H. DE SMITH & C. R. SEYMOUR.

SCORING MACHINE.

APPLICATION FILED OCT. 25, 1912.

1,054,962.

Patented Mar. 4, 1913.

6 SHEETS—SHEET 1.

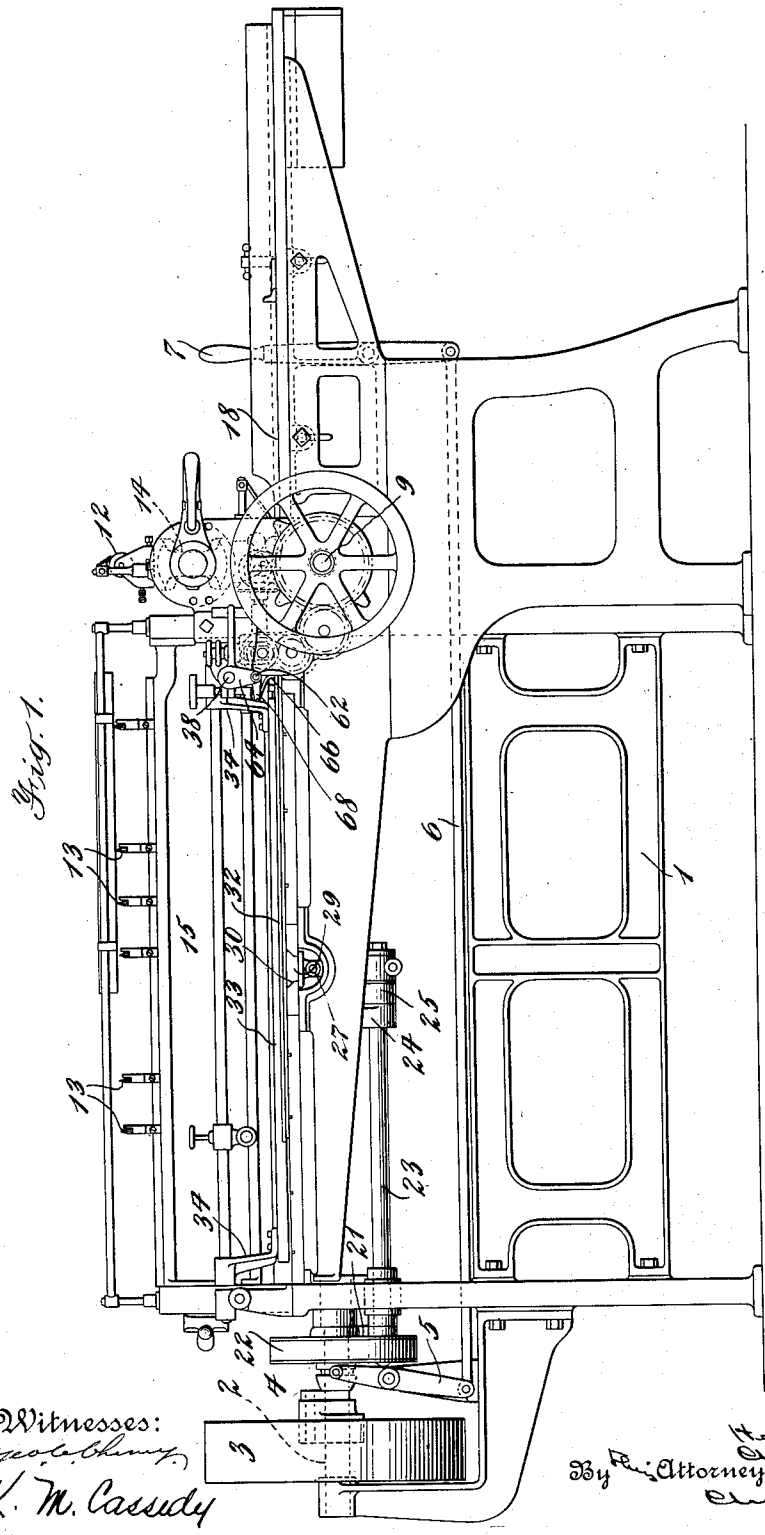

Fig. 1.

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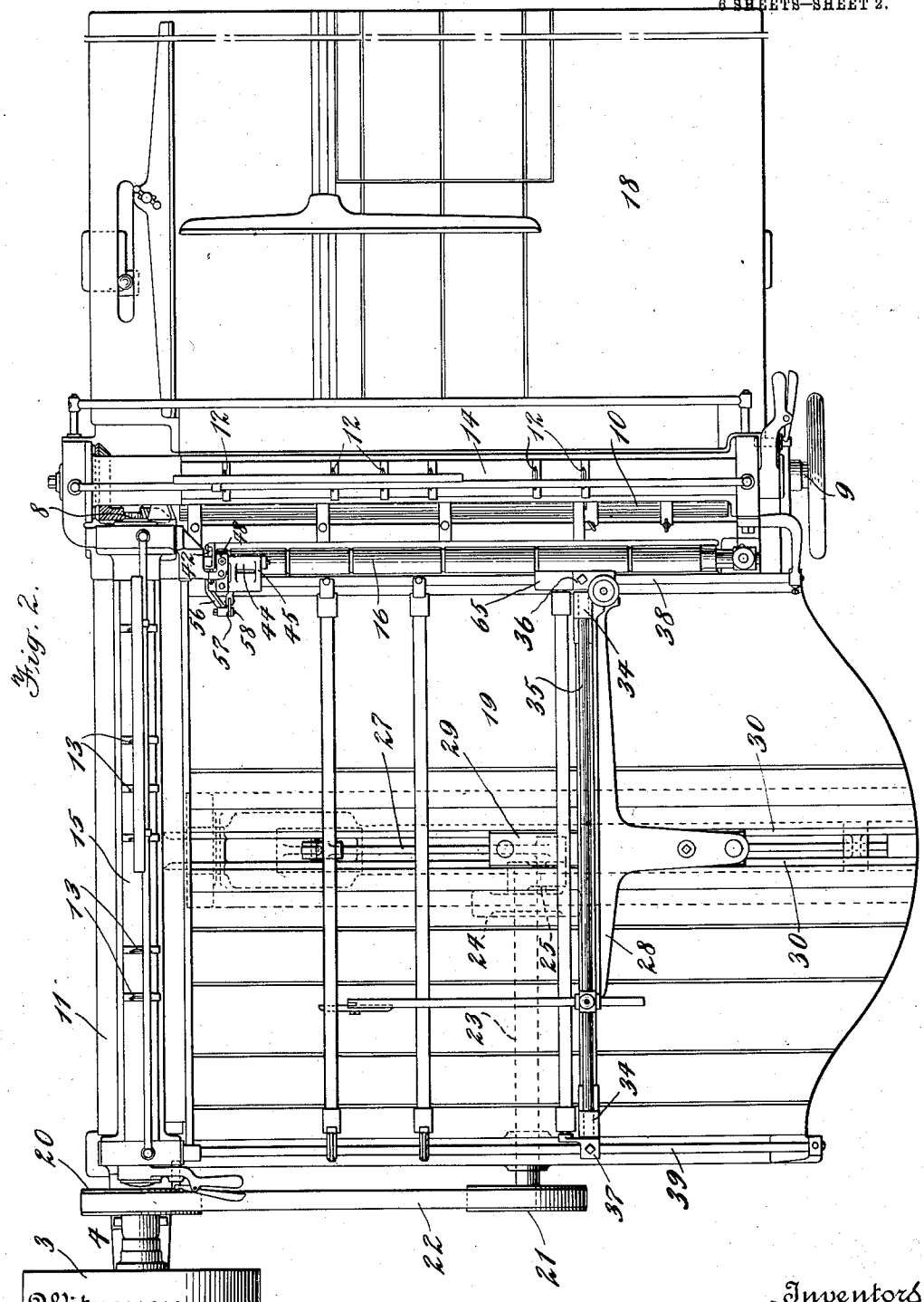

Fig. 2.

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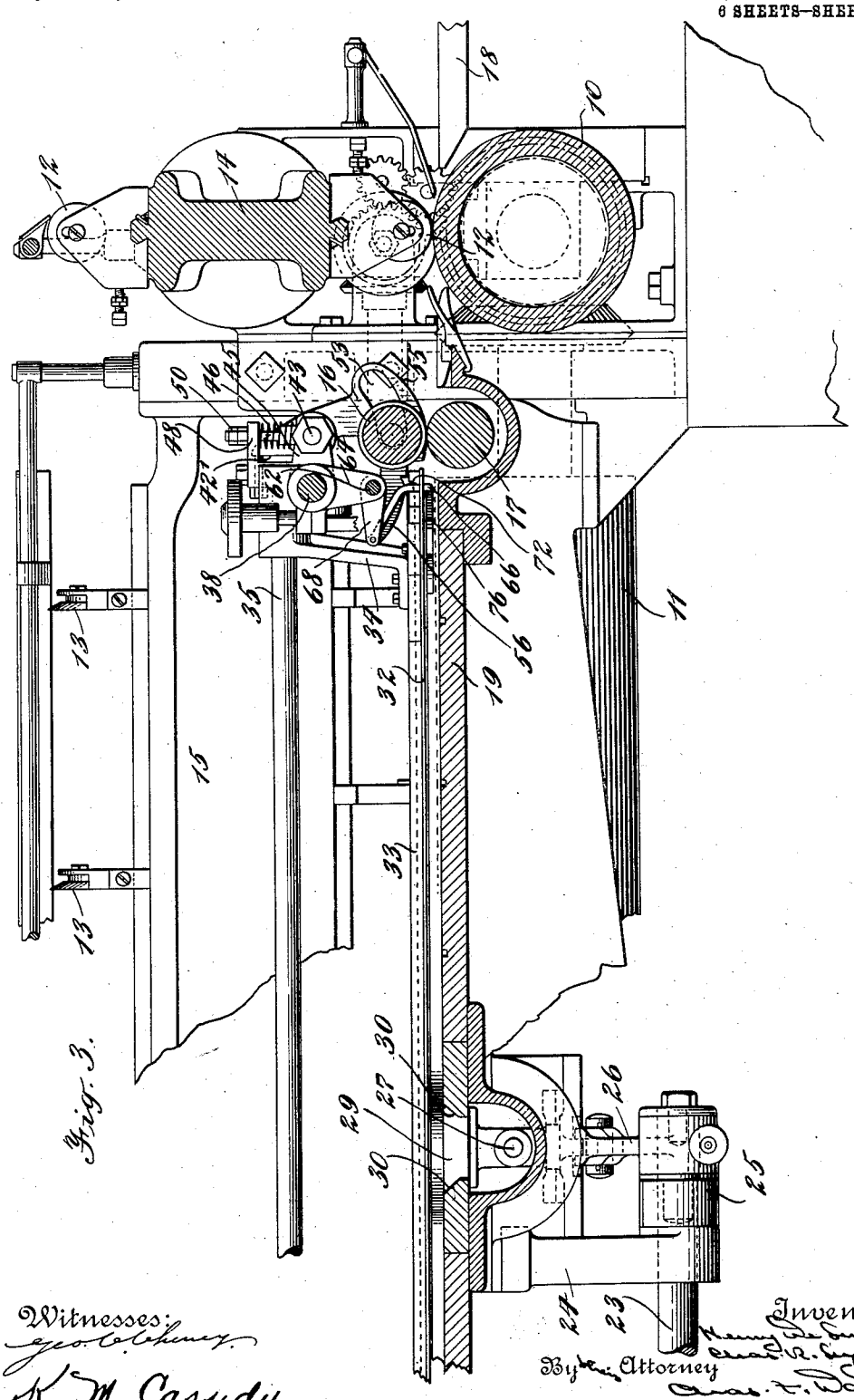

Fig. 3.

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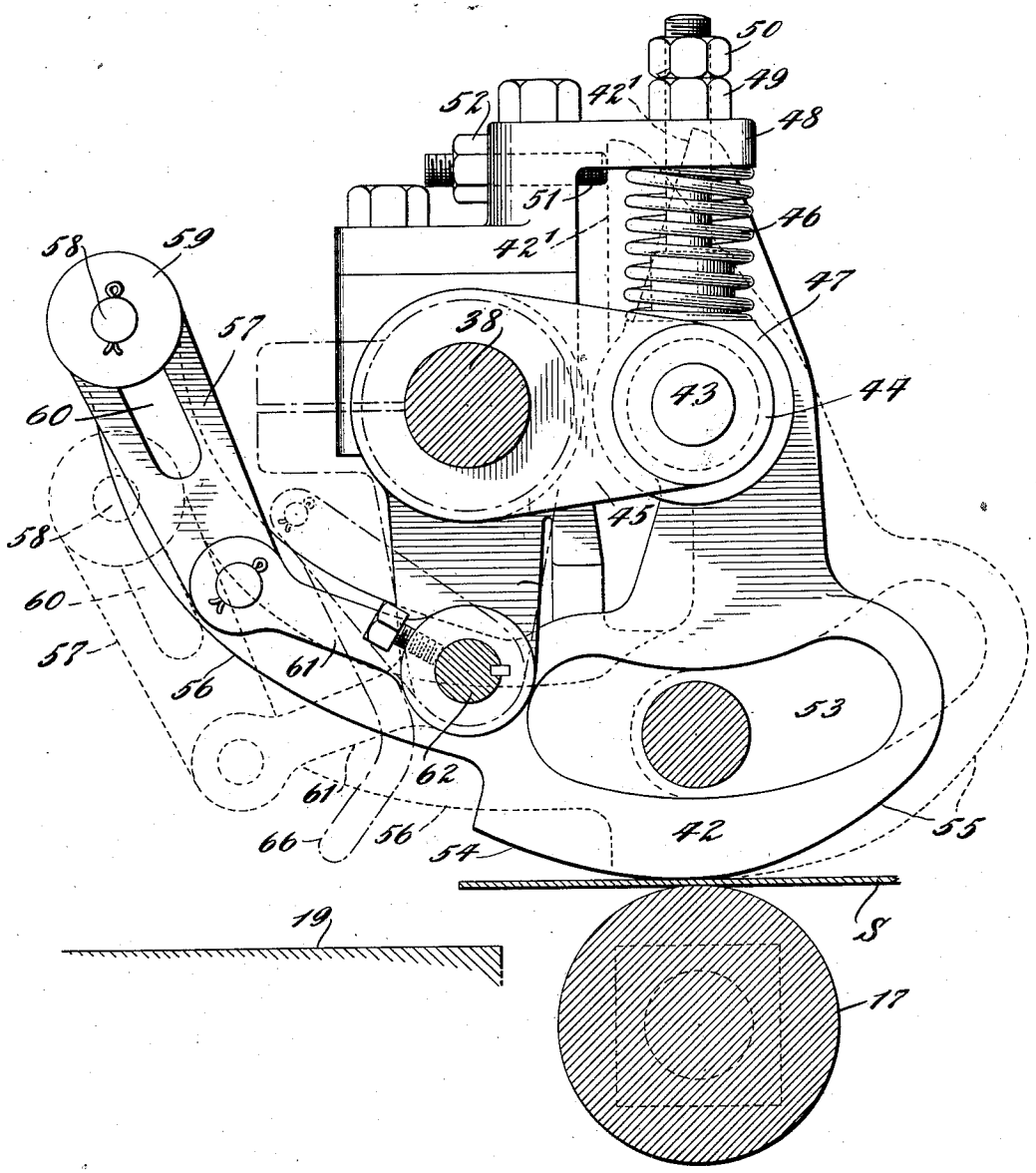
6 SHEETS—SHEET 4.

Fig. 4.



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6 SHEETS—SHEET 5.

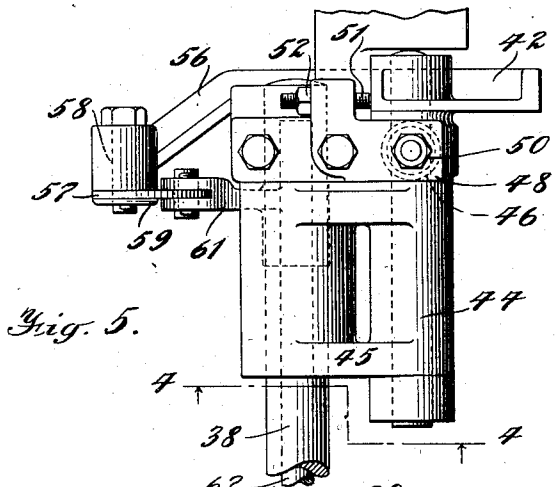


Fig. 5.

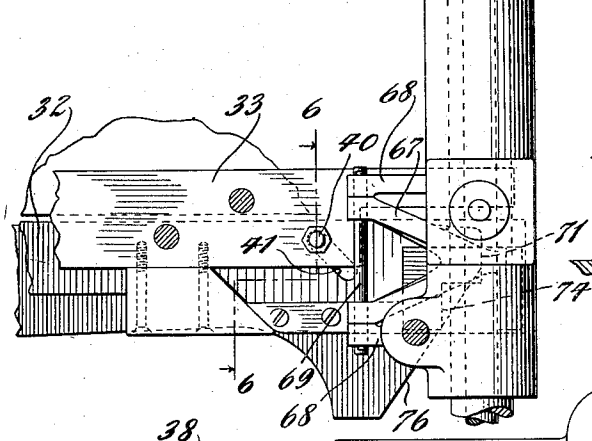


Fig. 6.

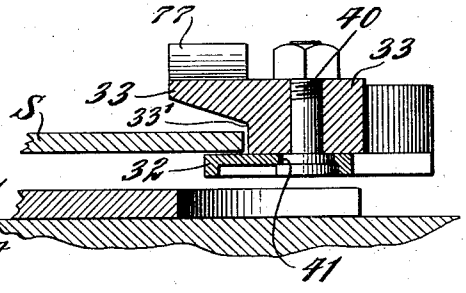
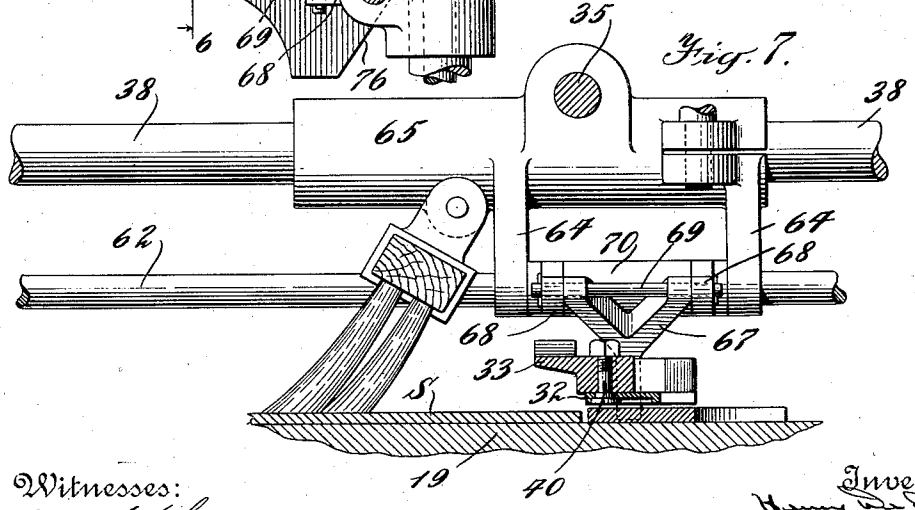


Fig. 7.



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APPLICATION FILED OCT. 25, 1912.

1,054,962.

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6 SHEETS—SHEET 6.

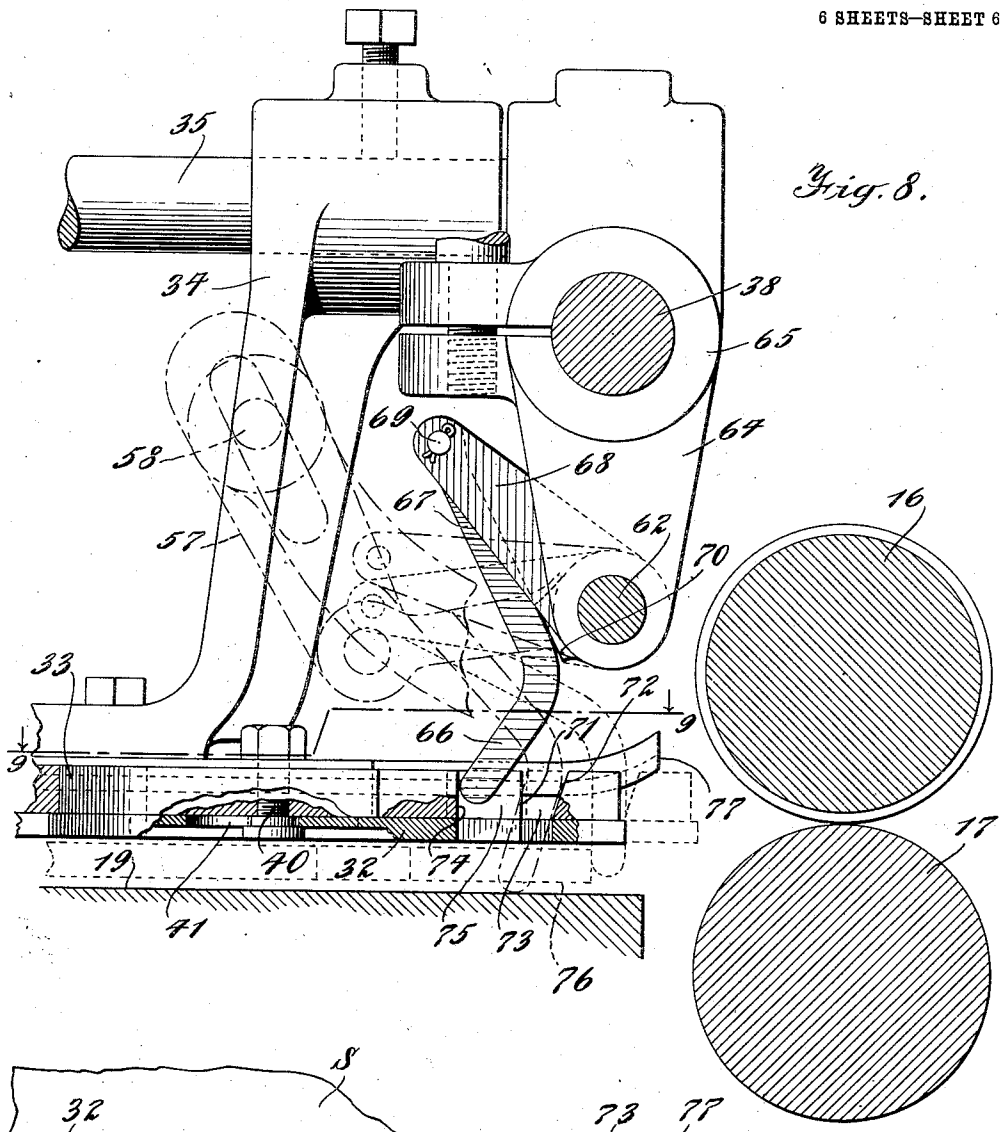

Fig. 8.

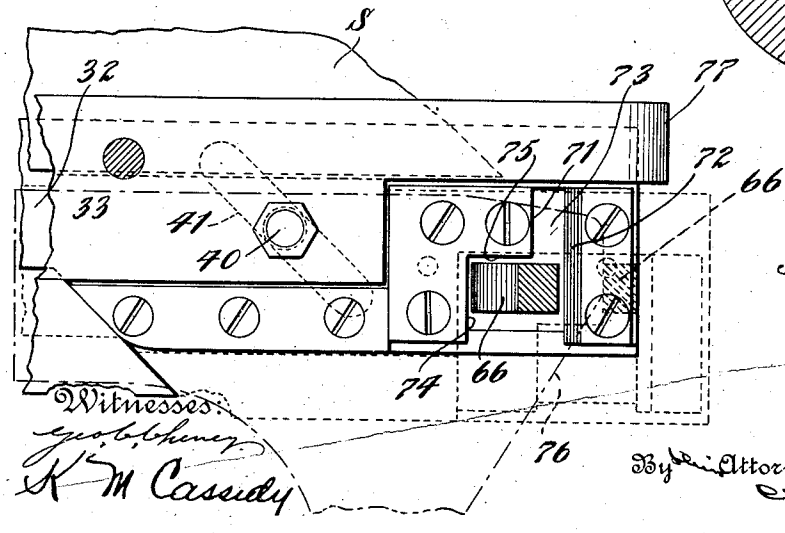

Fig. 9.

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UNITED STATES PATENT OFFICE.

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SCORING-MACHINE.

1,054,962. Specification of Letters Patent. Patented Mar. 4, 1913.

Application filed October 25, 1912. Serial No. 727,718.

To all whom it may concern:

Be it known that we, HENRY DE SMITH and CHARLES R. SEYMOUR, citizens of the United States, and residents of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Scoring-Machines, of which the following is a specification.

This invention relates to machines for scoring paper-board, and particularly to that class of scoring machines or apparatus adapted for double scoring paper-board or similar material, and which are provided with two sets of scorers or scoring mechanism arranged to score the paper-board in two directions (usually at right angles to each other) during a single passage of the same through the machine. A mechanism of this general type is disclosed in the prior patent to M. D. Knowlton #725,453, granted April 14, 1903, and the present invention is primarily an improvement upon that disclosed in said patent. In machines of this kind a suitable feed device is employed between the two sets of scorers for engaging a sheet or board after it has been operated upon by the first or primary scoring mechanism, and automatically feeding it to the next or secondary scoring mechanism. In the operation of such machines the sheets are fed one at a time to the primary scoring mechanism and after emerging therefrom are engaged one at a time by a reciprocatory feeding device in the nature of a cross-feed operating crosswise of the first path of movement of the sheet, and are fed by said device to the secondary scoring mechanism. In said machines it has also been customary to employ means for automatically controlling the passage of the sheets through the machine, for the purpose of preventing fouling or interference of two or more sheets when these are fed rapidly. In the machine illustrated in said Knowlton patent this automatic controlling means embodies as its main element sheet-supporting means for receiving that edge of each sheet which is to be acted upon directly by the aforesaid cross-feed device and supporting said edge above the path of reciprocation of said device for a predetermined length of time sufficient to assure the feeding of the sheets one at a time only to the secondary scoring mechanism. Machines of the type shown in said Knowlton patent have long been in regular commercial use, but in the actual use of said machines it has been found that their speed is limited. This is due to a number of causes, among which may be noted the construction and weight of the reciprocating feed device for transferring successive sheets to the secondary scoring mechanism, the length of the stroke of this device, and the manner in which it coöperates with the sheet-supporting means before referred to. In addition to this the construction and mode of operation of the sheet-controlling means and the principle upon which its controlling action is based, which is the timing of the operation of the sheet-supporting means from the front edge of each entering sheet or board, have been such as to make accurate work at high speeds difficult. It has however been found that it is practical to produce a machine of this general class capable of operation at high speed by properly modifying the construction of the feed device before referred to, and reducing its weight, and decreasing its stroke, and especially by operating it from its center, or in such a manner that it is acted upon substantially equally at all points in its length; and that the capacity of the machine is much increased and the control of the operation of the sheet supporting and releasing means is greatly improved by the provision, in connection with the lighter, short-stroke, cross-feed device operated from the center as just described, of controlling means for the device for supporting and releasing successive sheets in which means the action of the main controlling element is determined by frictional contact and movement with the surface of the traveling sheet.

The machine constituting the subject matter of the present invention embodies the features of improvement just referred to and also others which will be hereinafter more specifically described.

In the accompanying drawings there is shown a machine illustrating one embodiment of said invention, in which—

Figure 1 is a rear elevation of said machine; Fig. 2 is a plan of the same; Fig. 3 is an enlarged, substantially central vertical transverse section of a portion of the same illustrating the construction and organization of the sheet-supporting and controlling

means, the cross-feed device before referred to, and various coöperative parts; Fig. 4 is an enlarged transverse section of a portion of the mechanism illustrating in detail the construction and various positions of the principal elements of the controlling mechanism for the sheet-supporting means, the section being taken in line 4—4, Fig. 5, looking in the direction of the arrows; Fig. 5 is a plan of the same and of other portions of the controlling mechanism, the sheet-supporting means, and the cross-feed device, the same being illustrated on a smaller scale; Fig. 6 is a vertical longitudinal section, taken in line 6—6, Fig. 5, of portions of the cross-feed device and sheet-supporting means, showing the latter in position for supporting a sheet or board; Fig. 7 is a similar view of these parts and an elevation of other parts of the controlling mechanism, etc., drawn to a smaller scale, illustrating the main elements of the cross-feed device and the sheet-supporting means in the positions occupied by them after the sheet or board has been released and has dropped into the path of the cross-feed device in readiness for feeding to the secondary scoring mechanism; Fig. 8 is an enlarged view partly in vertical transverse section and partly in elevation of portions of the sheet-supporting means, its controlling mechanism, and the cross-feed device, and illustrates particularly the manner in which the sheet-supporting means is moved to its effective and ineffective positions through the action of the controlling mechanism and the cross-feed device, and Fig. 9 is a horizontal section and plan of a portion of the same, the section being taken in line 9—9, Fig. 8, looking in the direction of the arrows.

Similar reference characters designate like parts in all the figures of the drawings.

1 represents the main frame-work of the machine and may be of any suitable form and construction for supporting the various working parts. Near one end of this frame and supported in suitable bearings is a main driver, 2, carrying a pulley, 3, for transmitting power to the principal operative parts. A suitable clutch device is illustrated at 4 for controlling the coupling and uncoupling of this driving means and the driven parts of the machine. The clutch may be operated in any suitable manner, as for example through connections, such as 5 and 6, operated by a lever, 7, located at the opposite side of the machine in position to be conveniently grasped by the operator. Two shafts, such as 8 and 9, arranged at right angles to each other and each carrying a bed-roll thereon forming parts of the primary and secondary scoring mechanisms respectively, are driven from the main driving shaft 2 through suitable connections, as is usual. The two scoring mechanisms, of which the bed-rolls 10 and 11 form parts, are also of the usual construction, they comprising the aforesaid bed-rolls and the usual scoring knives or cutters, 12 and 13, adapted to coöperate therewith, said knives being carried in the well-known manner by reversible bars, such as 14 and 15. In the rear of the primary scoring mechanism are also located, as is usual, a pair of feed-rolls, 16 and 17, supported in suitable bearings and adapted to engage the leading edge of the sheet as it is fed by the operator from the feed table, 18, through the primary scoring mechanism, said feed-rolls serving to feed the sheets successively through said primary scoring mechanism and onto the table 19 between the primary and secondary scoring mechanisms. These feed-rolls are connected and driven in any suitable or well-known manner.

After the sheet has been scored in one direction and fed onto the table 19 it is engaged at the proper time by the reciprocating cross-feed device, which device operates, as is usual, in a direction at right angles to the path of the first feed movement of the sheet. This cross-feed device, as here shown, is driven from the main driver in any suitable manner, as for example, by means of pulleys, 20 and 21, connected by a belt, 22, the pulley 21 being secured to a relatively short shaft, 23, journaled in bearings at the under side of the machine in one end of the frame work and in a substantially central hanger, 24, respectively, said shaft having at its inner end a crank, 25, and suitable connections therefrom, including a pitman rod 26, for imparting reciprocating movement to a slidably supported rod 27 adjacent the under side of the table with which the cross-feed device proper is operatively connected. This cross-feed device is different in many respects from that disclosed in the aforesaid patent. It is similar, however, to that of said patent so far as the principal functions of such a device are concerned, that is to say, it is so constructed as to be capable of engaging the edge of the sheet substantially throughout the length of such edge, and of moving in a substantially straight line forward to feed a sheet to the secondary scoring mechanism, and then withdraw out of the path of delivery of the next succeeding sheet.

The feed device proper is a relatively light plate, designated generally by 28. It is considerably lighter than the corresponding feed device employed in the aforesaid patent and in the construction here shown is secured directly to a slide, 29, mounted for reciprocation in a corresponding guide, 30, formed by the walls of an opening extending entirely through and substantially at the center of the table 19, and which

slide in turn is adjustably connected with the reciprocating rod 27 before referred to. It will be obvious that by means of the crank 25 and the described connections therefrom to the slide 29, the feed device 28 secured to said slide will be reciprocated back and forth on the table 19. This stroke of the feed device is relatively short and the speed of movement is relatively great as compared with that of the corresponding feed device of the aforesaid patent; the difference between the two being the difference between a high-speed and a low-speed feed device for advancing successive sheets to the secondary scoring mechanism. The present device also has the further great advantage over that of said patent of being operated directly and positively from its center so that every point in the length of the working face of the feed device that comes in contact with the edge of a sheet advances at the same speed as every other throughout the working stroke, thus assuring positive feeding and accurate positioning of the sheet without the use of heavy and slow-moving operating parts.

As the sheet is fed onto the intermediate table 19 from the primary scoring mechanism the edge of the sheet adjacent to the working edge of the cross-feed device 28 is intended to be received upon a sheet-support or trip-plate substantially parallel with the forward or working edge of said feed device 28 and to be supported by said trip-plate above the path of the feed device so as not to be engaged by the same until a certain predetermined time, at which time the trip-plate is automatically shifted backward to permit the supported edge of the sheet to drop upon the table 19 and into the path of the cross-feed device 28. Mechanism for performing the operations of supporting and releasing said edge of each successive sheet fed onto the table 19 is disclosed in the aforesaid patent. In the present machine an improved mechanism for performing these operations constitutes one of the most important features of the invention and will now be described.

For the purpose of supporting one edge of each sheet and releasing it in the manner just referred to, sheet-supporting means and automatic controlling means therefor are employed, in which a trip-plate is disposed just above the path of reciprocation of the cross-feed device 28. This trip-plate is preferably a light strip, such as 32, slidably supported for movement to and fro in the same general direction as the feed device 28, on the under side of a fixed plate or cross-bar, 33, secured to the lower ends of a pair of arms, 34, depending from a rod, 35, above the table 19, which rod is supported at its ends in two adjusting slides, 36 and 37, mounted for movement on parallel guide-rods, 38 and 39, suitably supported on the frame-work of the machine at opposite sides of the table 19. In this construction the slidable frame formed by the parts 33, 34, 35, 36 and 37 is adjustable to different positions on the rods or rails 38 and 39 as required, and the trip-plate proper carried thereby is movable relatively thereto for the purpose of supporting and releasing a sheet or board, this movement of the trip-plate taking place while the supporting frame therefor is stationary. Because of this it is possible to use a light trip-plate, readily shiftable to its supporting and releasing positions, and operate the same at high speed. The trip-plate is preferably connected to the cross-bar 33 by pin-and-slot connections, as indicated at 40 and 41, the parts 40 being screws on the heads of which the trip-plate is supported and on the shoulder portions of which the walls of the slots are guided (see Figs. 6 and 7). The slots 41 are diagonal slots for a reason which will be hereinafter set forth. It will, of course, be understood that the trip-plate may be mounted for movement back and forth on its supporting frame in any suitable manner so long as it is capable of moving readily from the sheet-supporting position shown in Figs. 6 and 9, to the sheet-releasing position shown in Figs. 5 and 7 and vice versa. At the end of this trip-plate nearest the primary scoring mechanism it is so formed as to be capable of coöperation with one element of the automatic controlling means for governing the positions thereof. As this controlling mechanism is operated and controlled by the entering sheet or board, its construction and mode of operation will now be described in connection with the sheet-feeding mechanism.

As before stated, one of the principal features of the invention is the actuation of the sheet-supporting means proper, viz., the trip-plate, from a controlling element frictionally operated by engagement with the surface of a sheet being fed into the machine. The construction and mode of operation of a suitable controlling means for this purpose are illustrated particularly in Figs. 3, 4, 5, 8 and 9. The main element of this controlling means is a controller proper adapted to be actuated directly by frictional contact with the surface of an entering sheet. Preferably this controller is a pivoted element, such as the sector 42, secured to a rock-shaft, 43, mounted in a long bearing, 44, in a rock-frame 45, on the guide rod 38 before described. This rock-frame and the sector 42 and the shaft 43 carried thereby are intended to have a limited movement toward and from the surface of a sheet entering the machine, this limited movement being controlled preferably by a strong coiled spring, such as 46, interposed

between a cheek on an I-bolt, 47, journaled on the shaft 43, and a fixed stop, 48, carried at the rear end of the rod or shaft 38. This I-bolt passes through the stop 48 and is adjustable up and down and is held in place by means of suitable adjusting and check nuts, 49 and 50, this adjustment being for the purpose of locating the working face of the sector in proper relation with the periphery of the lower feed-roll 17 with which said sector coöperates. This adjustment is for the purpose of taking care of sheets or boards of different thickness and assuring the proper coöperation of the sector therewith.

In addition to the movement of the sector just described, it also has another and main movement, *i. e.*, in the direction of the line of feed of the sheet, for the purpose of controlling the movements of the trip-plate. This movement is a swinging one about the axis of the shaft 43, the limits of which movement are indicated in Fig. 4. In said figure it will be seen that at its upper end the sector has a stop-face, 42′, which coöperates with a stop, 51, which is also preferably adjustable in order that the throw of the sector may be varied within limits. The stop 51 shown herein is a screw-threaded one which may be held in any desired adjusted position by means of a nut, 52. The sector 42 as here shown has a long curved slot, 53, therein to permit it to straddle the shaft of the upper feed-roll 16 and coöperate properly with the lower feed-roll. It also has a working face, 54, which is substantially an arc of a circle struck from the axis of the shaft 43, and a prolongation, 55, of said working face which is not defined by an arc struck from said center, this prolongation being so shaped as not to come into feed relation with the surface of a board passing through the feed-rolls. The sector, 42, as illustrated, also has an extension or arm, 56, pivotally connected at its free end to one end of a link, 57, as by means of a headed pin, 58, engaging said link through a slot 60 therein (see Fig. 4) and carrying near its point a washer, 59, held in place by a cotter-pin, the connected end of the link being disposed between this washer and the adjacent cheek of a rounded bearing portion of the extension 56, as clearly shown in Fig. 5. At its opposite end said link 57 is pivotally connected to the free end of a rock-arm, 61, secured to a rock-shaft, 62, mounted in suitable supports including a pair of bracket arms, 64, depending from a sleeve, 65, on the rod or shaft, 38, as shown in Figs. 5 and 7. The construction and arrangement of these parts is such that the shaft 62 is rocked through the linkage just described by the sector 42 whenever said sector swings about its axis in the shaft 43. Such a swinging movement will take place both on the feeding of a sheet, such as S, (see Fig. 4) into the machine, and on the release of the sector 42 from said sheet when the sheet in its advance emerges from the pass between the sector and the feed-roll 17. In one case, that is, on the feeding of the sheet, the sector, the operated linkage and the rock-shaft 62 move in one direction, which is the direction determined by the advance of the sector in frictional contact with the sheet; while in the other case, that is, on the release of the sheet, all of these parts move in the opposite direction, which is the direction determined by the return stroke of the sector to its normal position. In Fig. 4, the dotted lines show the normal position of the sector and the full lines show the position of the sector when it is substantially at the end of its effective or forward movement in frictional contact with the sheet.

The controller or sector 42 constitutes the primary controlling element of the controlling mechanism for governing the movements of the trip-plate 32 before described. The connected linkage and rock-shaft constitute the movement-transmitting portion of this controlling mechanism. The terminal member of the controlling mechanism is actuated by these movement-transmitting devices for governing the movements of the trip-plate. It is here shown as a finger, such as 66 carried at the lower end of a substantially Y-shaped swinging arm, 67, pivotally mounted on a pivot-pin, such as 69, carried in the ends of a pair of rock-arms, 68, secured to the rock-shaft 62 between the bracket arms 64 (see Figs. 3, 4, 5, 7 and 8). This construction gives a long bearing for the depending finger 66 and also positions it very positively for operation in its predetermined path. It will be noticed that the upper portion of the member 67 is of relatively great length as compared with the depending finger 66, which in consequence is substantially rigid and has practically no movement except about or with its pivot 69. The various positions which this finger 66 assumes at the principal points in its cycle of operations are clearly shown in Figs. 4 and 8, to which and to Figs. 5, 6, 7 and 9, reference will now more particularly be made.

The normal position of the finger and its supporting rock-arms, that is, the position occupied by these parts at the moment a sheet begins to advance the sector 42 by frictional contact therewith, is clearly shown in full lines in Fig. 3 and in dotted lines in Fig. 8. At this time the lower end of the finger is in position to engage a portion of the trip-plate and shift said trip-plate forward with a diagonal movement determined by the oblique slots 41 to its working or sheet-supporting position. The position of the trip-plate at the beginning of this forward move-

ment, that is, the position it occupies when it is not advanced to support a sheet, is clearly shown in full lines in Figs. 5 and 7, and is also shown in dotted lines in Fig. 9. At this time the finger 66 is in the position indicated by dotted lines in Figs. 8 and 9. At such time it will be seen that the forward side of the finger is in contact with a wall, 71, of the trip-plate, this being the front wall of an opening in which said finger 66 works. The rear wall of this opening is preferably tapered and is indicated at 72. It is intended to coöperate with the rear side of the finger 66. It will be seen that the wall 72 is of much greater length than the wall 71 and in the construction illustrated it will also be noted that the opening 73 in the trip-plate is of different widths measured in the direction of the length of the trip-plate, the wider portion being at the rear of the trip-plate and its front wall being that indicated at 74. The connecting wall between the walls 71 and 74 of the trip-plate opening 73 is designated by 75.

With the parts in the positions just described, when a sheet enters the pass between the feed-rolls 16 and 17, and, by frictional engagement with the surface 54 of the sector 42 swings the latter from the dotted line position shown in Fig. 4 toward the full line position in said view, the finger 66, then in engagement with the wall 71 of the trip-plate, contacts at its upper side with a stop-face 70 in fixed relation with the rock-shaft 62 and is swung by the rock-arms 68 on said shaft from the dotted line position shown in Fig. 8 toward the full line position in said view, which position it reaches when the sector arrives at a predetermined point in its advance with the sheet. The sector throughout its further movement in contact with the sheet holds these parts, including the finger 66, in the full line position shown in Figs. 8 and 9, that is to say, it holds the trip-plate, 32, which has been advanced to the forward limit of its working stroke by this movement of the sector, in position for receiving and supporting one edge of the sheet advancing from the primary scoring mechanism. The trip-plate will remain in this position and will be held there positively because of the frictional contact of the sector with the sheet until the sheet passes beyond the feed-rolls 16 and 17. It should be noted here that as the trip-plate reaches the limit of its forward or working stroke, where it is in position for supporting an advancing sheet, the wall 71 passes beyond the edge of the actuating finger 66 and the latter enters the wide part of the opening 73 opposite the wall 74, as shown in Figs. 8 and 9. At this time the sheet just fed into position for delivery to the secondary scoring mechanism is supported at its edge on the trip-plate 32. On its passage beyond the feed-rolls the return movement of the trip-plate controlling means to its normal position will begin. The sector 42, the connected linkage, and all other parts of the controlling means, including the finger 66, will return under gravity to their normal positions, the finger 66 dropping into contact with the table 19 as indicated by the dot-and-dash lines in Fig. 8. The finger 66 will then be, as just stated, in contact with the table 19 and will also be in position to be operated upon by the reciprocating feed device 27. This feed device is intended in the present construction to coöperate at its right-hand or forward end with the depending finger 66, when the feed device is at the proper point in its movement, for the purpose of returning said finger to its normal position, that is, from the position shown by dot-and-dash lines in Fig. 8 to the position shown by dotted lines in the same view. In order to do this said feed device, in the present machine, has at its extreme right-hand end an actuator or cam face of considerable length in the direction of movement of said feed device, this cam being indicated at 76. It is so positioned that on the rearward or return stroke of the feed device this cam face comes into contact with the forward side of the lower end of the depending finger 66 and, with a gradual movement, but nevertheless quickly, returns said finger to its normal position shown in dotted lines in Figs. 8 and 9. At the same time it causes the engaged trip-plate to be shifted to release the last sheet fed through the machine and permits said sheet to drop down onto the table 19 into the path of the feed device, for delivery to the secondary scoring mechanism on the next forward stroke of said feed device. This releasing movement or backward stroke of the trip-plate is due to the engagement of the depending finger 66 with the rear wall 72 of the opening 73 in the trip-plate, during said return movement of the finger, which acts to positively shift said plate backwardly with a diagonal movement to its sheet releasing position. At the end of this movement the trip-plate is restored to its normal dotted line position shown in Figs. 8 and 9 and the finger 66 is in the narrow part of the opening in the trip-plate.

As soon as the feed device reaches the limit of its rearward stroke, by which time the finger 66 will be in its normal dotted line position as shown in said views and the trip-plate will have released the board supported by it, said feed device will be in readiness to feed said board to the secondary scoring mechanism, which feed movement will thereupon be brought about by

such forward movement of the feed device. The stroke of the reciprocating feed device 27 being a relatively short one, the board supported on the table will be quickly delivered to the secondary scoring and feeding mechanism and said board will be passed through them and onto the delivery side of the machine in the usual manner.

It will be noted that the cross-bar 33 supporting the trip-plate 32 is provided with an under-cut groove 33′ which, with the trip-plate in advanced position as shown in Fig. 6, forms with said trip-plate a three-walled guide which performs the function of properly locating the edge of the sheet in its travel along the trip-plate and also prevents buckling of the sheet.

Most of the other features of the machine are or may be of well-known construction and the operation of them will be understood without referring to them in detail.

What we claim is:—

1. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other at a predetermined time, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

2. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a pair of feed-rolls between the primary scoring mechanism and said table, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other in the passage of the sheet between said feed-rolls, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

3. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means to its operative position at a predetermined time, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

4. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a pair of feed-rolls between the primary scoring mechanism and said table, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means to its operative position in the passage of the sheet between said feed-rolls, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

5. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means governing the moving of said sheet-supporting means to release the supported edge of the sheet at a predetermined time, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

6. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a pair of feed-rolls between the primary scoring mechanism and said table, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means governing the moving of said sheet-

supporting means to release the supported edge of the sheet after the rear end thereof has passed beyond said feed-rolls, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

7. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other at a predetermined time, said controlling means embodying a pivoted frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet.

8. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other at a predetermined time, said controlling means embodying a pivoted frictionally-operated sector adapted to be engaged and actuated by the surface of the advancing sheet.

9. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other at a predetermined time, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet and also embodying means for normally returning said controller to one of its positions.

10. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other at a predetermined time, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet and also embodying means for normally pressing said controller into contact with said sheet.

11. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, sheet-supporting means for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device and being movable to and from said sheet-supporting position, and sheet-operated controlling means for moving said sheet-supporting means from one of its positions to the other at a predetermined time, said controlling means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet and also embodying means for normally pressing said controller into contact with said sheet and for normally returning said controller to one of its positions.

12. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device, and means for shifting said sheet-support into and out of operative or sheet-supporting position, said means embodying a frictionally-operated controller adapted to be engaged and actuated by the surface of the advancing sheet and released by the rear end thereof and governing both the shifting of the sheet-support to its operative or sheet-supporting position and its return to its inoperative or sheet-releasing position.

13. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above

the path of said feed device, and means for shifting said sheet-support into and out of operative or sheet-supporting position, said means embodying a frictionally operated controller adapted to be engaged and actuated by the surface of the advancing sheet and released by the rear end thereof and also embodying an actuator carried by said feed device, said controller governing the shifting of the sheet-support to its operative or sheet-supporting position and also governing conjointly with said actuator the return of the sheet-support to its inoperative or sheet releasing position.

14. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device, and means for shifting said sheet-support into and out of operative position, said means embodying two main instrumentalities, one of which instrumentalities is a controlling means having a primary sheet-operated element and a terminal element for shifting the sheet-support to its operative or sheet-supporting position, and the other of which instrumentalities is an actuator carried by the feed device and operative for actuating said terminal element of the controlling means to return the sheet-support to its inoperative or sheet-releasing position.

15. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device, and means for shifting said sheet-support into and out of operative position, said means embodying two main instrumentalities, one of which instrumentalities is a controlling means having a primary sheet-operated element and a depending terminal finger movable with said primary element for shifting the sheet-support to its operative or sheet-supporting position and having an independent return movement, and the other of which instrumentalities is an actuator carried by the feed device and operative for actuating said finger to return the sheet-support to its inoperative or sheet-releasing position.

16. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device, and means for positively shifting said sheet-support into and out of operative or sheet-supporting position, said means embodying an actuator carried by said reciprocatory feed device for shifting the sheet-support to its inoperative or sheet-releasing position on the return stroke of said feed device.

17. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device, and means for positively shifting said sheet-support into and out of operative or sheet-supporting position, said means embodying an actuator in fixed relation with the reciprocatory feed device for shifting the sheet-support to its inoperative or sheet-releasing position on the return stroke of said feed device.

18. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a table between the same, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said feed device, and means for positively shifting said sheet-support into and out of operative or sheet-supporting position, said means embodying an actuating cam in fixed relation with the reciprocatory feed device for shifting the sheet-support to its inoperative or sheet-releasing position on the return stroke of said feed device.

19. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed-table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed-table, a sheet-support movable from a sheet-supporting to a sheet-releasing position and vice versa in a path diagonal to the line of feed of the sheet through the primary scoring mechanism, and means for positively reciprocating the sheet-support in said diagonal path said means including an actuator movable in said line of feed of the sheet through the primary scoring mechanism.

20. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed-table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed-table, a fixed support over said feed-table, a trip-plate mounted on said sup-

port for reciprocation toward and from the secondary scoring mechanism from a sheet-supporting to a sheet-releasing position and vice versa, and means for reciprocating said trip-plate.

21. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed-table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed-table, a support over said feed-table and having an undercut guideway for receiving and confining one edge of a sheet delivered from the primary scoring mechanism, a trip-plate movable across the bottom of said undercut guideway from a sheet-supporting to a sheet-releasing position and vice versa, and means for reciprocating said trip-plate.

22. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed-table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed-table, a pivoted sector having a working face adapted to be engaged and actuated by the surface of a sheet passing through said feeding means, a rock-shaft connected with said sector for operation thereby, a depending finger operated by said rock-shaft, a trip-plate movable from a sheet-supporting to a sheet-releasing position and vice versa and operatively related to said finger for operation thereby to one of said positions, and means for returning said trip-plate to the other of said positions.

23. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed-table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed-table, a pivoted sector having a working face adapted to be engaged and actuated by the surface of a sheet passing through said feeding means, a rock-shaft connected with said sector for operation thereby, a depending finger operated by said rock-shaft and also movable independently thereof, a trip-plate movable from a sheet-supporting to a sheet-releasing position and vice versa and operatively related to said finger for operation thereby, and means for returning said trip-plate to the other of said positions and for also returning said finger to its normal position by a movement independent of the movement of said rock-shaft.

24. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed-table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed-table, a pivoted sector having a working face adapted to be engaged and actuated by the surface of a sheet passing through said feeding means, a rock-shaft connected with said sector for operation thereby, a depending finger operated by said rock-shaft, a trip-plate movable from a sheet-supporting to a sheet-releasing position and vice versa, and operatively related to said finger for operation thereby, and means for returning said trip-plate to the other of said positions said means embodying a reciprocatory feed device having a cam movable in a path into which said finger projects and operative for returning said finger to its normal position.

25. In a machine of the class described, the combination of primary and secondary scoring mechanisms, a feed table between the same, means for feeding a sheet through the primary scoring mechanism and onto said feed table, a reciprocatory feed device for feeding a sheet to the secondary scoring mechanism, a sheet-support for receiving one edge of a sheet fed from the primary scoring mechanism and supporting said edge above the path of said reciprocatory feed device, means operated by a sheet being fed to said feed table to positively shift the sheet-support to sheet-supporting position, and means for subsequently shifting said sheet-support to sheet-releasing position.

Signed at Rochester, in the county of Monroe, and State of New York, this 21st day of Oct. A. D. 1912.

HENRY DE SMITH.
CHARLES R. SEYMOUR.

Witnesses:
F. A. Collins, Jr.,
H. W. Speares.