Feb. 23, 1937. J. ZENNIG ET AL 2,071,487

PRINTING AND COUNTING SORTER

Filed Nov. 28, 1931 9 Sheets-Sheet 1

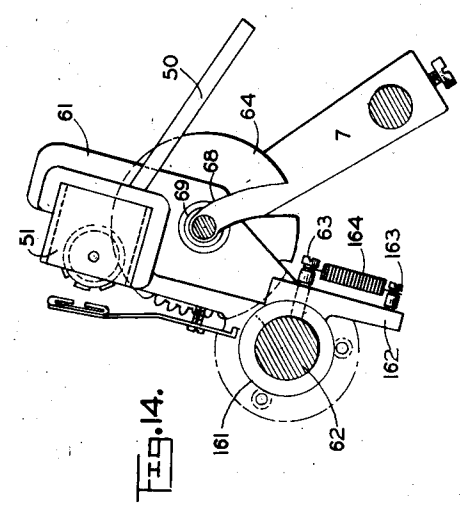

Fig. 14.

Fig. 1.

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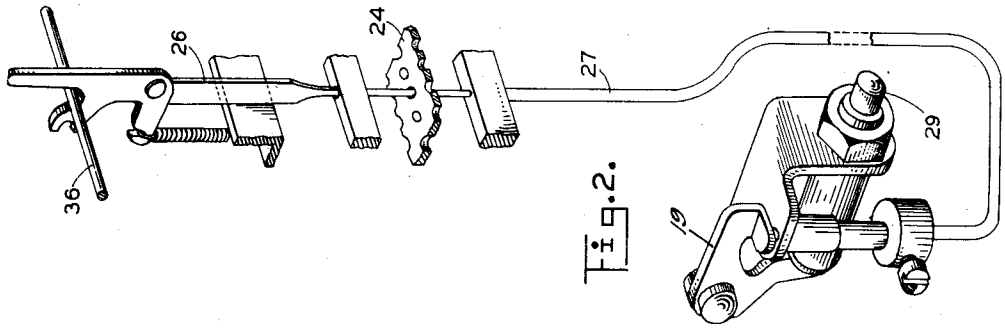

Fig. 2.

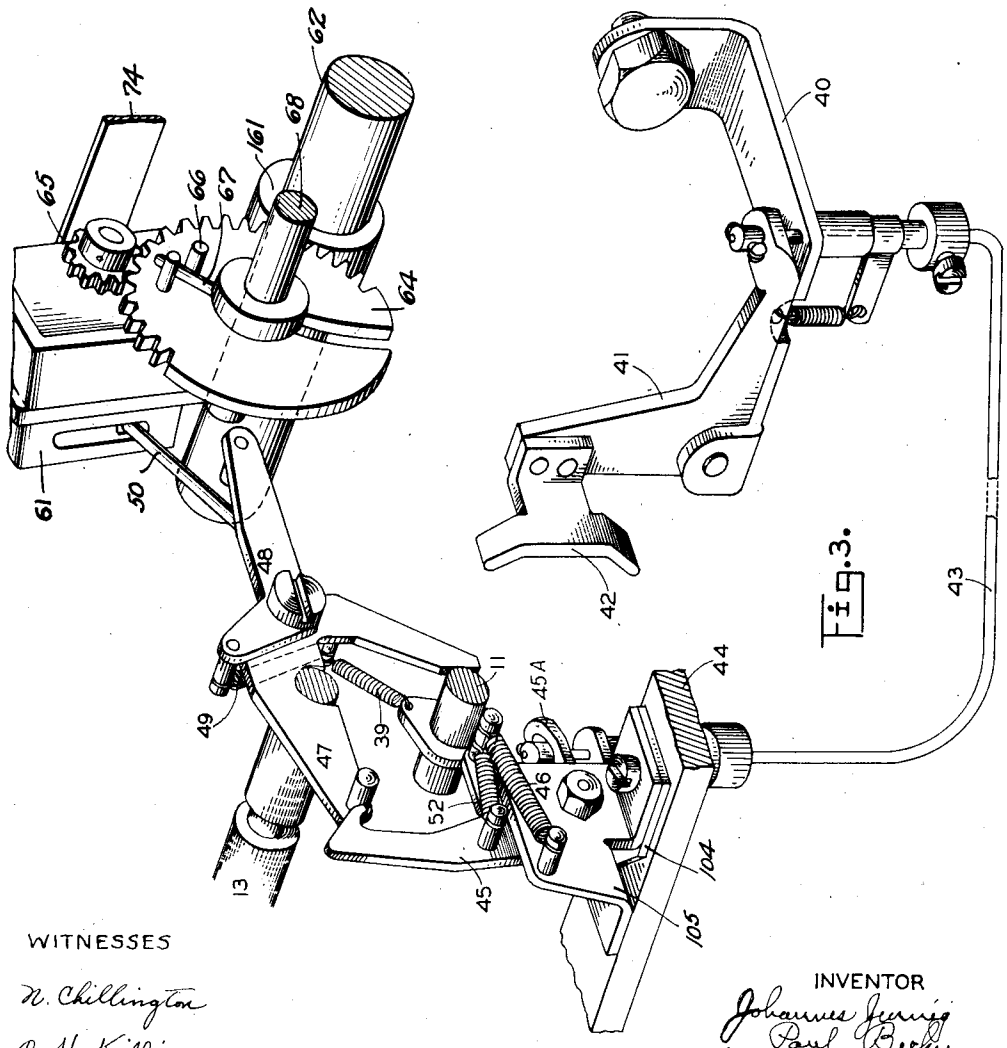

Fig. 3.

WITNESSES

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PRINTING AND COUNTING SORTER

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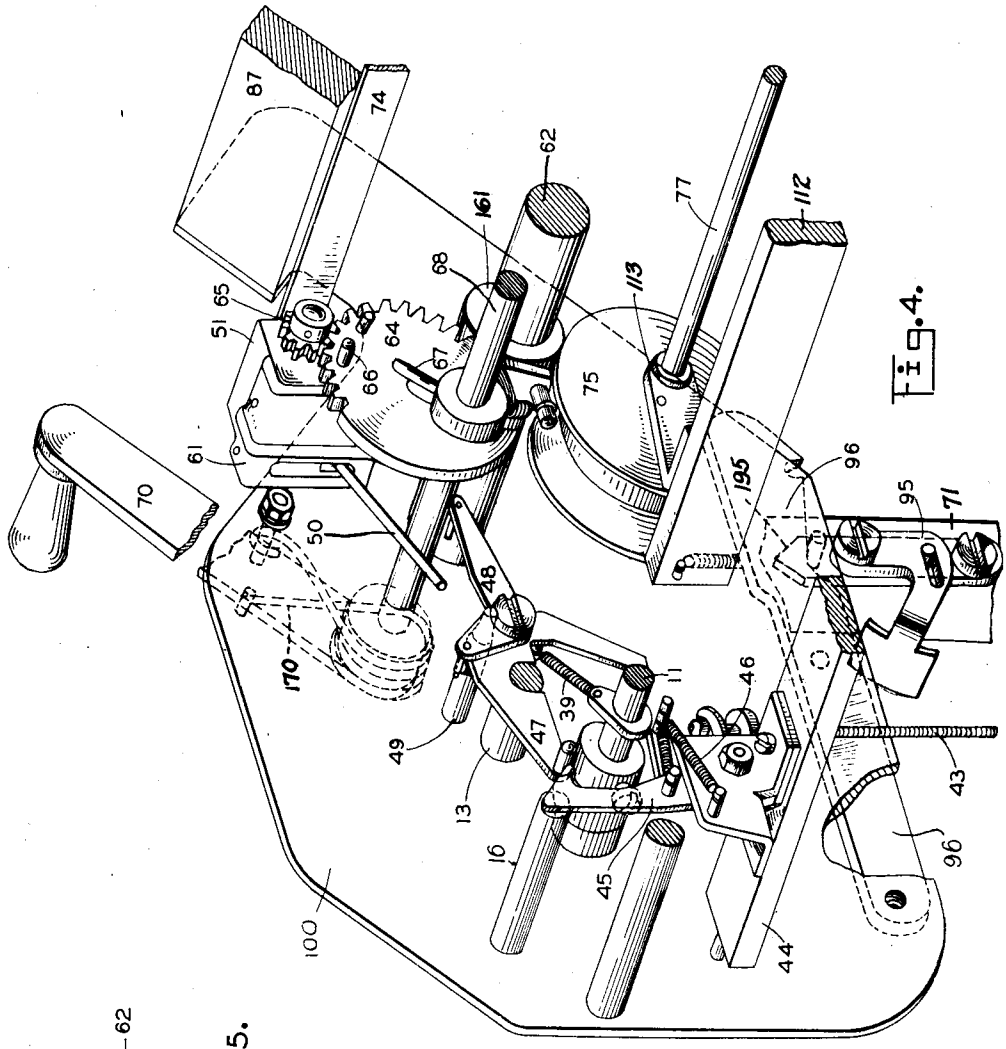

Fig. 4.

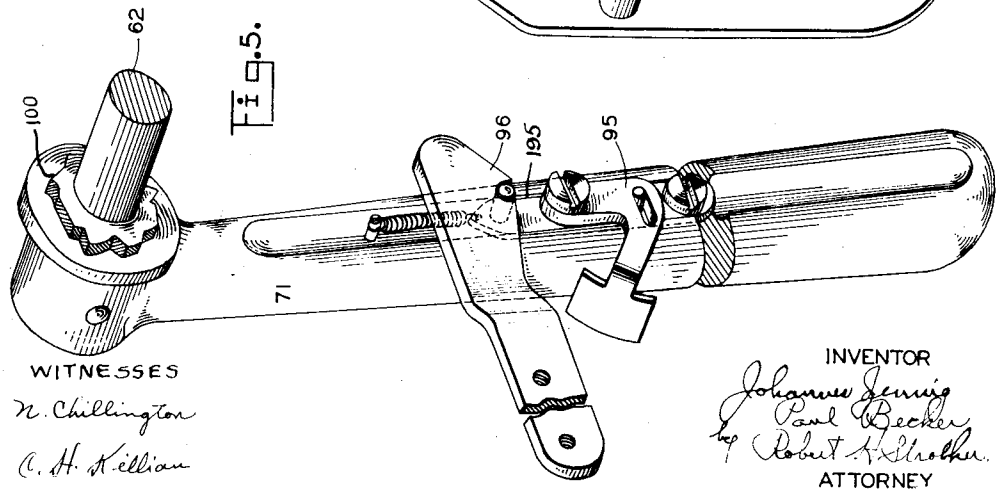

Fig. 5.

WITNESSES

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PRINTING AND COUNTING SORTER

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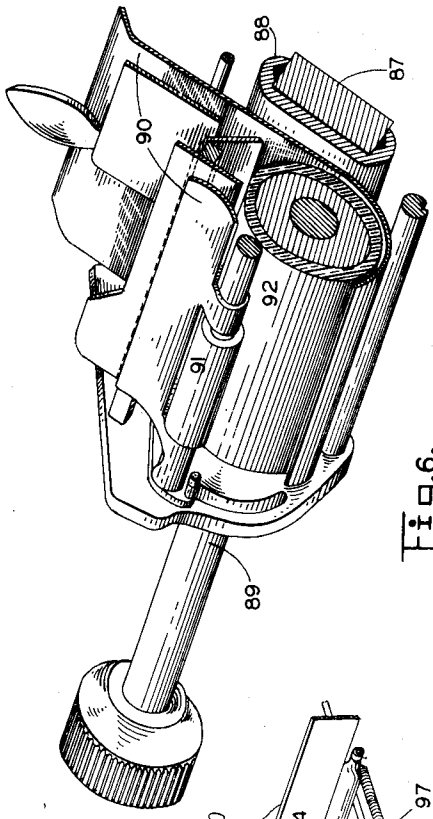

Fig. 6.

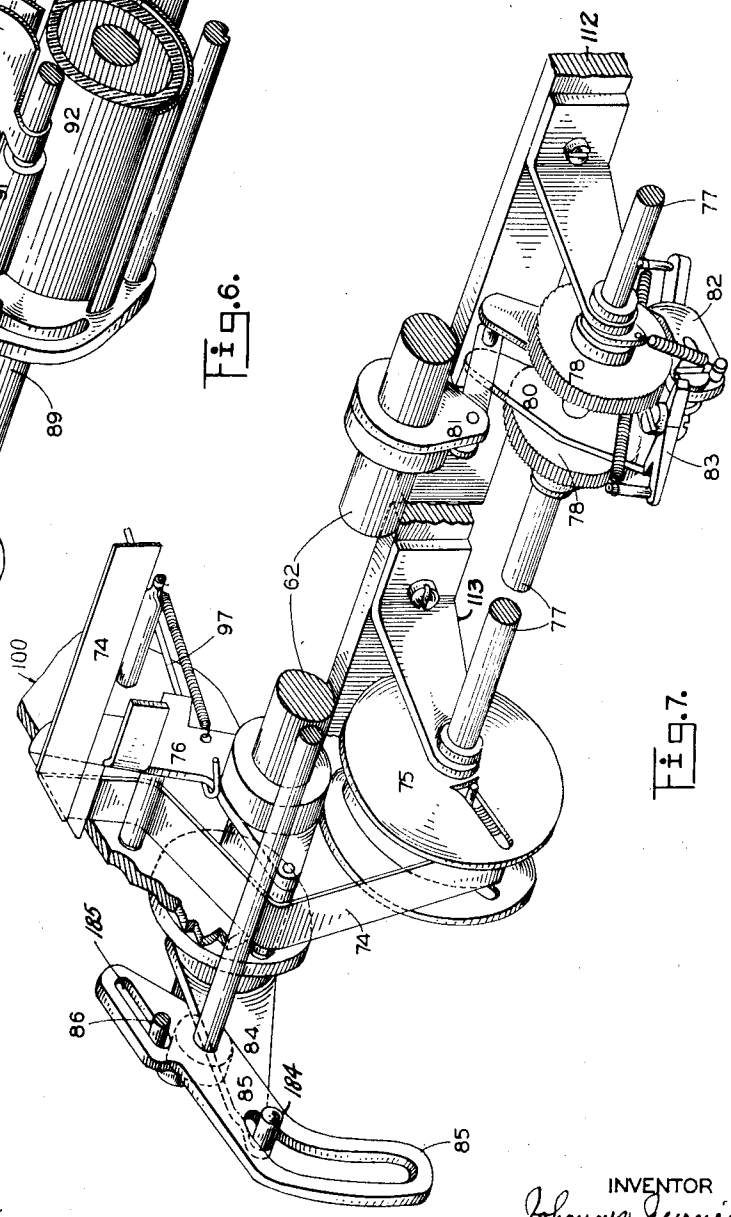

Fig. 7.

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PRINTING AND COUNTING SORTER

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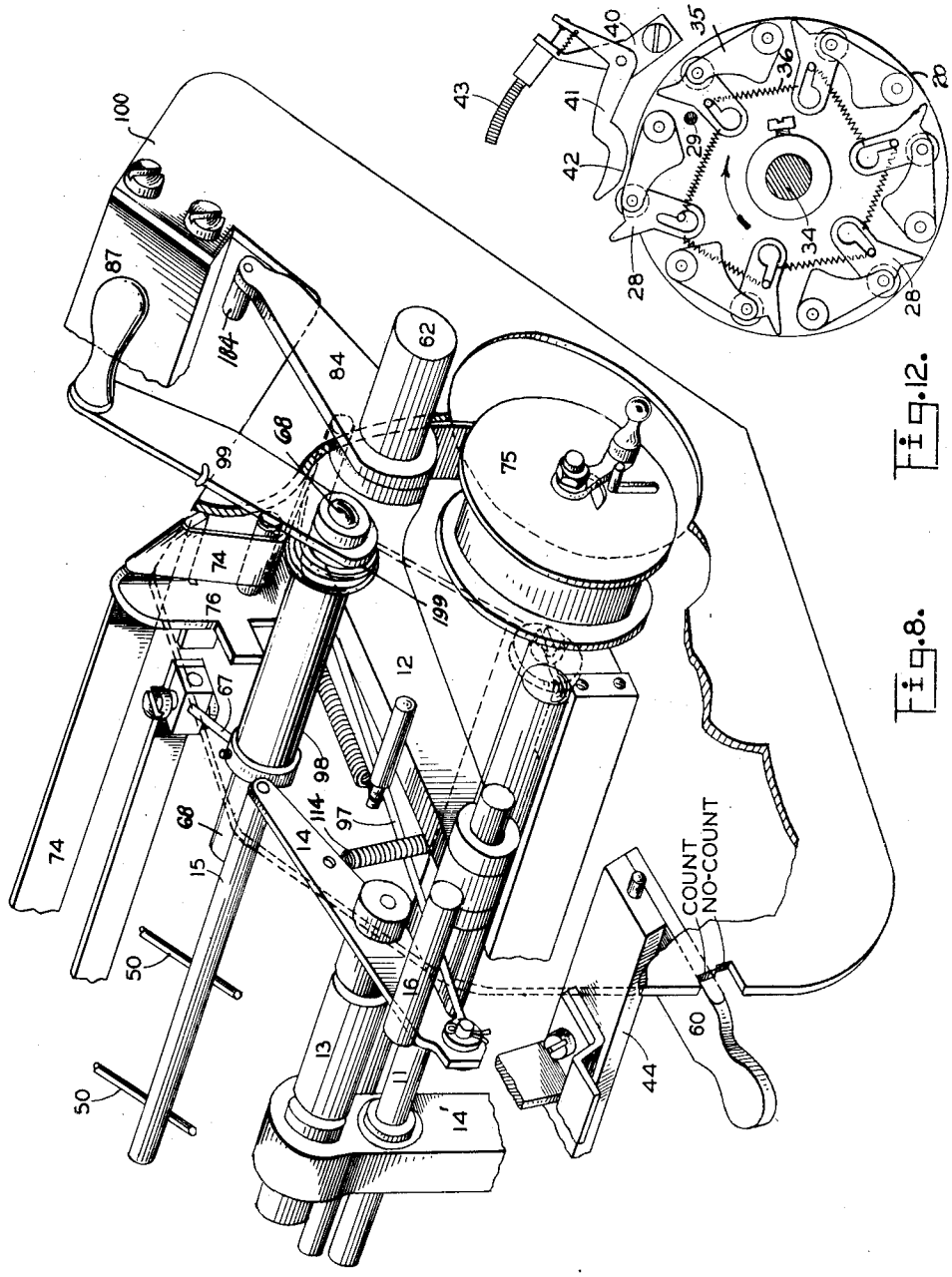

Fig. 12.

Fig. 8.

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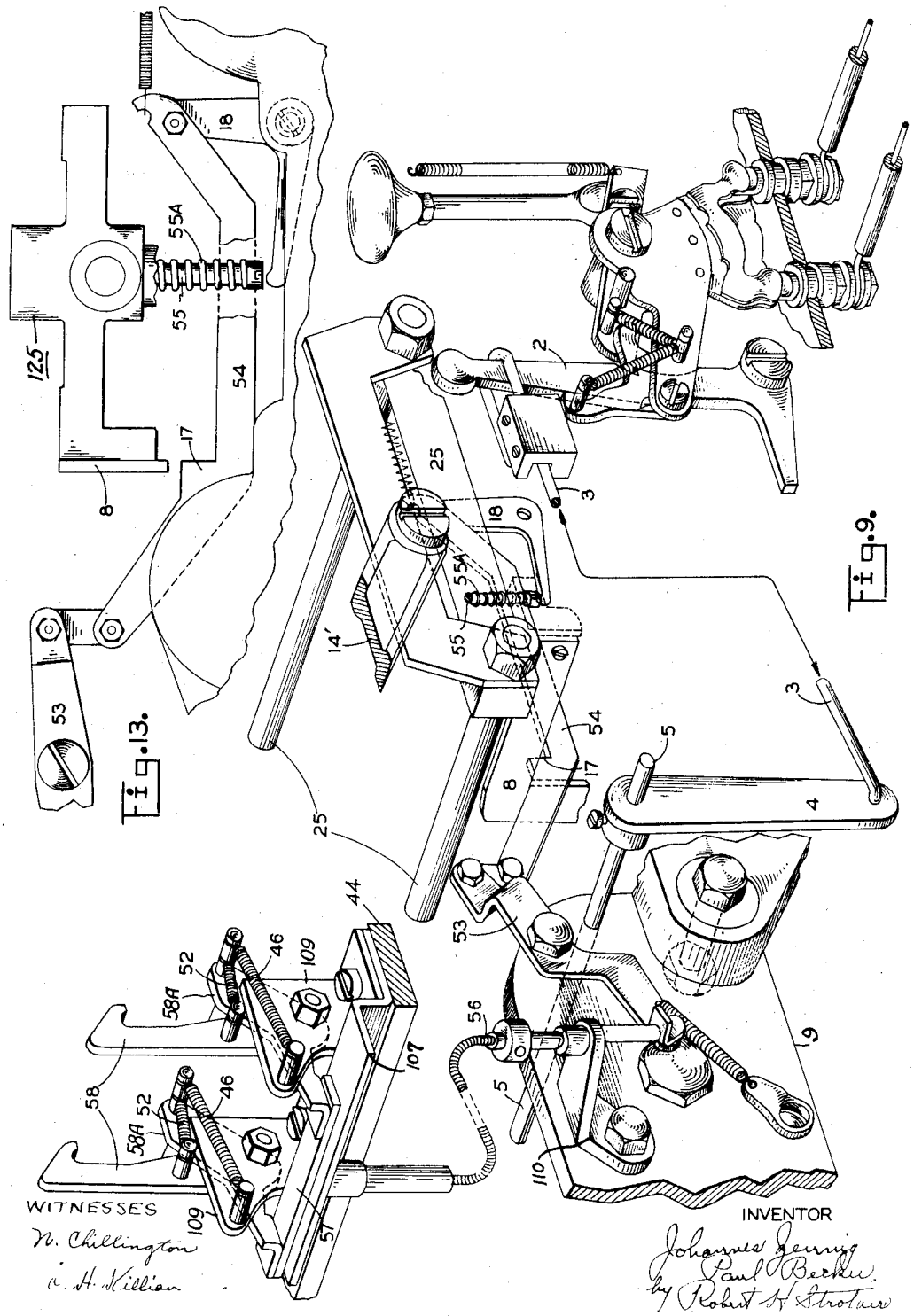

Fig. 13.

Fig. 9.

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PRINTING AND COUNTING SORTER

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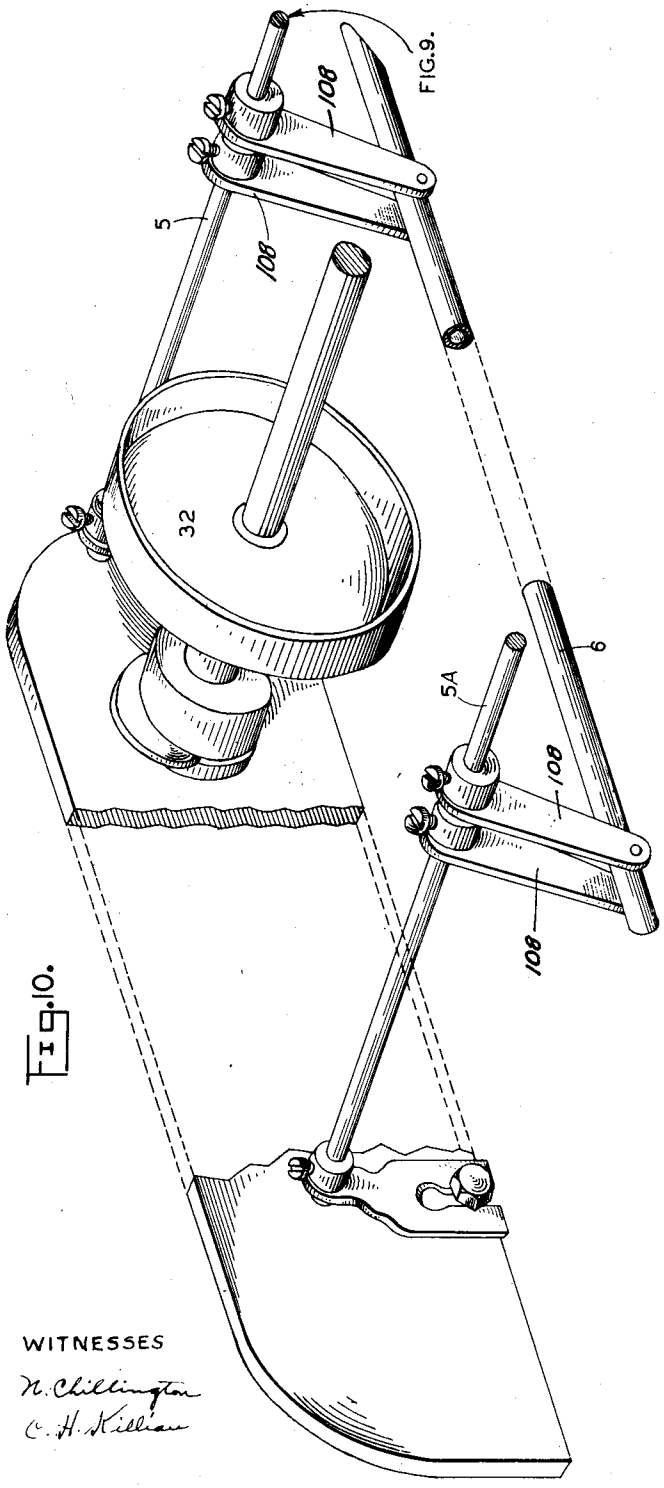

FIG. 10.

FIG. 9.

0006	0028	0005	0011	0030	0007	0008	0016	0014	0043	0000	0000	0168	0168	00336	00504		
0014	0019	0007	0011	0031	0010	0019	0025	0025	0007	0000	0000	0168	0168	00336			
0002	0000	0000	0001	0009	0012	0003	0029	0057	0055	0000	0000	0168	0168				

FIG. 11.

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PRINTING AND COUNTING SORTER

Filed Nov. 28, 1931 9 Sheets-Sheet 8

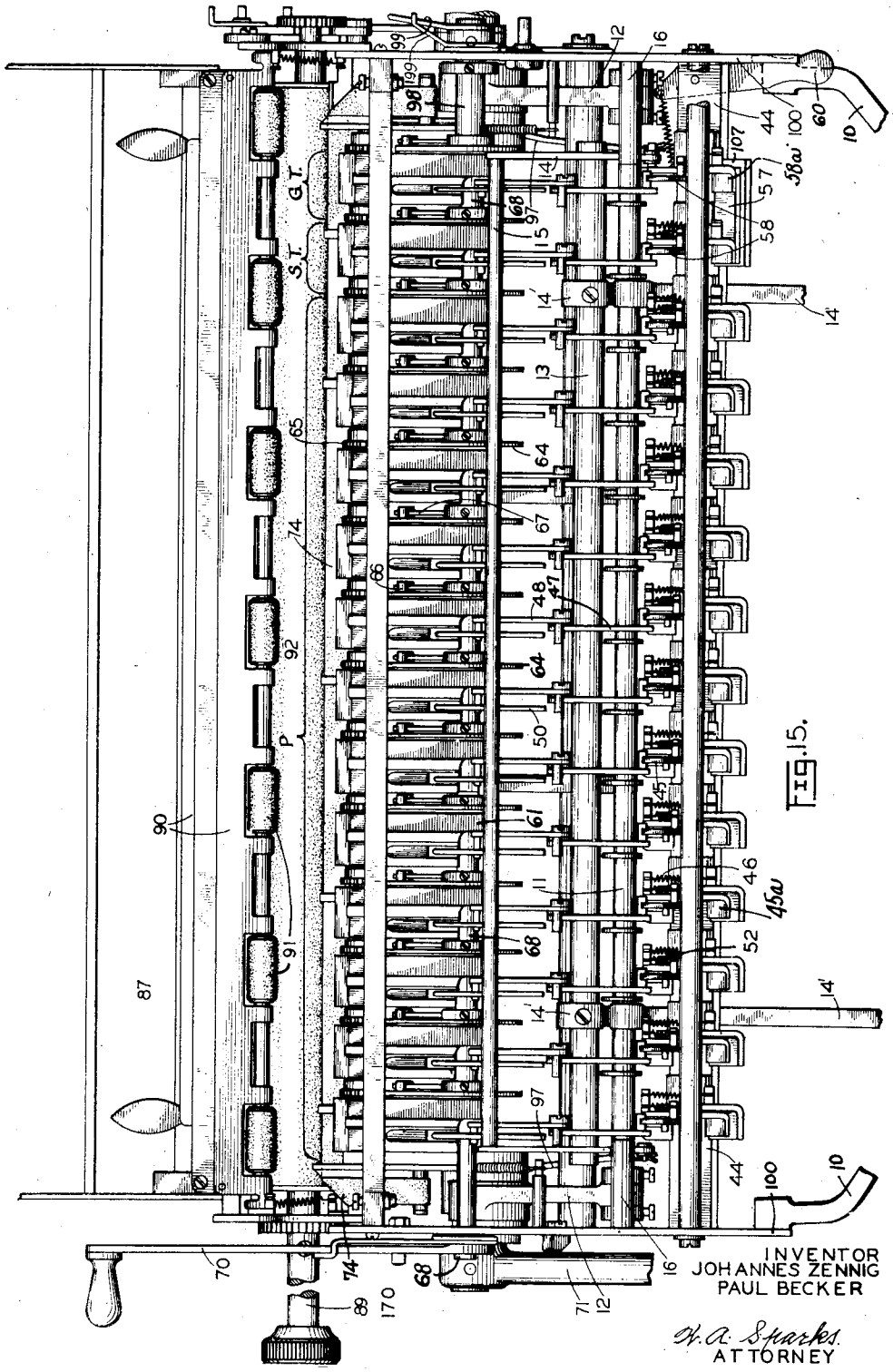

FIG. 15.

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PRINTING AND COUNTING SORTER

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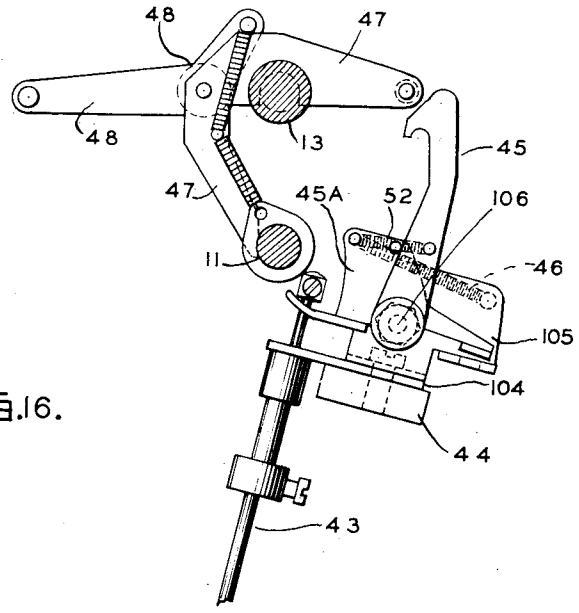

Fig. 16.

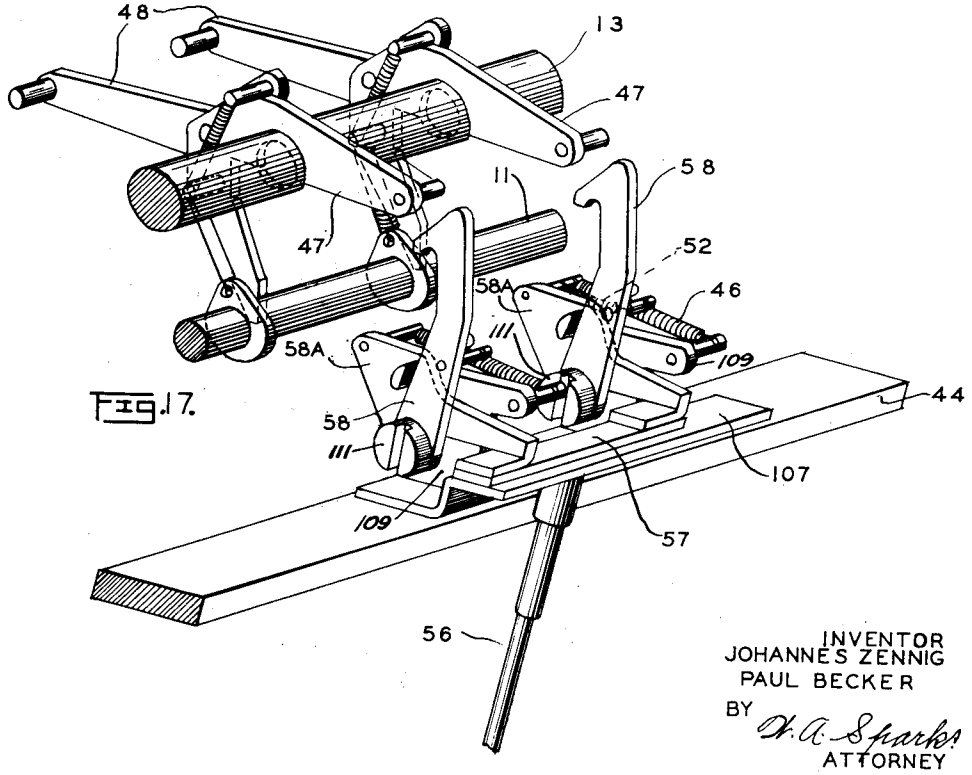

Fig. 17.

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Patented Feb. 23, 1937 2,071,487

UNITED STATES PATENT OFFICE

2,071,487

PRINTING AND COUNTING SORTER

Johannes Zennig and Paul Becker, Berlin, Germany, assignors to Accounting and Tubulating Machine Corporation, New York, N. Y., a corporation of Delaware

Application November 28, 1931, Serial No. 577,803
In Germany November 28, 1930

8 Claims. (Cl. 235—91)

Our invention relates to sorting machines which count cards as they pass into sorting pockets and count the total number of cards fed through the machine.

One object of our invention is to devise a simple and comparatively inexpensive attachment which may be readily installed on commercial sorting machines.

Another object of our invention is to provide consecutive numbering operating devices which may be attached to sorting machines where the extents of movement are variable within rough limits imposed by the manufacture.

Another object of our invention is to provide means for printing the amounts registered on the consecutive number counters.

Another objects of our invention is to provide for counting the total number of cards which have been run through the machine in successive runs.

Another object of our invention is to devise a printing counting head which is constructed largely from parts obtainable on the market, as for example, consecutive numbering counters, platen mechanism, ribbon feed mechanism, etc.

Another object of our invention is to provide means for stopping the machine if a damaged card obstructs the passage of succeeding cards.

In the drawings Fig. 1 is a side elevation of a commercial sorter with our invention applied thereto.

Fig. 2 is an isometric diagram of the connections between a sensing pin and a trigger setting plunger.

Fig. 3 is an isometric view of the connections operated by a set trigger for setting an interponent to operate a consecutive number counter.

Fig. 4 is a view similar to Fig. 3 showing a portion of the resetting devices and a ribbon spool.

Fig. 5 is a detail view of the printing lever.

Fig. 6 is an isometric view of a fragment of the paper carriage.

Fig. 7 is a rear isometric view of the ribbon feed and reversing means and a portion of the platen line space mechanism.

Fig. 8 is an isometric view showing the resetting mechanism for the grand total counter.

Fig. 9 is an isometric diagrammatic view of the mechanism for operating the grand total counters and part of the mechanism for stopping the machine.

Fig. 10 is a fragmentary isometric view of a part of the anti-stacking mechanism.

Fig. 11 is a sample of a record printed by the machine.

Fig. 12 is a view, on reduced scale, of one of the trigger carrying discs.

Fig. 13 is a view showing the train of mechanism for operating the grand total counter.

Fig. 14 is a substantially full sized elevation of a frame carrying one of the consecutive number counters.

Fig. 15 is an elevation of the counting head, taken from above and in front thereof, showing the relation of the various parts to each other.

Fig. 16 is a view of one of the two-part hooks 45—45*a*, showing the construction in detail.

Fig. 17 is a view of the two-part hooks 58—58*a*, showing details of construction.

In statistical work it is frequently desirable to tabulate, what is in effect, a census report of different data, for example, suppose it is desired to know the number of different sizes, the different styles and the number or quantity of shoes sold by a chain of shoe stores. In a card, representing a pair of shoes, one column of perforations will identify the style, another column will identify the sizes, and a third column will identify the branch store selling the shoes. If the cards of a stack representing the sales of pairs of shoes from the different stores are run through the sorter and are sorted according to the numbers of the branch stores, and a printing impression is taken, a row of numbers, such as the first in Fig. 11, will be a census résumé of the number of sales made by each branch store. If the sorter is then set to sort for sizes a second run of the cards will be a census of the different sizes which have been sold, and finally if the sorter is set for style, the last row in Fig. 11 will represent the differing styles which have been sold. After each printing operation the counters will be cleared. The next to the last column indicates that no cards have been omitted during each run and the last column gives a total of all the cards sent through the machine for the series of runs.

The example of a shoe sale census is merely typical of uses to which the machine may be put. Its application to other types of census tabulations will be apparent from the particular example cited.

Powers sorter

In order that the cooperation of the new mechanism with the Powers type of sorter for which it is especially designed may be clear, a brief description of the operation of that sorter will be given at this point.

Cards are stacked in the magazine 21 (Fig. 1) and are fed one by one by means of a picker

knife 22 (reciprocated, through links and eccentrics, by the main drive shaft 33) to the forward (left-hand, as viewed in Fig. 1) pair of feed rolls 23, which carries them into the sensing chamber formed by the upper and lower guide plates 24. Each card is held in the chamber by a card stop 8 (see Fig. 13) during a complete sensing operation, against the action of the rear feed or eject rolls 23.

The cards are sensed by a group of sensing pins 26 which are mounted in a sensing pin box 126 (of the type shown in W. W. Lasker Patent No. 1,534,595), which is in turn adjustably mounted on guide rails 25 forming part of a reciprocating sensing head or cross head 125. The pin box may be manually moved to any desired column of the card.

Mounted on guide rails 37 beneath the sensing chamber is a frame 137 in which are mounted the sheaths of Bowden wires 27, the cores of which are adapted to be moved by sensing pins which have found holes in the card above. This frame slides along its guide rails in conjunction with the manual setting of the sensing pin box so that the cores of said wires lie, at all times, directly under the sensing pins.

When the sensing head 125 is reciprocated, those pins which find holes in the cards come into contact with the cores of the Bowden wires and extend the remote ends of these cores.

Movement of the core of a Bowden wire 27 causes a bell crank 19 (see also Fig. 2, which shows details of the mechanism) to rock about its pivot to cause a pin or plunger 29 to be extended into the path of one of a series of tripping cams 28 mounted upon one of a series of tripping discs 20. There is a tripping disc for each pocket. All discs are mounted upon a tripping shaft 34, which is driven by the main shaft 33 and is thus synchronized with the reciprocations of the sensing head.

When a tripping cam 28 encounters an extended plunger 29, the cam moves radially outward to a position beyond the periphery of the disc and is locked in this position. The manner of locking tripped cams in their outward position is best seen by referring to Fig. 12, which shows the side elevation of a tripping disc and the tripping cams thereon. The tripping cam 28 comprises an arm 35 pivoted to the disc 20 on one end and having pivoted to it at the other end the actual cam 28. The lower end of the piece 28 has in it a slot, which is enlarged at its lower end and which fits over a pin in the tripping disc. Connected from each pin to the adjacent member 28 is a spring 36 which tends to pull the member 28 sidewise so that the pin extending into the slot thereof lies in the enlarged portion, thus holding the disc outwardly when it has been raised to that position through the action of a pin or plunger 29 on the arm 35. After the tripping shaft and the tripping disc involved have rotated a sufficient amount the tripped cam strikes an arm 30 (Fig. 1), which is thus caused to rotate the shaft 130 on which it is fixedly mounted. The shafts 130 carry the card gates or deflectors 31 so that the operation of an arm results in the opening of a gate. Arms 30 also carry pins on their outer ends, which strike the upstanding projections (see Fig. 12) on tripped cams and restore the cams to normal position.

Since the plungers 29 are mounted in different positions relative to the circumferences of the discs, it is obvious that the time between the operation of a plunger and the operation of an associated card gate varies. As is clearly described in Patent No. 1,315,370, issued to W. W. Lasker on September 9, 1919 the construction is such that the time between the operation of a particular plunger and the associated card gate is equal to the time required for the transporting rollers 32 (Fig. 1) to convey the card from the sensing chamber to the gate.

From the above it is seen that each card is separately sensed and deposited in a pocket with all other cards which are perforated in the same row in the column sensed.

The counting and printing mechanism of the present invention is especially adapted to cooperate with sorters of the type just described.

General construction of the counting head

Fastened to the sorter frame 9 just to the rear of the reciprocating cross head 125 are two standards 10, one on either side of the frame (Figs. 1 and 15).

Each of these standards supports a cheek plate 100; the two cheek plates are joined by various rods and shafts to form a counting head generally designated H (Figs. 1 and 15).

Printing counters and mountings therefor

Journaled in the two cheek plates 100 and extending beyond these plates on either side is a printing shaft 62 (Figs. 4, 8 and 15). Mounted on the shaft between the plates is a plurality of castings 61, each of which is provided with a recess into which a consecutive number counter of ordinary construction is fastened (Fig. 14). These counters in the present instance are of the type manufactured by H. Pautze and Company of Berlin, Germany. They comprise counters of the deep notch transfer type as shown, for example, in United States Patent No. 323,340 issued to Kilmer, combined with resetting mechanism of the spline and pawl type such as that shown in United States Patent No. 723,213 to Rinsche.

Each casting 61 (Fig. 14) is made with a hub portion 161, which surrounds the shaft 62 and is free to rotate with respect thereto within the limits imposed by a screw pin 63, which extends through a slot in the hub and is screwed into the shaft 62. Each casting 61 also has a projection 162 which carries a stud or screw 163; between the pin 63 and the screw 163 a spring 164 is stretched, thus holding the casting rotated counterclockwise to the greatest possible extent with respect to the shaft (as viewed in Fig. 14). All counters are mounted in the same manner, the pocket counters, designated P (Fig. 15) being mounted in order from left to right, the sub-total counter ST being mounted in the casting 61 second from the right and the grand total counter GT in the casting 61 nearest the right-hand cheek plate 100.

Platen

Mounted on the rearward extensions of the cheek plates 100 and extending between them is a bar 87 (Figs. 1, 4, 6 and 15) on which a channel member 88 is fastened. Brackets on said channel member 88, in turn, support the shaft 89 of a cylindrical platen 92 of usual type. Suitable paper guides 90 and pressure rolls 91 are provided for holding the paper sheet in contact with the platen 92 (Figs. 6 and 15). If desired, the channel member 88 may be arranged to move relative to the support 87 in the usual manner.

Ribbon mechanism

Mounted on bars 112 extending across the counting head is a pair of brackets 113, one near

each cheek plate of the counting head in these brackets is a pair of ribbon spools 75 (Figs. 4, 7 and 8) from which an inking ribbon 74 extends upwardly, thence over rollers on a direction changer 76 fast to the shaft 62, thence horizontally through ribbon guides to the other side of the counting head; thence downwardly over the ribbon direction changer 76 mounted rigidly on the shaft 62 and rollers likewise mounted on the shaft to the receiving spool 75. Each of the said ribbon spools 75 is attached to a shaft 77 in any well known manner. Near the middle of the machine, as shown in Fig. 7, is a pair of ribbon actuating ratchets 78. Each of the ratchets is fast to a corresponding ribbon spool shaft 77. Between the ratchets is pivoted a pawl carrying frame 80 which is connected by a link to an arm 81 fast on the main printing shaft 62. Each leg of the frame 80 carries a spring pressed ratchet operating pawl 83 for actuating a ratchet, its shaft and the ribbon spool, respectively. Mounted on a block rigid with the frame is a T-shaped spring pressed member lying over the center ribbon reversing lever 83, which shifts to one side or the other of the center when the one or the other of the ribbon spools becomes unwound and undue tension exists in the ribbon, thus reversing the direction of the ribbon feed.

Printing operation

On the left-hand end of the shaft 62, outside the cheek plate, there is a printing handle 71, which is adapted to be manually operated to rotate the castings 61 and thus bring the counter type wheels and the inking ribbon against paper on the platen.

The counters are normally retained in their non-printing position, or the handle 71 in its unoperated position, by means of a latch 195, which is controlled by a lever 95 (Fig. 5). The latch 195 is slidable in a groove in the handle 71 and has a pin which cooperates with a notch on latch plate 96, which is attached to the outside of the left-hand one of the cheek plates 100 (see also Fig. 4). Latch 195 is normally held in its upper position by a spring; pressure on lever 95 rotates the lever about its pivot and causes the latch 195 to be lowered due to action on the pin at the lower end of the latch by a slot in the lever, thus releasing the handle for operation.

As will be obvious from a consideration of the construction set forth above, the springs 164 obviate any difficulty which might arise due to inaccurate circumferential positioning of the screws 63 on the shaft 62; for with the spring arrangement, if the type wheels of one counter strike the platen before those of the others, then the spring of the one stretches and the other counters may be moved against the paper, thus substantially equalizing the printing pressure of all counters.

From the above, the manner of printing the record of the counters is obvious, but it is, of course, necessary to actuate the counters to produce a record. The power for operating the counters is derived from the movement of the reciprocating cross-head 125 and is transmitted to the counters through various levers, rods, etc.

Actuation of the counters

Attached to each end of the cross-head frame is a rod 14' (Figs. 1, 4 and 8). Each rod terminates adjacent to the corresponding cheek plate 100 and the two rods are joined by the spring anchor 11 and by bail member 13 to form an auxiliary oscillating framework, which, of course, moves synchronously with the cross-head 125. In order to prevent sidewise movement of the rods 14', anchor member 11 and bail 13, each end of the member 11 has pivoted thereto a link 12. The rearmost ends of the links 12 are loosely mounted between collars on the printing shaft 62, and thus serve to confine the motion of the auxiliary frame to a vertical plane, and to make a strong mechanical unit.

The bail 13 (Figs. 3 and 16) is provided with a plurality of grooves, equal in number to the number of counters, into each of which a notch in the forward portion 47 of one of the two part operating levers 47—48 is positioned. Each operating lever is composed of two bell cranks 47 and 48, joined by a spring 49 extending between the upwardly projecting arm of bell crank 48 and the downwardly extending arm of bell crank 47. The construction prevents breakage of parts, if for any reason, a "jam" should occur. It also obviates difficulties due to slight manufacturing inaccuracies. It will be seen that, except when "broken" by unusual resistance to motion, the levers 47—48 act as simple levers pivoted on bail 13. An additional spring 39 is provided for each lever 47—48; this spring extends from a pin located near the bend of the bell crank 47 to the anchor member 11 and serves two purposes, namely, to hold the lever 47—48 in its groove and to maintain it in its lowest position.

If the forward end of a lever 47—48 (that is the left end, as viewed in Fig. 3 or the right-hand end as viewed in Fig. 16) be held stationary with respect to the counting head H, while a reciprocation of the cross-head 125 occurs, it will be seen that the rearward end 48 will rise and will lift the associated actuating rod 50 to move the counter ahead a step or number. The mode of holding the forward end of the lever will be described hereinafter.

In order to assure proper operation of the counters positive restoration of the actuating rods to their lower or normal positions is provided. Pivoted on each end of shaft 13 is a lever 14 (Fig. 8 shows the right hand one of these; the left-hand one is not shown for the construction is symmetrical); the rearward ends of these levers are connected by a restoring bail 15 which lies over the actuating rods 50, against which it is normally held by the springs 114 extending from arms 14 to the cheek plates 100. Cooperating with the forward end of each lever and projecting above it, is a stud 16, which is fastened to the adjacent cheek plate 100. Thus, as the framework 14', 11, 13 rises the bail 15 rises against the action of springs 114 and permits selected levers 47—48 to operate associated counters. It will be noted (Figs. 7 and 8) that a wire link 97 extends from each arm 76 (which arms are associated with the ribbon mechanism described above) to a pin on the forward end of each lever 14. These links move to the rear whenever the printing shaft 62 is rotated, and since the arms 76 are fastened to that shaft, rearward motion of the links causes elevation of the bail 15, and thus permits the counters to rotate to printing position with no interference between the actuating rods 50 and the bail 15.

Selection of counters for actuation

In respect to the manner of controlling their operation, the counters may be divided into

groups; the pocket counters P and total counters ST and GT.

There are as many pocket counters P as there are card pockets or receptacles (exclusive of the reject pocket), or, in the present example, 11 (Fig. 15 shows these 11 counters extending from the left side of the counting head). These 11 counters are similarly selected and consequently a single description will suffice for all.

Pocket counters

Extending between and pivoted in the cheek plates 100 at the front ends thereof is a bar 44 (Figs. 4 and 8) adapted to be moved to either a "count" or "no count" position by a key or arm 60 fastened to the right-hand end of the bar and cooperating with notches in the right-hand cheek plate 100. Fastened to the bar 44 (see Figs. 3 and 16) are the L shaped pieces 104, which have holes in their rearward ends adapted to hold the sheaths of Bowden wire 43. On each piece 104 is a bracket 105, which serves to support a two part hook 45—45*a*. The portion 45*a* is a bell crank pivoted on a screw 106 and having a rearward extension which is slotted to provide for attachment of the core of a Bowden wire adapted to be rocked by the core of the associated Bowden wire. Also pivoted on 106 is the hook member 45, which is in line with a pin on one of the two part operating levers 47—48, and serves to hold the lever down to cause actuation of the counter in the manner described hereinbefore. The hook 45 and the bell crank 45*a* are joined by a spring 52 so that, when the core of the Bowden wire 43 is retracted, the bell crank will be positively rocked and the hook moved by the spring. The spring connected hooks permit the use of the counting head on sorters, the moving parts of which have different extents of movement, for, regardless of the movement of Bowden wires in excess of a definite minimum the hooks will be properly positioned above the pins, movement in excess of the minimum merely causing the springs 52 to stretch.

A restoring spring 46, for each hook 45—45*a*, is also provided. This extends from a stud on the bracket 105 to a stud on the bell crank 45*a*. Lying to the rear of the hook there is a stud fastened to the bell crank 45*a* so that the spring 46 serves to restore both the bell crank and the hook 45.

Bowden wires 43 extend to the sorter pockets, and are arranged so that their cores are operated by the tripping cams 20 of the discs 20. Two mechanisms for operating the Bowden wires 43 are illustrated; one in Fig. 3 and another in Fig. 12. Since the two mechanisms are the same in principle, the same reference characters are applied to corresponding parts.

Rigidly attached to each of the division plates 120, separating the discs 20, is a bracket 40 (Figs. 3 and 12) which supports a spring urged bell crank lever 41 having a cam plate 42 attached thereto. The brackets 40 are so located on the division plates that the cam plates 42 lie just ahead of the corresponding pins 20, that is, the cam plates 42 are spiraled about the discs just as are the pins 20. In this manner each cam plate is positioned to be operated by a tripping cam 20 immediately after the cam has been operated by its tripping pin 20. Thus, irrespective of the pocket or receptacle selected by the sensing of the card the proper Bowden wire is operated and the proper counter selected at a definite point in the cycle of the sorter.

Total counters

In addition to the pocket counters P, there are provided two total counters, one (ST) for sub-totals and the other (GT) for grand totals. The sub-total counter is used to determine the number of cards sorted in each run and the grand total counter to determine the number sorted in a number of runs. These two counters are selected and operated in exactly the same manner, but are re-set to zero reading differently. The re-setting mechanism for all counters will be discussed hereinafter.

The grand total counter GT is mounted in a casting 61 located at the right-hand side of the printing shaft 62, and the sub-total counter ST likewise mounted in a casting 61 is located immediately to the left of the grand total counter. These two counters are actuated by two part levers operated by the frame 11, 13, 14', and are restored by the bail 15 in exactly the same manner as described for the pocket counters.

The manner of selecting the total counters for actuation differs somewhat from that for the pocket counters. However, the last step in the selecting process is similar to the corresponding step in selecting the pockets, and consists in placing hooks in the path of pins on the lever parts 47.

Mounted on the bar 44 (Figs. 9 and 17) is an angle bracket 107 in which the sheath of a Bowden wire 56 is mounted. Mounted on the bracket 107 are two brackets 109, each of which supports a two part hook 58—58*a* (Figs. 9 and 17) each of which is in line with one of the levers 47—48. Each two part hook 58 and 58*a* comprises the hook portion 58 which is pivoted by means of a screw 111 to a bracket 109 and the bell crank portion 58*a* likewise pivoted to the bracket 109 through the medium of the screw 111. The two portions are connected together by means of a spring 52 which extends from a stud on the hook to a stud on the bell crank. Each bell crank portion 58*a* has a forward extension with a bent-over lug thereon, which lugs are fastened to a bail 57, which is adapted to be operated by pressure against it exerted by the core of the Bowden wire 56. In addition to the spring 52 joining the parts 58 and 58*a*, there is a spring 46 which extends from the bracket 109 to a stud on the member 58*a* and serves to restore the parts to their normal position. In order to provide for restoration of the hook portion 58 an additional stud on the bell crank 58*a* is provided, which stud lies in front of the hook and makes contact therewith as the bell crank moves to normal position. It is obvious, from the above, that whenever the core of the Bowden wire is extended the hook members 58 are projected into the paths of the pins on those members 47 which are associated with the total counters, thus conditioning those counters for actuation.

The other end of the sheath of Bowden wire 56 is mounted in a bracket 113 (Fig. 9) which is fastened to the frame of the sorter. Cooperating with the end of the core of the Bowden wire is a spring urged lever 59, which is pivoted on a stud fastened to the main frame work 9 of the sorter. The end of this lever, remote from the Bowden wire, is connected by a short link to a long link 64 which is, in turn, connected to the vertical arm of a spring urged bell crank 10. This bell crank is controlled by the card sensing plunger 65 (Figs. 9 and 18) which, when there

is a card in the chamber, is elevated against the action of the spring 55a, coiled about it, to permit the bell crank 18 to rock and position the step 17, on the link 54, under the card stop 8 (Fig. 13 shows the position when there is a card in the sensing chamber). The card stop 8 in descending thus causes the core of the Bowden wire 56 to be extended to actuate the total counters.

When there is no card in the sensing chamber, the plunger 55 will travel downward (stationary, relative to the cross-head 125) and the bell crank 18 will rock counterclockwise, wherefore the step 17 on lever 54 will be held out of the path of card stop 8. Thus, when there is no card in the chamber, hooks 58—58a will not be set. The operation of the part of the mechanism above described is similar to that of the corresponding mechanism shown and described in Patent No. 1,643,386, granted to W. W. Lasker September 27, 1927.

Resetting mechanism

The foregoing has shown how the various counters are operated in accordance with the operation of the sorter. It is necessary that the counters be restored to their zero settings; restoration of the pocket counters and the sub-total counter ordinarily occurs after each run, while restoration of the grand total counter occurs after a plurality of runs.

Each counter is provided with a shaft on which a re-setting gear 65 (Figs. 3 and 4) is mounted. Meshing with each re-setting gear is a mutilated gear 64 (Figs. 4 and 14). Integral with each gear 64 is a hub 69 (Fig. 14) adapted to rotate in a journal formed in the casting 61. The castings, hub and gear are arcuately slotted to permit them to move relative to an associated re-setting shaft 68 or resetting sleeve 98.

Immediately to the right of each gear 64 and fixed to shaft 68 or sleeve 98, as the case may be, is a collar which carries a pin 67. Each of these pins is adapted to lie between and cooperate with two pins 66 extending from an associated gear 64 when the counters are in their normal or non-printing position.

Journaled in the right-hand cheek plate 100 is the sleeve 98 (Fig. 8) which bears one of the pins 67. On its outer end this sleeve carries a handle 99 held in its rearmost position by a spiral spring 199. By rotating this handle forward the gear 64 of the grand total counter is rotated and the counter reset to give a zero reading.

Journaled at its left end in the left-hand cheek plate 100 and at its right end in the sleeve 98 is the re-setting shaft 68 (Figs. 4 and 8). This shaft carries at its left end, outside the left-hand cheek plate, a handle 70 (Fig. 4) maintained in its rearmost position by a spiral spring 170. This shaft carries pins 67 for all the pocket counters and for the sub-total counter, and by rotating it forwardly the readings of these counters are reduced to zero.

The paper, which is to receive the printing, is supported by a cylindrical roller platen (shown in section in Fig. 6) provided with mechanism for rotating it after each printing operation.

Paper feeding mechanism

Fast to one end of the printing shaft 62 is an arm 84 (Figs. 7 and 8) carrying a roller 184 which works in an open V-shaped slot in the lever 85. At the forward end of said lever 85 is a straight slot 185, through which extends a pin 86 on a slide, which carries the platen line-spacing pawl mechanism (Note that Fig. 7 is a rear view). This line-spacing mechanism is of the type fully illustrated and described in Patent No. 1,627,394, granted to W. W. Lasker on May 3, 1927 and, therefore, is not described in detail here.

Anti-stacking mechanism

Sometimes a faulty card, in passing through a sorting machine, becomes jammed and, unless the machine is quickly stopped, other cards will be snagged on the jammed card, thus resulting in destroying or mutilating some of the cards being sorted.

In order to provide for quickly stopping the machine and preventing the destruction of cards, there is provided, by the present invention, a mechanism for opening the circuit to the power source, whenever a card becomes jammed in the transporting chamber.

This mechanism comprises a light rod 6 (Figs. 1 and 10) extending the length of the transporting chamber along substantially the longitudinal center line thereof, and lying immediately above the plane of the card gates or deflectors 31. The rod 6 is supported in the position indicated by two pairs of arms 108 (shown in Fig. 10); each pair of arms is fastened to a shaft, which is journaled in brackets fastened to the frame member and each shaft extends transversely across the chamber. The rearmost shaft 5a (Fig. 10) serves no other purpose than to support the rod 6; the front shaft 5 (Fig. 9) extends through the left-hand frame member 9 and carries at its outer end an arm 4 to the lower end of which is pivotally attached a wire link 3, terminating in a loop. The loop in the forward end of wire 3 fits over the "break" arm 2 of a well known form of snap switch common in Powers sorting machines and illustrated in Lasker Patent No. 1,485,681 issued March 4, 1924.

It is readily seen from the above that when there is a card jam, it causes the rod 6 to be elevated, thus rotating the shaft 5 and pulling the link 3, and arm 2 rearwardly, to cause the switch to break the circuit to the driving motor, and thus immediately stop the machine.

Having described our invention, we claim:—

1. In combination, a counter mechanism including an actuating rod therefor, an operating lever for the actuating rod, a shaft on which said lever is pivotally mounted, a hook member adapted to engage one end of said lever, means for causing the engagement of said hook and said lever, and means for reciprocating said shaft whereby said lever is rocked to operate said actuating rod when said hook and said lever are in engagement.

2. In combination, a counter, a rod for effecting step-by-step operation of said counter, a lever for actuating said rod, a reciprocable assembly including a supporting shaft for said lever, a hook member adapted to engage said lever, means for setting said hook member to engage said lever, and means for reciprocating the supporting shaft assembly, whereby, when said hook is set to engage said lever, one end of said lever is held by said hook member, whereas the other end of said lever is forced upwardly to actuate said rod and thereby said counter.

3. In a machine having a counter mechanism mounted thereon, an actuating rod for inserting amounts in the counter, and operating means for the actuating rod, said operating means comprising a lever pivotally mounted on a moving part

of the machine and adapted when rocked to operate the actuating rod, a hook mounted on a fixed part of the machine and adapted when engaged with said lever to condition said lever to be rocked by said moving part, and means to engage said hook with said lever.

4. In a machine having a counter mechanism including an actuating rod therefor, the combination of a lever for operating said actuating rod, a hook mounted on a fixed part of the machine and adapted to engage one end of said lever, a shaft mounted on a moving part of the machine for supporting said lever whereby the lever is moved relatively to said hook and said actuating rod, and means to engage said hook with said lever to cause said lever to be rocked by said moving part to operate the counter actuating rod.

5. In combination, a plurality of printing counters, an oscillatable shaft for supporting the counters, a recording surface for receiving an imprint from the counters, means for oscillating said shaft to cause the counters to print, and resilient means disposed between the counters and the shaft to compensate for inaccuracies in the mounting of the counters on the shaft.

6. In a machine having a plurality of printing counters and a recording surface for receiving an imprint from said counters; the combination of a shaft, parallel to the recording surface, on which all said counters are mounted; resilient means disposed between each counter and the shaft; and means for rotating said shaft to cause said counters to print on the recording surface, said resilient means acting to equalize the impact of the counters on the recording surface to compensate for inaccuracies in the mounting of the counters on the shaft.

7. In combination, a plurality of printing counters, a rock shaft for supporting the counters, a record receiving surface, manipulative means for rocking the shaft to cause the counters to print on the record receiving surface and resilient means connecting the counters to the shaft to compensate for inaccuracies in the mounting of the counters on the shaft, said resilient means comprising a spring and pin-in-slot connection between each counter and the shaft.

8. In a machine having a plurality of printing counters, a shaft for supporting said counters, means for inserting amounts in each of said counters, a recording surface, means for actuating said supporting shaft to cause said counters to print on the recording surface simultaneously, and a resilient connection between each counter and the shaft whereby, during a printing operation, the impact of the counters on the recording surface is equalized.

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