

May 9, 1939.

D. C. DAUBMEYER

2,157,980

PRINTING MACHINE

Original Filed Jan. 8, 1936

5 Sheets-Sheet 1

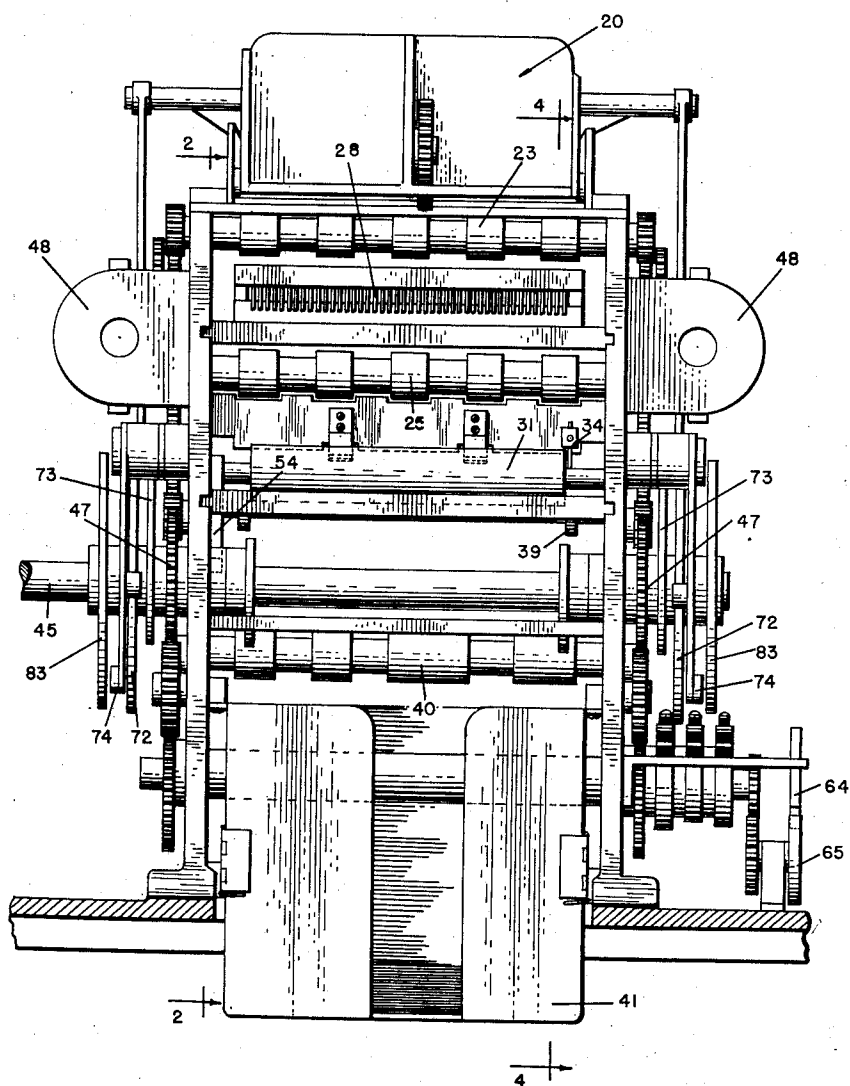


FIG. 1.

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5 Sheets-Sheet 2

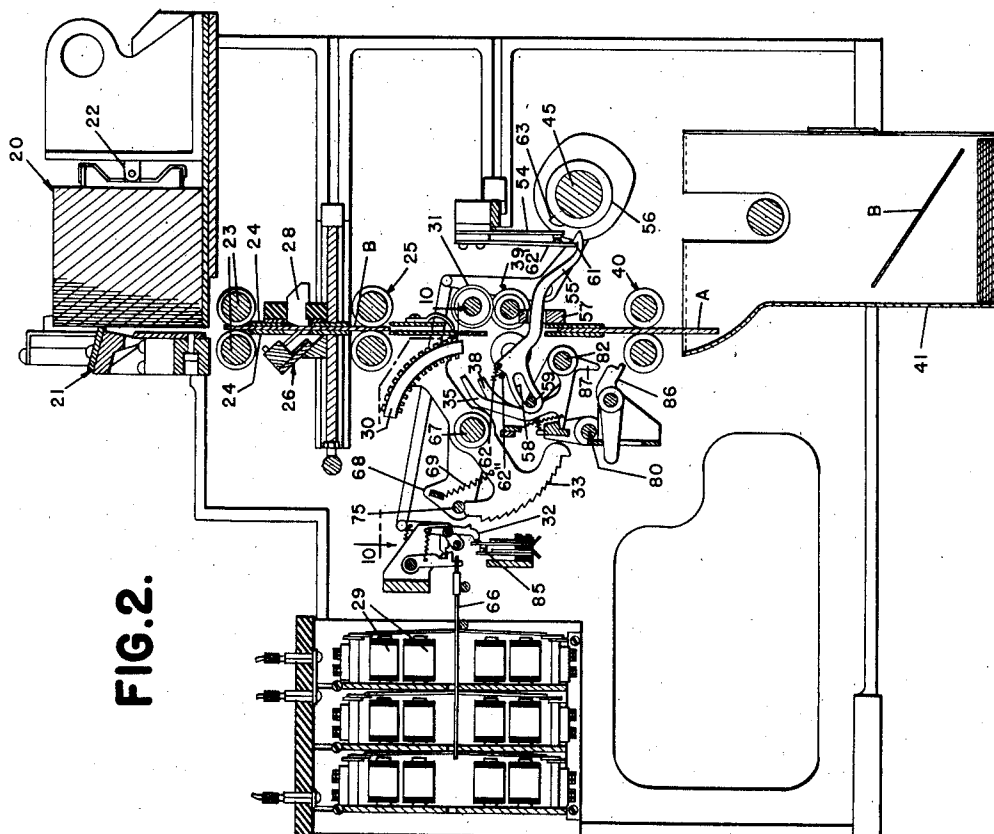


FIG. 2.

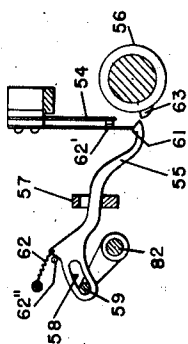


FIG. 5.

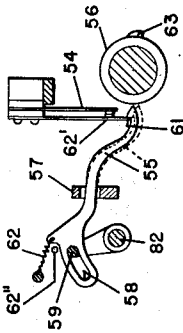


FIG. 6.

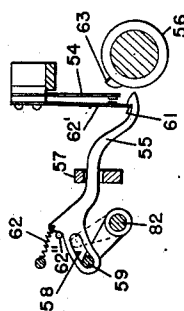


FIG. 7.

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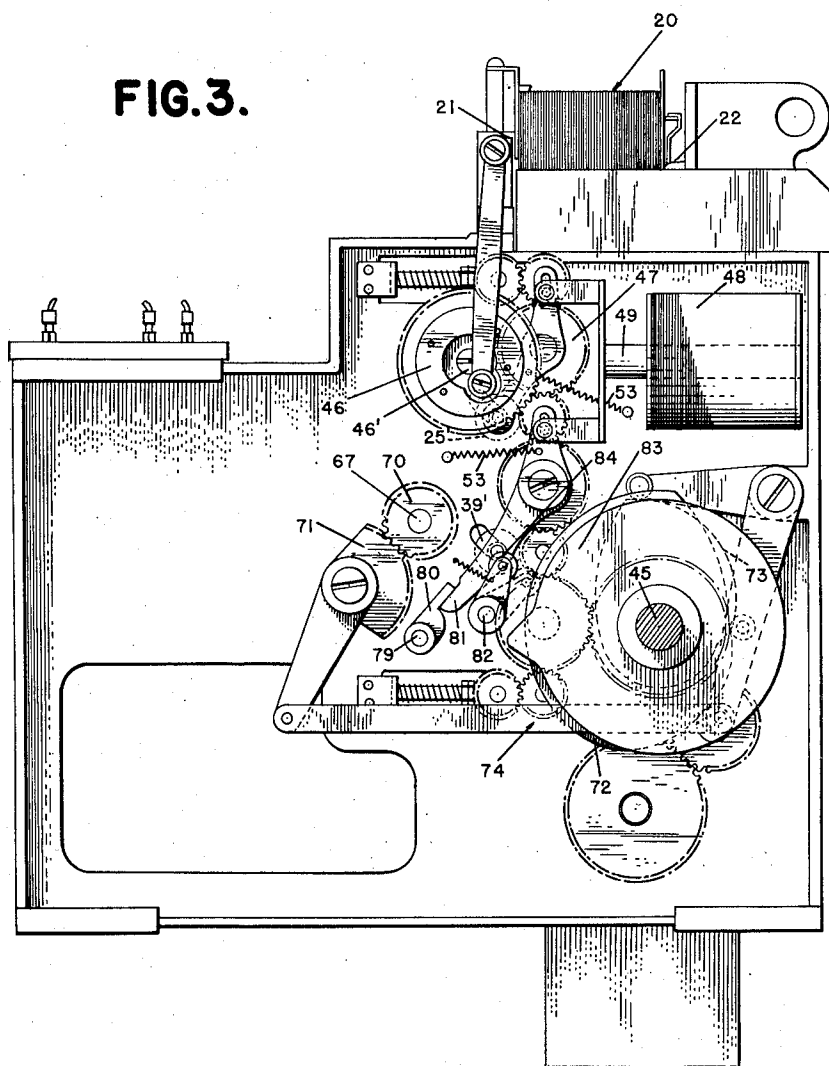
2,157,980

PRINTING MACHINE

Original Filed Jan. 8, 1936

5 Sheets-Sheet 3

FIG. 3.



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PRINTING MACHINE

Original Filed Jan. 8, 1936

5 Sheets-Sheet 4

FIG.4.

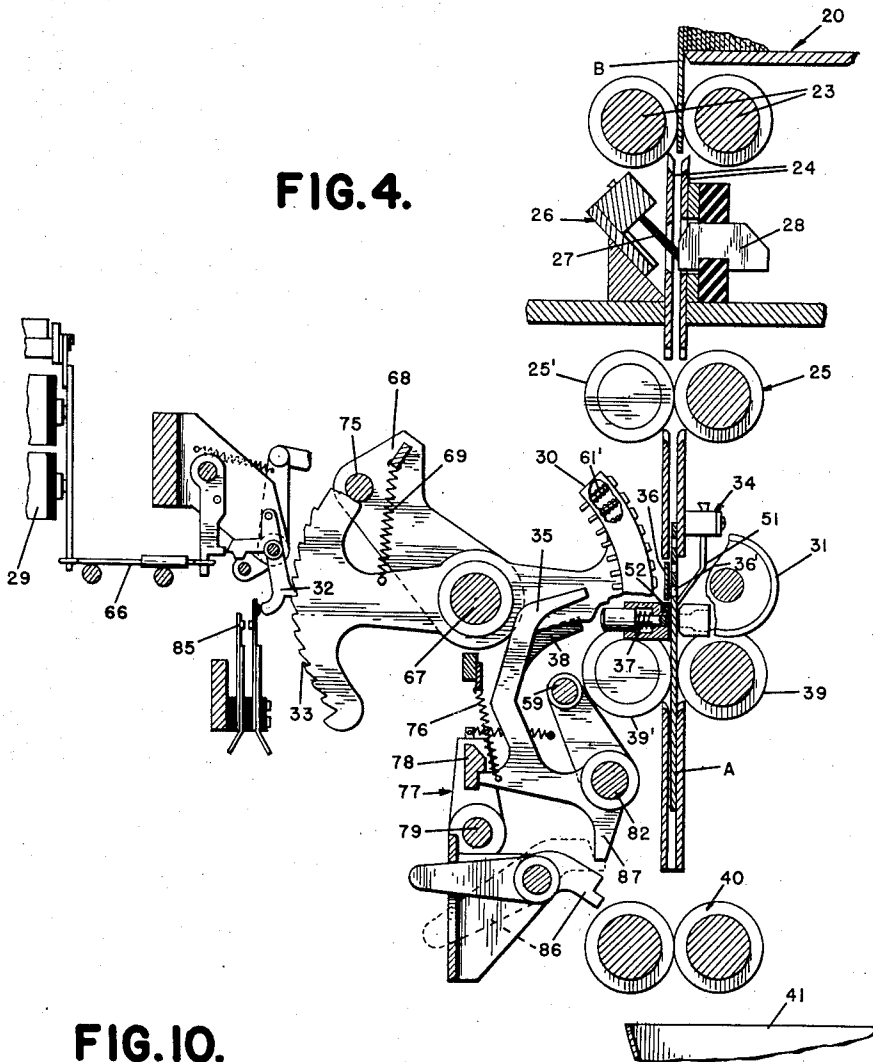
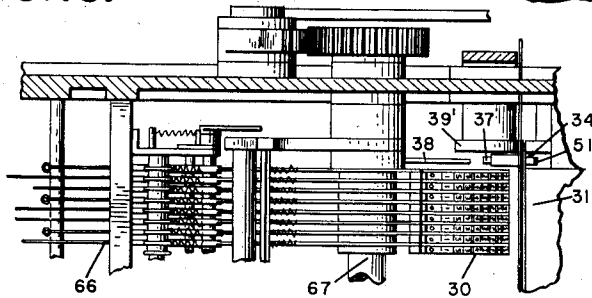


FIG.10.



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PRINTING MACHINE

Original Filed Jan. 8, 1936

5 Sheets-Sheet 5

METER RECORD												356	962	1	REMARKS
TYPE	AMR	VOLTS	WIRE	FACTORY NUMBER				COMPANY NUMBER				HOUSE NUMBER	STREET CODE	FLOOR	
000	000	000	000	000	000	000	000	000	000	000	000	9763	10		
111	111	111	111	111	111	111	111	111	111	111	111	1825	132	1	
222	222	222	222	222	222	222	222	222	222	222	222	12672	125	2	
333	333	333	333	333	333	333	333	333	333	333	333				
444	444	444	444	444	444	444	444	444	444	444	444				
555	555	555	555	555	555	555	555	555	555	555	555				
666	666	666	666	666	666	666	666	666	666	666	666				
777	777	777	777	777	777	777	777	777	777	777	777				
888	888	888	888	888	888	888	888	888	888	888	888				
999	999	999	999	999	999	999	999	999	999	999	999				

FIG.9

B

PREMISE RECORD

12672 BYRON AVE. FL. 2.

BUSINESS	CLASS	IN READING	OUT READING	METER NUMBER	HOUSE NUMBER	STREET CODE	FLOOR	IN	OUT
Grocery	1a	3762	9767	256763	000000	000000	00	6-9-25	4-25-28
Conf.	1	00		698012	011111	011111		4-25-28	
					202202	202202	20		
					333333	333333	33		
					444444	444444	44		
					555555	555555	55		
					666666	666666	66		
					777777	777777	77		
					888888	888888	88		
					999999	999999	99		

FIG.9.A

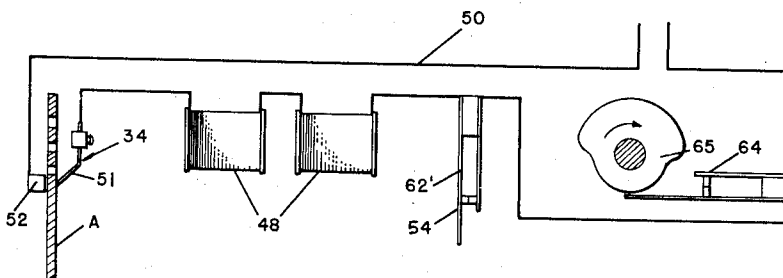


FIG.8.

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UNITED STATES PATENT OFFICE

2,157,980

PRINTING MACHINE

Dewey C. Daubmeyer, Detroit, Mich.

Application January 8, 1936, Serial No. 58,217

Renewed July 7, 1938

35 Claims. (Cl. 101—93)

This invention relates generally to printing machines and refers more particularly to improvements in machines of the character set forth in the James W. Bryce Patent No. 1,608,837, dated November 30, 1926.

It has been customary in the past to provide record cards with statistical data in the form of perforations. In actual practice, the record cards are printed with characters such as numbers, letters, etc., and the cards are punched directly in the spaces in which the corresponding printed characters are placed. The arrangement is such that after a card is punched, the printed number or letter, designating a particular hole, is punched out and the method of reading the card consists in interpreting the omitted characters rather than in reading directly visible characters. After the cards have been properly punched, they are introduced to a printing machine of the type set forth in the James W. Bryce Patent No. 1,608,837, wherein each card is printed on its top edge with the sensed data as derived from the perforations previously punched in the same card.

Although the machine illustrated in the above identified patent renders it possible to print the data indicative of the perforations in the record card directly over the perforations to which they correspond, or in a space offset with respect to the perforations, nevertheless, no provision is made to transfer the data from one record card to another. It is, therefore, one of the principal objects of this invention to provide a machine having means for sensing the data from one card and printing the same in a predetermined space on another card.

The advantage of this feature will be readily understood when considering that it is customary to maintain records by means of sets of two or more record cards for the same items whereby the records may be cross-referenced. In such instances, it is generally customary to indicate a portion of the data by perforations on one card, and another portion of the data by perforations on another card of the set. In such a method of recording, the present invention may be used to advantage because with the herein described machine the perforated data from one card may be printed upon another card of the set, and vice versa.

In accordance with this invention, a plurality of cards is fed into the machine in succession and the perforations in one card, corresponding to the characters it is desired to print on an adjacent card, are sensed by a device operating to automatically set the type of a suitable printing mechanism

to record these characters on the aforesaid adjacent card.

Another advantageous feature of this invention resides in the provision of means for stopping advancement of the printed record card, upon which it is desired to print the record from the punched data card, at a point so located with respect to the printing mechanism, that the characters derived from the perforations in the data card will be printed in a selected space on the record card.

Another object of this invention consists in the provision of card arresting apparatus of the character set forth in the preceding paragraph comprising means cooperating with a perforation in the record card, located in predetermined relation to the space in which it is desired to print the characters corresponding to the sensed perforations in the data card, to stop the record card in a position where the space aforesaid registers with the printing mechanism.

Still another advantageous feature of the present invention resides in the provision of means operable in timed relation to the printing mechanism to punch a perforation in the latter card in predetermined relation to the next available space, so that when the record card is again passed through the machine, the card will be stopped in a position wherein the aforesaid space registers with the printing mechanism.

A further object of this invention consists in the novel means provided for preventing any succeeding perforation in the record card from cooperating with the arresting mechanism to stop the card again. In other words, the machine is operated solely by the arresting perforation formed in the record card during the preceding operation and any additional perforations that may be in the card have no effect, whatsoever, on either the card arresting apparatus or the printing mechanism.

A further feature of the present invention resides in the provision of means for automatically actuating in timed relation, the type striking hammers, the punch for forming the perforation in the record card required to arrest the latter at the proper position relative to the type, and the card feeding means to render the latter inoperative during the posting operation.

In addition to the foregoing, the present invention contemplates means for preventing the operation of the machine except in the cycle of operation when the card to be printed is in registration with the printing mechanism. This feature offers the possibility of printing the desired characters in a predetermined space on alternate

cards, even though the adjacent cards from which the characters are read are perforated in regions exposed to the card arresting mechanism. In other words with the present invention, it is not necessary that the data cards be free from index perforations in the region of the card arresting apparatus, and this is desirable since it renders it possible to transfer data from one record card to another, even though both cards have been perforated in the region of the arresting mechanism during previous postings.

The foregoing will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawings, wherein:

Figure 1 illustrates a front elevation of a machine constructed in accordance with this invention;

Figure 2 is a vertical sectional view taken substantially on the plane indicated by the line 2—2 of Figure 1;

Figure 3 is a side elevational view of the machine shown in Figure 1;

Figure 4 is an enlarged sectional view taken substantially on the plane indicated by the line 4—4 of Figure 1;

Figures 5, 6, and 7 are fragmentary sectional views illustrating several positions of operation of one detail of the machine;

Figure 8 is a wiring diagram;

Figures 9 and 9A are views showing two typical cards in the position they are advanced through the machine; and

Figure 10 is a sectional view taken substantially on the plane indicated by the line 10—10 of Figure 2.

Although it will be understood from the following description that my improved card printing machine may be employed in all cases where it is desired to affect the transition of printed matter from one record to another, nevertheless, for the purpose of illustration and simplicity of identification, the machine will be described for the purpose of transferring printed matter from a premise card to a meter card.

In general, the cards are properly interleaved and are stacked in a magazine 20 of conventional construction with a premise card B preceding a meter record card A. The stack of cards are normally urged toward suitable picker mechanism 21 by means 22, and the mechanism 21 operates to successively introduce the cards to the cooperating feed rolls 23. The feed rolls 23 are arranged upon opposite sides of the path of travel of the cards and function to advance the latter along a predetermined path of travel defined by the guides 24.

Due to the particular arrangement of stacking the record cards, it will be noted that the premise record card is the first one to be advanced along the path of travel, and this card is adapted to be engaged by a second set of feed rolls 25 just prior to disengagement of the feed rolls 23 from the card. After a predetermined interval of advancement of the premise record card B, the picker mechanism 21 again operates to introduce a meter record card A to the feed rolls 23 and the latter functions to advance the meter card between the guides 24. As the premise record card B is advanced by the rolls, the perforations representing certain characters, previously punched out of the premise record card B, are read or sensed by a suitable sensing device 26 supported between the two pairs of feed rolls 23 and 25. The sensing device 26 is of conventional

construction such as is commonly used in electrically controlled tabulating machines, and briefly comprises brushes 27 positioned to one side of the path of travel of the cards, and contact blocks 28 located upon the opposite side of the path of travel of the cards.

The brushes 27 are normally insulated from electrical contact with the blocks 28 by the card passing therebetween and at the intervals in the cycle of operation when the premise record card B passes therebetween, the extremity of certain of the brushes 27 contacts with the blocks 28 through the perforations in the premise card representing the characters it is desired to print upon the record card A. Thus, the electric circuits to the magnets 29 are completed which, in turn, operate through suitable mechanism to arrest the corresponding type sectors 30 in positions wherein the characters on the type sectors, corresponding to the perforations in the premise card B, are on the printing line opposite the platen 31. It will, of course, be understood that the number of sensing devices 26 and the magnets 29 correspond to the number of vertical columns on the premise record card B and also, that a type sector 30 is associated with each electromagnet 29.

With the construction thus far described and assuming that the premise record card B is perforated in the manner shown in Fig. 9A, it will be noted that the sensing brushes 27 will contact with the blocks 28 through the perforations corresponding to the numbers 1, 2, 6, 7, 2, 1, 2, 5 and 2. The electromagnets 29 are energized by the circuits closed by engagement of the brushes 27 with the blocks 28, through the aforesaid perforations in the premise record card B, and the operation of the magnets releases the pawls 32 to permit engagement of the latter with the ratchet teeth 33 on the type sectors 30 to arrest the type sectors in a position wherein the type on each sector at the printing line corresponds to the above mentioned indicia.

The type sectors 30 are set during the interval the meter record card A is advanced by the feed rolls 25 and 39 to the position thereof shown in Figure 4. In this figure, the space on the card within which it is desired to print the data, is located just in advance of the printing line of the sectors 30 and the brush 51 has not yet engaged perforation 36', Figure 4. A slight continued movement of the card A brings the perforation 36' opposite the brush 51 of the arresting mechanism 34 to stop the meter record card in its arresting position. With the card A in this position, the hammers 35 are actuated to effect the operation of the type to print the characters in the proper space on the record card. In this connection, it will be noted that the usual inking ribbon 36 is supported opposite the platen 31 between the type and the adjacent side of the card. At the same time that the type striking hammers 35 operate, an index perforation 36'' is formed through the card adjacent one marginal edge thereof. This perforation is formed in the meter record card A by a punch 37 actuated by the auxiliary hammer 38, and the resulting perforation is made in preparation for a subsequent run of the card through the machine. After the meter record card A has been properly printed and punched with the required index perforation, the same is advanced by a third pair of feed rolls 39 to a fourth set of rolls 40 and from the latter, deposited in a suitable retainer 41.

Having described in general the operation of the machine forming the subject matter of this invention, particular reference will now be made to the detailed construction of the several parts involved. The drive shaft of the machine is designated in the several figures by the reference character 45 and this shaft is driven by a suitable prime mover such as an electric motor (not shown). Mounted upon opposite ends of the shaft 45 which is geared to drive shaft 45, are suitable discs 46 operatively connected to the picker mechanism 21 for reciprocating the latter to feed one record card at a time to the feed rolls 23. As shown in Figure 3, a suitable gear train 47 serves to operatively connect the drive roll of each pair of feed rolls 23, 25, 39 and 40 to the drive shaft 45. The cooperating rolls of each of the aforesaid pairs of feed rolls are idler rolls and, in the present instance, the idler rolls of the pairs 25 and 39 are adapted to be moved laterally, in a direction away from the cooperating drive rolls, in timed relation to positioning a record card A in operative position with respect to the printing line previously determined by the sensing mechanism 34. The idler rolls are moved out of operative relation with the record cards in dependence upon the operation of the arresting mechanism 34 to energize the magnets 48, shown in Figures 1 and 3 of the drawings as having the armatures 49 connected to the shiftable idler rolls in such a manner that displacement of the armatures in the magnetic fields effects a movement of these rolls in a direction away from the cooperating drive rolls. The magnets 48 are energized by completing a circuit 50 through the last index perforation 36' in the meter record card A by a brush 51 having the free end engageable with a contact block 52 through the index perforation 36'. It will be observed from Figure 8 that the magnets 48 are arranged in the circuit 50 so that when the latter is completed by the brush 51, the idler rolls of the pair of feed rolls 25 and 39 are moved to an inoperative position with respect to the cards. After the meter record card A has been properly printed by the printing mechanism and simultaneously punched in preparation for the next run through the machine, the idler rolls are returned to their operative positions with respect to the card by means of suitable springs 53.

In the brief description of this machine, it was pointed out that each time the record card A is printed, the same is punched by the mechanism 37 to form an index perforation in the card below the next open line, so that this perforation will cooperate with the brush 51 in the next posting of the card to stop the latter in a position wherein the open space is opposite the printing line. It necessarily follows, therefore, that the meter record card A may have a number of perforations 36' therethrough and in order that the circuit 50 will be closed only by the index perforation associated with the open line in the card A, some means must be provided to maintain the circuit 50 open even though the brush 51 contacts with the block 52 through any one of the following index perforations. This is accomplished herein by the mechanism shown in Figures 5 to 8 inclusive. The mechanism illustrated in the above figures comprises a switch 54 in the circuit 50 and means for automatically breaking this circuit by opening the switch 54 before advancement of the meter record card A is continued after the printing operation. Hence, engagement of the contact brush 51 with the

contact block 52, through any perforations in the card A resulting from previous postings, will have no effect on the printing mechanism. In detail, the switch 54 is actuated by a finger 55 and a cam 56 operatively connected to the drive shaft 45. The finger 55 is slidably supported intermediate the ends thereof between suitable guides 57 and is slotted as at 58 at one end for receiving a bail 59. The opposite end of the finger 55 is provided with a shoulder 61 normally urged toward the switch 54 by means of a spring 62, and adapted to assume a position adjacent the inner side of one of the contact arms 62' of the switch 54 when the bail 59 is in the position thereof shown in Figure 6. In this connection, attention may be called to the fact that the length of the slot 58, in the finger 55, is slightly less than the travel of the bail 59, so that during the final portion of movement of the bail in a clockwise direction, the finger 55 is moved to locate the shoulder 61 thereof beyond the contact 62' aforesaid of the switch 54. When the finger 55 is in this latter position, the spring 62 functions to move the finger into engagement with the stop 62' and in so doing positions the shoulder 61 adjacent the inner side of the contact arm 62'. In this connection, attention is called to the fact that the spring 62 is so located that it exerts a pull on the finger 55 in a direction to move the contact 62' of the switch 54 away from the cooperating contact, and this operation is effected instantaneously upon completion of the firing operation of the hammers. As will be more fully hereinafter set forth, the bail 59 also restores the hammers and, as soon as the latter strike the type to effect the printing operation, the type retracting springs 61' function to instantaneously relieve the hammers 35, permitting the bail 59 to rise to the dotted line position thereof, shown in Figure 7, and allowing the spring 62 to move the finger 55 the extent required to open the switch 54 in the circuit 50, with the result that the perforations 36' in the record card A, resulting from a previous posting of this card, will have no effect on the printing mechanism. The switch 54 remains open until the projection 63 on the cam 56 strikes the free end of the finger to disengage the shoulder 61 from the contact permitting the latter to return to its normal position wherein the circuit through the switch 54 is closed. It will, of course, be understood that the bail 59 and cam 56 are operated in timed relation to the advancement of the cards through the machine. In other words, the arrangement of timing is such that the circuit 50 is maintained open by the switch 54 until the record card A is advanced beyond the printing mechanism and is permitted to close by the time the next card to be posted approaches the printing line. In Figure 5, the actuating mechanism for the switch 54 is shown in the position the same assumes just prior to the time the lower edge of the card enters the printing position, while Figure 6 shows the parts in a position the same assume during the printing operation and Figure 7 shows the relative positions of the parts as the record card A is leaving the printing position or after the cam 83 has lifted the bail 59 to restore the hammers 35.

It has also been stated in the preceding description that data from one card may be transposed to a predetermined space on a following card, even though both cards are provided with index perforations. In the event adjacent cards passing through the machine are provided with index perforations, means must be provided to

prevent the operation of the arresting mechanism 34 when the card containing the data is advanced or passed by the printing mechanism 30. For accomplishing this result, a second switch 64 is located in the circuit 50 in operative relation to a cam 65 fashioned in such a manner that it will not affect the switch 64 during the interval the meter record card A is opposite the printing mechanism 30, but will maintain the switch 64 open during the interval the premise record card B is advanced beyond the printing mechanism and at the interval between cards. Thus, the arresting mechanism 34 is prevented from operation even though the premise record card B is provided with index perforations in a position where the latter registers with the brush 51 opposite the contact block 52 or when there is a break between two cards. The cam 65 is also driven from the drive shaft 45 through reduction gearing and the latter is determined to affect the speed of rotation of the cam 65 required for the latter to operate the switch in accordance with the foregoing.

In the general description of the machine, it was pointed out that the characters printed on the record card A are derived from the record card B and that these characters are sensed through the card B by means of the devices 26. The number of sensing devices 26 correspond to the number of indicia columns on the record card B and these devices serve to operate the printing sectors 30 in such a manner that characters corresponding to those sensed assume a position on the printing line. The number of type sectors 30 correspond to the number of sensing devices 26 and the manner of operating the former from the latter is identical to the construction shown in the Bryce Patent No. 1,608,837. Briefly described, the brushes 27 of the sensing devices 26 complete circuits to the electromagnets 29 through the perforations in the premise record card B as the latter is advanced by the feed rolls 23. Energization of the electromagnets releases the pawls 32 from the position thereof shown in Figure 2, through suitable linkage 66 and permits the pawls to engage the ratchet teeth 33 on the segments 30. This arrangement stops further movement of the segments 30 in the position thereof wherein the characters previously sensed from the premise record card B are on the printing line.

In order that the function of the type sectors may be more clearly understood, reference may be briefly made to the manner in which the latter operate, although the mode of operation thereof is conventional. As shown particularly in Figure 10, the type sectors 30 are loosely mounted upon a shaft 67 and each sector is connected to a combined actuating and restoring bail structure 68 by means of a suitable spring 69. The bail 68 is operatively connected to the drive shaft 45 for rocking movement thereby and this connection comprises a gear 70 adapted to mesh with a gear sector 71. As shown in Figure 3, the gear sector 71 is oscillated by cams 72 and 73 fixed to the drive shaft and operatively connected to the sector by means of the linkage 74. The construction is such that when the bail 68 is rocked in a clockwise direction, the springs 69 will rock the sectors 30 concurrently in a clockwise direction. The sectors may be arrested at any point in their travel by the pawls 32 without interfering with continued movement of the bail 68 since the springs 69 will merely elongate. Upon reverse rocking of the bail 32, by the mechanism hereto-

fore described, a suitable cross rod 75 carried by the ball structure, contacts with the sectors and positively moves them in a counter-clockwise direction. It will, of course, be understood that the mechanism for operating the bail 68 is so timed with respect to the movement of the premise record card past the sensing devices 26 that the sensed characters will be in a position on the printing line when the meter record card A is arrested with the proper space thereon opposite the printing line.

After the type sectors 30 have been arrested in their predetermined positions with respect to the meter record card A, the striking hammers 35 and 38 are actuated to respectively print the card and to perforate the same by the punch mechanism 37. As shown in Figure 4, the hammers are normally urged to their operative positions by means of a spring 76 and operation of the spring to effect movement of the hammers is controlled by suitable tripping mechanism 77. This mechanism comprises a retaining bail 78 secured to a rock shaft 79 having fingers 80 secured on the opposite ends thereof in a position to engage the bell crank levers 81. By reference to Figure 3, it will be noted that the bell crank levers are operatively connected to the armatures 49 of the electromagnets 48, in such a manner as to operate the fingers 80 to trip the hammers when the magnets are energized to relatively move the feed rolls 25' and 39' to their inoperative positions. In other words, the hammers are automatically actuated to effect their respective operations as soon as advancement of the meter record card A is stopped by the arresting mechanism 34.

Upon completion of the printing operation, the hammers are restored and relatched by the bail 59 previously described as operating the fingers 55 to control the switch 54. In the present instance, the bail 59 is secured to the rock shaft 82 upon which the hammers are journaled and function upon rocking movement of the shaft 82 in a counter-clockwise direction to engage the hammers and move the same to the position thereof shown in Figure 4. The shaft 82 is rocked in a counter-clockwise direction to restore the hammers by means of a cam 83 and a follower 84 secured to the rock shaft 82. During the interval the hammers are retracted by the bail 59, the bail travels through the slot 58 in the fingers 55 and upon completion of the return movement of the hammers, the bail moves to the extent shown in Figure 7. As previously stated, the switch 54 is maintained open, after a line is printed, by the finger 55 until the meter record card A is advanced beyond the printing mechanism whereupon, the cam 56 assumes a position wherein the projection 63 thereon disengages the fingers 55 from the switch to permit the latter to return to its closed position. While the hammers have been relatched by the retaining bail 78, the cam 83 operates to return the bail 59 to the position thereof shown in Figure 2.

In machines of the character described above, it is desirable that the circuits through the perforations in the premise record card B to the magnets 29 be interrupted before the brushes 27 leave the perforations in order to prevent arcing at the brushes. As shown in Figure 2, the above result is accomplished by locating a switch in each of the aforesaid circuits with the associating contacts 85 associated with each pawl 32 in such a manner that the contacts are held closed by the pawl when the same is in its inoperative position, shown in Figure 2. The arrangement is

such that immediately upon the energization of the magnets 29 and the tripping of the pawls 32, the latter swing in a counter-clockwise direction and thereby permit the contacts 85 to open the circuit to the magnets 29 before the brushes 27 leave the perforations in the premise record card B.

Attention may also be called to the fact that provision is made in the machine forming the subject matter of this invention to suppress printing entirely of the data sensed by any particular group of brushes 27 and this may be accomplished by providing plug connections (not shown), in each of the circuits from the sensing devices 26 to the magnets 29 rendering it possible to disconnect any one of these circuits. In the event that there are no plug connections, the type sectors 30 will move to the extreme limit positions, wherein there will be no type in alignment with the actuating hammers. Consequently, there will be no indicia printed upon the card. In this connection, provision is also made to suppress the printing in any desired column by providing locking devices 86 for the hammers. As shown in Figure 4, when the hammer locking devices 86 are swung to the dotted line position, they are adapted to engage depending lugs 87 on the hammers and prevent the latter from swinging forward when they are unlatched by the retaining bail 78. With this construction, it necessarily follows that the hammer locking devices may be selectively operated at will to suppress printing in any desired column on the card.

Thus, from the foregoing, it will be observed that my improved machine renders it possible to print indicia on alternate cards derived from the adjacent cards. It will further be understood from the foregoing description that I have accomplished this desired result without departing radically from the principles of conventional tabulating machines and accordingly, it is possible to achieve the benefits of my invention with a combination composed of proven mechanisms. Of course, my contribution to the art may be realized with various different specific types of mechanism and for this reason, reservation is made to make such changes in the details of construction as may come within the purview of the accompanying claims.

What I claim as my invention is:

1. In card printing apparatus, means for advancing a succession of alternately arranged data and record cards, means for reading perforations in the data cards, means for printing on the succeeding record cards the data derived from the perforations aforesaid, and means operable to prevent the printing means from printing on the data cards.

2. In card printing apparatus, means for advancing a pair of successively arranged cards, means for reading perforations in one of said pair of cards as they are advanced, means for printing the data derived from the perforations in the first-mentioned card on the succeeding card, and means rendering the printing means inoperative while the first-mentioned card is passing the printing means.

3. In card printing apparatus, means for advancing a succession of alternately arranged data and record cards, means for reading perforations in one card, means for subsequently arresting another card, and means controlled by the arresting means and operable during the interval the latter card is arrested to print on said

latter card data derived from the perforations in the preceding card.

4. In card printing apparatus, means for advancing a series of alternately arranged data and record cards, means for sensing the data cards in said series, means controlled by the sensing means to print on the record cards the data derived from the cards sensed, and means rendering the printing means operative only during the time the record cards are in position to be printed.

5. In card printing apparatus, means for feeding a succession of data and record cards from a single magazine, means for sensing data on certain of the data cards, means controlled by the sensing means for printing on succeeding record cards printed characters indicative of the sensed data, and means for predetermining the space on the last named cards within which the data is printed.

6. In card printing apparatus, means for advancing a succession of alternately arranged data and record cards, means for sensing data on the data cards, means for arresting the adjacent record cards, printing mechanism controlled by the sensing means and operable during the interval the record cards are arrested to print data thereon corresponding to the sensed data, and means controlling the operation of the arresting means to stop the record cards in predetermined position relative to the printing mechanism.

7. In card printing apparatus, means for advancing a series of alternately arranged data and record cards along a predetermined path of travel, means for sensing data on the data cards, printing mechanism for printing said data on the record cards, and means controlled by index indicia on the record cards to successively arrest the latter during the printing operation in a predetermined position relative to the printing mechanism.

8. In card printing apparatus, means for advancing a succession of cards along a predetermined path of travel from a single magazine, means for sensing data on certain of the cards, printing mechanism for printing said data on the next succeeding card, means for arresting said succeeding cards in a predetermined position relative to the printing mechanism, and means for controlling the operation of the arresting means adapted to be operated by index indicia predeterminedly located on the aforesaid succeeding cards with respect to the spaces on the latter within which the data is to be printed.

9. In card printing apparatus, means for advancing a succession of alternately arranged data and record cards along a predetermined path of travel, means for sensing data on the data cards, printing mechanism for printing said data on the adjacent record card, means for arresting said record cards in a predetermined position relative to the printing mechanism, means for controlling the operation of the arresting means adapted to be operated by index indicia predeterminedly located on the record cards with respect to the spaces on the latter within which the data is to be printed, and means for providing index indicia on the record cards in predetermined relation to the space on the latter within which the next posting is to be printed.

10. In card printing apparatus, means for advancing a succession of alternately arranged data and record cards, means for sensing data in certain of the cards, printing mechanism for

printing the sensed data on other of the cards, means for arresting the second named cards in a predetermined position relative to the printing mechanism, means for controlling the operation of the arresting means adapted to be operated by index indicia predeterminedly located on the second mentioned cards with respect to the spaces on the latter within which the data is to be printed, means for providing index indicia on the second named cards in predetermined relation to the spaces on the latter within which the next posting is to be printed, and means preventing the operation of the arresting means by the index indicia related to the spaces on the second cards previously printed upon.

11. In card printing apparatus, means for advancing a plurality of cards along a predetermined path of travel, means for sensing perforations in certain of the cards, printing mechanism for printing on other of the cards data corresponding to the perforations, means for arresting the second named cards in a predetermined position relative to the printing mechanism, means for controlling the operation of the arresting means adapted to be operated by index perforations predeterminedly located in the second mentioned cards with respect to the spaces on the latter within which the data is to be printed, and means rendering the arresting means inoperative during the interval the first named cards are advanced past the printing mechanism.

12. In card printing apparatus, means for advancing a plurality of cards along a predetermined path of travel, means for sensing perforations in certain of the cards, printing mechanism for printing on other of the cards data corresponding to the perforations, means for arresting the second named cards in a predetermined position relative to the printing mechanism, means for controlling the operation of the arresting means adapted to be operated by index perforations predeterminedly located in the second mentioned cards with respect to the spaces on the latter within which the data is to be printed, means for perforating the second named card in predetermined relation to the space on the latter within which the next posting is to be printed, and means rendering the arresting means inoperative during the interval the first named cards are advanced past the printing mechanism.

13. In card printing apparatus, means for advancing a plurality of cards along a predetermined path of travel, means for sensing perforations in certain of the cards, printing mechanism for printing on other of the cards data corresponding to the perforations, means for arresting the second named cards in a predetermined position relative to the printing mechanism, means for controlling the operation of the arresting means adapted to be operated by index perforations predeterminedly located in the second mentioned cards with respect to the spaces on the latter within which the data is to be printed, means for perforating the second named cards in predetermined relation to the spaces on the latter within which the next posting is to be printed, means preventing the operation of the arresting means by the index perforations related to the spaces on the second named cards following the spaces to be printed upon, and means rendering the arresting means inoperative during the interval the first named cards are advanced past the printing mechanism.

14. In apparatus of the class described, means

for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for printing on the following record card the data derived from the preceding data card, and means for preventing operation of the printing means while the data card is passing the printing means.

15. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on the following record card the data derived from the preceding data card, and means adapted to be operated by index indicia on the record card for arresting the record card in position to receive the data aforesaid.

16. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on the following record card the data derived from the preceding data card, means adapted to be operated by index indicia on the record card for arresting the record card in position to receive the data aforesaid, and means for applying index indicia on the record card in predetermined relation to the next open space.

17. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for printing on the following record card the data derived from the preceding data card, means adapted to be operated by index indicia on the record card for arresting the record card in position to be printed upon by the printing mechanism, and means operable simultaneously with the printing operation for applying index indicia on the record card in predetermined relation to the next open printing space.

18. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on the following record card the data derived from the preceding data card, means adapted to be operated by index indicia on the record card for arresting the record card in position to receive the data aforesaid, means for applying index indicia on the record card in predetermined relation to the next open space, and means preventing operation of the arresting means by index indicia related to previously used record card spaces and during the interval the data card is advanced.

19. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for printing on the following record card the data derived from the preceding data card, means adapted to be operated by index indicia on the record card for arresting the record card in position to be printed upon by the printing mechanism, means operable simultaneously with the printing operation for applying index indicia on the record card in predetermined relation to the next open printing space, and means preventing operation of the arresting means by index indicia related to previously printed record card spaces and during the interval the data card is advanced.

20. In apparatus of the class described, card feeding means including a magazine adapted to contain a stack of alternately arranged data and record cards from which said cards are successively fed, means for sensing data on each data card,

means for printing on the following record card the data derived from the preceding data card, means adapted to be operated by index indicia on the record card for arresting the record card in position to be printed upon by the printing mechanism, means operable simultaneously with the printing operation for applying index indicia on the record card in predetermined relation to a selected open printing space, and means preventing operation of the arresting means by index indicia related to previously printed record card spaces and during the interval the data card is advanced.

21. In card printing apparatus, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for arresting the record cards, printing mechanism controlled by the sensing means and operable during the interval the record cards are arrested to print data thereon corresponding to the sensed data, and means controlling the operation of the arresting means to stop the record cards in predetermined position relative to the printing mechanism.

22. In card printing apparatus, means for advancing a succession of cards along a predetermined path of travel from a single magazine, means for sensing data on certain of the cards, printing mechanism for printing said data on a subsequently arrested card, means for arresting said latter cards in a predetermined position relative to the printing mechanism, and means for controlling the operation of the arresting means adapted to be operated by index indicia predeterminedly located on the aforesaid latter cards with respect to the spaces on the latter within which the data is to be printed.

23. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for printing on a subsequent record card the data derived from a preceding data card, and means for preventing operation of the printing means while the data card is passing the printing means.

24. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on a following record card the data derived from a preceding data card, and means adapted to be operated by index indicia on the record card for arresting the record card in position to receive the data aforesaid.

25. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on a following record card the data derived from a preceding data card, means adapted to be operated by index indicia on the record card for determining the space in which the data is to be produced, and means for applying index indicia on the record card in predetermined relation to the next open space.

26. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for printing on a following record card the data derived from a preceding data card, means adapted to be operated by index indicia on the record card for arresting the record card in position to be printed upon by the printing mechanism, and means operable simultaneously with the printing operation

for applying index indicia on the record card in predetermined relation to the next open printing space.

27. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on a succeeding record card the data derived from a preceding data card, means adapted to be operated by index indicia on the record card for determining the space in which the data is to be placed, means for applying index indicia on the record card in predetermined relation to the next open space, and means preventing operation of the arresting means by index indicia related to previously used record card spaces.

28. In apparatus of the class described, card feeding means including a magazine adapted to contain a stack of alternately arranged data and record cards from which said cards are successively fed, means for sensing data on each data card, means for printing on a succeeding record card the data derived from a preceding data card, means adapted to be operated by index indicia on the record card for determining the space in which the data is to be printed, means operable simultaneously with the printing operation for applying index indicia on the record card in predetermined relation to a selected open printing space, and means preventing operation of the arresting means by index indicia related to previously printed record card spaces.

29. In card printing apparatus, means for advancing a series of alternately arranged data and record cards along a predetermined path of travel, means for sensing data on the data cards, printing mechanism for printing said data on the record cards, and means to successively arrest the latter during the printing operation in a predetermined position relative to the printing mechanism.

30. In apparatus of the class described, means for advancing a succession of alternately arranged data and record cards, means for sensing data on each data card, means for producing on the record card the data derived from the data card, and means adapted to be operated by index indicia on the record card for arresting the record card in position to receive the data aforesaid.

31. In card printing apparatus including a printing station, means for advancing a plurality of data and record cards alternately past said station, said data cards having control indicia and said record cards having index indicia, means for sensing indicia on said data cards, printing mechanism at said printing station for printing the sensed indicia on the record cards, and means operated by said index indicia on the record cards to successively arrest said record cards during their advancement in a predetermined position relative to the printing mechanism.

32. In card printing apparatus, means for advancing a plurality of alternate data and record cards past a printing station, said data cards having control indicia and said record cards having index indicia, means for sensing indicia on each data card, means operated by the index indicia for arresting the record cards in predetermined position relative to the printing station, and printing mechanism at said printing station controlled by said sensing means and operable during the interval the record cards are arrested to print the sensed indicia.

33. In apparatus of the class described includ-

ing a record producing station, means for advancing a pair of data and record cards through said station, said data and record cards being provided with control and index indicia respectively, means for sensing indicia on said data card and for effecting a record of said indicia on said record card, and means adapted to be operated by said index indicia on the record card for determining the space in which the record is to be produced.

34. In apparatus of the class described including a record producing station, means for advancing a pair of data and record cards through said station, control indicia on said data card, means for sensing said indicia on said data card, means at said station to effect a record on said record card of the indicia sensed, index indicia on said record card and means adapted to be operated by said index indicia for determining the space in which the record is to be produced,

and means for applying index indicia on the record card in predetermined relation to the next open space.

35. In apparatus of the class described including a printing station, means for advancing a pair of data and record cards through said printing station, said data and record cards being provided with control and index indicia respectively, means for sensing indicia on said data card, means at said station to effect a record on said record card of the indicia sensed, means adapted to be operated by said index indicia on the record card for determining the space in which the record is to be printed, means for applying index indicia on the record card in predetermined relation to the next open space, and means preventing operation of the arresting means by index indicia related to previously used record card spaces.

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