July 16, 1935. W. W. LASKER 2,008,396

PUNCHING MECHANISM

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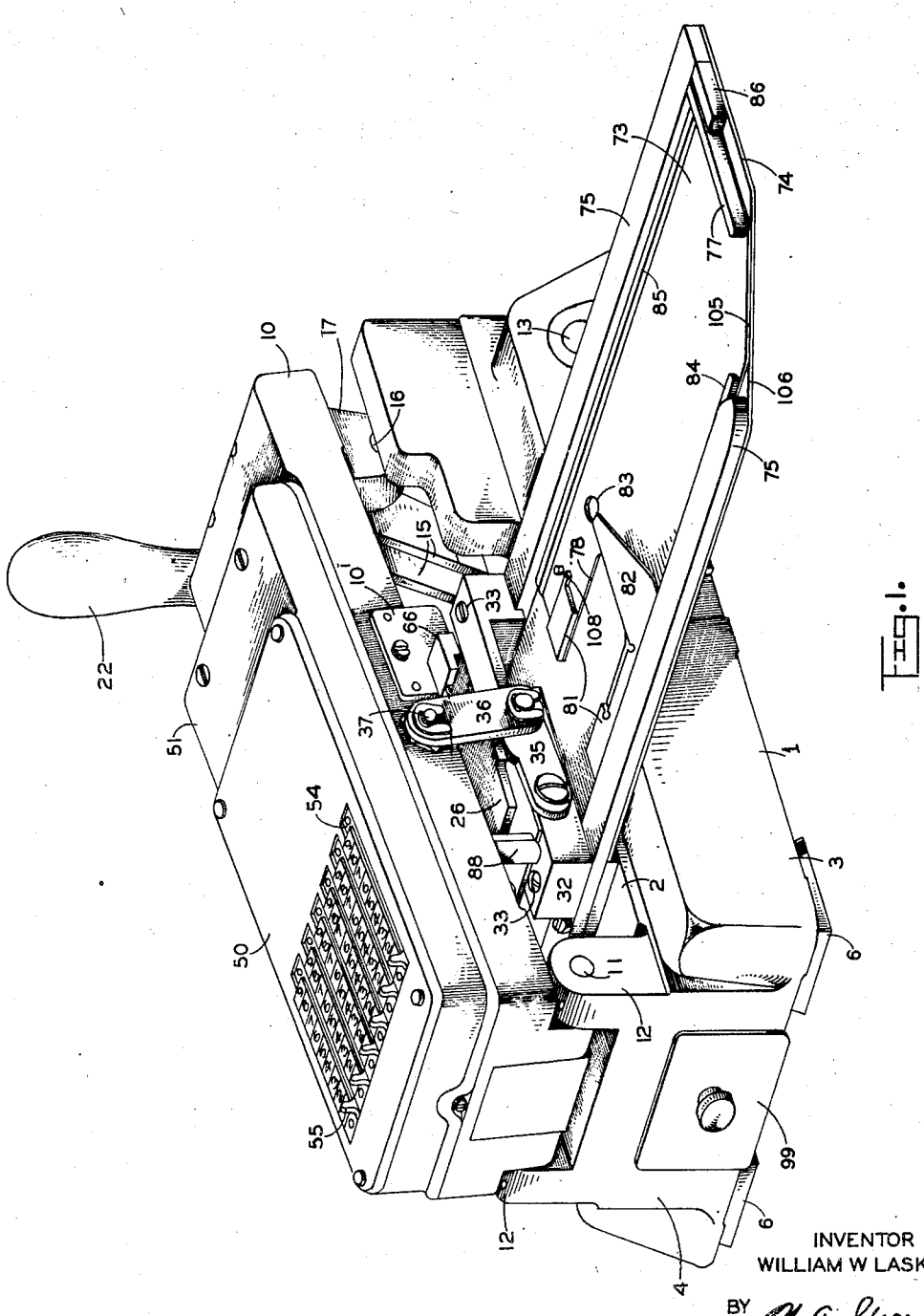


Fig. 1.

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PUNCHING MECHANISM

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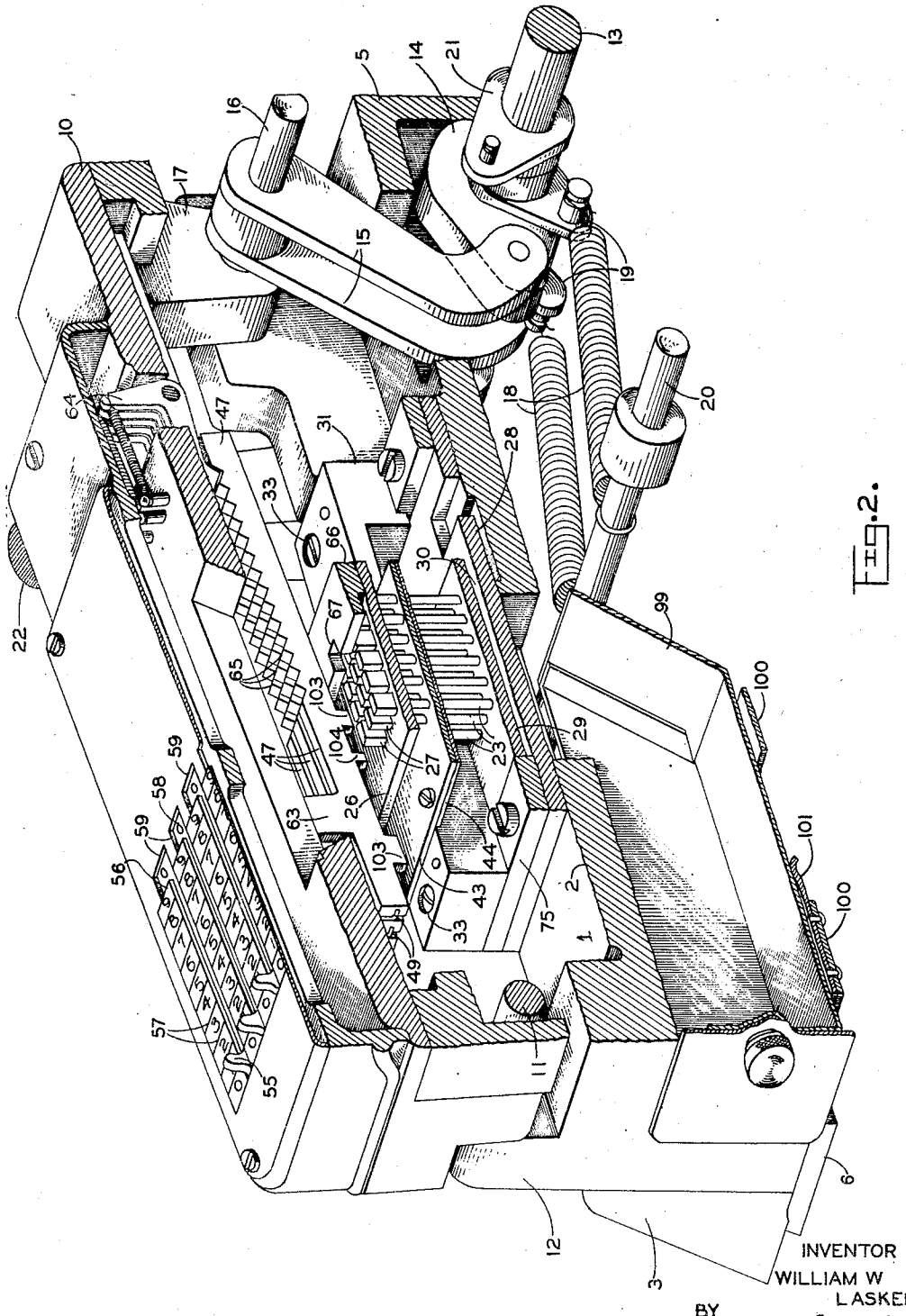


FIG. 2.

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PUNCHING MECHANISM

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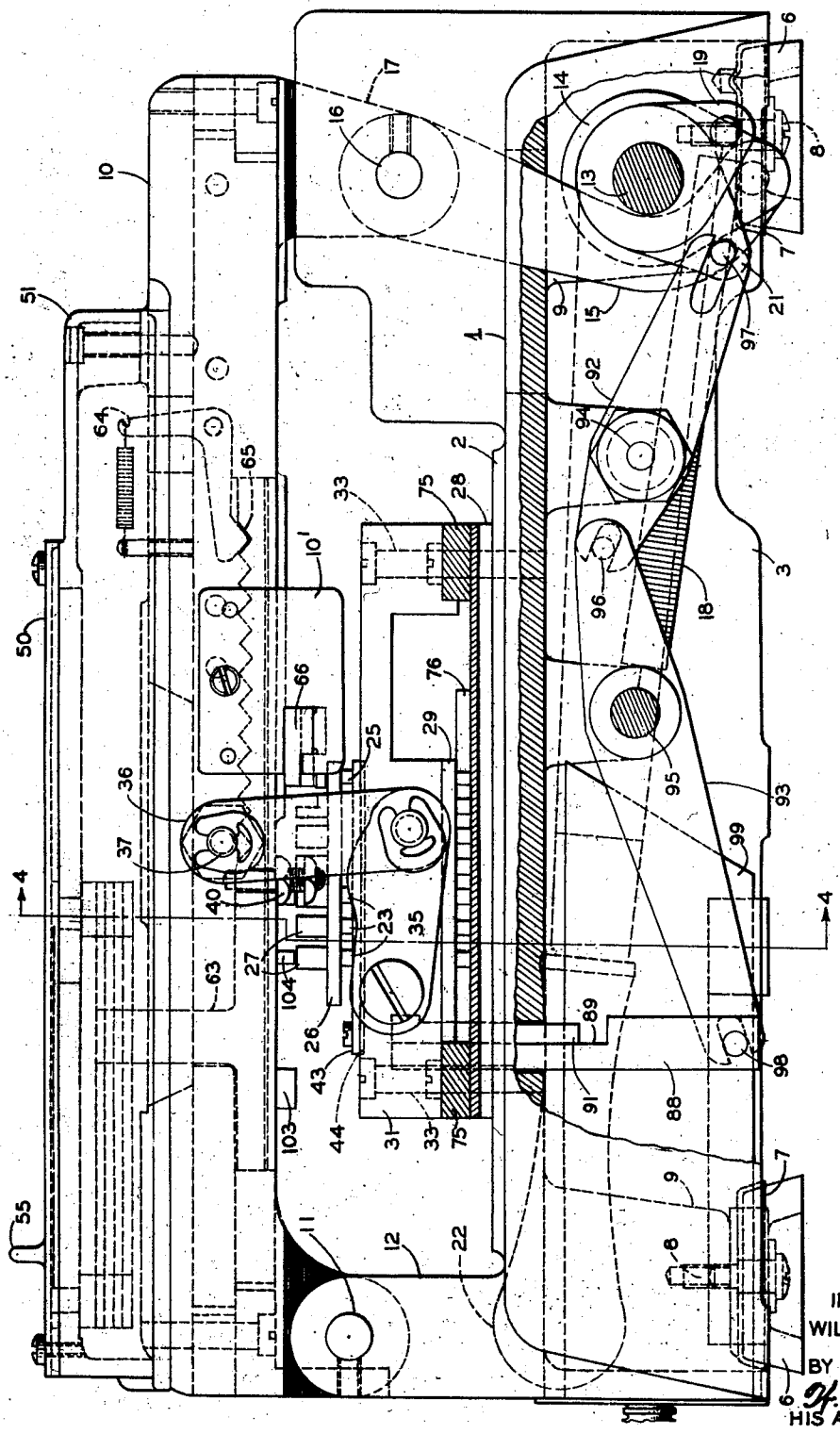


Fig. 3.

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July 16, 1935. W. W. LASKER 2,008,396

PUNCHING MECHANISM

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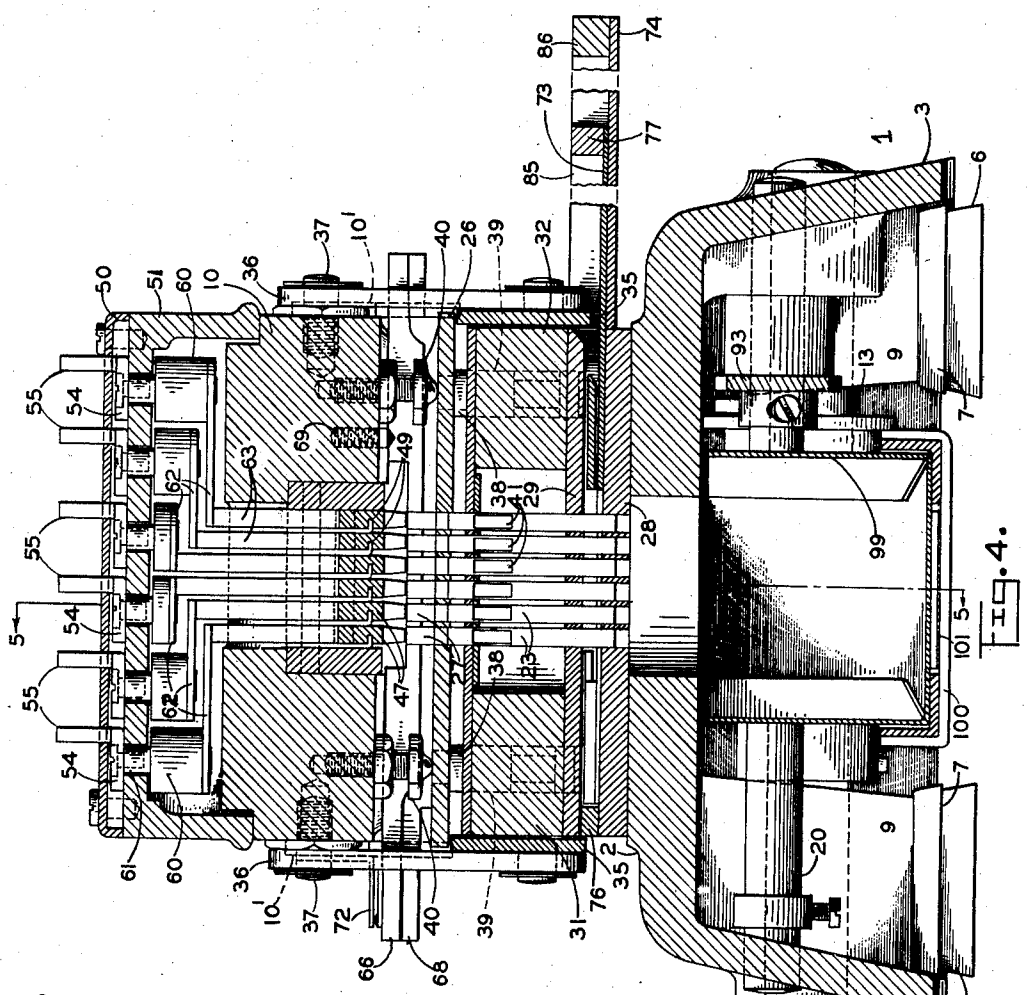


FIG. 4.

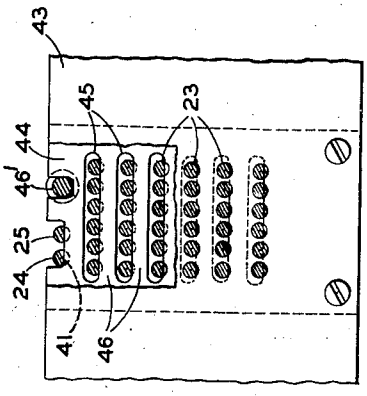


FIG. 8.

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July 16, 1935. W. W. LASKER 2,008,396

PUNCHING MECHANISM

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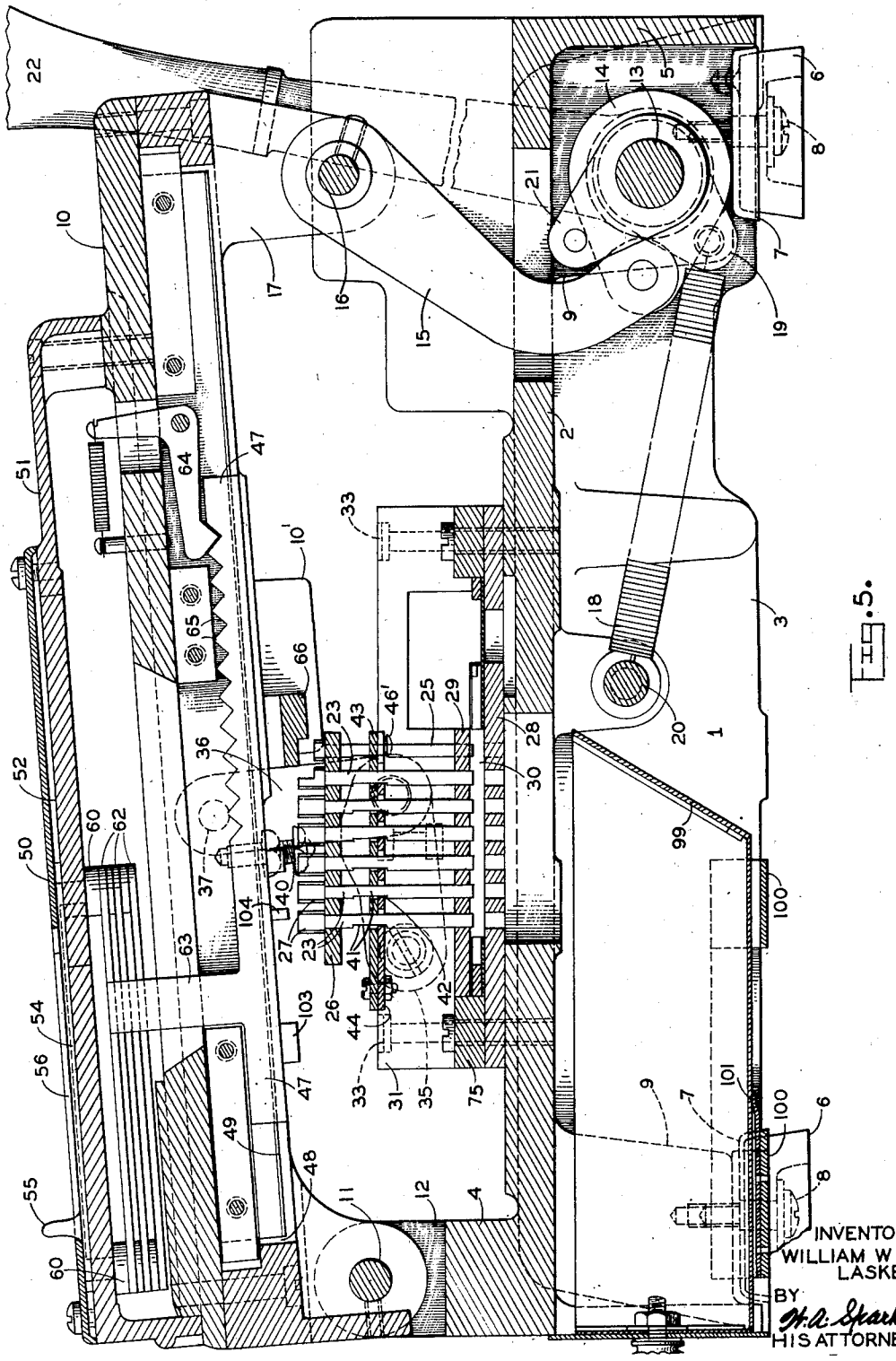


Fig. 5.

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PUNCHING MECHANISM

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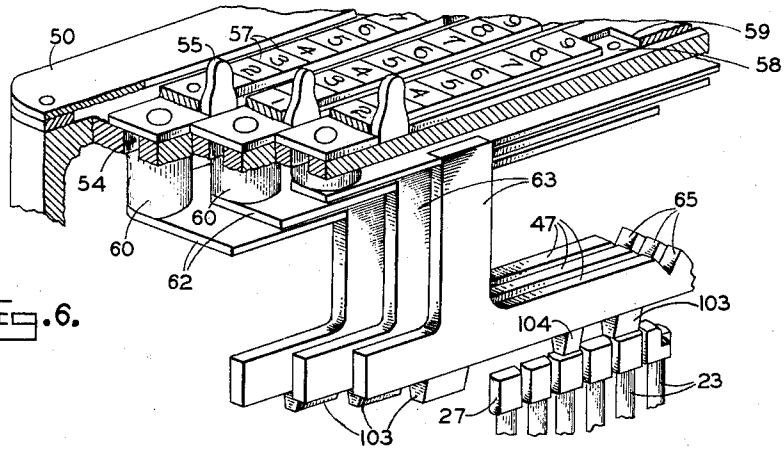


Fig. 6.

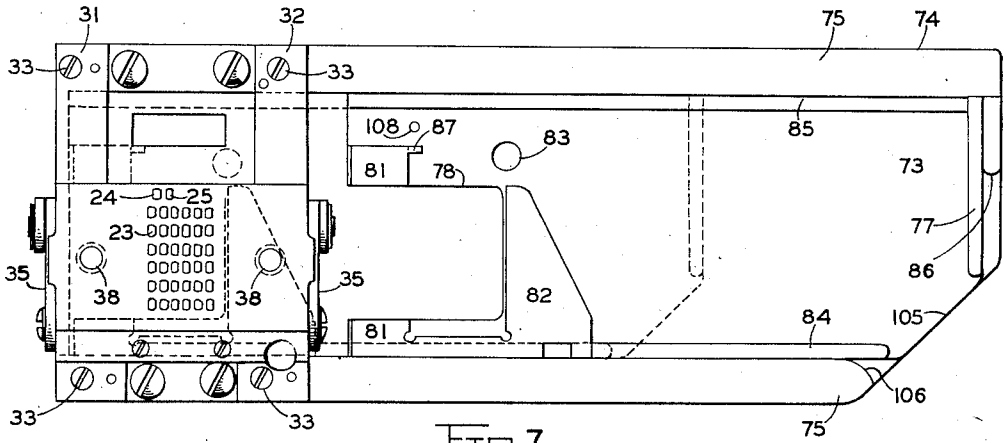


Fig. 7.

NO	CODE
1	3 — 5
2	2 — 4
3	1 — 3
4	2 — 6
5	5 — 6
6	4 — 5
7	3 — 4
8	2 — 3
9	1 — 2
0	4 — 6

Fig. 14.

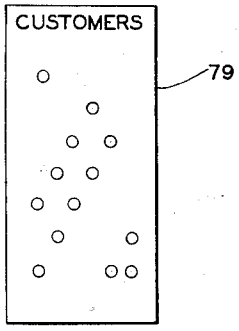


Fig. 15.

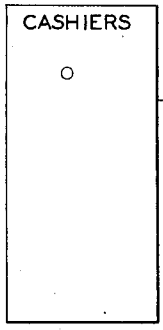


Fig. 17.

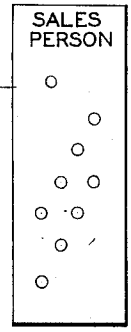


Fig. 16.

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PUNCHING MECHANISM

Filed July 21, 1934 7 Sheets-Sheet 7

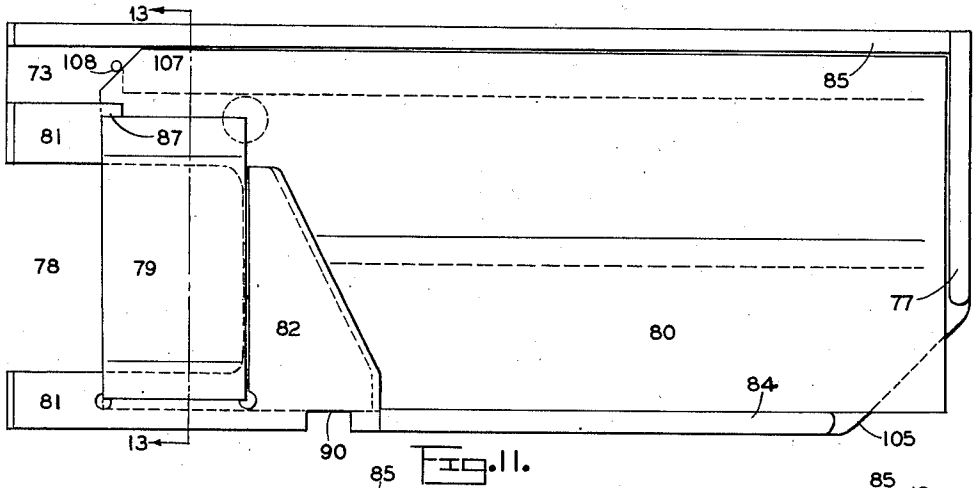


Fig. 11.

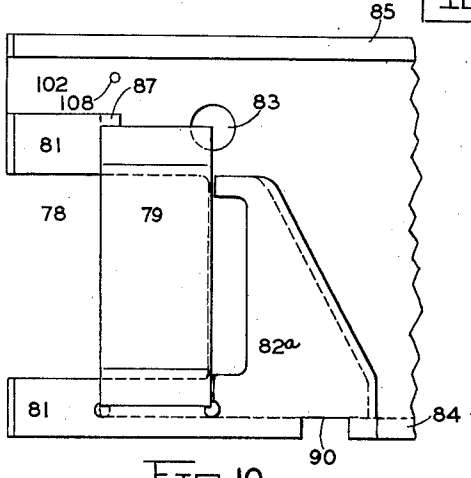


Fig. 10.

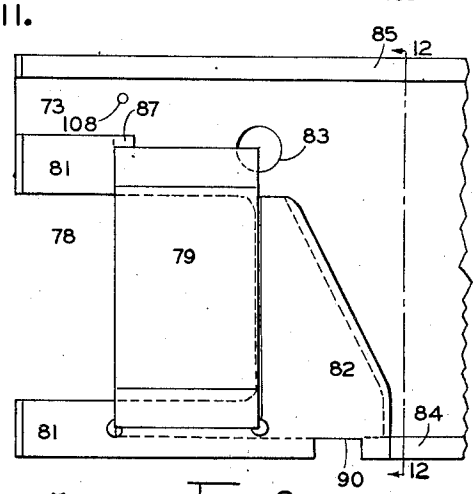


Fig. 9.

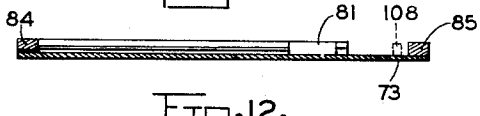


Fig. 12.

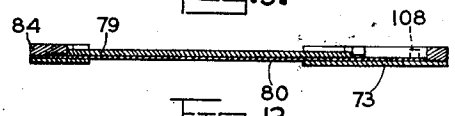
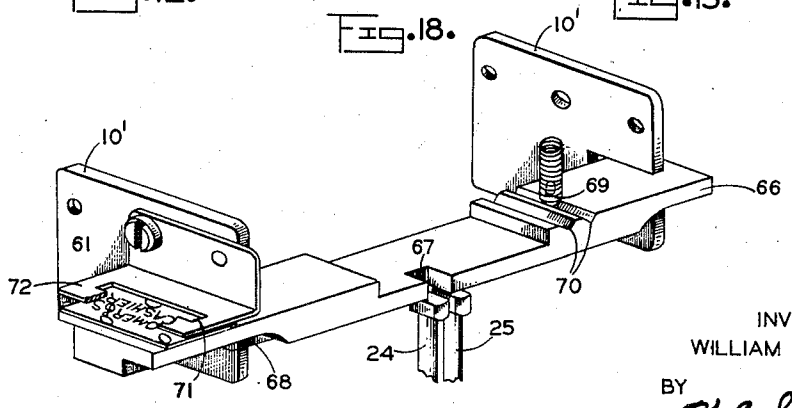


Fig. 13.

Fig. 18.



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Patented July 16, 1935 2,008,396

UNITED STATES PATENT OFFICE

2,008,396

PUNCHING MECHANISM

William W. Lasker, Brooklyn, N. Y., assignor to Remington Rand Inc., Buffalo, N. Y., a corporation of Delaware

Application July 21, 1934, Serial No. 736,309

8 Claims. (Cl. 164—111)

My invention relates to improvements in punching mechanism for producing punched records for use particularly in punched card accounting systems.

By way of explanation, in certain systems of accounting, as practiced in mercantile establishments, small tags, commonly designated "tokens" are used for identifying customers, sales clerks, and the cashier, or cashiers, as the case may be, by distinctive numbers, code representations of which are punched therein. Customer's record cards of the usual tabulating card type, and containing the names and addresses of the customers, are also used, which cards are punched in accordance with the customers' tokens. These tokens are used as control mediums for machines, which automatically produce tabulating cards punched to represent the numbers of the tokens and which are designed for subsequent use in tabulating machines for billing, ledger posting, and other operations all of which, being relatively unimportant to a proper understanding of the present invention, need not be entered into in detail herein. A special designation and control perforation is punched in the tokens. These last perforations are differently located in the customers' and cashiers' tokens to indicate thereon, and on the tabulating card, whether the latter are concerned with cash or credit transactions and for differently controlling the above mentioned machines, and others, such as sorting machines. The special perforation in the sales clerk's token is located, as in the customer's token, for a purpose which need not be explained herein.

So far as I am aware no machine has ever been devised for punching small tokens and larger record cards as above described either singly or simultaneously.

Having the foregoing in mind, the principal object of my invention is to provide an efficient, simplified hand punch for punching small tokens and larger record cards with code representations of distinctive numbers and with special designation and control perforations differently located relative to the number representing punches and to each other, for the purposes above set forth.

Another object of my invention is to provide for simultaneously punching a token and a record card.

Another object is to provide, in such a punching mechanism, for assembling a token and a record card in superposed fixed relation for simultaneous punching thereof.

A specific object is to provide a punching mechanism including a work carrier for moving the work to and from punching position, and adapted to hold either a token, or a larger card, or both, in superposed fixed relation.

Another object is to lock the work carrier against movement from punching position as a condition precedent to the punching operation.

Still another object is to lock the work carrier during the punching operation, and to maintain it locked until the punches have been retracted.

A further object of my invention, specifically stated, is to provide efficient, compactly arranged operating connections between a series of closely spaced punch selector racks and widely spaced sliding keys.

Other and subordinate objects, together with the structural details of my invention, will be clearly understood when the following description and claims are read in conjunction with the accompanying drawings, wherein:

Fig. 1 is an isometric view of a punching mechanism constructed in accordance with my invention, and showing the parts in normal position.

Fig. 2 is an isometric sectional view, taken longitudinally through the mechanism, and showing approximately one half thereof.

Fig. 3 is a view in side elevation, partly in section, and showing the mechanism in punching position.

Fig. 4 is a view in transverse section taken on the line 4—4 of Fig. 3 and looking in the direction indicated by the arrows.

Fig. 5 is a longitudinal section taken on the line 5—5 of Fig. 4 with the parts in normal position.

Fig. 6 is a fragmentary isometric view of punch selecting mechanism.

Fig. 7 is a top plan view, illustrating the relative arrangement of the punches and the work carrier.

Fig. 8 is a detail plan view, partly broken away, and showing punch guiding and locking plates.

Fig. 9 is a fragmentary top plan view, illustrating a token positioned on the work carrier.

Fig. 10 is a similar view of another work carrier for a smaller size token.

Fig. 11 is a top plan view of the work carrier of Fig. 9 with a record card and token positioned thereon for simultaneous punching.

Fig. 12 is a transverse section taken on the line 12—12 of Fig. 9.

Fig. 13 is a similar view taken on the line 13—13 of Fig. 11.

Fig. 14 is a view illustrating the code for punching the number representing perforations.

Fig. 15 is a view of a token punched to rep-

resent a customer's identifying number, and also with a special designation indicating a credit transaction.

Fig. 16 is a similar view of a clerk's token.

Fig. 17 is a similar view of a cashier's token, punched with a special designation perforation indicating a cash transaction.

Fig. 18 is an isometric view of a punch selecting slide and parts directly associated therewith.

Describing my invention in detail, and with reference to the drawings, 1 designates the base of the mechanism, the base preferably having the form of a rectangular casting comprising a base plate 2, and side, front and rear flanges 3, 4 and 5, respectively, depending therefrom. Suitable resilient supports 6, and sockets 7 therefor, are secured to said base by screws 8 threaded into bosses 9.

Surmounting the base 1 is a similarly shaped head 10, presently described in detail, pivoted at its front end, as at 11, for vertical rocking movement on supports 12 upstanding from the base plate 1. The head 10 is normally held elevated by head operating mechanism, as follows:

Journaled at the rear of base 1, in the side flanges 3, is a transverse shaft 13, operatively connected to said head by means of a crank arm 14 thereon, and links 15 connecting said crank arm to a rod 16 secured in lugs 17 on said head. Shaft 13 and links 15 are urged in a head elevating direction by springs 18 connected to crank arms 19, on said shaft, and to a rod 20 secured to flanges 3. A crank arm 21, fast on the shaft 13, establishes the normal elevated position of the head 10 by engagement with the base plate 2. A hand lever 22 is provided on one end of the shaft 13 for operating the latter to depress the head 10 in opposition to the springs 18. Depression of the head 10 is limited by engagement of the links 15 with the shaft 13, as shown in dotted lines in Fig. 3.

Intermediate the base 1 and head 10 is a field or set of vertical punches 23, disposed in rows corresponding to line and columnar positions on the work, and a pair of auxiliary special designation punches 24 and 25, located in the rear of the punches 23 and intermediate columnar rows thereof, to punch distinctive perforations in the work for indicating cash and credit transactions therein. The punches 23, 24 and 25 are mounted for independent movement in the usual perforated stripper plate 26 from which they are normally suspended by heads 27 thereon.

Cooperating with the punches 23, 24 and 25 are perforated die and guide plates 28 and 29, respectively, superposed in spaced apart relation, to form therebetween a punching chamber 30, and through which said punches pass in a punching operation. The plate 29 is spaced from the plate 28 by attachment to opposed undercut side bars 31 and 32, which, together with plate 28, are secured to the base plate 2 as by screws 33.

The stripper plate 26 is suspended from the head 10 for vertical movement thereby, as follows:

At opposite sides of said plate are opposed pairs of angularly related links, including horizontally disposed parallel links 35, pivotally connected to the side bars 31 and 32, and vertically movable by the head 10 through the medium of vertically disposed links 36 pivoted to said head, as at 37. The stripper plate 26 is supported at its side edges by said links 35, whereby it is elevated to retract said punches from the punching chamber 30. Vertical plungers 38, depending from the stripper plate 26, adjacent each side thereof, and fitted into bores 39 in the side bars 31 and 32, guide said plate in its vertical movement to maintain it in horizontal position. Under normal operation, that is to say in punching operations, the heads 27 of active punches act to depress the stripper plate 26, as will be clear. However, it has been found that the plungers 38 are liable to bind and jam under such action by said punches, because of the locations of the punches relative to said plungers. Therefore, set screws 40 are provided on the head 10, directly above the plungers 38, whereby depressing forces are exerted by said head 10 against the stripper plate 26 in line with said plungers 38, and binding of the latter obviated.

The punches 23, 24 and 25 are recessed, as at 41, intermediate their ends to form longitudinally spaced shoulders 42 thereon. A perforated punch guiding plate 43 is suitably secured to the side bars 31 and 32. A locking plate 44, provided with transverse slots 45 and intermediate tongues 46, is adjustably secured to the plate 43, as at 46', so that said tongues 46 are positioned in said recesses in intercepting relation to the shoulders 42 to lock the punches against removal from the machine. The locking plate 44 is adjustable to an ineffective position to unlock said punches, as will be clear.

The punches 23 are selected for operation through the medium of a series of key set toothed selector bars 47, one for each columnar row of punches, and suspended in a recess 48 in said head, as by rails 49, for sliding movement longitudinally of their associated row of punches. The connections between the keys and selector bars are arranged and mounted as follows:

Secured upon the head 10, in any suitable manner, are superposed housing members 50 and 51, forming upper and lower chambers 52 and 53 above said head. A series of laterally spaced slides 54 is mounted in the chamber 52 for movement longitudinally of said rows of punches 23, said slides being provided with keys 55 projecting through slots 56 in the housing member 50 for manual manipulation of the slides. The upper face of the housing member 50 is provided with rows of numbered graduations 57 for indicating the number represented by the punch selection in each columnar row of the latter, and the slides 54 are likewise graduated and numbered as at 58 to display, through suitable sight openings 59, in the housing 50, the aggregate number representation of the punch selections.

As will be understood, it is desirable that the rows of punches 23 be closely spaced for condensing the punched record, and that the keys 55 be widely spaced, relatively speaking, to facilitate their operation. To dispose the selector bars 47 in spaced apart relation, corresponding to that of the columnar rows of punches 23, and for setting by the widely spaced keys 55, the following connections between the slides 54 and said bars are provided:

Suspended from the slides 54, as by posts 60 passing through slots 61 in housing member 51, are two opposed series of plates 62 arranged in each series in overlapping stepped relation to overlie related selector bars 47. Vertical legs 63 on the bars 47 connect the latter to appropriate plates 62. Tensioned detent dogs 64, cooperating with notches 65 in the bars 47, yieldingly

latch the latter together with the keys 55 and slides 54 in selected position.

Mounted below the head 10, in opposed brackets 10' secured to said head, is a special punch selector slide or key 66 endwise movable manually over the special designation punches 24 and 25 to select the latter for operation by the head 10, when the latter is depressed, and having one end extending beyond the head 10 for manipulation of said slide by the operator. Preferably the slide 66 has two positions only, in each of which an edge thereof overlies a punch 24 or 25, as the case may be, and is provided with an edge notch 67 for clearance of the other punch by said slide when said head is depressed. Shoulders 68 on the slide 66 establish the two positions of the latter. A spring pressed detent 69, mounted in the head 10 and cooperating with notches 70 in the slide 66, yieldingly retains the slide in either of its two positions. The special designation punch 24 is designed for indicating credit transactions on the customer's and sales clerk's token, and card, and the punch 25 for indicating cash transactions on the cashier's token and card. Appropriate legends, such as shown in Fig. 18, are provided on the extending end of the slide 66 for indicating through a sight opening 71 in a suitably mounted plate 72 whether or not the selection of the punches 24 or 25 is appropriate to the token to be punched.

The work carrier comprises a tray 73 removably mounted on a support 74 for sliding movement between edge guides 75 on the latter, to advance and retract the front end thereof into and from the punching chamber 30, stop member 76 and end rail 77, on the die plate 28 and table 74, respectively, limiting advance and retraction of said tray 73. The front end of the latter is provided with a recess 78 for clearance by the punches in a punching operation, and over which the token 79 or a record card 80, or both, are placed for perforation by said punches. Adjacent the edges of the recess 78 are front and rear work holding members 81 and 82, respectively, suitably secured to the bottom of said tray and forming, together with the latter, a pocket for receiving three corners of the token 79, the fourth corner being left free. An aperture 83 is provided in the bottom of the tray 73 below the free corner of said token, for facilitating removal of the latter by the operator as will be clear. The front work holding members 81, together with front, rear and end flanges 84, 85 and 77 on said tray, form a pocket for positioning a record card in said tray beneath a token 79, and for aligning the front edges of said card and token as shown in Fig. 11, the rear member 82 being spaced from the bottom of the tray 73 for insertion of said card thereunder and one front member 81 having an undercut keeper lip 87 for holding the front edge of the card against said member.

The work carrier tray 73 is locked in its advanced position and hence the work in punching position by means of the following:

A plunger 88 is mounted in the base plate 2, in the line of movement of one edge of the work carrier tray 73, and for vertical movement in said plate. Normally, the plunger 88 is elevated, in which position said edge of the tray 73 is movable through a recess 89 in said plunger. When the work carrier tray is fully advanced, a recess 90 in said edge thereof registers with a key 91 extending along said plunger. Operation of the hand lever 22 to depress the head 10 lowers said plunger to enter the key 91 in the recess 90 and lock said tray against movement prior to and during the punching operation. The operating connections between the hand lever 22 and plunger 88 comprise a pair of levers 92 and 93 pivotally mounted as at 94 and 95, a pin and slot connection 96 between said levers, and similar connections 97 and 98 between said levers and the crank arm 21 and plunger 88, respectively. The plunger is returned to normal position by the beforementioned spring 18 as will be clear, the key 91 maintaining the tray 73 locked until the punches 23, 24 and 25 have been fully retracted.

A receptacle 99 is slidingly mounted below the base plate 2 in supports 100 to receive the punchings from the die plate 28. A leaf spring 101 frictionally engages the bottom of said receptacle to hold the latter against accidental displacement.

By referring to Figs. 13, 14 and 15, it will be seen that the customer's and cashier's tokens are of the same size, whereas the clerk's token is relatively narrower. For punching the latter, and a record card therewith, a work carrier tray 102 (Fig. 10) is provided, in which the front and rear holding members 81 and 82a form a narrower pocket for said token, and which may be substituted for the work holder of Figs. 9 and 11, as will be understood.

A corner of the tray 73, or 102, is beveled, as at 105, and the corresponding corner of the support 74 is similarly beveled, as at 106, so that a corner of a card 80, located in said tray, will project beyond said tray and support to facilitate removal of the card from the tray by an operator.

A corner of the card 80 is usually beveled as at 107 for a purpose not important to this disclosure. To prevent the operator from inserting such a card in the tray, or trays, in wrong position, a pin 108 is provided on said tray for cooperation with said beveled corner 107, when the card is correctly positioned and which blocks location of said card in wrong position in said tray.

It remains to be stated that the machine is particularly designed for perforating according to the well known Lasker-Woodruff code disclosed in British Patent No. 378,571 of 1929. Suffice it to explain herein that this particular code is based on ten permutations of six punches in each columnar row, as shown in Fig. 14, and that the racks 47 are provided with wide and narrow teeth 103 and 104 arranged to select successive and alternate punches 23, respectively, according to the punch combinations of said code.

The operation of my invention will, it is believed, be understood from the foregoing description of a preferred embodiment thereof.

Obviously, however, changes in form and modifications of details could be made without departure from the inventive concept disclosed, and it is, therefore, to be understood that only such limitations shall be imposed on the appended claims as are required by the prior art.

What I claim is:

1. In a card punching machine, the combination with a field of punches, and means for selectively operating the same, of a work carrier operable to feed the work to said punches and including work holding members forming superposed pockets of relatively different sizes for holding relatively large and small cards in superposed fixed relation.

2. In a machine of the class described, the combination with a field of downwardly acting punches, and punch operating mechanism, of a work carrier movable to position the work be-

neath said punches and including a sliding plate having a recessed end for clearance of the plate by the punches, and means on said plate for holding relatively large and small cards in superposed position over said recess and engaging edges of said cards.

3. In a machine of the class described, the combination with downwardly acting punches, and punch operating mechanism, of a sliding tray for positioning the work beneath said punches and having a recessed front edge for clearance of the tray by said punches, and work holding means on said tray and including edge rails for holding a card on said tray and over said recess, and pocket forming members at the edges of said recess for holding a card over said recess of smaller size than the first mentioned card.

4. In a machine of the class described, the combination with downwardly acting punches, and operating mechanism therefor, of a work supporting tray slidable to a position beneath said punches, and having a recessed front end for clearance of said tray by said punches, and work holding means on said tray and including opposed abutment members at the front thereof for engagement by the front edge of the card to locate the same over said recess, and a member in the rear of said recess spaced from the bottom of the tray, for insertion of said card thereunder and forming together with said abutment members a card holding pocket for a card of smaller size than said first mentioned card.

5. A card carrier for use in a punching machine, and comprising a tray having a recessed end, and work holding means thereon including pocket forming members adjacent the edge of said recess seating three corners of a card disposed therebetween, said tray having a finger opening in the bottom thereof beneath the free corner of the card, to facilitate removal of said card from said pocket.

6. A card carrier for use in a punching machine, and comprising a tray having a recessed front end, and work holding means thereon and including abutment members at the front end of said tray for engagement by the front edge of a card to locate the same over said recess, said abutment members extending over said edge of the card, and edge rails on said tray for retaining the card in location, the tray having a beveled corner whereby a corner of the card projects beyond said tray for manipulation to remove the same.

7. In a machine of the class described, the combination with a base, a vertically rocking head thereon, and a field of punches intermediate said base and head, of means for withdrawing said punches by movement of said head and including opposed pairs of links pivoted to said head and base for movement with said head and each including a horizontally disposed link, a punch carrying plate supported at its opposite edges by the horizontally disposed links of said pairs, and abutment members depending from said head for engagement with said plate.

8. In a machine of the class described, the combination with a work support, a field of punches operative to punch the work in a plurality of column positions thereon, and means for selectively operating said punches, of auxiliary punches one or another of which is operated as an incident to operation of punches of said field, and to punch the work above the punchings in the column positions and intermediate two adjacent column positions.

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