H. HOLLERITH.

QUICK SETTING PUNCH.

APPLICATION FILED FEB. 14, 1912.

1,193,390.

Patented Aug. 1, 1916.

4 SHEETS—SHEET 1.

Fig. 1,

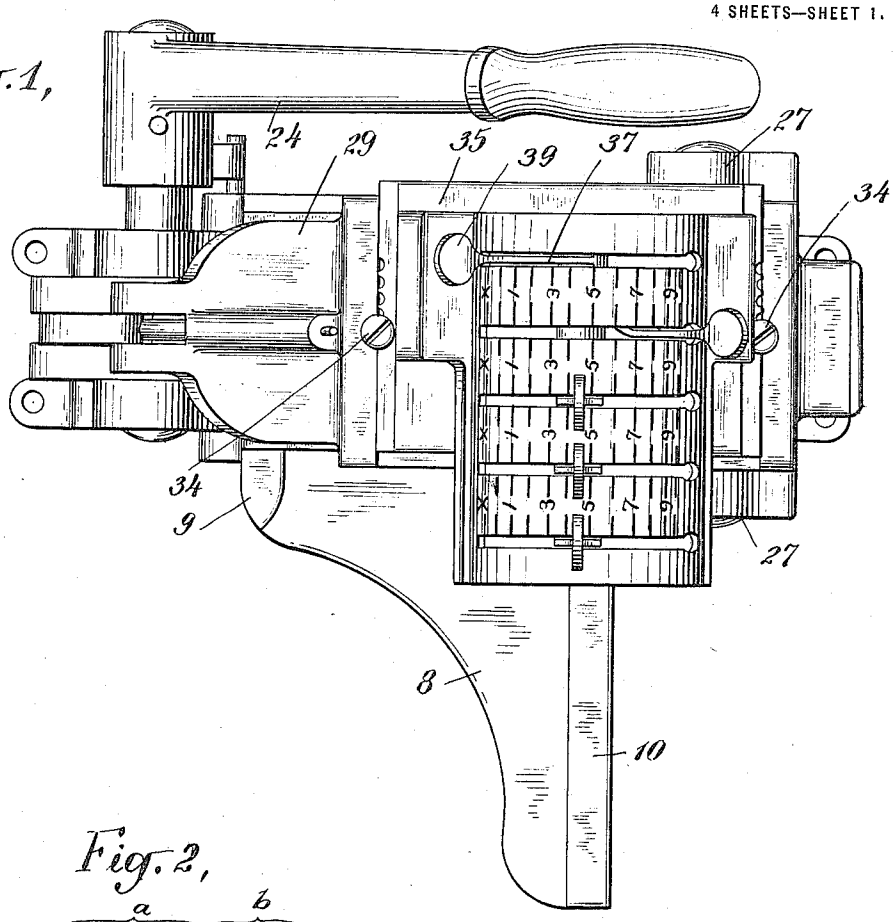
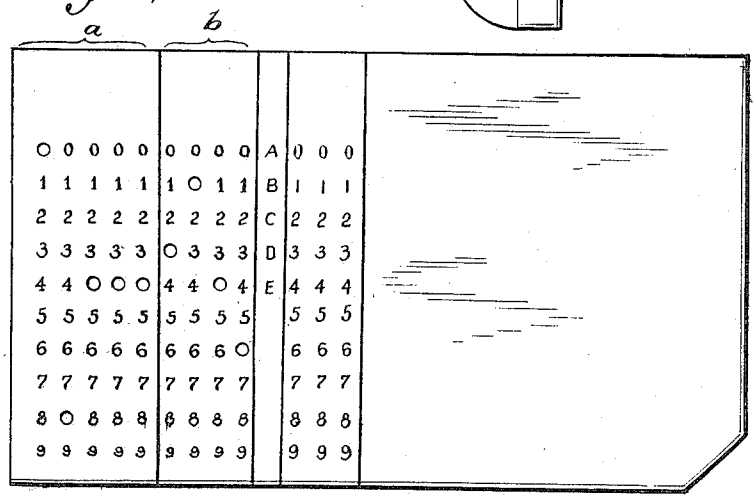



Fig. 2,




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4 SHEETS—SHEET 2.

Fig. 3.

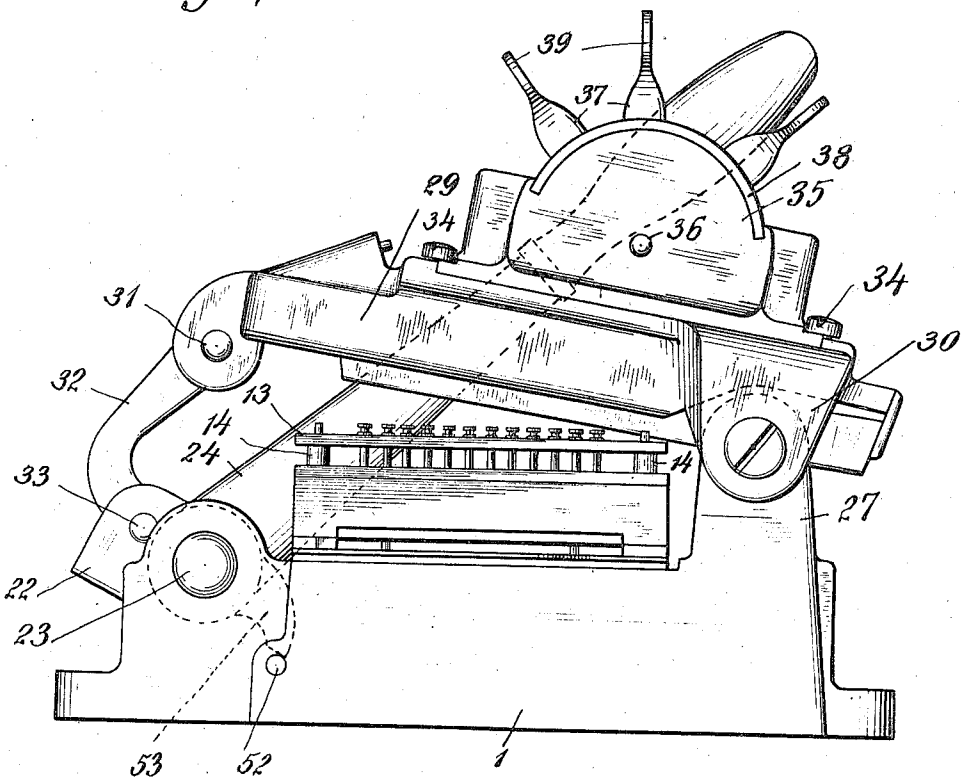
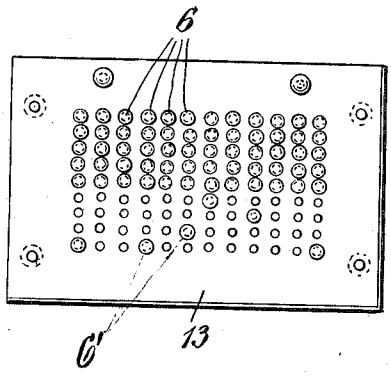



Fig. 4.




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4 SHEETS—SHEET 3.

Fig. 5.

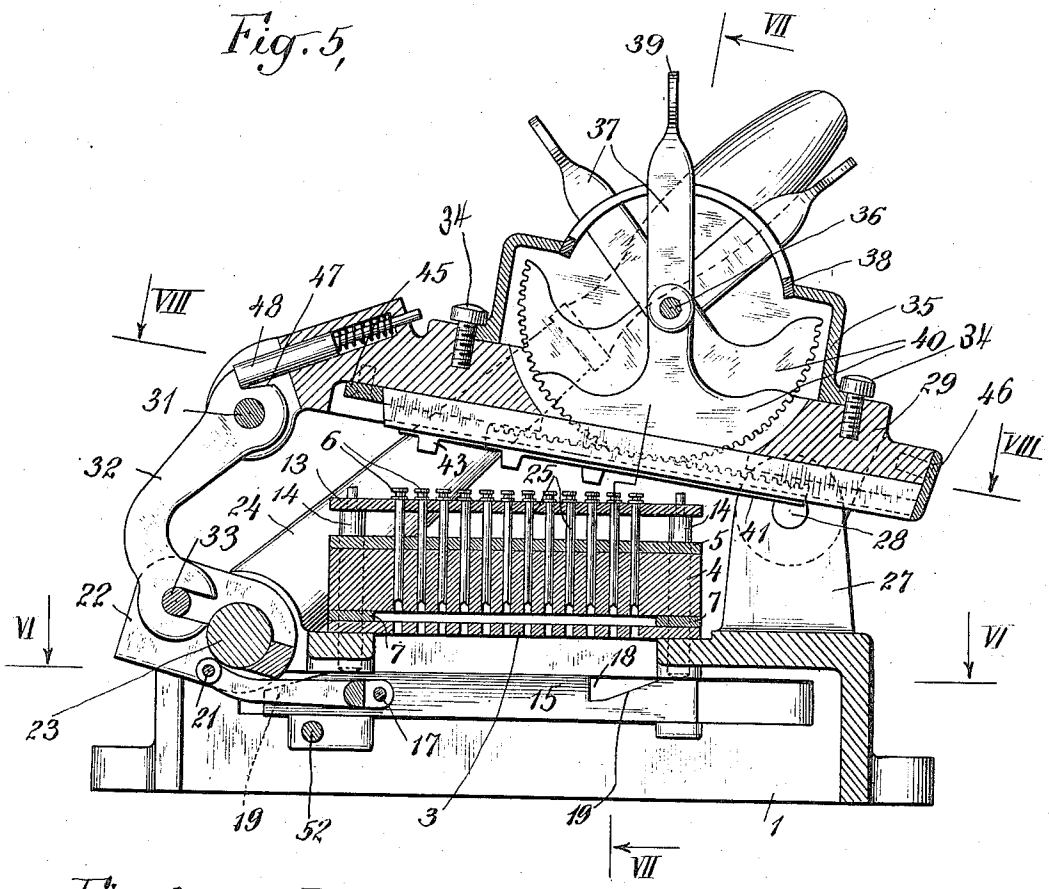
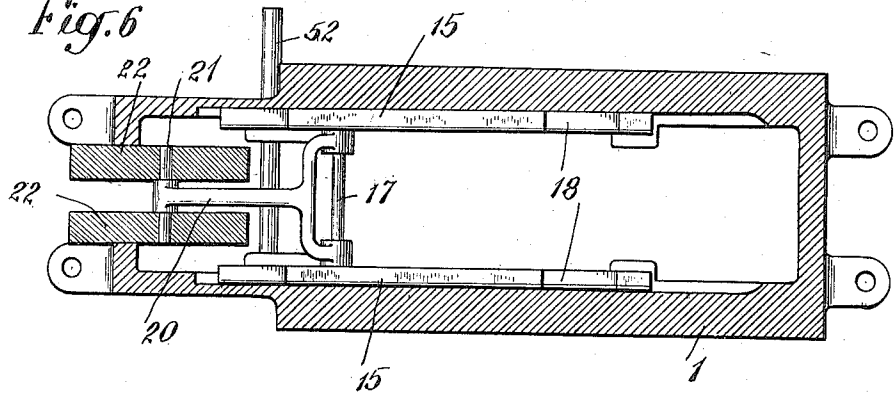



Fig. 6.




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**1,193,390.**

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4 SHEETS—SHEET 4.

Fig. 10,

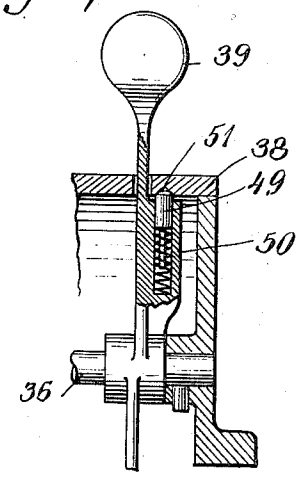



Fig. 7,




Fig. 7a,




Fig. 8

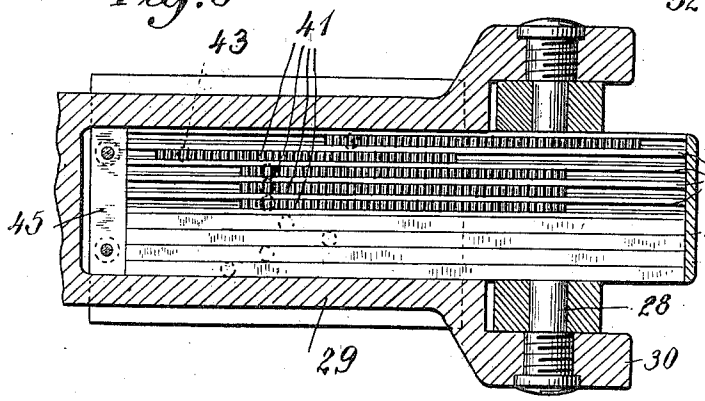
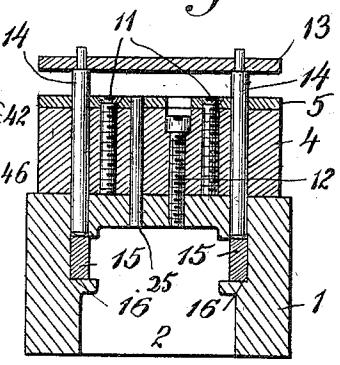



Fig. 9




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# UNITED STATES PATENT OFFICE.

HERMAN HOLLERITH, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO THE TABULATING MACHINE COMPANY, OF EAST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## QUICK-SETTING PUNCH.

1,193,390. Specification of Letters Patent. Patented Aug. 1, 1916.

Application filed February 14, 1912. Serial No. 677,497.

*To all whom it may concern:*

Be it known that I, HERMAN HOLLERITH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Quick-Setting Punches, of which the following is a full, clear, and exact description.

This invention relates to a quick-setting punch, and is especially adapted for punching or perforating record-cards having index-points as used in connection with the Hollerith tabulating system, holes punched in the record-cards being located thereon in accordance with the data which each card represents.

The primary object of my invention is to provide a machine whereby the cards may be perforated at the desired points with speed and accuracy.

Referring to the drawing in which I show the preferred embodiment of the invention, Figure 1 is a top plan view of the entire machine. Fig. 2 is a card adapted for use in one form of the machine. Fig. 3 is a side view of the machine. Fig. 4 shows the supporting plate for the punches. Fig. 5 shows a longitudinal section of the device. Fig. 6 is a section taken on the line VI—VI of Fig. 5. Fig. 7 is a section taken on line VII—VII of Fig. 5. Fig. 7ª is a slight rearrangement of parts shown in Fig. 7. Fig. 8 is a section taken on line VIII—VIII of Fig. 5. Fig. 9 is a cross section of a detail. Fig. 10 shows a detail.

Referring to the drawings in detail wherein like characters refer to the same part in all the views the reference numeral 1 designates the frame or base portion of the device, said frame being hollowed out at 2 (see Fig. 9) to receive the planchets punched from the cards. Located directly upon the base portion is a plate or matrix 3 comprising a plurality of dies (see particularly Fig. 3) and located above this plate are plates 4 and 5 having perforations which register with the dies in the aforesaid plate and in which the headed punches 6 are adapted to coöperate. The plates 3 and 4 are separated slightly from each other by means, for example, of the arms 7 at either end thereof which project from and support the feed-board 8. Upon reference to Fig. 7 it will be apparent that the upper surface of the feed board is flush with the upper surface of the plate 3 for easily feeding the cards to the machine. The feed board is constructed as shown and guide rails 9 and 10, somewhat thicker than the arms 7, are employed to facilitate the insertion of the card into and the removal of the same from the space between the matrix 3 and plate 4. Suitable screws 11 at either end of the matrix 3 and plate 4 are employed to secure the same together, and screw-threaded means 12 (only one being shown) are provided to secure said plates to the base of the machine. A perforated plate 13 is mounted on shouldered standards 14 which pass through perforations in the aforesaid plates, the arms of the feed-board and through the base of the punch. These shouldered standards are free to reciprocate and constitute in conjunction with the plate 13 a supporting frame for the punches 6. The lower ends of these standards rest upon horizontally movable sliding members 15 which fit in grooves 16 in the base. (See Figs. 6 and 9.) The sliding members 15 are connected by one or more cross pieces 17 (Fig. 6), and are provided on their upper edges with notches 18 into which the standards drop to lower the plate 13 and the punches, the surface 19 of said notches serving to cam the standards upwardly when the members are moved in one direction. (See Figs. 5 and 6.) To the cross piece 17 is pivoted one end of a link 20 the other end of which is pivoted to a pintle 21 mounted in two spaced-apart plates 22 extending at right angles from and carried by the pivot 23 of an operating lever 24. The plates 3, 4 and 5 are provided with pins 25 therein for causing the perforations in said plates to register exactly with each other. (See Fig. 9.) Pintles 26 (see Fig. 7) are employed to limit the inward movement of the card to be punched and in conjunction with the guide rails 9 and 10 serve to aline the card properly under the punches.

The base 1 is provided with upwardly projecting lugs or arms 27. Pivoted to these

arms at 28 and superimposed over the base portion is another frame 29 having the pivotal lugs or arms 30 projecting downwardly therefrom. The forward portion of this frame is pivoted at 31 to a link 32; said link in turn is eccentrically pivoted at 33 to the spaced-apart plates 22 of the operating lever. It will be apparent that when the lever 24 is moved forward from the position shown in either Figs. 1, 3 or 5 the upper frame will be moved downwardly about the pivoted point 28 as an axis of rotation. Adjustably secured to this frame, as by screws 34 is a removable frame 35 in the ends of which is journaled a shaft 36. Upon this shaft are pivoted a number of index-fingers 37 which project through an index plate 38 and are provided with operating parts or flattened ends 39, while the opposite ends are provided with toothed sectors 40. These sectors operatively engage with rack bars or setting devices 41 which are adjustably held in the frame 29 by spaced-apart longitudinal bars 42 the latter being provided with lateral flanges which engage with grooves in the rack bars, as clearly shown in Figs. 7, 7ª and 8. As shown five sectors and a corresponding number of setting devices are provided, but it is obvious that any desired number may be employed. These setting devices are provided with downwardly projecting studs or plungers 43, one on each (see Fig. 5) which may be set by the index-fingers to engage with punches to punch the desired characters on the card. Bars 44 are provided, four shown in the drawings, (see Fig. 7) the surfaces of the lower side of which lie in the same plane with the corresponding surfaces of the studs 43. These bars engage with punches which perforate the card to indicate, for example, the number of the department in which particular sales are made. The rack bars or setting devices 41, the bars 42 and the bars 44 are beveled at their ends and are held to the frame 29 by means of the plates 45 and 46 which are secured to said frame and engage with said beveled portions of said bars. One end of the link 32 has a cut out portion 47 (see Fig. 5) sufficiently large to readily slide over the pintle 33 carried by the spaced-apart plates 22. The link is held firmly in engagement with the pintle 33 by means of a spring pressed plunger 48, acting against the upper end of the link, and while the pintle serves to all intents and purposes as a pivotal point, at the same time the link can be readily disengaged therefrom and the upper frame thrown backward on its pivot 28 as a center of rotation for the purpose of obtaining access to the punches.

The index-fingers are provided with spring pressed plugs 49 located in housings 50 the ends of said plugs engaging with a plurality of notches 51 on the underside of the index-plate 38. When the index-fingers are operated to indicate the particular item or condition the plugs will engage with the notches and afford an automatic or yielding stop and when so engaged the operator has the assurance that the studs are in alinement with the proper punches.

The base or bed-frame is provided with a stop 52 which serves to limit the oscillation of the operating handle in both directions. When at the extreme right (see Figs. 3 and 5) the dog 53 on said operating handle engages said stop, and when in the other extreme position the plates 22 engage therewith. In Fig. 7ª is shown a slight rearrangement of parts. The exact arrangement of each machine will depend of course upon the use to which it is to be put.

The operation is as follows: Suppose the amount of the sales to be $84.44. The index-finger (see Fig. 1) adjacent the handle is placed on "X" which corresponds to zero and which is in the column which registers "hundreds". Since hundreds are not registered the index-finger is placed on the mark indicating zero. The index-finger adjacent is placed on the numeral "8" and the other three fingers on the numerals "4". Suppose now that the card has been properly placed on the matrix 3 and the operating lever 24 moved to the left (Figs. 1, 3 and 5) about its pivotal point 23 as an axis of rotation. The upper frame will be drawn downwardly and the studs 43 on the setting devices 41, which have been set by the index-fingers, will engage with the punches 6 to punch out the numbers on the cards corresponding to the numbers indicated by the index-fingers. Simultaneously with the dropping of the upper frame 29 the members 15 will be moved to the right (see Fig. 5) and the shouldered standards will drop into the notches 18 therein and thus allow the plate 13 carrying the punches 6 to drop sufficient to permit the latter to pass well into or substantially through the dies in the matrix. It will be observed that all the punches will engage with the card but their weights alone will not be sufficient even to deface the card and obviously will not puncture it. The only punches therefore that will pass through the cards are those that are engaged by the studs 43. When the lever 24 is moved to the right the movement of the mechanism will be reversed; that is to say, the upper frame will be raised and the members 15 slid to the left the surface 19 engaging with the standards and camming the plate 13 upward, separating or shedding the plungers from the card. The result of the part of the operation is a card punctured as indicated at "*a*" Fig. 2, the characters "O" corresponding to the position "X" on the indicator, "8", "4", "4", and "4" being punched out of

the 1st, 2nd, 3rd, 4th and 5th rows respectively numbered from left to right. It will be noted that there is a punch 6 for each character on the card (see Fig. 4). This is the preferred arrangement and the advantage is that inasmuch as the punches are movable in fixed planes, an accurate punch is invariably accomplished. The studs 43, on the other hand, do not necessarily have to be perfectly alined with the punches to operate the same.

Suppose it is desired to indicate the department in which the particular sales are made. For this purpose it is arbitrarily assumed that the number of the department is 3146. The link 32 is disengaged from its pintle 33, as before described, the frame 29 raised and certain punches 6′ are manually positioned in certain of the perforations of the plate 13, (Fig. 4) corresponding to those numbers. The bars 44 will always engage these punches 6′ wherever set in their respective rows corresponding to the column (marked "*b*", Fig. 2) on the record card employed to indicate the class or department number. This arrangement to indicate, for instance, the department number is preferred for this reason: the number of the department is rather fixed and by eliminating corresponding index-fingers with their rack bars the device is reduced to its simplest form and obviates unnecessary confusion to the particular cashier for that department. Furthermore in event that the machine is to be used in another department or in event that the particular department number is changed the punches can be set to correspond almost as quickly as if index-fingers were present for that purpose.

It is quite apparent from the description above taken in connection with the drawings herewith, that the mechanism described and shown to elucidate the principles of my invention is simply the expression of one embodiment thereof. As previously mentioned the present embodiment of the invention discloses two items merely—the number of the department and the amount of the particular sale. It is obvious that a machine indicating only one item or any number greater than one could be utilized without in any way departing from the true spirit and scope of my invention. For example it may be desired to determine by whom the particular sale was made in addition to the number of the particular department. In this case it would only be necessary to employ a card with one or more additional vertical rows of numerals or other indicia, and to multiply the number of index-fingers or bars 44 accordingly together with their associated mechanism.

What I claim is:

1. In a quick-setting punch, in combination, a bed forming a support for a record-card, a punch-carrier, a plurality of punches controlled by said carrier above a record-card on said bed, means for raising and lowering said carrier to place the punches into or move them out of contact with a record-card, and means independent of the last mentioned means for positively engaging and forcing one or more punches through a record-card.

2. In a quick-setting punch, in combination, a bed having a support for a record-card, a plurality of punches arranged in rows in vertical alinement above said bed, supporting means for said punches movable toward and away from said bed, means for lowering the punch-supporting means whereby the punches may contact with a record-card, and means independent of the last mentioned means for engaging one of said punches of each row when the punches are in contact with a card for perforating the same.

3. In a quick-setting punch, in combination, a bed having a support for a record-card, punches for perforating such record-card, a carrier for said punches, a frame connected to said bed, means on said frame for engaging the punches, and means for effecting a relative movement between the punches and the punch-engaging means to cause the former to perforate a card.

4. In a quick-setting punch, in combination, a bed having a support for a record-card, punches for perforating such record-card, means located above and connected to said bed for supporting said punches, a frame connected to the bed and movable from and toward the punch-supporting-means, means on said frame for engaging the punches, and means for moving the frame to operate the punches.

5. In a quick-setting punch, in combination, a bed for supporting a record-card, a plurality of punches, a support therefor, means independent of said punch-support for operating one or more of said punches, and means for effecting a relative movement between the card-support and the punch-support and simultaneously actuating the punch-operating means.

6. In a quick-setting punch, in combination, a bed for supporting a record-card, a plurality of vertically movable punches arranged in rows, a support therefor, means for lowering said punch-support, to permit the punches to engage a record-card, and selective means one for each row of punches, located above the punch-support for simultaneously moving one of said punches of each row independently of its support for perforating a record-card.

7. In a quick-setting punch, in combination, a bed for supporting a record-card, a plurality of punches arranged in rows, a support therefor operatively connected to

said bed, means for lowering said support to permit the punches to engage a record-card, a frame above said bed, selective means one for each row of punches, carried by said frame for operating one or more of said punches, and means for simultaneously raising and lowering the punch-support and said frame.

8. In a quick-setting punch, in combination, a bed for supporting a record-card, a plurality of punches arranged in rows, a support therefor connected to and located above said bed, means for raising and lowering said support to bring the punches into and out of contact with a record-card, and means common to each of the punches of a row for positively engaging and forcing one of said punches of a row through the record-card.

9. In a quick setting punch, in combination, a bed for supporting a record-card, a plurality of punches arranged in rows, means on said bed located above said record-card for movably supporting said punches, means for lowering and raising said punches into and out of contact with said record-card, and adjustable means common to each of the punches of a row for engaging with said punches and perforating said card at predetermined points.

10. In a quick-setting punch, in combination, a bed for supporting a record-card, a frame movable vertically with respect to said bed, a plurality of punches arranged in rows and carried by said frame, a second frame located above the first mentioned frame, means on said second frame common to each of the punches of a row for engaging one of the punches thereof, and means for simultaneously operating both frames to cause the punch-engaging means to operate said punches to perforate a record-card.

11. In a quick-setting punch, in combination, a bed, a matrix or die plate on said bed for supporting a record-card, said matrix having a die for each index-point location on the record-card, a plurality of punches, one for each die, said punches being arranged in rows, a support therefor, said punches being located over and in direct alinement with the dies, means for lowering said support to place the punches in contact with the record-card, and means common to each row of punches and independent of the last mentioned means for forcing one of said punches into contact with a die to perforate said card.

12. In a quick-setting punch, in combination, a bed for supporting a record-card, a punch-supporting frame located above said bed, a plurality of rows of punches carried by said frame, a second frame, adjustable means on said second frame, one for each row of punches, said means having downwardly projecting studs to engage said punches, and means for actuating said second frame to bring said studs into and out of contact with said punches.

13. In a quick-setting punch, in combination, a die-plate, a plurality of punches arranged in rows in direct alinement with the dies, a support for said punches, means for operating the punches comprising slidably movable bars, one for each row, index fingers for operating said bars, and means for effecting a relative movement between the punches and said bars.

14. In a quick-setting punch, in combination, a card-support, a series of dies arranged in rows, a series of punches, a series of longitudinally-movable punch-actuating members, one for each row of dies, capable of being positioned each to operate a single punch, a support for said members, and means for effecting a relative movement between the card-support and said punches.

15. In a quick-setting punch, in combination, a card-support, a series of dies arranged in rows, a series of punches, one for each die, a series of longitudinally-movable punch-actuating members, one for each row of punches, capable of being positioned each to operate a single punch, a support for said members, and means for effecting a relative movement between the card-support and said punches.

16. In a quick-setting punch, in combination, a support, a series of bars adjustably mounted in said support, punches controlled by said bars, means for retaining said bars in any of a number of adjusted positions, a card-support, and means for effecting a relative movement between the card-support and the punches to cause the card to be punched.

17. In a quick-setting punch, in combination, a support, a series of toothed bars adjustably mounted in said support, punches controlled by said bars, index-fingers mounted on said support and having toothed sectors engaging said toothed bars, means for retaining said bars and sectors in any of a number of adjusted positions, a card-support, and means for effecting a relative movement between the card-support and the punches to cause the card to be punched.

18. In a quick-setting punch, in combination, a die plate, a plurality of punches arranged in rows and in direct alinement with the dies, a support for said punches, means for operating the latter comprising a slidably mounted bar for each row of punches, and an index-finger for operating said bar, said bar being adapted to engage with a punch and to perforate a record-card corresponding to the position of the index-finger.

19. In a quick-setting punch, in combination, a bed having a die plate, punches above said die plate, a support therefor,

means connected to the bed and located above said punches for engaging the same comprising a longitudinal bar secured to said means, and means for lowering and raising the aforesaid means to bring the bar into and out of contact with the punches.

20. In a quick-setting punch, in combination, a base provided with a die plate, means having a plurality of perforations therein in one of which a punch is supported, means connected to the base and adapted to engage with said punch, and means for operating the second mentioned means to bring the same into contact with said punch and forcing the latter into contact with the die plate.

21. In a quick-setting punch, in combination, a base, a plurality of punches, means mounted on said base for supporting said punches, means for operating said punches comprising a slidable rack bar having a stud projecting therefrom to engage a punch, and an index-finger having a sector to engage with a rack bar.

22. In a quick-setting punch, in combination, a base for supporting a record-card, a plurality of punches, a supporting frame therefor mounted on said base, the lower ends of said punches being normally out of contact with said card, means for lowering and raising the punches into and out of contact with said card, and means movable independently of said last mentioned means for engaging with one or more of said punches when the latter contact with said card for perforating the same.

23. In a quick-setting punch, in combination, a base for supporting a record-card, means mounted on said base and supporting a plurality of punches arranged in rows above said record card, the lower ends of said punches being normally out of contact with said record-card, means for lowering the punches into contact with said record-card, and means for engaging with one punch of each row when the latter are in contact with said card for perforating it.

24. In a quick-setting punch, in combination, a base for supporting a record-card, a plurality of punches, a support therefor, a series of selective devices for actuating the punches, a frame for carrying said selective devices, said frame being pivoted at one side for swinging toward and away from said punches, and operating means detachably connected to the other end of said frame.

25. In a quick-setting punch, in combination, a base on which a record-card is horizontally supported, a plurality of punches adapted to perforate said card on pressure being applied thereto, means mounted on said base and above said record-card for vertically supporting said punches, means located above the aforesaid means and adjacent the upper ends of the punches for applying pressure thereto, said means being pivoted at one end to the base, and swingingly connected to the base at the other end, said last mentioned end being disengageable from the base to swing the said means about its pivotal point as a center to afford access to said punches.

26. In a quick-setting punch, in combination, a series of punches, means for supporting the same, means for operating said punches comprising rack bars, an index-plate located above said bars, index-fingers, and a shaft therefor transverse to said rack bars, said index-fingers having toothed sectors at one end engaging with said rack and their other ends projecting through said index-plate.

27. In a quick-setting punch, in combination, a series of punches, means for supporting the latter, means for operating said punches, said latter means comprising a setting device adjustably mounted thereon and having a downwardly projecting stud to engage with a punch, an index plate, means for operating said setting device and projecting through said index plate, said means adapted to set the stud to engage with one of the punches to punch the location on a record card corresponding to the position of the operating means outside the index plate.

28. In a quick-setting punch, in combination, a series of dies, a punch for said dies, adjustable means common to a plurality of said dies for effecting a coöperative relation of a punch and die, and an operating device for actuating said means.

29. In a quick-setting punch, in combination, a base adapted to support a record-card, a plurality of punches, means for supporting the same, manually-operable means for raising and lowering said punch supporting means, means for engaging one or more punches, and connecting devices between the last mentioned means whereby the engaged punches are forced through the record-card upon the operation of the manually-operable means.

30. In a quick-setting punch, in combination, a bed for receiving a record-card, means above and operatively connected to said bed for supporting a plurality of series of punches, said punches, adjustable means located above each of said series of punches for engaging the latter, and means for actuating the punch-support and said punch-engaging means for perforating the record-card.

31. In a quick-setting punch, in combination, a bed for receiving a record-card, a die, a plurality of punches for coöperating with said die, a carrier for said punches, reciprocating slides for actuating said carrier to move the punches into and out of engagement with a record-card, a series of se-

lective devices for engaging one or more punches to force them through a record card, a support for said devices, and means for simultaneously operating said support and said slides.

32. In a quick-setting punch, in combination, a bed for receiving a record-card, a die, a plurality of punches for coöperating with said die, a carrier for said punches, reciprocating slides for actuating said carrier to move the punches into and out of engagement with a record-card, a series of selective devices for engaging one or more punches to force them through a record-card, a support for said devices, detachable connecting means between said support and said slides, and means for simultaneously operating said support and said slides.

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

HERMAN HOLLERITH.

Witnesses:
O. E. BRAITMAYER,
ANNE MALONEY.