adapted for connection with the tension member, the compression member being attached to the shank of said spring and one of the parts of the spring being provided with an outwardly-curved portion which enhances the resiliency of the spring.

28. In a pedal-action for pianos, the combination with a pedal, of a lever connected at one end with the pedal and adapted for connection at its other end with the mechanism which the piano controls, comprising an upper tension member and a lower compression member, and a restoring and fulcrum spring provided with a laterally-turned attaching-foot and with a

shank which is connected at its upper end with the tension member and near its lower end with the compression member, the shank of the spring being joined to the foot portion by an outwardly-curved part.

29. In a pedal-action for pianos, the combination with two pedals, of two levers connected with said pedals and extending in the same direction therefrom, and adapted for connection at their other ends with the mechanism which the pedals control, and restoring and fulcrum springs for said levers, each comprising a shank which is attached to the lever and a laterally-extending attaching-foot, the feet of the two springs being joined by an integral connecting part.

30. In a pedal-action for pianos, the combination with the pedal-levers, of two restoring and fulcrum springs for two of the levers, the two springs being made of a single strip of metal and having parts comprising component parts of said levers.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 29th day of March, A. D. 1904.

RUDOLF MOE.

Witnesses:

WILLIAM L. HALL,
GERTRUDE BRYCE.