J. POWERS.

TWELVE-KEY HAND PUNCH.

APPLICATION FILED DEC. 30, 1915.

1,272,089.

Patented July 9, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

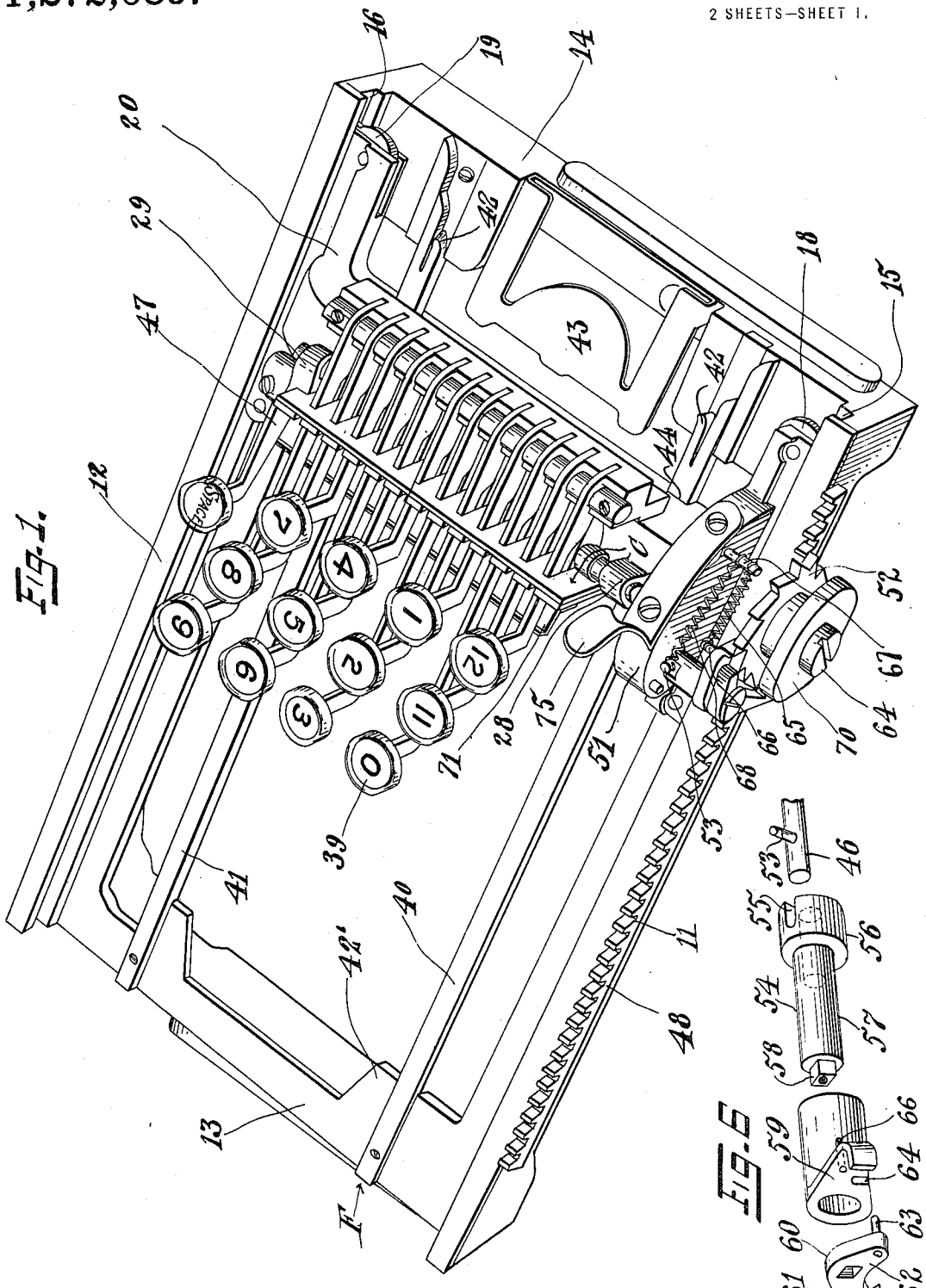


Fig. 5.

Witnesses:

Chas. E. Whiteman

H. D. Penney

Inventor:

James Powers.

By his Att'y: F. A. Richards

J. POWERS.

TWELVE-KEY HAND PUNCH.

APPLICATION FILED DEC. 30, 1915.

1,272,089.

Patented July 9, 1918.

2 SHEETS—SHEET 2.

Fig. 2

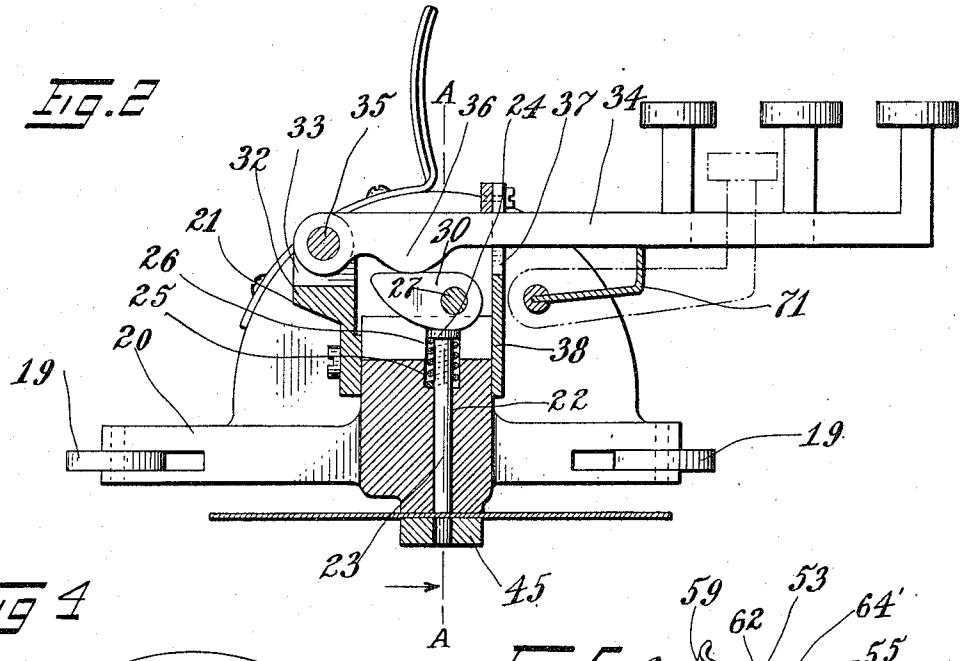


Fig 4

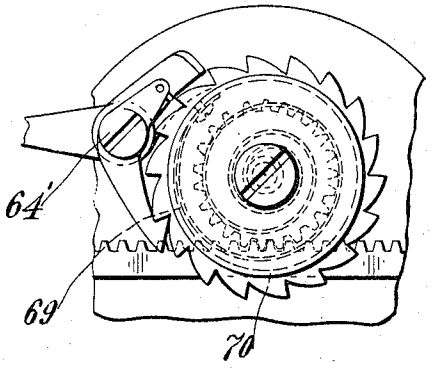


Fig 5

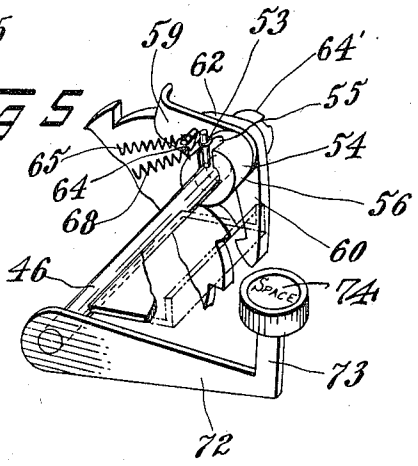
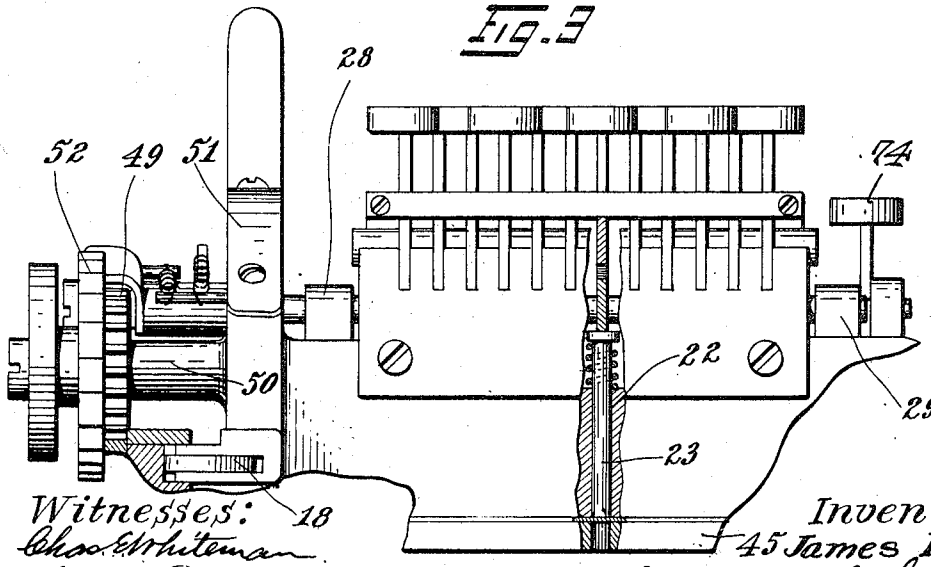


Fig. 3



Witnesses:
Chas. E. Whiteman
H. D. Penney

Inventor:
James Powers.

By his Atty: F. B. Richards

UNITED STATES PATENT OFFICE.

JAMES POWERS, OF NEW YORK, N. Y., ASSIGNOR TO POWERS ACCOUNTING MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TWELVE-KEY HAND-PUNCH.

1,272,089. Specification of Letters Patent. Patented July 9, 1918.

Application filed December 30, 1915. Serial No. 69,459.

To all whom it may concern:

Be it known that I, JAMES POWERS, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Twelve-Key Hand-Punches, of which the following is a specification.

This invention relates to the general class of perforated card accounting machines, and has for its main object to provide an improved manually operated card perforator.

Among the particular objects of the invention, it is aimed to provide a manually operated perforator having an improved key operation in which the force is so distributed as to facilitate the operation of the keys.

Another object is to provide a simplified construction of escapement mechanism particularly adapted for hand perforators in which the entire escapement mechanism is carried by the movable carriage.

Still another object of the invention is to provide an escapement having the usual form of a pawl and ratchet in which the entire escapement mechanism including the actuation means thereof is carried by the movable carriage.

These and other features, capabilities and advantages of the present invention will appear from the subjoined detailed description of one specific embodiment thereof illustrated in the accompanying drawings in which—

Figure 1 is a perspective view of a complete embodiment of the present invention.

Fig. 2 is a side elevation partly in section of the carriage.

Fig. 3 is a fragmental end elevation of the carriage.

Fig. 4 is a fragmental side elevation of the escapement mechanism.

Fig. 5 is a fragmental perspective view of the escapement mechanism.

Fig. 6 is a perspective view of several elements of the escapement mechanism separated from one another.

In the embodiment shown there is a frame F comprising essentially two side members 11 and 12 and two end members 13 and 14 integral with one another in the present instance. The side members 11 and 12 are provided with guideways 15 and 16 respectively facing one another in which the rollers 18 and 19 of the carriage C travel the rollers 18 and 19 being mounted on shafts vertically disposed in the end portions of the frame 20 of the carriage C. The middle of the frame 20 disposed between the end portions is enlarged and extends upward, and at its upper end is provided with a plurality of transversely extending slots 21 running parallel with the guideways 15 and 16, and vertically extending bores 22 for the reception of punches 23 having heads 24 at their upper ends the upper ends of which bores 22 are formed into enlargements 25 adjacent to the slots 21 to accommodate springs 26 which are strained between the bottoms of said enlargements 25 and the heads 24 of the punches 23 to normally maintain the punches in raised position. Above the heads 24 of the punches and a little to one side thereof, a shaft 27 extends which is journaled in the bearings 28 and 29 secured to the frame 20. Cams 30 are secured to the shaft 27 with their long curved faces in engagement with the heads 24 and defining the upper limit of movement of the punches 23. To the frame 20 at the front of the slots 21 a support 32 is provided having a plurality of slots 33 at its upper end to receive the front ends of the key levers 34 pivotally connected to the shaft 35 which is secured to the upper end of the support 32. Each of the key levers 34 has a cam lug 36 at its lower edge to engage one of the cams 30 and extend rearwardly through the slots 37 formed in the upper portion of the plate 38 secured to the frame 20 at the rear of the slots 21. The rear ends of the key levers 34 are bent upward, in staggered arrangement relative to one another and provided at their extremities with buttons 39 having the designation characters thereon to indicate to which punch they are connected in the usual manner. From the foregoing it will be seen that by the depression of the buttons 39 the lugs 36 will engage the cams 30 to depress the punches 23 against the tension of the springs 26.

For guiding the cards to be perforated, two guideways 40 and 41 are provided, secured to the end members 13 and 14, the front ends 42 of the guideways 40 and 41 being bifurcated and flared to form mouths for the easy insertion of the cards between

such guideways 40 and 41. On the end member 13 a stop plate 42' is provided to position the rear end of the card to be perforated and at the front end there is provided a pivotally mounted stop plate 43 which is normally maintained in raised or stop position by suitable springs not shown, the plate 43 defining the front position of the card.

The frame 20 is provided at its lower end with slots 44 through which the guideways 40 and 41 extend to permit the carriage C to travel along the same.

A die plate 45 is formed below the punches 23 and is spaced apart from the frame 20 to permit the passage of the cards to be perforated between such die plate and the frame 20, the die plate 45 having a plurality of perforations corresponding and registering with the bores 22 of the frame 20 to permit the punches 23 to pass into the same when perforating a card.

The escapement mechanism comprises essentially a shaft 46 disposed in the rear of the plate 38 and mounted in the bearing 47 formed on the frame 20 adjacent to one end of the plate 38. On the side member 11, a rack 48 is provided with which the gear 49 loosely mounted on the stub shaft 50 meshes. The stub shaft is secured to the boss 51 formed on the side of the frame 20 adjacent to the side member 11. On the shaft 50, the ratchet wheel 52 is loosely mounted but fixed to rotate with the gear 49. The shaft 46 extends through the boss 51 and has a pin 53 extending radially therefrom. On the end of this shaft 46, the cylindrical bearing 54 is mounted which has a slot 55 at one end thereof to register with the pin 53 whereby the bearing 54 will be fixed to rotate with the shaft 46. The portion 56 of the bearing 54 in which the slot 55 is disposed is relatively large, adjacent to which a diminished cylindrical portion 57 is formed and at the other end of the bearing 54 a diminished seat 58 is provided. The pawl member 59 is loosely mounted on the cylindrical portion 57 of the bearing and the pawl member 60 is fixedly mounted on the angular seat 58. The pawl member 60 has a long hook arm 61 to engage the teeth of the ratchet wheel 52 and a short arm 62 provided with a pin 63 which extends through a slot 64 of the pawl member 59 which pawl member 59 is also adapted to engage the teeth of the ratchet wheel 52 but on the other side of the shaft 46. For securing the pawl members 59 and 60 in place on the bearing 54, the small screw 64' is secured to the end of the angular seat 58. For normally maintaining the pawl member 59 in engagement with the teeth of the ratchet wheel 52 to the exclusion of the pawl member 60, the spring 65 is provided which is secured to the pin 66 on the pawl member 59 at one end and to the pin 67 on the boss 51 at the other end. In addition, a spring 68 is provided which is secured at one end of the pin 53 on the shaft 46 and at its other end to the aforesaid pin 67 and the boss 51. For driving the ratchet wheel 52, a coil spring 69 is provided in the housing 70 secured adjacent to the ratchet wheel 52, one end of which spring is secured to the shaft 50 and the other end secured to the housing 70, the ratchet wheel 52 and housing 70 being loosely mounted on the shaft 50. Thus when the carriage C is drawn along the rack 48 in a forward direction, the shaft 50 being immovably fixed to the carriage C, the engagement of the gear 49 with the rack 48 will rotate the housing 70 about the shaft 50 and thereby tense or wind up the spring 69, thus being prevented or anchored against unwinding by the pawl members 59 and 60, the pawl member 59 normally serving to lock the spring against unwinding and therewith the carriage from moving. When the shaft 46 is rocked, the pawl member 60 being fixed on the shaft 46, its pin 63 engaging the pawl member 59 will raise the same out of engagement with the ratchet wheel 52 but simultaneously therewith depress the pawl member 60 into engagement with the ratchet wheel 52, the arrangement being so timed that the ratchet wheel 52 will have been permitted to rotate the space of one tooth and therewith move the carriage C rearward a corresponding space defined by the registration of the gear 49 with the rack 48.

For rocking the shaft 46 to move the carriage C rearward, a universal plate 71 is fixed to the shaft 46 and has a portion thereof disposed adjacent to and in contact with the lower edges of the key levers 34 whereby whenever a key lever 34 is depressed to actuate the punch 23 to make a perforation, the carriage C will be moved rearward a space to position the carriage for its next perforation. In order to move the carriage one space without perforating the card, there is provided the space lever 72 fixed to the shaft 46 and having at its free upwardly extending portion 73 a finger button 74 similar to buttons 39 of the key levers 34.

At the upper end of the boss 51 an upwardly extending finger piece 75 is provided to be engaged when it is desired to return the carriage C to its forward position.

It is obvious that various changes and modifications may be made to the details of construction without departing from the general spirit of the invention.

I claim:

1. In a perforator, the combination of a base; a carriage slidable on said base; punches carried on said carriage a die plate secured to the carriage and provided with

perforations cooperating with the punches; and means carried on the base for holding said cards against endwise movement relative to the base.

2. In a perforator, the combination of a base; a carriage slidable on said base; punches carried on said carriage a die plate secured to the carriage and provided with perforations coöperating with the punches; side guides secured to said base; and means carried on the base for holding said cards between said guides and against endwise movement relative to the base and guides.

3. In a perforator, the combination of a stationary base; a carriage slidable on said base; punches carried on said carriage a die plate secured to the carriage and provided with perforations coöperating with the punches; stationary side guides secured to said base; and means carried on the base for holding said cards between said guides and against endwise movement relative to the base and guides.

4. In a perforator, the combination of a base; a carriage slidable on said base; punches carried on said carriage a die plate secured to the carriage and provided with perforations coöperating with the punches; side guides secured to said base; and end pieces carried on the base for holding said cards between said guides and against endwise movement relative to the base and guides.

5. In a perforator, the combination of a stationary base; a carriage slidable on said base and provided with punches; end pieces secured to said base; a die provided with perforations coöperating with said punches and equal in number to the punches; and stationary side guides secured to said base and adapted to engage the edge of the cards.

6. In a perforator, the combination of a stationary base; a carriage slidable on said base; manually operable punches carried on said carriage; a die plate secured to the carriage and provided with perforations; stationary side guides secured to said base; and end pieces for holding said cards stationary relative to said guides, base and end pieces.

7. In a perforator, the combination of a stationary base; a carriage slidable on said base; manually operable punches carried on said carriage; a die plate secured to the carriage and provided with perforations corresponding in number to said punches; stationary side guides secured to said base and disposed between said die plate and carriage; and end pieces for holding said cards stationary relative to said guides, base and end pieces.

8. In a perforator, the combination of a stationary frame comprising a floor and an end member at one end; a carriage slidable on said frame; a row of vertically movable punches carried in said carriage; a die plate secured to and movable with the carriage and provided with a single row of perforations coöperating with the punches; stationary side guides secured to said frame and passing between the carriage and die plate; and a movable end piece for said frame.

9. A perforator having a frame, a carriage mounted to travel along said frame, a plurality of punches mounted in said frame, acutating mechanism for moving said carriage along said frame, a plurality of key levers, cams interposed between said key levers and said punches, the actuation of said key levers engaging said cams to actuate said punches, and a universal plate rockably mounted in engagement with said key levers and connected to said actuating mechanism, the actuation of said key levers also actuating said universal plate to actuate said actuating mechanism.

10. In a device of the character described having a frame, a carriage mounted to travel along said frame, a rotatable member mounted on said carriage and in engagement with said frame, a spring mounted on said carriage to rotate said rotatable member in one direction, a ratchet wheel fixed to rotate with said rotatable member, pawl members for permitting the free rotation of said rotatable member in one direction and permitting only an intermittent partial rotation of said rotatable member by said spring in the other direction.

11. In a device of the character described having a frame, a carriage mounted to travel along said frame, a rotatable member mounted on said carriage and in engagement with said frame, a spring mounted on said carriage to rotate said rotatable member in one direction, a ratchet wheel fixed to rotate with said rotatable member, a rock shaft, a bearing fixed on said rock shaft having a cylindrical portion, and an angular seat, a pawl member mounted on said cylindrical portion, a second pawl member fixed on said seat, an arm on said second pawl member, a pin on said arm, there being a slot in said first pawl member in which said pin engages to raise said first pawl member when said rock shaft is rocked to actuate said second pawl member into engagement with said ratchet wheel, and a spring for normally maintaining said first pawl member in engagement with said ratchet wheel, the pawl members thereby permitting only an intermittent partial rotation of said rotatable member by said spring.

12. In a device of the character described having a frame, a carriage mounted to travel along said frame, a rotatable member mounted on said carriage and in engagement with said frame, a spring mounted on said

carriage to rotate said rotatable member in one direction, a ratchet wheel fixed to rotate with said rotatable member, and pawl members for permitting only an intermittent partial rotation of said rotatable member by said spring.

13. In a device of the character described having a carriage, a row of punches mounted in said carriage, a row of cams one disposed above each punch and in engagement therewith, a plurality of key levers, and a lug on each key lever in engagement with one of said cams, the actuation of said key levers serving to actuate said cams by engagement with said lugs, and said cams serving to actuate said punches.

14. In a device of the character described having a carriage, a row of punches mounted in said carriage, a shaft mounted on said carriage, a plurality of cams rockably mounted on said shaft, disposed adjacent to each punch and in engagement therewith, and a plurality of key levers one disposed adjacent to each cam and in engagement therewith, the actuation of said key levers serving to actuate said cams, and said cams serving to actuate said punches.

15. In a perforator having a frame, a carriage mounted to travel along said frame, a plurality of punches mounted in said frame, actuating mechanism for moving said carriage along said frame, a plurality of key levers, cams interposed between said key levers and said punches, the actuation of said key levers engaging said cams to actuate said punches, a universal plate rockably mounted in engagement with said key levers and connected to said actuating mechanism, the actuation of said key levers also actuating said universal plate to actuate said actuating mechanism, and a space lever for actuating said actuating mechanism independently of said punches.

JAMES POWERS.

Witnesses:
GUSTAV DREWS,
H. D. PENNEY.