

J. SCHULL.  
JACQUARD CARD CUTTING MACHINE.  
APPLICATION FILED AUG. 16, 1909.

960,118.

Patented May 31, 1910.

4 SHEETS—SHEET 1.

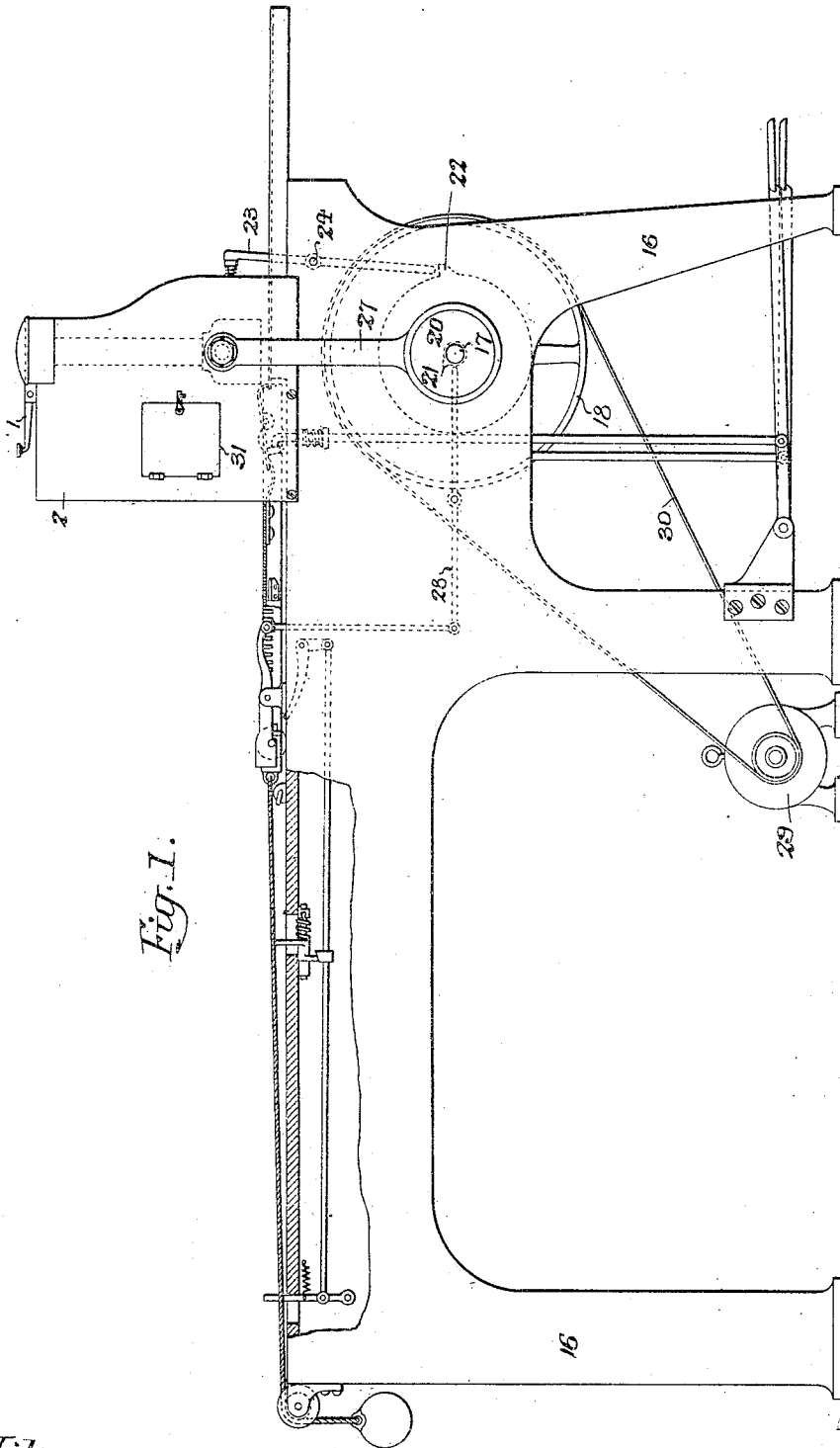


Fig. 1.

Witnesses—  
William A. Rorer.  
Wells A. Rorer.

Inventor—  
John Schull,  
by his Attorneys—  
Housen & Housen

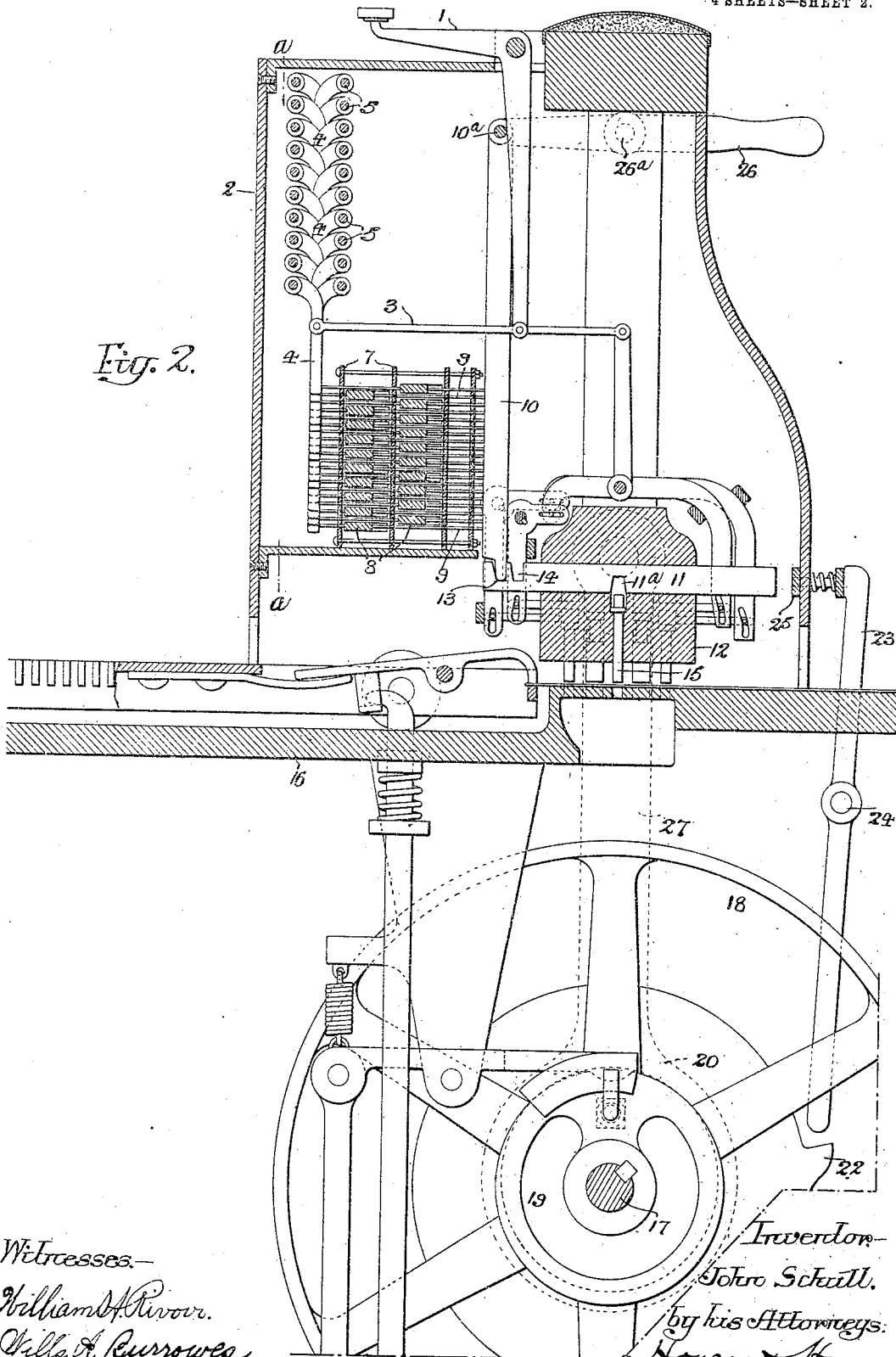
960,118.

J. SCHULL.  
JACQUARD CARD CUTTING MACHINE.  
APPLICATION FILED AUG. 16, 1909.

Patented May 31, 1910.

4 SHEETS—SHEET 2.

Fig. 2.



Witnesses—  
William D. Rivour.  
Chas. A. Burrows

Inventor—  
John Schull.  
by his Attorneys.  
Houson & Houson

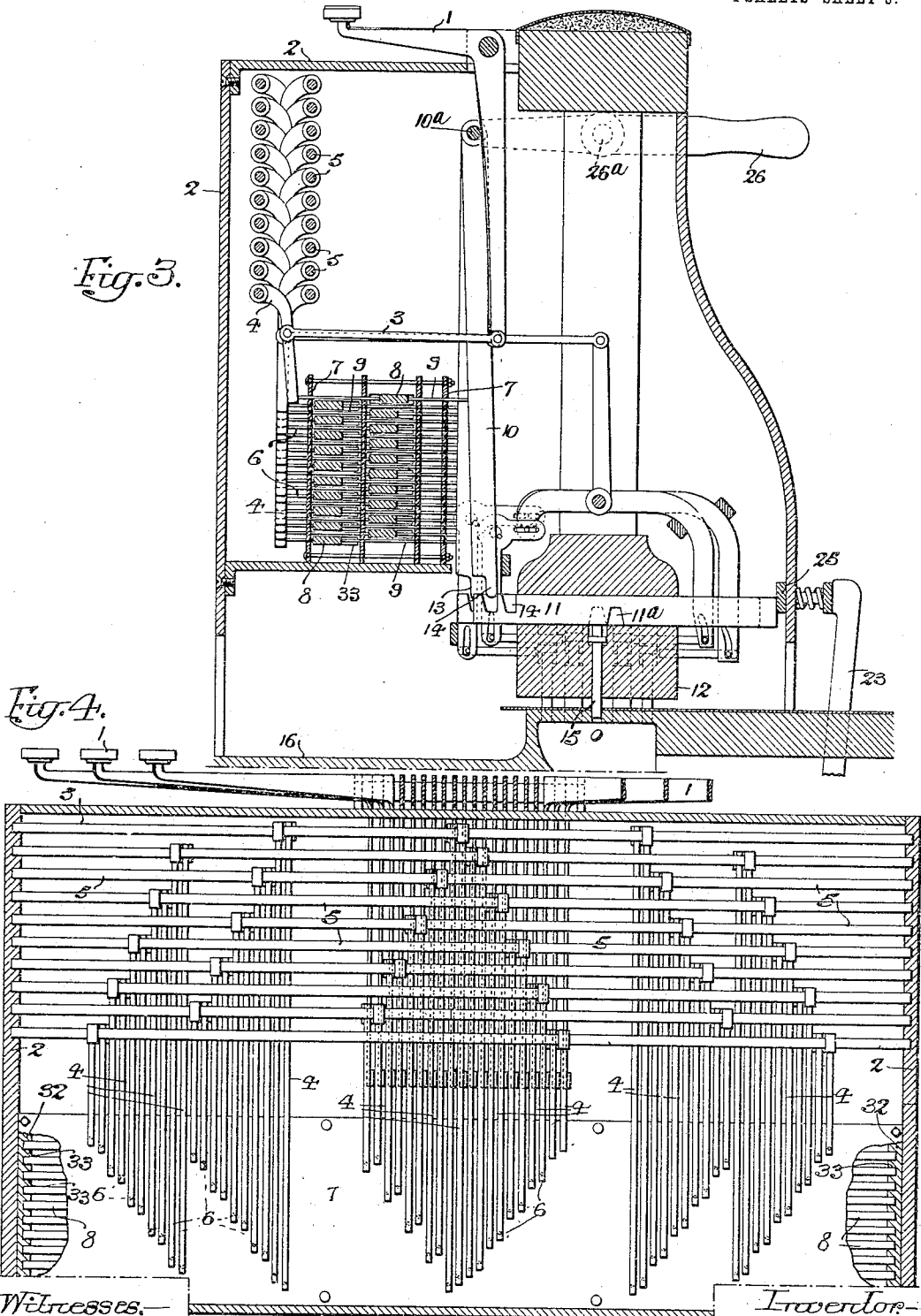
J. SCHULL.  
JACQUARD CARD CUTTING MACHINE.  
APPLICATION FILED AUG. 16, 1909.

960,118.

Patented May 31, 1910.

4 SHEETS—SHEET 3.

Fig. 3.



Witnesses.  
William H. Brown.  
C. H. Brown.

Inventor.  
John Schull.  
by his Attorneys  
Hosmer & Hosmer

J. SCHULL.  
JACQUARD CARD CUTTING MACHINE.  
APPLICATION FILED AUG. 16, 1909.

960,118.

Patented May 31, 1910.

4 SHEETS—SHEET 4.

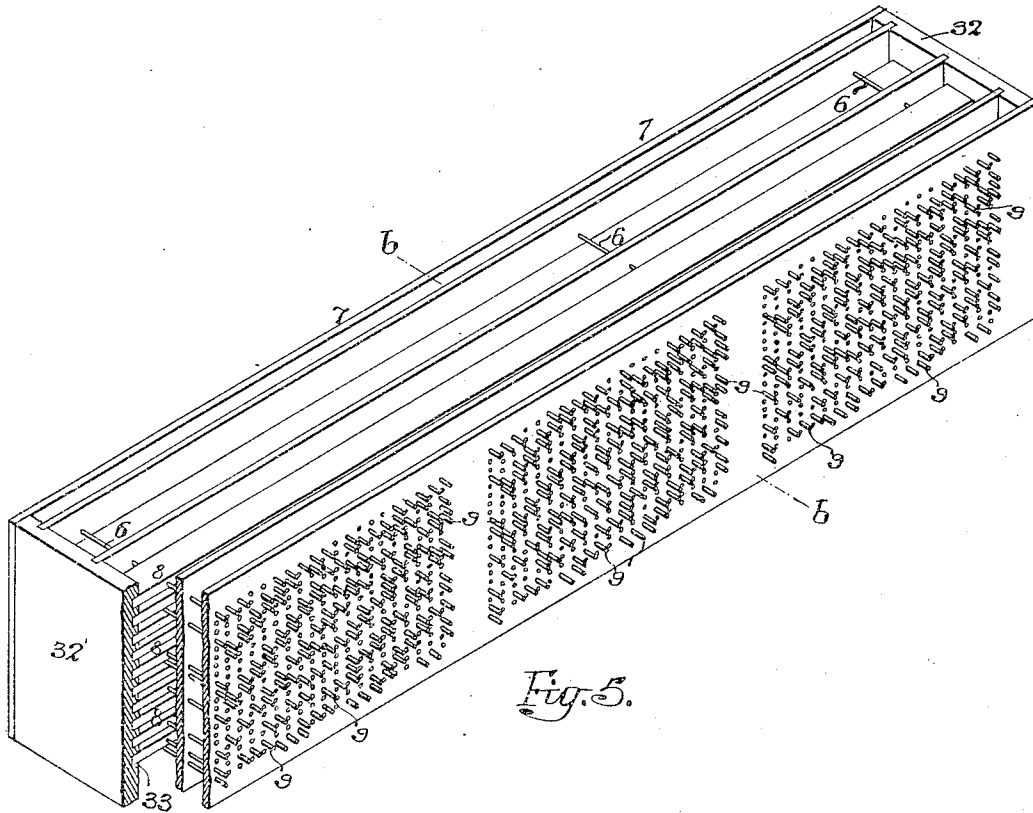


Fig. 5.

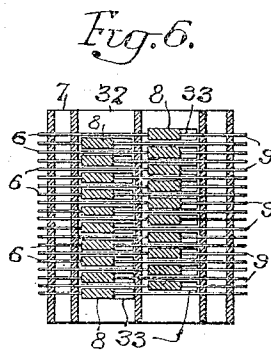


Fig. 6.

Witnesses:-  
Gillies Burrows  
William H. Rivoir.

Inventor:-  
John Schull.  
by his Attorneys:  
Howson & Howson

# UNITED STATES PATENT OFFICE.

JOHN SCHULL, OF PHILADELPHIA, PENNSYLVANIA.

JACQUARD-CARD-CUTTING MACHINE.

960,118.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed August 16, 1909. Serial No. 513,035.

*To all whom it may concern:*

Be it known that I, JOHN SCHULL, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Jacquard-Card-Cutting Machines, of which the following is a specification.

This invention relates to punching mechanisms and consists primarily of a machine for cutting jacquard cards for use on looms.

The object of the invention is to facilitate and improve the methods employed for selecting the punches and effecting the operation of the same to cut the cards and in many respects is similar to and embodies certain of the characteristic features of my pending application, filed August 8, 1908, Serial No. 447,549; that is to say, it provides a structure that will permit the simultaneous cutting of a number of cards to reproduce the same design where the pattern or design requires multiplication and it also renders possible the cutting of a number of cards of a different design or the cutting of a series of cards where each card is a part of a different design.

By the use of the present invention, holes representing a single color or a combination of colors may be cut automatically after the pressing of one key, and the mechanism for selecting the punches is so constructed as to allow for a rapid rearrangement of its several parts.

The invention is fully illustrated in the accompanying drawings, in which:

Figure 1, is a side elevation of a card cutting machine embodying my invention; Fig. 2, is a sectional elevation of the selecting and punching mechanisms; Fig. 3, is a sectional elevation of the selecting and punching mechanism under operative conditions; Fig. 4, is a sectional view on the line *a-a*, Fig. 2, partly broken away; Fig. 5, is a perspective view illustrating an important detail of my invention, and Fig. 6, is a sectional view on the line *b-b*, Fig. 5.

Referring to the drawings, 1 represents the key levers pivoted to a casing 2, and connected by means of links 3 to a series of depending levers 4. These levers are carried by transverse rocking bars 5 and arranged to cooperate with pins 6 slidably mounted in a frame 7. Buffer strips 8 are positioned between the ends of the pins 6 and the ends of pins 9 which are also slid-

ably mounted in the frame 7. Levers 10, loosely mounted on a bar 10<sup>a</sup>, are arranged to be operated upon by the outer ends of the pins 9. Slidable blades 11, cut away at 11<sup>a</sup> and slidably mounted in a vertically movable punching head 12, are provided with notches 13 and 14 for the reception of the ends of the levers 10. Slidably mounted in the punching head 12 are a series of punches 15, one of said punches being disposed below each blade 11.

A frame 16, which supports the casing 2, forms a bearing for a rotatable shaft 17 provided with a loose pulley 18, a clutch collar 19, eccentrics 20, and cams 21 and 22. The cam 22 is so arranged as to strike the lower end of a two armed lever 23 which is pivoted at 24 to the frame 16; the upper end of the lever 23 acting to move a buffer plate 25 for the re-alignment of the blades 11 after the punching of each series of holes in the cards.

A handle 26, pivoted at 26<sup>a</sup> serves to operate the bar 10<sup>a</sup> to raise it in order that the ends of the levers 10 may be changed from one to the other series of notches 13 and 14.

Instead of having the punching mechanism operated by cams as in my former application, it is controlled by the eccentrics 20 and the rods 27. Also, instead of having the card-conveying carriage spaced by treadle mechanism, as was the case in the previous application, it is performed by the cam 21 striking one end of a double armed lever 28 which is connected to the spacing mechanism. The pulley 18 is driven by a motor 29 and a belt 30. In all other respects the construction is identical with that of my former application.

In the use of my invention, the pins 9 are pre-arranged within the frame 7; their presence or absence, combined with the use of one or the other of the series of notches 13 or 14 in the blades 11 occupied by the ends of the levers 10, denotes the character of the card to be cut. Each key lever 1 controls a specific depending lever 4; each lever 4 controls a buffer bar 8, and each lever 10 may be controlled by pins 9 operated from any of the buffer bars 8. The levers 10 are shown occupying the notches 13 and the cut-away portions of the blade 11 directly over the heads of the punches 15. The pressing of a key lever as shown in Fig. 3 moves a lever 4, pins 6, buffer bar 8 and pins 9. When

punching positive cards, each pin 9 backed by a buffer bar will move a separate lever 10 to slide a blade 11, and the blades thus moved will prevent the raising of their respective punches 15 in the punching head, which on the downward movement of said punching-head will punch the card. When cutting negative cards, however, the action is reversed and the sliding of the blade will permit the punch to rise and no cut will be made.

The operation is as follows: When a key lever 1 is pressed, certain of the levers 10, affected by the pre-arranged pins 9, will slide their respective blades into a position such as shown in Fig. 3. The foot lever which operates the clutch collar 19 to rotate the shaft 17, is then pressed and the eccentrics 20 lower the punching head 12; the jacquard cards that rest on the top of the frame 16 and that are held between the jaws of the spacing carriage, being punched by the punches 15 which had their heads directly beneath the solid portions of the blades 11, *i. e.*, which had their respective blades moved by the levers 10. On the other hand, the blades 11, not moved by the levers 10, allow the heads of their respective punches to slide up into the cut-away portions 11<sup>a</sup>, thus preventing the punching of the cards by those punches. A continued movement of the shaft 17 raises the punching head and causes the cam 22 to strike the lower end of the lever 23 and press in the buffer 25 to realine the blades 11, and levers 10. After the selecting mechanism has been re-set by the buffer plate 25, the cam 21 strikes the lever 28 and operates the spacing mechanism to feed the card forward. The shaft 17 is then automatically stopped by the clutch collar withdrawing its driving means from out of the path of the pulley 18. The mechanism is now set to punch another row of holes whenever another key lever 1 is pressed.

The peg and lacing holes are punched by mechanism similar to the previous application.

In the drawings, the punching head 12, blades 11 and punches are the only elements within the casing 2 that are moved by the eccentrics but the entire contents of the casing can be moved thereby if it is so desired.

An important feature of this invention is the arrangement of the frame 7 in such a manner that it can easily be removed from the casing through an aperture 31 thus facilitating the changing of the pins 9. The frame 7 is clearly shown in Figs. 5 and 6. It carries the buffer bars 8 and pins, the latter being supported by plates 32 while, the buffer bars are supported in notches or recesses 33 in the side walls of the casing. The pins 9 are entirely free from the buffer

bars and are moved by said bars as well as serving to move the same when actuated by the levers 4.

If it is desired to cut a negative card the levers 10 are placed within the notches 14. Then any movement of the levers 10 will slide their respective blades 11 so that their cut-away portion 11<sup>a</sup> will be over the heads of the punches 15 so that when the head 12 descends the said punches will slide in the punching head 12 and will not punch the card. On the other hand, the keys that were not affected by their respective levers 10 will prevent the punches from sliding when the punching head descends, thereby causing them to punch the card.

I claim:

1. The combination, in a card punching machine, of key levers, punch mechanism, and interchangeable selective mechanism disposed in operative relation therewith, said selective mechanism being removable independently of the key levers and punch mechanism.

2. The combination, in a card punching machine, of punch keys, punch mechanism, punch selector mechanism comprising a series of movable pins and a series of bars for coöperation therewith, and a frame carrying said punch selector mechanism, said frame being removable independently of the punch selector mechanism.

3. The combination, in a card punching machine, of punches, levers for actuating said punches, selector mechanism for controlling the operation of said punches, said selector mechanism comprising a frame carrying removable pins, and means for operating said pins, said selector mechanism being disposed in operative relation with the punches and pins, and said frame being removable independently of the rest of the mechanism.

4. The combination, in a card punching machine, of a series of punches, levers for actuating said punches, selector mechanism controlling the operation of said punches, said mechanism comprising bars, removable pins connected by and with said bars and means for operating said bars, and a frame carrying said bars and disposed in operative relation with respect to the levers and punches and being removable independently thereof.

5. In jacquard card punching machines, the combination of punches, mechanism for causing the same to operate, selecting means for coaction therewith, comprising horizontally disposed bars, a series of pins removably mounted with respect to said bars, and supporting means for said pins independent of the bars, said pins forming a connection between the key operated levers and the punch controlling levers.

6. In jacquard card punching machines,

the combination of the punches, mechanism for causing the same to operate, and selecting means for coaction therewith, comprising horizontally disposed bars and pins removably mounted with respect to said bars, said pins forming a connection between the key operated levers and the punch controlling levers.

7. The combination, in a jacquard card punching machine, of a supporting structure, a casing mounted thereon, a punching head within said casing, blades slidably mounted in the punching head and provided with notches, levers supported within said casing and capable of entering the notches, a frame adjacent said levers, pins mounted therein and abutting the levers, buffing bars abutting said pins, and key levers mounted on said casing, and means connecting the buffing bars to the key levers.

8. The combination, in a card cutting machine, of a reciprocable punching head, a punch mounted therein, a blade slidably mounted in said punching head and coacting with the punch, said blade having two notches, a lever capable of engaging either of said notches, means for actuating said lever for sliding the blade in one direction, and means acting upon the blade to slide it in the opposite direction.

9. The combination, in a jacquard card punching machine, of a feed table, a casing mounted thereon, a punching head within the casing, a drive shaft, eccentrics connecting the drive shaft to the punching head, key levers mounted on said casing, punch selecting mechanism intermediate the key levers and the punching head, a card conveying carriage, means operable by said shaft to actuate the card conveying carriage and means for actuating the shaft.

10. The combination, in a card punching machine, of the supporting structure, a casing mounted thereon, an opening in said casing, a punching head within said casing, blades slidably mounted within said punching head and provided with notches, levers attached to the casing and entering certain of said grooves, a portable frame adjacent said levers and capable of being slid through said opening in the casing, pins mounted in said frame and abutting said levers, buffing bars abutting said pins, and key levers mounted on said casing, with means connecting the buffing bars to the key levers.

11. The combination, in a machine capable of punching a plurality of jacquard cards simultaneously, of a feed table, a casing mounted thereon, a punching head within the casing, a drive shaft, eccentrics connecting the drive shaft to the punching head, key levers mounted on said casing, punch selecting mechanism intermediate the key levers and the punching head, means for actuating the selecting mechanism for

controlling the punches, a card conveying carriage, and means operable by said shaft to actuate the card conveying carriage, with means for actuating the shaft.

12. The combination, in a jacquard card punching machine, of a supporting structure, a casing mounted thereon, a punching head, punches mounted therein, blades slidably mounted in said punching head and coacting with the punches, levers mounted within the casing and operable to slide the blades, a portable frame adjacent said levers, pins mounted in said frame and abutting said pins, buffing bars abutting said pins, key levers, means connecting the buffing bars to the key levers, a shaft, means operable from said shaft for imparting motion to the punching head, a card spacing carriage, means operable from said shaft for spacing said carriage, a buffer bar adjacent said blades, mechanism operable from said shaft for realining the blades, means for actuating the shaft, and means for automatically stopping said shaft after each ascending stroke of the punching head.

13. The combination, in a jacquard card punching machine, of a reciprocable punching head, a punch mounted therein, a blade slidably mounted in said punching head and coacting with the punch, said blade having a plurality of notches, and a lever adapted for engagement with either of said notches, said lever serving to move the blade into engagement with the punch when in engagement with one of said notches and to move said lever out of engagement with the punch when in engagement with the other notch.

14. The combination, in a jacquard card punching machine, of a reciprocable punching head, a punch mounted therein, a blade slidably mounted in said punching head and coacting with the punch, said blade having a plurality of notches, a lever adapted for engagement with either of said notches, said lever serving to move the blade into engagement with the punch when in engagement with one of said notches and to move said lever out of engagement with the punch when in engagement with the other notch, and means for raising the lever out of engagement with the said notches.

15. The combination, in a jacquard card punching machine, of a reciprocable punching head, a punch mounted therein, a blade slidably mounted in said punching head and having a plurality of notches in its upper edge and a single notch in its lower edge, and a lever operable to engage one of the upper notches to slide the blade and bring the lower notch in the path of the punch, said lever being also operable to engage another of the upper notches of the blade and move the same so as to position said lower notch out of the path of the punch.

16. The combination, in a jacquard card  
punching machine, of a reciprocable punch-  
ing head, a punch mounted therein, a blade  
slidably mounted in said punching head and  
5 having a plurality of notches in its upper  
edge and a single notch in its lower edge,  
a lever operable to engage one of the upper  
notches of said blade and move the latter  
so as to bring the lower notch in the path  
10 of the punch, said lever being also operable  
to engage another of the upper notches of  
the blade and move the same so as to posi-

tion said lower notch out of the path of the  
punch, and a buffer for re-aligning said  
blade after each return movement of the 15  
punch head.

In testimony whereof, I have signed my  
name to this specification, in the presence  
of two subscribing witnesses.

JOHN SCHULL.

Witnesses:

MURRAY C. BOYER,  
WM. A. BARR.