Oct. 23, 1934. F. A. PUTNAM ET AL 1,978,225

MARKING MACHINE

Original Filed Jan. 31, 1931 2 Sheets-Sheet 1

Fig. 1.

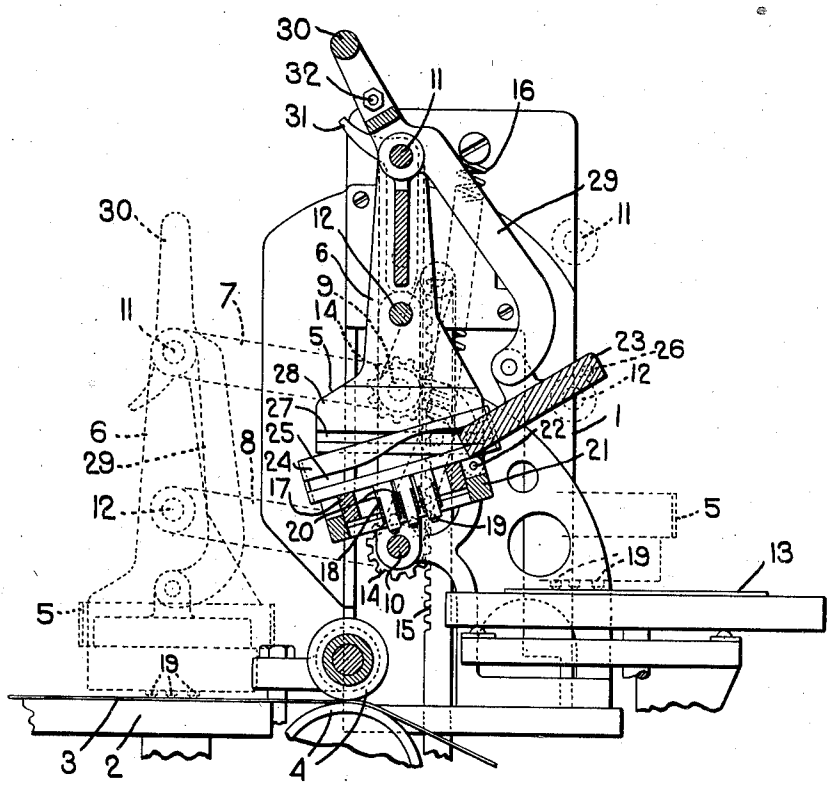

Fig. 2.

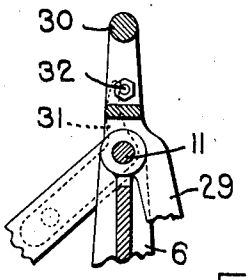

Fig. 3.

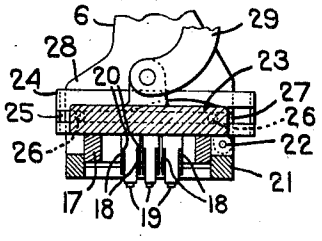

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Fig. 4.

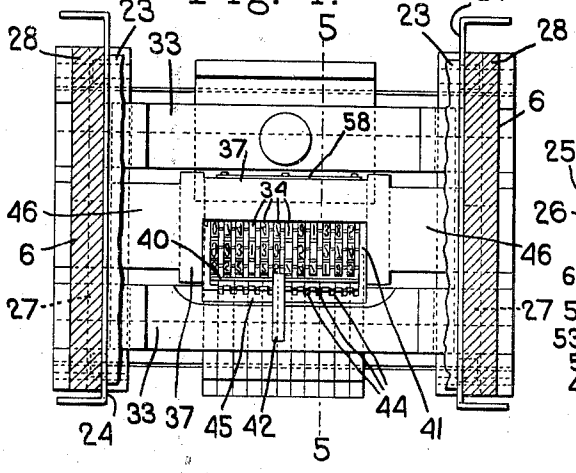


Fig. 5.

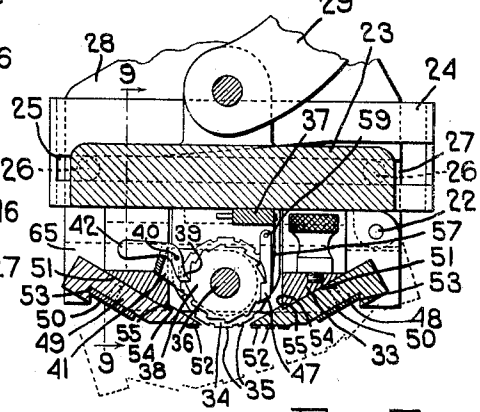


Fig. 6.

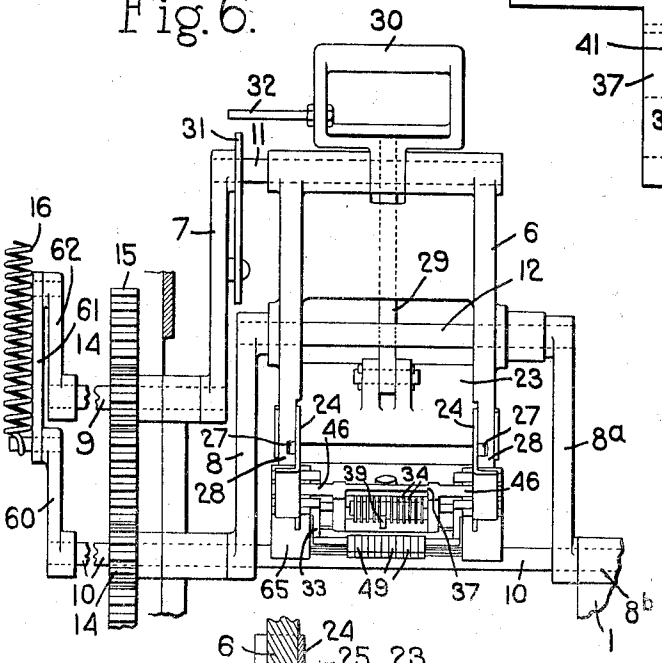


Fig. 7.

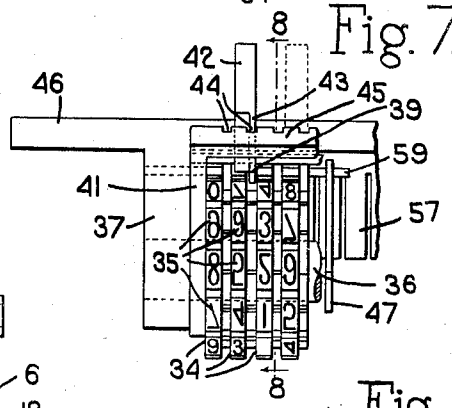


Fig. 8.

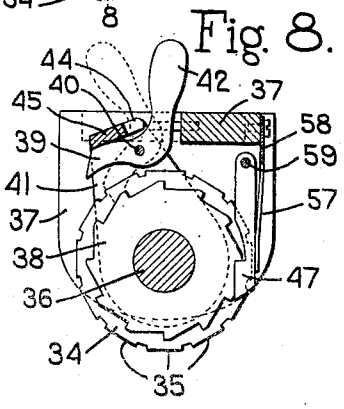
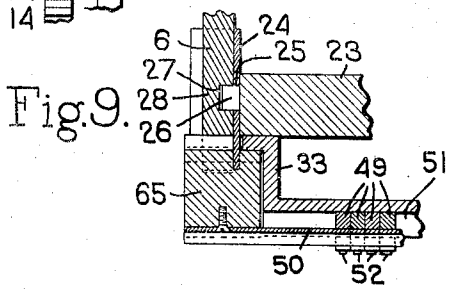


Fig. 9.



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UNITED STATES PATENT OFFICE

1,978,225

MARKING MACHINE

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Original application January 31, 1931, Serial No. 512,693. Divided and this application November 25, 1933, Serial No. 699,724

15 Claims. (Cl. 101—110)

This invention relates to marking machines and especially to the printing head portion thereof which carries the type characters.

One object of the invention is to provide a marking machine having an improved form of printing head which is constructed to facilitate the change of the type characters.

Other objects of the invention are to improve generally printing heads for marking machines in the particulars hereinafter set forth.

In the drawings wherein we have illustrated a selected embodiment of our invention, Fig. 1 is a vertical sectional view of a portion of a printing machine showing one embodiment of our invention;

Fig. 2 is a fragmentary view illustrating a safety attachment forming part of the printing head;

Fig. 3 is a sectional view of the printing head showing the type chase closed and the type characters locked therein;

Fig. 4 is a sectional view illustrating a printing head having a different construction from that shown in Figs. 1 and 3;

Fig. 5 is a section on substantially the line 5—5, Fig. 4;

Fig. 6 is a front view of a printing head having the construction shown in Figs. 4 and 5;

Fig. 7 is a fragmentary detail view of the printing head shown in Figs. 4 and 5 and illustrating the setting mechanism for the type wheels;

Fig. 8 is a section on the line 8—8, Fig. 7;

Fig. 9 is a section on the line 9—9, Fig. 5;

The invention is herein shown as applied to a printing machine adapted to make repeated printed impressions upon a strip or web of material as it is fed forward. A printing machine of this type is illustrated in our co-pending application, Serial No. 512,693, filed January 31, 1931, of which this application is a division. Inasmuch as the present invention relates simply to the printing head we have not thought it necessary to illustrate a complete printing machine but have shown only a sufficient portion thereof to enable the present invention to be understood.

The printing machine is provided with a suitable frame 1 which is provided with a work support or platen 2 on which the work 3 or other material to be printed is supported during the making of the printed impression. As herein shown the work is in the form of a strip which is fed over the platen or work support 2 by means of feed rolls 4 that may be operated in any appropriate way.

The printing head is indicated generally at 5. This comprises a frame 6 by which the type elements are supported and which is mounted on parallel rods 11, 12 that are carried by parallel arms rigid with two parallel shafts 9 and 10 which are journalled in the frame 1. The shaft 9 has an arm 7 rigid therewith and the rod 11 carried by said arm. The shaft 10 has two arms, 8, 8a fast thereon which are connected by the rod 12. The rods 11 and 12 are parallel to each other and to the shafts 9 and 10. With this construction the oscillation of the shafts 9 and 10 and the corresponding swinging movement of the arms 7, 8 and 8a will carry the printing head from its printing position shown in dotted lines at the left Fig. 1 to its inking position shown in dotted lines at the right Fig. 1. In the inking position the type characters of the printing head engage an inking plate 13 which is suitably mounted on the frame 1.

The arms 7 and 8 operate with a parallel ruler motion so that the printing head will be maintained in an upright position during its entire excursion from the printing position to inking position and back again. This oscillating movement of the shafts 9 and 10 may be provided for in any suitable way but as herein shown each shaft has a gear 14 thereon which meshes with a rack 15 that reciprocates vertically in the frame 1. The up and down movement of the rack 15 will thus operate through the gears 14 to give the parallel ruler arms 7 and 8 their movement by which the printing head is carried from printing position to inking position and back again to printing position.

Any suitable means such for instance as that shown in our co-pending application Serial No. 512,693 may be employed for giving the rack 15 its vertical reciprocation, and a construction is provided by which when the printing machine is not in operation the printing head will be held in a raised position between the printing position and inking position. This is provided for by the use of a spring 16 which is connected at one end to the main frame 1 and at the other end to an arm 60 fast on the rock shaft 10. Said arm 60 is parallel to the arm 8 and it is shown as connected by a link 61 to an arm 62 fast on the shaft 9 and parallel to the arm 7.

With this arrangement the spring will be placed under increased tension as the printing head is swung into either its printing position or the inking position and the resiliency of the spring tends normally to bring the printing head into an intermediate position shown in full lines in Fig. 1,

which is the position the printing head will assume when the printing machine has been brought to rest.

The printing head herein shown is provided with a type chase carrying interchangeable or adjustable type characters and said type chase is constructed so that the type characters may be introduced thereinto from the upper side. In the construction shown in Figs. 1 and 3 the type chase is arranged to carry individual type members and is constructed somewhat similar to the type chase or printing head shown in Patent No. 1,687,951, dated October 16, 1928. The type chase comprises a skeleton frame member 17 which is provided with a plurality of pairs of type supporting bars 18 extending transversely across the frame, each pair of bars forming a slot between them into which individual type members 19 may be inserted from the upper side of the frame. These type members are provided with shoulders 20 adapted to rest on the bars.

The type chase 17 is carried in a skeleton frame 21 which in turn is pivotally connected at 22 to the sides of the printing head frame 6, so it can swing about its pivot from working position shown in Fig. 3 into loading position shown in Fig. 1.

The type characters are retained in position in the skeleton frame 21 by a backing plate 23 which, when in operative position shown in Fig. 3, overlies the upper ends of the type members 19 and retains them firmly in position while the printed impression is being made.

The backing plate 23 is movably carried by the printing head so that it can be moved either into operative position wherein it forms a backing for the type characters as seen in Fig. 3 or into inoperative or open position as shown in Fig. 1 in which position it is removed from engagement with the type characters so that they can be readily removed from the frame 17. The inoperative position of the backing plate 23 shown in Fig. 1 is also the position which the plate occupies while type characters are being inserted into the frame 17.

We have provided herein a simple means for giving the backing plate 23 its movement from operative to inoperative position and for controlling the swinging movement of the type chase between its working position shown in Fig. 3 and its loading position shown in Fig. 1. When the type chase is in its loading position shown in Fig. 1 it is inclined somewhat thereby making it easier to remove the type characters therefrom or insert new type characters therein. The skeleton frame 21, which is pivoted to the printing head frame 6 at its rear edge as shown at 22, has at each side an upstanding flange or wall 24 which is provided with a slot 25, said walls 24 being situated just inside of the two side walls of the frame 6.

The backing plate 23 is provided at each side with two rolls or projections 26, one near the front edge and the other near the rear edge. When the backing plate is in its operative position shown in Fig. 3 these projections extend through the slots 25 in the walls 24 and into grooves 27 formed in the inner faces of the cheek pieces 28 of the frame 6. The backing plate 23 is thus locked to the frame 6 so that any downward pressure on the frame will be transmitted to the type 19 through the backing plate. As stated above, the backing plate is movable from its operative position shown in Fig. 3 to its open position shown in Fig. 1 and during this movement the projections 26 travel longitudinally of the grooves 27 and the slots 25. As the backing plate approaches its inoperative position shown in Fig. 2 the frame 21 will swing downwardly about its pivot 22 into loading position thereby placing the type chase in the favorable position for removing or replacing type characters. When the backing plate is swung forwardly from its inoperative position to its operative position the movement of the projections 26 at the front of said plate longitudinally of the grooves 27 and slot 25 serves to swing the frame 21 upwardly into its working position, in which position it is locked by the backing plate. The backing plate is shown as pivotally connected to the lower end of a lever 29 which in turn is pivoted on the rod 11. Said lever extends above the frame and is provided with a handle 30 at its upper end by which it may be manipulated.

Fig. 1 shows the backing plate 23 in its inoperative position with the type characters 19 uncovered and accessible for removal from the type chase 17 through the top. If the handle 30 is swung to the right Fig. 1 about its pivot 11 such movement will swing the backing plate to the left into the position shown in Fig. 3 and as stated above during this movement the rolls 26 at the front of said plate will move along the slots 25 and along the grooves 27 thereby to swing the frame 21 upwardly about its pivot 22 into a horizontal working position shown in Fig. 3. The frame 21 will thus be locked in its working position and the backing plate 23 will also be locked to the frame 6 thereby forming a solid backing for the type elements 19.

A swinging movement of the handle from its normal vertical position into the position shown in Fig. 1 will withdraw the backing plate 23 as shown in said Fig. 1 thereby releasing the type characters 19 so that they can be interchanged or adjusted from above the type chase 17. The connection between the frame 21 and the backing plate 23 allows the type chase to swing downwardly into its loading position as the backing plate is moved into its inoperative or open position shown in Fig. 1, and as stated above a reverse movement of the backing plate from inoperative position to operative position serves to swing the type chase from its loading position to its working position.

The machine herein shown is provided with a safety attachment which will automatically move the backing plate 23 into its operative position when the machine is started in case said plate has been left in the inoperative position shown in Fig. 1.

The arm 7 is provided with a finger or extension 31 which is adapted to engage a pin 32 extending laterally from the handle 30 as shown in Fig. 6.

The starting and stopping mechanism by which the printing machine is operated will preferably be so constructed that when the machine is first set in motion the initial movement of the printing head will be from its raised position shown in Fig. 1 to the right into inking position, which is the right hand dotted line position Fig. 1.

If when the machine is started the backing plate 23 has been left in its inoperative position shown in Fig. 4, then during the initial movement of the frame 6 into inking position the finger 31 will engage the pin 32 and swing the lever 29 into a position to carry the plate 23 into its operative position. This closing movement of the plate 23 will thus occur before the type characters have been brought into engagement with the inking pad. Said finger 31 and projection 32, therefore, constitute a safety device to ensure that the backing plate 23 will always be in operative po-

sition when the machine is started and before the type have been brought into engagement with the inking pad.

In Figs. 4 to 9 we have shown a form of printing head in which some at least of the type are in the form of rotary type wheels. In this embodiment of the invention the type carrier or type chase is indicated at 33 and it supports a plurality of rotary type wheels 34 each bearing a series of type characters 35. These type wheels are rotatively mounted on a shaft 36 carried in a block 37 which is removably supported in the type carrier 33, the latter having a central opening in which the type wheels are located. The type carrier 33 and the block 37 assembled therewith are carried in a supporting frame 65 which is pivoted to the frame 6 at 22 in a manner similar to that in which the frame 21 is pivoted in Figs. 1 and 3. This frame 65 is provided with the upstanding walls 24 which fit against the inside of the portions 28 of the frame 6 and which are provided with the slot 25 as in the embodiment shown in Figs. 1 to 3.

The block 37 is provided at each end with a wing 46 which is received in a recess formed in the upper edge of the member 33. The block 37 and the type carrier 33 are retained in their operative position in the frame 65 by the backing plate 23 which has the same construction as that illustrated in Figs. 1 to 3. Said backing plate is provided on each end with the two outwardly-projecting pins or projections 26 which operate in grooves 27 formed in the sides 28 of the frame 6 and which also project through the slots 25 in the upstanding walls 24. When the backing plate is in operative position as shown in Fig. 5 it engages the upper side of the type carrier 33 and the block 37 and holds them firmly in position in the swinging frame 65 as seen in Figs. 5 and 9.

Means are provided for adjusting each type wheel independently to bring any desired type character thereon into printing position. As herein shown each type wheel has rigid therewith a ratchet wheel 38.

The setting of the type wheels is accomplished through a dog member 39 slidably and pivotally mounted on a rod 40 which is carried in a yoke 41 that is pivotally mounted on the shaft 36. This dog is provided with a handle 42 by which it may be manipulated.

When the dog is swung clockwise about its pivot 40 to disengage its nose from a ratchet wheel 38 as shown by the full line position Fig. 8, said dog can be moved longitudinally of the rod 40 to bring it into position to engage the ratchet wheel 38 connected with any type wheel 34. When the dog is in register with any particular ratchet wheel then the dog may be swung counter-clockwise to bring the nose thereof into engagement with said ratchet wheel as shown in dotted lines Fig. 8 and full lines Fig. 5.

The dog has a locking flange 43 adapted to engage in any one of a series of notches 44 that is formed in the bridge piece 45 of the yoke 41 when the dog is in its operative position in engagement with the wheel 38. This locks the dog from movement longitudinally of the rod 40. With the dog in its operative position the corresponding type wheel may be set by oscillating the yoke 41 about the shaft 36.

During the upward swinging movement of the yoke from the position shown in Fig. 5 to that shown in Fig. 8 the dog will click over a tooth of the ratchet and on the downward swinging movement the dog which is then in dotted line position Fig. 8 will engage a tooth of the ratchet 38 and said ratchet and corresponding type wheel will be rotated counter-clockwise Fig. 8. By this means the type wheel can be set to bring any desired printing character thereon into printing position. The pawl 39 can be easily shifted from along the rod 40 to bring the dog into operative engagement with the ratchet of any type wheel and hence the type wheels can be selectively adjusted independently.

When it is desired to adjust any individual type wheel the backing plate 23 is swung backwardly as shown in Fig. 1 and this exposes the dog 39 so that it can be readily actuated to set the type wheels.

Each ratchet 38 has co-operating therewith a spring-pressed stop pawl 47, the function of which is to prevent backward movement of the type wheel. These stop pawls 47 are suspended from a rod 59 carried by the block 37 and are acted on by spring fingers 57 which yieldingly maintain them in engagement with the ratchet wheels. The spring fingers 57 are carried by a plate 58 which is secured to the block 37.

The printing head shown in Figs. 4 to 9 is also provided with additional type members carrying type characters that are situated closely adjacent the operative type characters on the printing wheels. These additional type members are indicated at 48, 49 and they are confined between bars 50 and the under faces 51 of the type carrier 33. These type members have an inclined or angular relation and they are provided on their inner extremities with type characters 52 which are situated closely adjacent the operative type characters on the type wheels.

Each type member 48, 49 is provided with a shoulder 53 on its under face to engage the outside edge of the bar 50 and with another shoulder 54 on its upper face which engages the edge 55 of the opening in the member 33 that receives the type wheels. The bars 50 are slightly resilient so that the type members 48, 49 can be readily inserted into place.

The bars 50 are carried by the frame 65. The backing plate 23, when in operative position, engages the upper face of the member 33 as shown in Fig. 9. Hence while the printed impression is being made the pressure against the type members 48, 49 will be transmitted directly to the member 33 and thus to the backing plate 23 and the frame 6.

We claim:

1. A marking machine having a printing head mounted for movement toward and from a work support, a type chase carried thereby, said type chase being open at the top to permit type elements to be placed therein from the top, a backing plate carried by the printing head and movable thereon in a direction transverse to the direction of movement of the printing head to shift said backing plate from operative position in which it closes the opening in the type chase and forms a backing for the type elements to an open position in which the type elements are exposed for removal through said opening.

2. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and provided with an opening in its top through which type elements may be placed therein, a backing plate movably connected to the frame and movable from an operative position in which it closes the opening in the type chase and forms a backing for the type elements to open position in which the type elements are exposed,

and a connection between said backing plate and type chase which allows gravitational swinging movement of the type chase into an inclined loading position when the backing plate is moved into its open position.

3. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and provided with an opening in its top through which type elements may be placed therein, the pivotal mounting of said type chase permitting it to swing from working position into an inclined loading position, a backing plate movably connected to the frame and movable from a position in which it closes the opening in the type chase when the latter is in working position and forms a backing for the type elements to open position in which the type elements are exposed, a connection between said backing plate and type chase by which the type chase is held in working position when the backing plate is in operative position and is allowed to move into an inclined loading position when the backing plate is moved into its open position.

4. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and provided with an opening in its top through which type elements may be placed therein, a backing plate movably connected to the frame and movable from an operative position in which it closes the opening in the type chase and forms a backing for the type elements to open position in which the type elements are exposed, a connection between said backing plate and the type chase which permits the type chase to swing into loading position when the backing plate is moved into open position and which swings the type chase into working position and locks it therein when said backing plate is moved into operative position.

5. In a marking machine, the combination with an inking plate and a work support, of a printing head, means to move the printing head into engagement with the inking plate and the work support alternately, said printing head having a frame, a type chase pivoted thereto and provided with an opening in the top through which the type elements may be inserted, a backing plate movably carried by the frame and in one position closing said opening and forming a backing for the type elements and in another position leaving the type elements exposed, and means operative to move the backing plate automatically from open position to closed position during movement of the printing head into the inking position.

6. A marking machine having a platen, a printing head movable toward and from the platen, said printing head comprising a frame, a type chase pivotally mounted thereon and swingable from a working position to a loading position, said type chase being provided with an opening in its top through which type elements may be placed therein, a backing plate mounted on the frame and movable thereon in a direction transverse to the direction of movement of the printing head, said backing plate being thus movable from an operative position in which it closes the opening in the type chase and forms a backing for the type elements to a position in which the type elements are exposed, and a connection between the backing plate and the type chase by which said type chase moves from working position to loading position when the backing member moves from operative position to open position.

7. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and swingable from a working position to a loading position, said type chase being provided with an opening in its top through which type elements may be placed therein, a backing plate movably connected to the frame and movable from operative position in which it closes the opening in the type chase and forms a backing for the type elements to open position in which the type elements are exposed, and a connection between said backing plate and type chase by which when the backing member is swung from its operative position to its open position the front edge of the type chase is swung downwardly to place it in a more favorable position for having the type inserted therein.

8. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and provided with an opening in its top through which type elements may be placed therein, a backing plate, an arm pivoted to the frame and to which the backing plate is secured, swinging movement of the arm moving the backing plate from a position in which it closes the opening in the type chase and forms a backing for the type elements to an open position in which the type elements are exposed.

9. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and provided with an opening in its top through which type elements may be placed therein, a backing plate, an arm pivoted to the frame and to which the backing plate is secured, swinging movement of the arm moving the backing plate from a position in which it closes the opening in the type chase and forms a backing for the type elements to an open position in which the type elements are exposed, and a handle carried by said arm and by which it may be manipulated.

10. A printing head for a marking machine comprising a frame, a type chase pivotally mounted thereon and provided with an opening in its top through which type elements may be placed therein, a backing plate, an arm pivoted to the frame and to which the backing plate is secured, swinging movement of the arm moving the backing plate from a position in which it closes the opening in the type chase and forms a backing for the type elements to an open position in which the type elements are exposed, and means controlled by the movement of the backing plate from its closed to its open position which provides for swinging the type chase into an inclined position.

11. A printing head for a marking machine comprising a frame, a type-supporting member carried by the frame and having an opening extending from the top to bottom, a type assembly element removably carried by said member and comprising a block and type wheels rotatably mounted thereon, means carried by the block for adjusting the type wheels independently, and a backing plate movably carried by the frame and when in operative position retaining the type assembly unit in its operative position.

12. A printing head for a marking machine comprising a frame, a type-supporting member carried thereby having an opening extending from the top to the bottom, a type assembly unit removably carried by said member and comprising a block and type wheels rotatably mounted therein, means carried by the block for adjusting the type wheels independently, a series of re-

movable auxiliary type members also carried by said type-supporting member and bearing type characters which are situated closely adjacent the operative type characters of the type wheels.

13. A printing head for a marking machine comprising a frame, a type-supporting member carried by the frame and having an opening therethrough, a type assembly element removably carried by said member and comprising a block, a plurality of type wheels rotatively mounted therein, a type-setting pawl shiftable into position to co-operate with any type wheel for adjusting the same, and a backing plate movably carried by the frame and movable from operative position in which it engages the type assembly unit and holds the latter in position to inoperative position in which the type assembly unit is released for removal from the frame.

14. A printing head for a marking machine comprising a frame, a type-supporting member carried by the frame and having an opening extending therethrough, a type assembly element removably carried by said member and occupying the opening in the type-supporting member, said type assembly element comprising a block and type wheels rotatably mounted thereon, means for adjusting the type wheels independently and a backing member movably carried by the frame and when in operative position forming a backing for the assembly unit to transmit printing pressure thereto, said backing plate being movable into inoperative position in which the type assembly unit is released so that it can be removed from the type-supporting member.

15. A marking machine having a platen, a printing head movable toward and from the platen, said printing head comprising a frame, a type chase pivotally mounted thereon and swingable from a working position to a loading position, said type chase being provided with an opening in its top through which type elements may be placed therein, a backing plate mounted on the frame and movable thereon in a direction transverse to the direction of movement of the printing head, said backing plate being thus movable from an operative position in which it closes the opening in the type chase and forms a backing for the type elements to a position in which the type elements are exposed, and a connection between said backing plate and type chase by which the type chase is moved from loading position to working position when the backing plate is moved from open position to operative position.

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