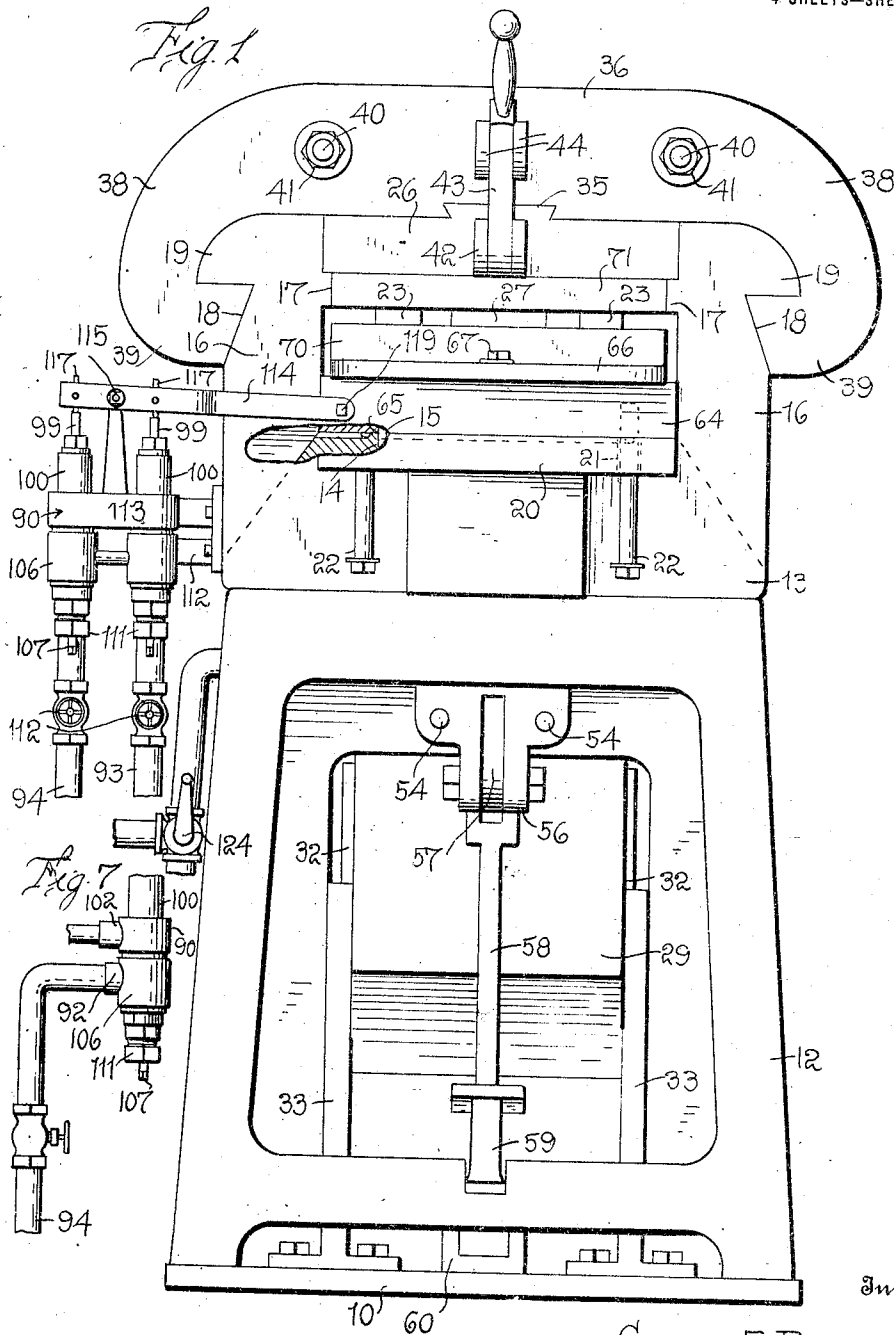


G. E. DAVENPORT.  
HYDRAULIC PRESS FOR SOUND RECORDS.  
APPLICATION FILED AUG. 11, 1917.

1,290,105.

Patented Jan. 7, 1919.

4 SHEETS—SHEET 1.



Inventor

GEORGE E. DAVENPORT

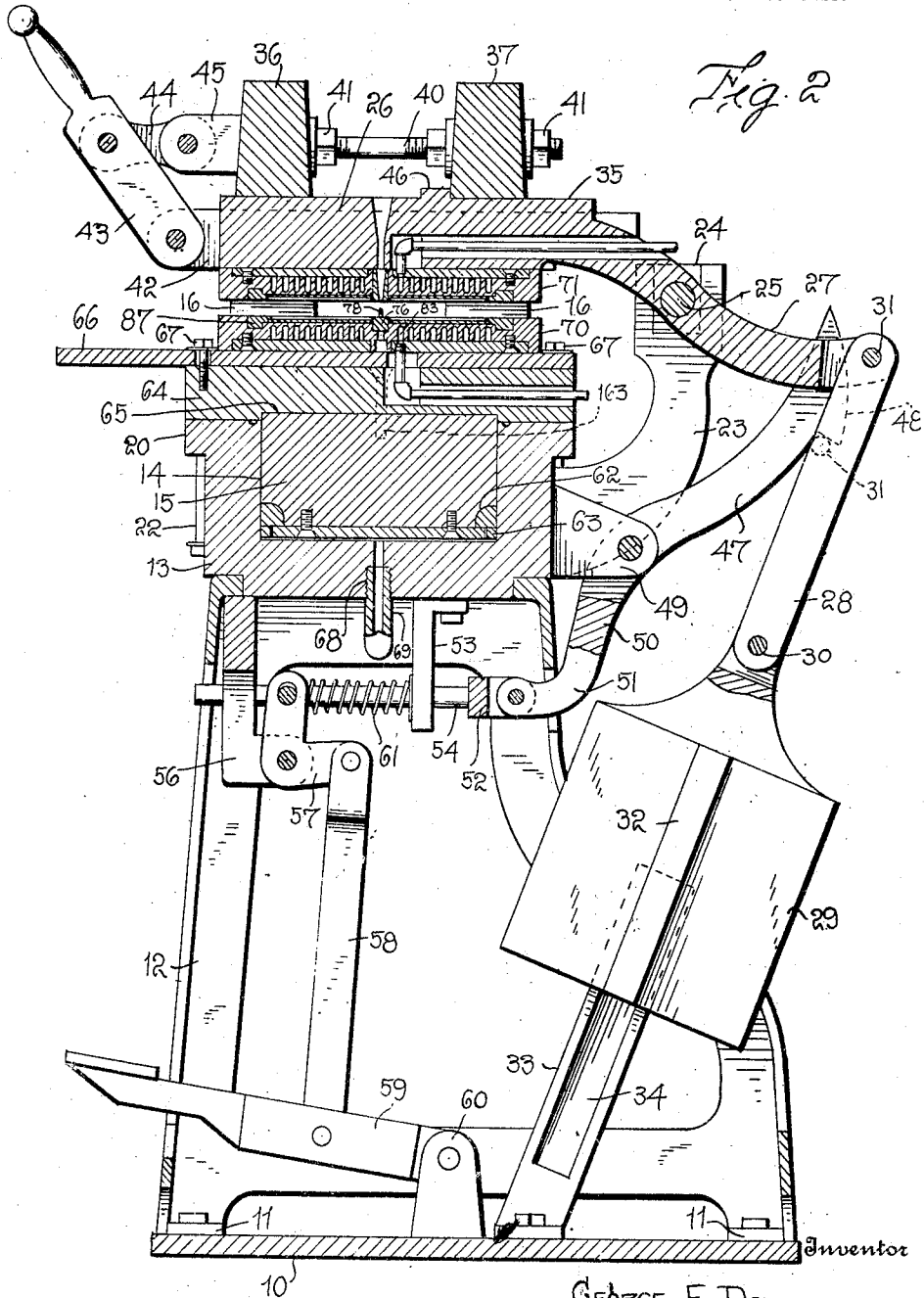
By *Watson & Coleman*  
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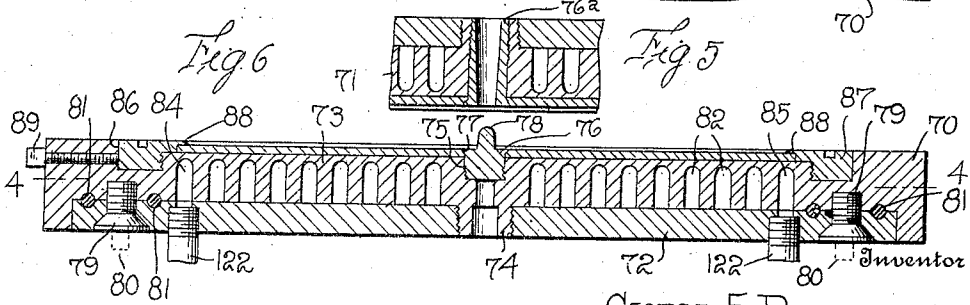
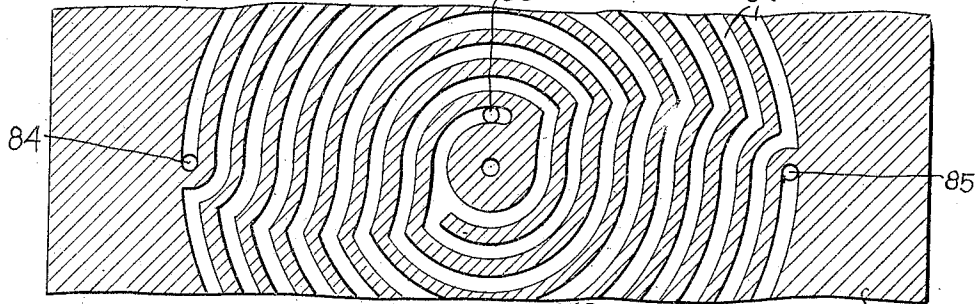
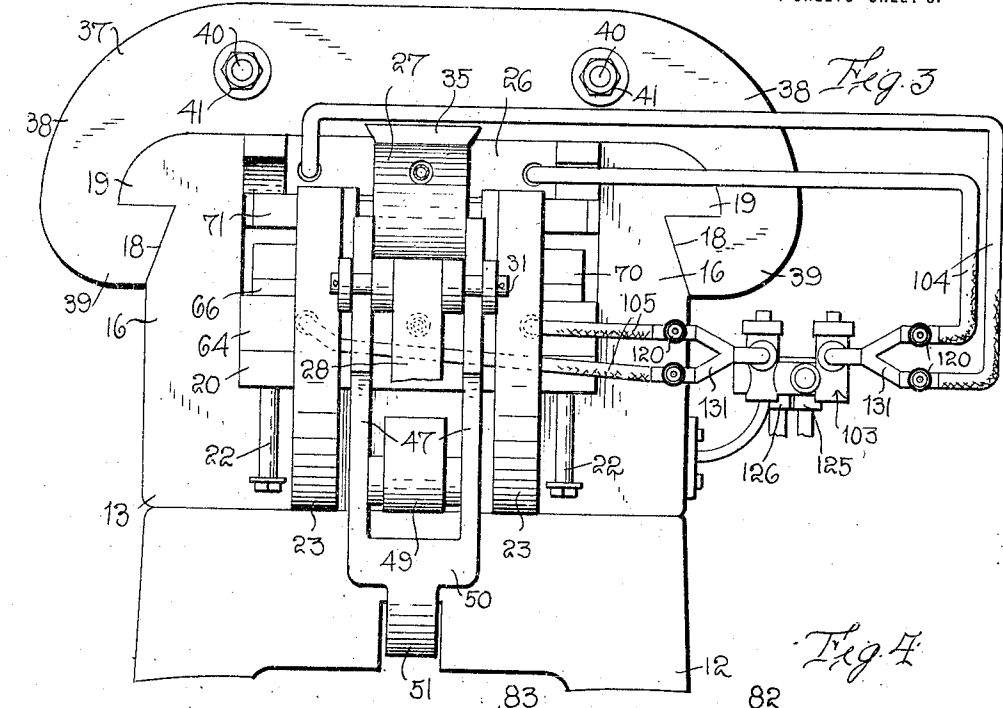
4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

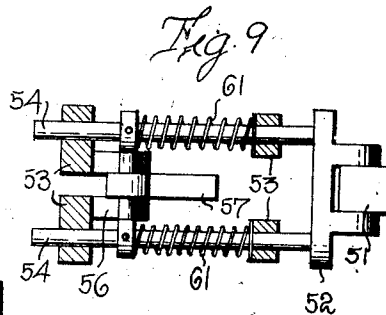
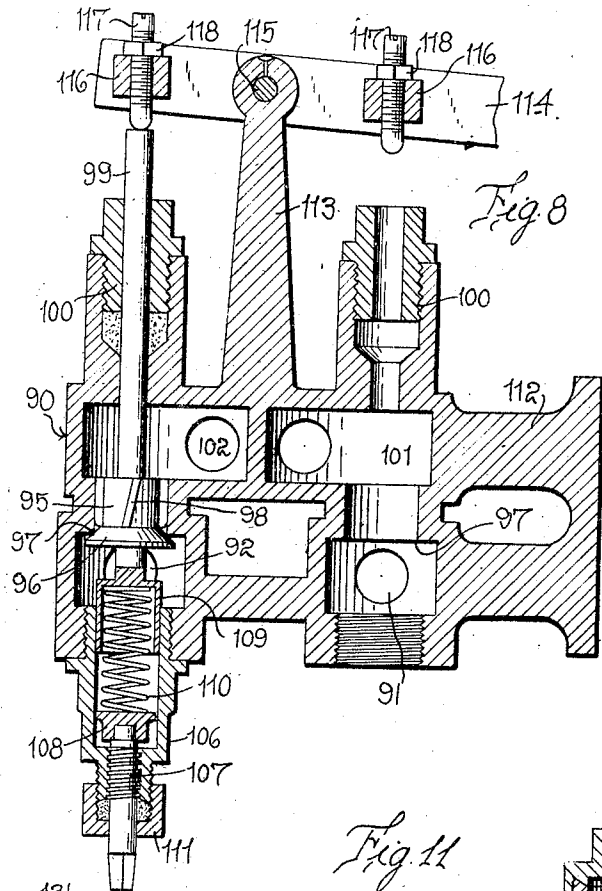


Fig. 10

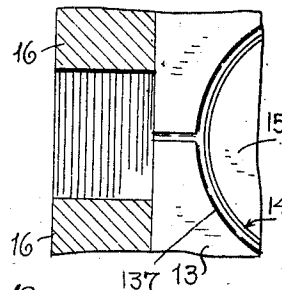
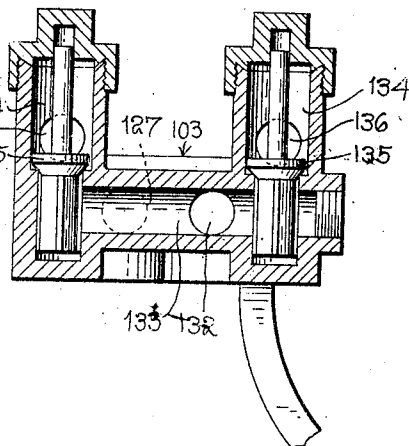
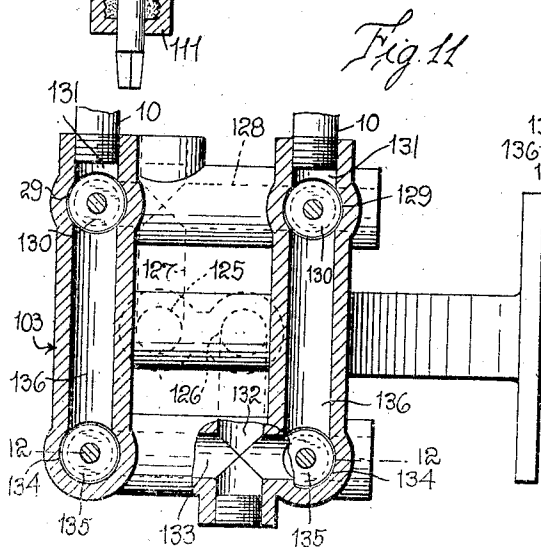


Fig. 12



Inventor



GEORGE E. DAVENPORT

By *Watson & Coleman*  
Attorney

# UNITED STATES PATENT OFFICE.

GEORGE E. DAVENPORT, OF CAMDEN, NEW JERSEY.

HYDRAULIC PRESS FOR SOUND-RECORDS.

1,290,105.

Specification of Letters Patent.

Patented Jan. 7, 1919.

Application filed August 11, 1917. Serial No. 135,783.

*To all whom it may concern:*

Be it known that I, GEORGE E. DAVENPORT, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Hydraulic Presses for Sound-Records, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to hydraulic presses, and particularly to presses of that character used for stamping the flat record tablets or record disks used in sound reproducing machines.

One object of this invention is to provide a machine of this character with a pivotally mounted buck-head which supports the upper matrix or die and provide improved means for locking this buck-head in its lowered or operative position.

A further object is to provide a construction of this character in which the bed of the press is provided with laterally disposed upstanding members having outwardly projecting lugs at their upper ends, and provide upon the buck-head sliding yokes having inwardly projecting lugs or detents which, when the yokes are shifted into one position, engage the first named lugs to hold the buck-head in its lowered position and which, when disengaged, permit the buck-head to be rotated upon its pivot to a raised position.

A further object is to provide a counterweight for raising the buck-head and to provide guides between which the counterweight moves so that the counterweight will not accidentally injure an operator standing behind the press. In other words, to provide means whereby the counterweight will be guided downward to a position within the base of the press so that by no chance can an operator accidentally place himself or any portion of himself between the counterweight and the floor.

A further object is to provide means whereby the buck-head may be locked in its lowered or its raised position, and provide a foot lever whereby the locking device may be shifted to an inoperative position, thus protecting the person operating the press, and furthermore preventing the buck-head from dropping down upon the lower die in case the bolt which supports the counterweight should by any chance break.

Still another object is to provide a press

of this character with die carrying members or platens so arranged or constructed that hot water or steam may be caused to circulate through the platens or cold water may be caused to circulate therethrough, and in this connection to provide automatic means whereby when the buck-head is raised and the hydraulic piston of the press is lowered, steam or other heating fluid shall be caused to circulate through the platens to thereby heat the dies, and as soon as the piston of the press is raised and the buck-head lowered, the steam will be driven out and cold water will be caused to circulate through the platens to thereby cool the dies.

A further object is to provide improved means for controlling the admission of water to the piston cylinder.

Other objects relate to improvements in the details of construction and arrangement of parts as will appear more fully hereafter.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a front elevation of my improved hydraulic press showing the buck-head closed, a part of the piston block being broken away;

Fig. 2 is a vertical sectional view from front to rear;

Fig. 3 is a fragmentary rear elevation of the upper portion of the press.

Fig. 4 is a fragmentary sectional view on the line 4—4 of Fig. 6;

Fig. 5 is a fragmentary vertical section through the center of the upper platen;

Fig. 6 is a transverse vertical section through the lower platen;

Fig. 7 is a fragmentary side elevation of the steam and water controlling valve;

Fig. 8 is a vertical sectional view through the valve casing for controlling the inlet of steam and hot water to the dies;

Fig. 9 is a detailed plan view partly in section showing a part of the latch operating mechanism,

Fig. 10 is a fragmentary top plan view of the piston, the uprights being in section;

Fig. 11 is a sectional view of the manifold on the line 11—11 of Fig. 2;

Fig. 12 is a vertical sectional view through the manifold on the line 12—12 of Fig. 11.

Referring to these drawings, it will be seen that the press comprises a base plate 10 having upwardly extending flanges 11, this plate being formed to support in-

strumentalities which will be later described. Mounted upon this plate, in any suitable manner, is the base, designated generally 12, which is illustrated as approximately rectangular in cross section and with sides extending upward and inward, these sides being preferably cut-away so as to make the base relatively light and permit access to the parts inclosed within the base. Mounted upon the base in any suitable manner and either bolted thereto or formed integral therewith, is the bed 13 of the press. This bed is relatively thick and solid and is formed with a centrally disposed cylinder 14 within which a piston 15 operates in the usual manner.

Extending upward from the bed on each side of the press are a pair of uprights 16, the inner faces of which uprights extend vertically upward. The two uprights 16 disposed at the front of the press are formed with transversely extending lugs 17, for a purpose which will be later stated. The outer faces of the uprights 16, which uprights constitute guides for the buck-head and piston block, are inwardly beveled as at 18 and then outwardly extended to provide lugs 19, which project beyond the edge faces of the uprights, the upper faces of these lugs being rounded. The bed is also formed with an outwardly projecting flange 20 at its front, the upper face of the flange being coincident with the upper face of the bed and this flange being perforated as at 21 for the passage of limiting bolts 22, the purpose of which will be later described.

Extending rearward and upward from the bed are the arms 23, which at their upper ends are transversely recessed for the purpose of supporting the bearing blocks 24, which are provided with suitable journal bearings for the extremities of a transverse shaft 25. The buck-head, which is designated generally 26, has a rearwardly and downwardly extending arm 27, the shaft 25 constituting trunnions for said arm, resting in the bearings 24 and to the outer extremity of this arm 27, there is pivotally attached a link 28 and pivoted to this link is a counterweight 29, the upper end of which is bifurcated for the passage of a bolt 30, which connects the link to the counterweight. The arm 27 is also bifurcated for the reception of the upper end of the link 28, which is held to the arm by the bolt 31. The side faces of the counterweight are provided with longitudinally extending ribs 32, and mounted upon the base 10 in the manner illustrated in Fig. 2, are the upwardly extending guides 33 which are formed with longitudinally extending grooves 34 within which the ribs 32 engage and by which the counterweight is guided downward and inward, so that when the counterweight is in its extreme lowered po-

sition, it will rest upon the base plate 10 and no portion of the counterweight will project out beyond this base plate 10.

The buck-head 26 is formed upon its upper face to provide a rib 35, this rib having undercut side edges which are preferably inwardly beveled. Slidingly mounted upon this rib and resting upon the upper face of the buck-head are the forward and rear yokes 36 and 37. These yokes extend transversely of the machine and are bent over at their outer ends, as at 38; and then bent inward as at 39, these inwardly extending ends forming lugs which are so shaped as to engage beneath and have snug engagement with the lugs 19, in the manner illustrated in Fig. 1. These yokes are connected to each other by a pair of longitudinally extending bolts 40, each of these bolts being threaded in opposite directions, these threaded portions passing through the front and rear yokes and being provided on each threaded portion with the clamping nuts 41, which engage firmly on each side of the yokes and hold the yokes in proper relation and against strain. The rib 35 terminates flush with the forward face of the buck-head but extends rearward beyond the rear edge of the buck-head and over the arm 27.

For the purpose of longitudinally shifting the yokes 36 and 37, I provide a bracket 42, which extends out from the front of the buck-head at the middle thereof and mount on this bracket an upwardly extending operating lever 43, which is connected by links 44 to an ear 45 projecting out from the yoke 36. It will be obvious now that by shifting the lever 43 in one direction or the other, the yokes will be shifted from a position in engagement with the lugs 19 to a position out of engagement, that is, to a position between the uprights 16. The rib 35 is provided with a stop 46, which limits the rearward movement of the yokes so that when the yokes are moved rearward to their farthest position, they will be in staggered relation to the uprights 16 and, therefore, the buck-head is entirely released from its engagement with these uprights and the counterweight will act to draw the buck-head up. When, however, the lever is thrown in a contrary position, the yokes will be drawn in alinement with the uprights 16 and the lugs 39 and 19 will be interlocked with each other.

For the purpose of locking the buck-head in its raised position and preventing any accidental descent of the buck-head, due for instance to the breaking of the pivot bolts which connect the counterweight to the buck-head, I provide latches 47. There are two of these latches 47 disposed in spaced relation to each other, and disposed in planes on each side of the arm 27, these latches being each provided with a rearwardly pro-

jecting detent lug which is beveled upon its upper face. The detent lug is adapted to engage over the pivot pin 31 that engages the arm 27 with the link connected to the counterweight. The latches 47 are pivotally mounted upon a bracket 49 projecting out from the base and are shown as being pivoted upon a bolt passing through the bracket and through the two latches. The two latches are connected at their lower ends by a cross bar 50 and this cross bar extends downward and forward in the form of a curved arm 51 and is pivotally connected to ears on a transverse cross bar 52. Depending from the under face of the bed are guides 53, through which transverse rods 54 pass, these rods being connected to a cross bar 52, in turn connected to the arm 51, and pivotally supported upon a bracket 56 is a bell crank lever 57, the upper end of which has a cross bar which is connected to the two rods 54, and the lower end of which is connected by a link 58 to a treadle lever 59 pivoted at its rear end upon upstanding ears 60 and extending out through an opening in the front wall of the base and provided with a treadle plate. Springs 61 surround the rods 54 and bear against the guides 53 and thus urge the latches 47 downward and outward into the path of movement of the pivot pin 31, which pivot pin or bolt extends out laterally beyond the co-acting ears on the arm 27.

Now when the buck-head is raised, the connecting bolt or pin 31 moves downward and sliding against the beveled faces of the lugs 48 forces the latches inward until the pivot bolt 31 has passed below the lugs, whereupon the springs 61 force the latches outward. Now if an attempt be made to lower the buck-head under these circumstances, the pivot pin or bolt will bear against the detent lugs 48 and the buck-head cannot be lowered. Thus if the counterweight is released from its engagement with the buck-head by the breaking of bolts or pins, the buck-head cannot drop because of the latches. If it is desired to lower the buck-head it is only necessary to depress the treadle lever 59 and this withdraws the latches out of the path of movement of the bolt 21 and the buck-head may be lowered. It will be seen that when the buck-head is raised, these latches lock automatically and that they are unlocked by the foot lever.

The piston 15 as illustrated in Fig. 2, is formed at its bottom with a circumferential groove or channel 62 and a metal plate 63 is attached to the bottom of the piston by screws, this metal plate defining one wall of the channel 62. This channel is designed for the carriage of a piston ring. The upper face of the piston has a pair of screw-threaded openings 63 by which the piston block 64 is held to the piston. This piston

block 64 is formed with an annular recess 65, on its under face, within which the upper end of the piston is disposed. Mounted upon the piston block 64 is the adjusting plate 66 perforated at its forward and rear ends for the passage of the adjusting screws 67. The piston block and the adjusting plate are provided with a plurality of passages as will be later stated. The bed of the press is provided with an opening 68 connected by a pipe 69 to a valve which will be later described, whereby water may be allowed to enter the cylinder to force the piston up or be allowed to escape from the cylinder to permit the downward movement of the cylinder. The buck-head and the piston block both carry platens 70 and 71 constructed as will be now described.

The lower platen 70 is illustrated in detail in Fig. 6, and comprises a bottom plate 72 and a top plate 73. The top plate is formed with a central screw-threaded hub 74 which screws into a central opening in the plate 72, and this hub is bored entirely through the plate and the upper face of the plate is formed with a counterbore 75 wherein is disposed a plug 76 having an overhung annular flange 77 and a central pin 78, which is rounded and forms the pin whereby the guide or matrix is centered on this die plate or platen and whereby the upper die plate and die are centered with relation to the lower die plate and die. The plate 72 is held to the plate 73 by disposing it within a circular recess in the under face of the plate 73 and locking it in place by screws 79, each of these screws being initially formed with a square shank 80 whereby the screw may be turned, this square shank being later cut off so as to prevent any reverse movement of the screw. Packing rings 81 are disposed between the margins of the plates 72 and 73. The plate 73 is formed with a plurality of approximately concentric grooves 82 forming circulating coils arranged as illustrated in Fig. 4, the open sides of these grooves being closed by the plates 72. Preferably there are two series of these grooves, both merging into each other at the center of the disk and ending at diametrically opposite portions of the platen.

Adjacent the center of the platen there is a passage 83 with which both series of grooves connect, this passage 83 being connected to an outlet duct or pipe and at diametrically opposite portions of the platen and communicating each with one of the series of grooves are inlet passages 84 and 85, each connected to a source of water and to a source of steam, the entrance of steam and the entrance of water being controlled by a valve which will be later described. By this means, either steam may be allowed to travel through the concentric channels, or cold water may be allowed to travel through the

channels to thus intermittently heat the platen or chill it.

For the purpose of holding a die or matrix upon the upper face of the plate 73, I form upon the upper face of the plate an annular recess 86, the inner wall of which is screw-threaded and I provide a ring 87, which has screw-threads on the inner wall of the recess, this ring being formed with an overhanging flange 88 corresponding to the overhanging flange 77 on the plug 76 and the die or matrix is disposed beneath this overhanging flange 88 and held in place by the ring or by the plug. By removing the plug and by removing the ring, the matrix may be readily removed. The ring is formed with openings whereby a wrench may be applied thereto and is preferably held from any unscrewing action by means of a set screw 89.

The upper platen is constructed in the same manner as the lower platen except that a plug 76<sup>a</sup> is provided which extends entirely through the upper platen and has screw-threaded engagement therewith and is formed with a central opening to receive the pin 78 on the lower platen.

For the purpose of controlling the flow of steam and cold water to the die plates, I provide the steam and water controlling valve (Fig. 8) which is designated generally 90 and is mounted upon one side of the bed of the press. The valve casing is constructed to provide two inlet chambers 91 and 92, the chamber 91 being for the inlet of steam and the chamber 92 being for the inlet of cold water and these chambers being connected by pipes 93 and 94 to suitable sources of steam and water respectively. Disposed in these chambers are the valves 95, one valve in each chamber, each valve being provided at its bottom with a beveled flange or head 96, which engages with a shoulder 97 at the upper end of the corresponding chamber, this shoulder forming a seat. The bodies of the valves are formed with ribs 98 whereby the valves are centered properly within the chambers. Each valve is provided with an upwardly extending stem 99, which passes upward through the valve body and through a stuffing box 100 in the upper end of the valve body.

Disposed above the chambers 91 and 92 are the outlet chambers 101 and 102. These chambers both connect to a manifold 103, this manifold being connected by pipes 104 and 105 to the inlet openings 84 and 85 of the platens. Thus steam may pass to both of said inlet openings or cold water may pass to both of said inlet openings, depending upon the positions of the valves 95 within the respective chambers 91 and 92. The particular construction of this manifold and its connections will be later described. Ex-

tending downward from the chambers 91 and 92 are the bonnets or hoods 106, which are provided with stuffing boxes at their lower ends and are interiorly screw-threaded at their lower ends and in the lower end of each hood there is disposed an adjusting screw 107, which has swiveled engagement with a plunger 108 and disposed within each chamber 91 and 92 is a cap 109 having an upwardly projecting boss which bears against the under face of the corresponding valve 95, this cap fitting over a coiled compression spring 110 which is disposed within the cap and the plunger 108. It will thus be seen that the springs hold the valves to their respective seats or urge them toward these seats and that the pressure of the springs may be adjusted. The adjusting screw 107 is held in its adjusted position by means of the jam nut 111.

The side of the valve casing 90 is provided with a bracket 112 whereby it may be attached to the bed of the press and the upper end of the valve casing is provided with an upwardly projecting pedestal 113. A rocker arm 114 having oppositely disposed parallel legs is rotatably mounted upon this pedestal by means of the bolt 115, this rocker arm being provided with a pair of cross bars 116, through which pass adjusting screws 117, these screws being held in their adjusted positions by lock nuts 118. The lower ends of these adjusting screws are rounded and bear against the upper ends of the valve stems 99. Now it will be seen that the valve stems are disposed on each side of the pedestal and that therefore when the rocker arm 114 is in one position, one valve 98 will be depressed while the other will be raised and vice versa. The inner end of the rocker arm is pivotally connected by means of a bolt 119 to the piston block, as illustrated in Fig. 1. Globe valves 120 are provided for primarily controlling the passage of water or steam to the respective valve chambers and when the machine is entirely out of operation, these globe valves are turned to cut off the supply of steam.

Normally, and when the piston block 64 is in its lowered position, communication will be established between the steam inlet chamber 91 and the platens on the buck-head and on the piston block, so that both of said platens and the dies attached thereto will be heated. When, however, the piston block moves upward under the hydraulic pressure of the water in the cylinder, so as to bring the dies into compressing relation to the tablet, then the steam valve in chamber 91 will close and the valve 98 in chamber 92 will open, thus permitting cold water to circulate through the dies, thus driving out the steam and chilling the dies and the composition tablet between the dies so that the latter will harden sufficiently to be removed.

As soon as the press is open, however, and the piston descends, the steam will be allowed again to flow to the platens and the cold water will be cut off. The piston block is provided with limiting bolts 22 which are attached to the piston block and pass through the passages 21, these bolts being provided at their lower ends with heads, which constitute stops limiting the too great upward movement of the piston and preventing the detachment of the piston block and piston from the cylinder. By removing these heads, of course, the piston block and piston may be removed.

By reference to Fig. 6, it will be seen that the outlet passages 84 and 85 of each platen are screw-threaded and that pipes 122 are connected to these screw-threaded openings, these pipes extending outward to a suitable header, or manifold, this header being connected by flexible pipes to the steam water inlets. I do not wish to limit myself, however, to any particular arrangement of the headers and pipes connecting the valves to the platens. Each of the platens has a central water passage 83, which connects to an outlet pipe whereby the cold water or the exhaust steam may be withdrawn whenever desired. The admission of water to the cylinder below the piston is controlled by means of the double valve 124 which may be of any suitable or usual construction so that when the valve is shifted in one direction, the water will be cut off but allowed to pass again when the valve is shifted in the opposite direction.

The manifold designated 103 generally is illustrated in Fig. 3, and this manifold is supported by a bracket at the back of the press. The body of the manifold is formed with a water inlet 125 and a steam inlet 126 disposed at the same level. From the water inlet 125 extends a passage 127, which opens into a transverse passage 128, which at its ends opens into superimposed valve chambers 129, in which are disposed the check valves 130. From these valve chambers extend the outlet passages 131. The steam inlet is provided with a passage 132 extending oppositely to the passage 127 and opening into the transverse passage 133 extending beneath the valve chambers 134, in which are disposed check valves 135. These valve chambers 134 communicate by passage 136 with the valve chambers 129.

From each of the outlet passages 131 extends a Siamese connection 137 (see Fig. 3) from which flexible pipes 104 and 105 as previously described extend to the inlet openings of the two platens. Now it will be obvious that when, for instance, water is allowed to flow through the controlling valve, the water will enter the inlet 125, thence pass into the passage 128 and lift the check valves 129. This will not only fill the

passages 136 but it will force down the check valves 135 and therefore the water will flow out through the Siamese connections to the upper and lower platens. When, however, the controlling valve is shifted so as to permit steam to enter, the steam will enter through the steam inlet 126, thence pass to the passage 133, force up the valves 134, enter the passages 136 and pass out through the Siamese connections, forcing the check valves 129 to their seats. The purpose of these check valves is to prevent the steam backing up into the main valve by way of the water pipe while water is passing through the check valves 129 and check valves 134 are provided for the purpose of preventing the water from backing up by way of the steam pipes.

The operation of this invention will be readily understood from what has gone before. Normally of course the valves 120 are closed but when it is desired to operate the press, the proper dies are disposed upon the platens and held in position thereon by screwing down the rings 87 and the plugs 76 and 76<sup>a</sup>. Then a tablet of the composition ordinarily used in forming phonographic tablets is placed between the dies and the buck-head is drawn downward by hand against the force of the counterweight and locked by shifting the lever 43 as heretofore described. Water is then admitted beneath the piston in the usual manner and the piston rises and as it does so the steam which has been circulating through the platens is cut off and cold water is allowed to flow through the platens, thus chilling the dies. After a suitable interval, the foot lever 59 is depressed, thus releasing the latches 47 and then by shifting the lever 43 rearward the locking yokes are carried into a position beneath the standards and the counterweight causes the buck-head to rise to its normal position and the tablet is removed and a new tablet put in place.

By constructing the press as described, I secure great strength and effectiveness therefor. It is to be noted that the inner faces of the uprights 16 form guides for the buck-head and for the piston block so that the buck-head and the upper platen and the piston block and the lower platen are held in proper registering relation with each other, so that a perfect concentricity of the record on both sides of the tablet is secured and there is no tendency of the piston to shift laterally as it rises and emerges more and more from the cylinder. As before stated, it is impossible for the buck-head to fall accidentally and because of the fact that the counterweight is guided downward and inward, there is no chance of an operator getting caught between the descending and relatively heavy counterweight and the floor which would be the case did the counter-

weight depend by gravity from the arm 27. In this case, the counterweight would fall directly downward and outward of the base. These machines in actual use are placed relatively close together, one behind the other and hence there is constant liability of the counterweights falling and hurting an operator behind the machine on which the counterweight is mounted. This is avoided in my construction.

It will be noted that the yokes 36 may be adjusted toward or from each other and locked in their adjusted positions, so as to secure a perfect alinement between these yokes and the spaces between the uprights 16. These spaces between the uprights are, of course, just sufficient to permit a certain turning movement of the yokes as the buck-head rises. These uprights are about 4" wide while the spaces between the uprights are approximately 6" wide. It will further be noted that control of the cold water and steam is not left to the operator who might otherwise keep the steam on too long or keep the cold water on too long, but that the steam is cut off exactly at the same point under all circumstances and the cold water allowed to flow for the same period under all circumstances. This period, during which the cold water and steam may be allowed to flow, may be readily adjusted by adjusting the point of pivotal connection of the arm 114 to the piston block or by adjusting the screws 117. Thus the screws may be so turned that they will not engage with the outer ends of the valve rods or stems until after the rocker arm 114 is moved a certain predetermined distance or they may be engaged immediately and these screws may further be located so as to take up any lost motion.

Preferably, as will be noted from Fig. 10, the upper faces of the piston block is formed with a gutter 137 which acts as an overflow gutter and has a channel leading off to the side face of the piston block. While I have illustrated a particular form of my construction and the particular arrangement of the various parts, it may be understood that various modifications may be made both in the construction and operation, without departing from the spirit of the invention.

Having described my invention, what I claim is:—

1. A press including a base open at its rear end, a bed mounted upon the base, a buck-head pivotally mounted upon the bed, a counterweight operatively connected to the buck-head to raise it, and means for guiding the counterweight downward and inward through the opening in the rear of the base as the counterweight is lowered.

2. A press including a bed, means for supporting the bed, a buck-head pivotally mounted upon the bed, a counterweight op-

eratively connected to the buck-head to raise or lower it, and means for guiding said counterweight downward into a position entirely beneath the bed when the counterweight is lowered.

3. A press including a base open at its rear end, a bed mounted thereon, a buck-head pivotally mounted upon the bed and having a rearward extension, downwardly and inwardly inclined guides mounted upon the base, extending upward and through the rear end of the base, and a counterweight operatively connected to the extension of the buck-head and slidably engaging said guides, said guides carrying the counterweights downward within the base of the press when the counterweight is lowered.

4. A hydraulic press including upper and lower platens one movable toward and from the other, each of said platens being provided with channels, means for directing alternately a heating or a cooling medium into said channels, comprising a pair of valves one controlling the outlet of heating medium and the other the outlet of cooling medium, and a valve actuating device operatively engaging said valves and alternately shifting them to open position, said actuating device being operatively connected to one of said platens to move therewith.

5. A press including a lower outwardly movable platen and an upper downwardly movable platen, both of said platens being provided with channels, and means for directing a heating medium or a cooling medium into the channels of the platens, comprising valve chambers, one connected to a source of water and the other to a source of steam, there being outlet passages leading from said valve chambers and operatively connected to both of said platens, an actuating lever pivotally mounted between the two valves and operatively engaging the valves, said actuating lever being pivotally connected to the lower platen.

6. A press including a lower platen and an upper platen movable toward or from each other, a piston operatively engaging the lower platen to lift it, said platens being formed with channels, and automatically acting means for directing cold water into the platens upon the upward movement of the piston and the platen connected thereto and directing steam into the platens upon a downward movement of the piston and the platen connected thereto.

7. In a press of the character described, the combination with platens movable toward or from each other, and dies carried by said platens, one of said dies having fluid passages through it, of means for controlling the passage of fluid through the die including a header operatively connected to the die and having a pair of inwardly

opening inlet valves, closing upon pressure within the header, a steam inlet pipe connected to the header behind one of said valves, a water inlet pipe connected to the header behind the other of said valves, and means connected to one of said platens for directing water or steam alternately to said header.

8. In a press of the character described, the combination with platens movable toward or from each other, and dies carried by said platens, one of said dies having fluid passages through it, of means for controlling the passage of fluid through the die including a header having inlet openings at its opposite ends, valve chambers extending downward from said inlet openings, upwardly opening valves disposed in said chambers, a steam chamber opening into one of said valve chambers beneath the valve, a water chamber opening into the other of said valve chambers beneath the valve, connections extending from said water and steam sources respectively, and means controlled by one of said movable platens for cutting off the supply of water to the header and admitting steam or cutting off the supply of steam and admitting water.

9. In a press of the character described, the combination with platens movable toward or from each other, and dies carried by said platens, one of said dies having fluid passages through it, of means for controlling the passage of fluid through the die including a pair of headers extending parallel to each other and having outlet pipes, a pair of valve chambers extending downward from each header and having upwardly opening valves therein, a chamber disposed below the pair of headers and con-

necting the two valve chambers at one end of the headers, a chamber extending below the opposite ends of the headers and connecting the valve chambers at that end, means for supplying water to one of said chambers and steam to the other of said connecting chambers, and means controlled by the movement of one of said platens for intermittently supplying water to the header and cutting off the supply of steam thereto or supplying steam thereto and cutting off the supply of water.

10. In a press of the character described, opposed platens movable toward or from each other, a die movable with one of said platens and having fluid circulating passages therein, and means for controlling the circulation of fluid through the die comprising a valve casing having two chambers, each operatively connected to the die, valve chambers extending downward from the first named chambers and connected one to a source of water and another to a source of steam, downwardly opening valves in said chambers having stems extending upward through the valve casing, springs urging said valves to a closed position, and a lever pivoted intermediate its ends and having operative connection to one of said platens to move therewith, and members adjustably mounted upon the lever to engage with the valve stems as the lever is oscillated to thereby depress one or the other of the valves.

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

GEORGE E. DAVENPORT.

Witnesses:

HATTIE SATINSKY,  
PATRICK H. HARDING.