

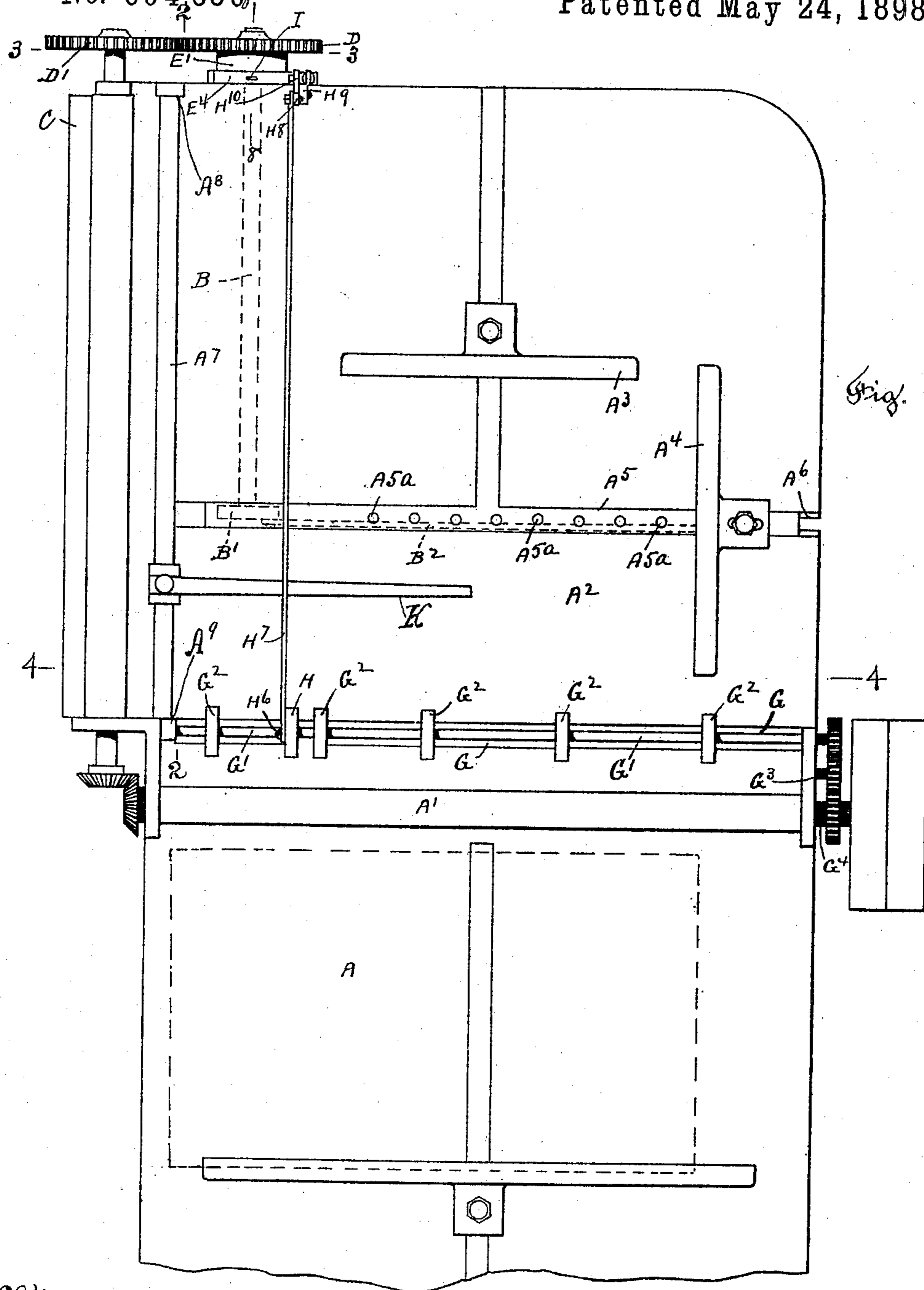
(No Model.)

2 Sheets—Sheet 1.

C. W. HOBBS.  
MACHINE FOR SCORING CARDBOARD.

No. 604,530

Patented May 24, 1898.



Witnesses  
A. W. Whitings.  
Emma Kester.

By his Attorney

Inventor  
Clarence W. Hobbs

Rufus B. Fowler

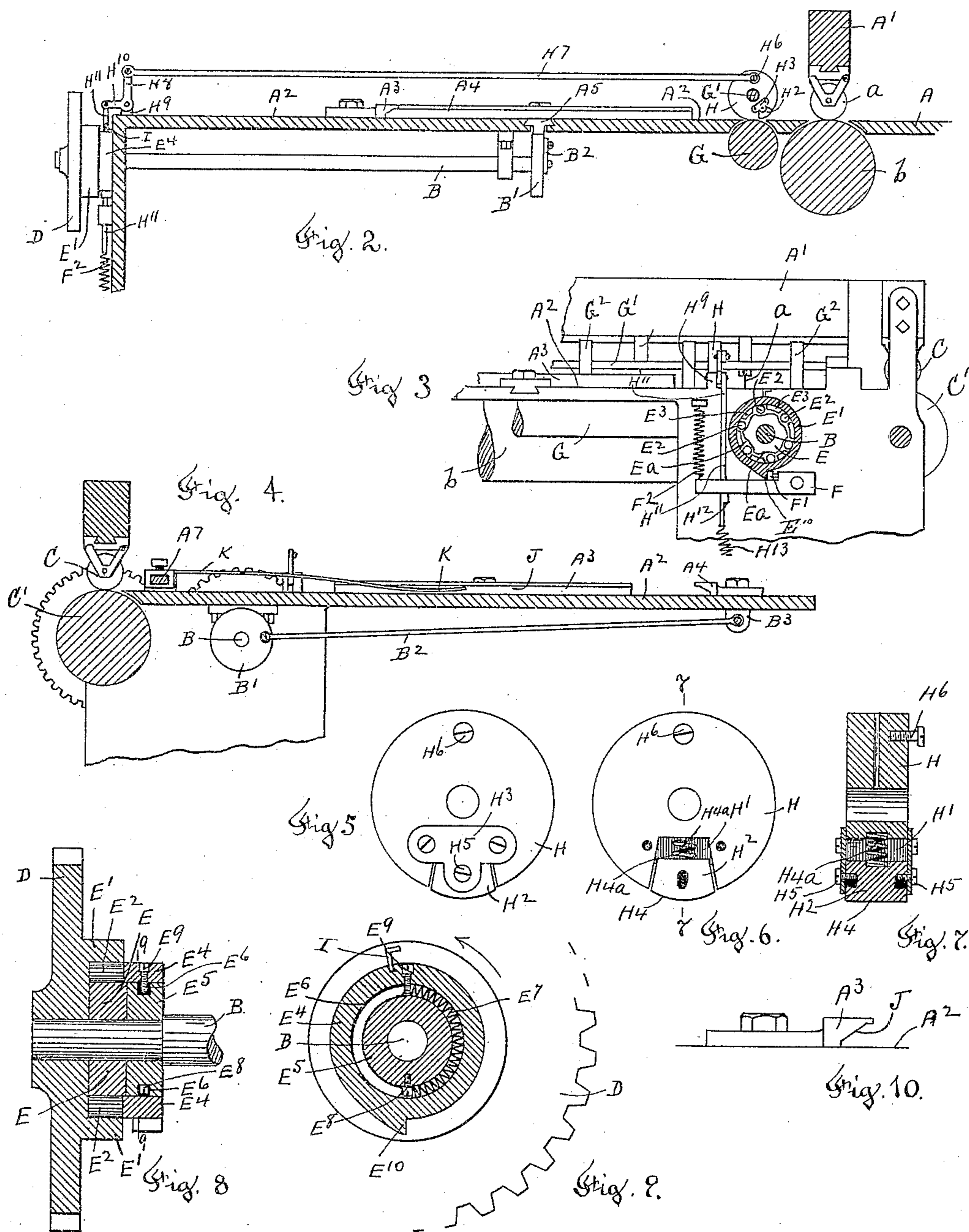
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# UNITED STATES PATENT OFFICE.

CLARENCE W. HOBBS, OF WORCESTER, MASSACHUSETTS.

## MACHINE FOR SCORING CARDBOARD.

SPECIFICATION forming part of Letters Patent No. 604,530, dated May 24, 1898.

Application filed August 19, 1893. Serial No. 483,586. (No model.)

*To all whom it may concern:*

Be it known that I, CLARENCE W. HOBBS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Machines for Scoring Cardboard, reference being had to the accompanying drawings, forming a part of the same, in which—

Figure 1 denotes a top view of the machine, a portion of the feeding-table having been broken away. Fig. 2 is a sectional view of a portion of the machine represented on line 2 2, Fig. 1. Fig. 3 is a sectional view of a portion of the machine shown on line 3 3, Fig. 1. Fig. 4 is a sectional view on line 4 4, Fig. 1. Fig. 5 is a side view of the tripping-wheel, which is engaged and rotated by a passing sheet of cardboard for the purpose of setting in motion the pushing mechanism by which the sheet of cardboard is carried to the second scoring-roll. Fig. 6 is a side view of the tripping-wheel with one of the retaining-plates removed. Fig. 7 is a central sectional view of the tripping-wheel on line 7 7, Fig. 6. Fig. 8 is a central sectional view on line 8 8, Fig. 1. Fig. 9 is a sectional view on line 9 9, Fig. 8; and Fig. 10 is a side view of the stop-plate A<sup>3</sup>, showing its overhanging beveled face.

Similar letters refer to similar parts in the different figures.

My invention relates to an improvement in a card-scoring machine embracing two sets of scoring-knives adapted to score the cardboard in two directions at right angles to each other by means of a single passage of the cardboard through the machine; and my present invention has for its object to provide means by which the cardboard after passing the first set of scoring-knives will be automatically fed to the second set of scoring-knives; and it consists in the mechanism hereinafter described, and specifically pointed out in the annexed claims.

Referring to the accompanying drawings, A represents the table upon which the cardboard is presented to the first set of scoring-knives *a*, carried upon the under side of the transverse bar A'. After the cardboard passes between the scoring-knives *a* and the roller *b*, Fig. 2, it is delivered upon the top of the

second scoring-table A<sup>2</sup>, lying in the same horizontal plane.

A<sup>3</sup> represents an adjustable stop upon the table A<sup>2</sup>, and A<sup>4</sup> denotes a pushing-plate adjustably attached to a slide A<sup>5</sup>, sliding in ways A<sup>6</sup> upon the table A<sup>2</sup>. The slide A<sup>5</sup> is provided with a series of holes A<sup>5a</sup> to permit the adjustment of the pushing-plate A<sup>4</sup>.

A<sup>7</sup> denotes a bar supported at one end by a stand A<sup>8</sup> and at the opposite end by a bracket A<sup>9</sup>, said bar being placed a short distance above the surface of the table and immediately in front of and parallel with the second scoring mechanism. The bar A<sup>7</sup> serves as a guide for one edge of the advancing sheet of cardboard as it is fed forward upon the table A<sup>2</sup> and holds the edge of the cardboard upon the table so it will properly enter the second scoring mechanism.

Journaled in suitable bearings beneath the table A<sup>2</sup> is a shaft B, carrying upon one end a crank-plate B', connected by a pitman-rod B<sup>2</sup> with a lug B<sup>3</sup>, depending from the under side of the slide A<sup>5</sup>, so that by a single rotation of the crank-plate B' the pushing-plate A<sup>4</sup> is given a reciprocating movement over the surface of the table A<sup>2</sup> toward the second scoring mechanism, its forward motion pushing the sheet of cardboard lying upon the table A<sup>2</sup> forward, so as to be seized by the cutting-knives C and roll C' of the second scoring mechanism.

The shaft B is connected by a clutching device with a gear D, which is driven by a gear D' on the shaft of the roll C'. The clutch by which the gear D is connected with the shaft B may be of any known form of clutching mechanism suitable for the purpose, that represented in the drawings consisting of a collar E, attached to the shaft B and inclosed within a hollow hub E' on the side of the gear D.

In the annular space between the collar E and the inner wall of the hub E' are a series of rolls E<sup>2</sup>, separated by fingers E<sup>3</sup>, projecting from the side of a ring E<sup>4</sup>, capable of turning about a collar E<sup>5</sup>, attached to the shaft B. The collar E<sup>5</sup> is provided with an annular groove E<sup>6</sup>, within which is placed a spiral compression-spring E<sup>7</sup>, acting against a screw E<sup>8</sup>, held in the collar E<sup>5</sup>, and a screw E<sup>9</sup>, held in the ring E<sup>4</sup>, with its tension applied to ro-

tate the ring  $E^4$  around the collar  $E^5$  in the direction of the arrow, Fig. 9. The collar  $E$  has its face or periphery formed in curved sections  $E^a$ , Fig. 3, slightly eccentric to the axis of the shaft  $B$ , and as the action of the spring  $E^7$  tends to rotate the ring  $E^4$  and fingers  $E^3$  the rolls  $E^2$  will be wedged between the inner wall of the hub  $E'$  and the eccentric faces of the collar  $E$ , causing the rotation of the gear  $D$  to be imparted to the shaft  $B$ .

In order to disengage the clutching mechanism, the ring  $E^4$  is provided with a projecting spur  $E^{10}$ , and immediately below the hub  $E'$ , I hang a pivoted lever  $F$ , provided with a shoulder  $F'$ , which is held in the path of the spur  $E^{10}$  by means of a spring  $F^2$ . The shoulder  $F'$  of the lever  $F$  in its normal position holds the ring  $E^4$  from rotation as actuated by the spiral spring  $E^7$  and prevents the rolls  $E^2$  from being wedged between the hub  $E'$  and collar  $E$ , thereby allowing the gear  $D$  to revolve independently of the shaft  $B$ . If the free end of the lever  $F$  be pushed down, the ring  $E^4$  will be released, allowing the clutching mechanism to be thrown into action and the rotary motion of the gear  $D$  to be imparted to the shaft  $B$  until the lever  $F$  is raised in position to engage the spur  $E^{10}$  and disconnect the gear  $D$  and shaft  $B$ . The clutching mechanism as above described forms no part of my present invention, which relates particularly to the mechanism by which the clutching device is brought into action by the passage of a cardboard upon the table  $A^2$ , causing the pushing-plate  $A^4$  to be automatically moved forward to carry the sheet of cardboard resting upon the table  $A^2$  to the second scoring mechanism. The mechanism by which this result is accomplished consists of a roll  $G$ , journaled immediately behind the first scoring mechanism with its face slightly raised above the surface of the table  $A^2$ .

Above the roll  $G$  and parallel therewith is a shaft  $G'$ , having attached thereto a series of disks  $G^2$ , by which the sheet is fed onto the table  $A^2$ , both shaft  $G'$  and roll  $G$  being driven by intermediate gearing  $G^3$  from the shaft  $G^4$ . Turning loosely upon the shaft  $G'$  is a tripping-wheel  $H$ , recessed at  $H'$  to receive a segment  $H^2$ , which is retained in its place by plates  $H^3$   $H^3$ , allowing a slight radial motion to the segment  $H^2$ , which is forced outward by a spiral spring  $H^{4a}$ , so its face  $H^4$  projects slightly beyond the face of the tripping-wheel  $H$ , its outward motion being limited by the screws  $H^5$ , held in the segment  $H^2$  and passing through slots in the plates  $H^3$ .

The tripping-wheel  $H$  carries a crank-pin  $H^6$ , connected by a pitman-rod  $H^7$  with the vertical arm  $H^8$  of a bell-crank lever pivoted upon a post  $H^9$ . The horizontal arm  $H^{10}$  of the bell-crank lever is pivoted to the upper end of a rod which passes through a hole in the free end of the pivoted lever  $F$ , and is provided with a shoulder  $H^{12}$ , adapted to engage the lever  $F$  as the rod  $H^{11}$  is raised and

depress the lever  $F$  as the rod is drawn down by the action of a spring  $H^{13}$ , which holds the rod  $H^{11}$  and connected tripping-wheel  $H$  in the position shown in Fig. 2, with the spring-actuated segment  $H^2$  just in advance of the roll  $G$ , so that as a sheet of cardboard is passed between the roll  $G$  and tripping-wheel  $H$  it will be caught by the face of the segment  $H^2$ , causing the tripping-wheel  $H$  to rotate in the direction of the arrow 1, Fig. 2, rocking the bell-crank lever and raising the rod  $H^{11}$  until the shoulder  $H^{12}$  engages the lever  $F$ . As soon, however, as the sheet of cardboard has passed between the roll  $G$  and segment  $H^2$  the tension of the spring  $H^{13}$ , which is now free to act, will draw the rod  $H^{11}$  down, depressing the lever  $F$  and releasing the ring  $E^4$ , thereby causing the clutch to connect the gear  $D$  and shaft  $B$ , which begins to rotate, carrying the pushing-plate  $A^4$  forward. As the ring  $E^4$  rotates a projecting pin  $I$  strikes against the rod  $H^{11}$ , pushing the shoulder  $H^{12}$  out of engagement with the lever  $F$ , which is raised by the spring  $F^2$ , so as to bring the lever  $F$  into the path of the spur  $E^{10}$ , thereby checking the rotation of the ring  $E^4$  and again disconnecting the rotating gear  $D$  from the shaft  $B$  at the end of one complete revolution of the shaft, which has carried the pushing-plate  $A^4$  forward and back to the position shown in the drawings.

When thin and limber sheets of cardboard are being scored, it becomes necessary to insure their operative contact with the segment  $H^2$ , and this is secured by the roll  $G$ , and while I prefer to use a roll and to shape the segment  $H^2$  to coöperate therewith in its rolling contact upon the cardboard I do not confine myself to the use of a rolling device, the essential features being a tripping member and means for holding the cardboard in contact therewith during the period required to actuate the tripping member.

The faces of the pushing-plate  $A^4$  and of the stop  $A^3$  are beveled, as shown in Fig. 10 at  $J$ , so the edge of the cardboard sheet, if raised above the surface of the table  $A^2$ , is pushed down by the beveled face  $J$  and held in contact with the surface of the table, while the edge next the second scoring mechanism is held upon the surface of the table by the parallel bar  $A^7$ , and the fourth or rear edge of the cardboard sheet is held in the angle between the roll  $G$  and disks  $G^2$ .

From the stop  $A^7$  an arm  $K$  extends over the center of the cardboard sheet, with its free end raised a short distance above the surface of the table in order to prevent the cardboard from being lifted off the table at its center.

The operation of my improved machine for scoring cardboard is as follows: A sheet of cardboard is laid upon table  $A$  and is pushed along on said table by the attendant until it is engaged by the scoring-knives  $a$  and the roller  $b$ , by which the cardboard is scored in one direction. The action of the roller  $b$  and scoring-knives continues the motion of the

sheet of cardboard forward between a roll G and disks G<sup>2</sup>, attached to the table G', bringing the forward edge of the cardboard into contact with the segment H<sup>2</sup>, carried by the tripping-wheel H, which turns loosely upon the shaft G'. The roll G and disks G<sup>2</sup> engage the sheet of cardboard and act as feed-rolls to continue the movement of the sheet of cardboard and deliver it upon a second table A<sup>2</sup>. The engagement of the roll G and disks G<sup>2</sup> with the forward edge of the cardboard takes place just as the forward edge of the cardboard is brought against the segment H<sup>2</sup>, so that the resistance to the forward movement of the cardboard offered by the segment H<sup>2</sup>, which would tend to buckle the cardboard between the segment H<sup>2</sup> and the scoring-knives a, is counteracted by the action of the roll G and disk G<sup>2</sup>, which, serving as feed-rolls, draw the sheet of cardboard forward. The contact of the cardboard with the segment H<sup>2</sup> rocks the tripping-wheel H and through connecting mechanism raises the rod H<sup>11</sup> until its shoulder H<sup>12</sup> is brought above and into engagement with the lever F. As soon as the sheet of cardboard passes the segment H<sup>2</sup> the tripping-wheel H is released, allowing the spring H<sup>13</sup> to draw the rod H<sup>11</sup> down and depress the lever F, which releases the ring E<sup>4</sup>, thereby connecting the gear D and shaft B, which actuates the reciprocating pusher-plate A<sup>4</sup> and causes it to push the sheet of cardboard which is supported upon the table A<sup>2</sup> forward toward the second scoring mechanism.

My improved scoring-machine comprises, therefore, the following instrumentalities: first, a table No. 1, upon which the cardboard is supported while it is fed to the first scoring mechanism; second, a scoring mechanism No. 1, by which the cardboard is scored in one direction; third, a table No. 2, upon which the cardboard is delivered from the first scoring mechanism and from which it is fed to the second scoring mechanism; fourth, a scoring mechanism No. 2, arranged to score the cardboard at right angles to scoring mechanism No. 1; fifth, an automatic feeding mechanism by which the cardboard is fed from table No. 2 to the second scoring mechanism; sixth, a clutching mechanism by which the automatic feeding mechanism is connected with and disconnected from the driving power; seventh, a clutch-controlling mechanism arranged to be actuated by a sheet of cardboard so that the movement of the cardboard through the machine will cause the automatic feeding mechanism to be connected and disconnected as the sheets of cardboard pass successively onto table No. 2. The clutch-controlling mechanism is located between table No. 1 and table No. 2 and in the path of the sheet of cardboard as it passes from table No. 1 to table No. 2. Table No. 1 therefore serves to support the sheet of cardboard as it is presented to the clutch-controlling mechanism, and the roller b and scoring-knives a serve to feed the cardboard forward

and bring its advancing edge into contact with the clutch-controlling mechanism. The tendency of the cardboard to buckle caused by the resistance of the clutch-controlling mechanism to the forward movement of the cardboard is overcome by the pulling strain caused by the engagement of the roll G and disks G<sup>2</sup> while the cardboard is held up against the segment H<sup>2</sup> of the clutch-controlling mechanism by the pressure of the roll G. As the cardboard advances the segment H<sup>2</sup> is carried out of the path of the cardboard, thereby allowing the cardboard to pass forward upon table No. 2. This result is accomplished in the present instance by carrying the segment H<sup>2</sup> in a tripping-wheel which turns upon the shaft G', causing the segment H<sup>2</sup> to move in the arc of a circle, by which it is carried upward out of the path of the cardboard as it moves forward.

The location of the clutch-controlling mechanism between table No. 1 and table No. 2 causes the moving sheet of cardboard to actuate the clutch-controlling mechanism during its passage from table No. 1 to table No. 2, so that when the sheet of cardboard is supported upon table No. 2 and in position to be fed to the second scoring mechanism it has entirely completed its action upon the clutch-controlling mechanism. The cardboard is fed to the machine usually in large sheets, which are frequently thin and limber, and therefore means are necessary to control the cardboard in its contact with the clutch-controlling mechanism and also to relieve it of strain or pressure while it is supported upon table No. 2 in position to be fed to the second scoring mechanism.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a machine for scoring cardboard, the combination of a scoring mechanism, a table from which a sheet of cardboard is fed to said scoring mechanism, an automatic feeding mechanism by which the cardboard is fed to said scoring mechanism, a clutching mechanism by which said feeding mechanism is connected with the driving power, a clutch-controlling mechanism arranged in the path of the cardboard and adapted to be actuated thereby, and a table upon which the cardboard is supported as it is presented to said clutch-controlling mechanism, substantially as described.

2. In a machine for scoring cardboard, the combination of two tables for successively supporting the sheet of cardboard, a scoring mechanism, a feeding mechanism by which the sheet of cardboard is fed from the second of said tables to said scoring mechanism, a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, and a clutch-controlling mechanism located between said tables and arranged to be actuated by the sheet of cardboard as it passes from the first to the second table, substantially as described.

3. In a machine for scoring cardboard, the combination of two tables for successively supporting the sheet of cardboard, a feeding mechanism for feeding the sheet of cardboard from the second of said tables, a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, a clutch-controlling mechanism located between said tables and arranged to be actuated by the sheet of cardboard as it passes from the first to the second of said tables, and comprising a tripping member capable of being carried out of the path of the cardboard, substantially as described.

4. In a machine for scoring cardboard, the combination with a feeding mechanism and a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, of a clutch-controlling mechanism arranged to be actuated by the sheet of cardboard and comprising a tripping member and rolls for engaging the cardboard as it strikes said tripping member, substantially as described.

5. In a machine for scoring cardboard, the combination with the scoring mechanism, a feeding mechanism by which a sheet of cardboard is fed to said scoring mechanism, a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, means for automatically disengaging said clutching mechanism at the end of the feeding movement, means for engaging said clutching mechanism with the driving power, consisting of a tripping member adapted to be moved in one direction by the advancing edge of the cardboard and be held from reverse movement by the contact of the cardboard, means for reversing the motion of said tripping member after the cardboard has passed and means for operatively connecting said tripping member with said clutching mechanism whereby said feeding mechanism is set in motion upon the reverse movement of said tripping member, substantially as described.

6. In a machine for scoring cardboard the combination of a scoring mechanism, a table upon which a cardboard is fed to said scoring mechanism, a feeding mechanism, a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, means for automatically disengaging said clutching mechanism at the end of the feeding movement, means for engaging said clutching mechanism with the driving power, consisting of a tripping member pivoted above the surface of the table and arranged to be rocked about an axis parallel with the surface of the table by the advancing edge of the cardboard and arranged to be held from reverse movement by the contact of the cardboard, means for reversing the motion of said tripping member and connected mechanism by which the reverse motion of said tripping member is made to engage said clutching mechanism immediately

after the cardboard has passed beneath said tripping member, and means for moving the cardboard beneath said tripping member, substantially as described.

7. In a machine for scoring cardboard, the combination with a scoring mechanism, a table upon which a sheet of cardboard is fed to said scoring mechanism, rolls by which the cardboard is carried upon said table, a feeding mechanism by which the cardboard is fed to said scoring mechanism, a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, means for automatically disengaging said clutching mechanism at the end of the feeding movement and means for engaging said clutching mechanism with the driving power consisting of a tripping member which is moved in one direction by the advancing edge of the cardboard, a spring by which the motion of said tripping member is reversed, means for operatively connecting said tripping member with said clutching mechanism whereby said clutching mechanism is thrown into action by the reverse movement of said tripping member, substantially as described.

8. In a machine for scoring cardboard, the combination with a feeding mechanism and a clutching mechanism by which said feeding mechanism is operatively connected with the driving power, of a clutch-controlling mechanism arranged to be actuated by the sheet of cardboard and comprising a tripping member, and means for holding the cardboard against said tripping member, substantially as described.

9. In a machine for scoring cardboard, the combination with mechanism for scoring a sheet of cardboard, of a tripping-wheel arranged to be actuated by the passage of a sheet of cardboard beneath it, and feeding mechanism for pushing the cardboard toward the scoring mechanism, clutching mechanism by which said feeding mechanism is connected with the driving power, said clutching mechanism being operatively connected with said tripping-wheel, substantially as described.

10. In a machine for scoring cardboard, the combination with mechanism for scoring the sheet of cardboard, feeding mechanism for pushing the sheet toward the scoring mechanism, and clutching mechanism by which said feeding mechanism is connected with the driving power, of a tripping-wheel provided with a projecting segment placed in the path of the sheet of cardboard, by which said tripping-wheel is oscillated, said tripping-wheel and said clutching mechanism being operatively connected, whereby the oscillation of said tripping-wheel will bring said clutching mechanism into action, substantially as described.

11. In a machine for scoring cardboard, the combination with a pair of scoring mechanisms placed at right angles to each other and with an intervening table, of a feeding mech-

anism sliding upon the surface of said table and clutching mechanism by which said feeding mechanism is connected with the driving power, of a roll G, shaft G', tripping-wheel H, turning loosely on said shaft and provided with a projecting segment, arranged to be engaged by a passing sheet of cardboard, said tripping-wheel and said clutching mechanism being operatively connected, substantially as described.

12. The combination with the table A<sup>2</sup>, and scoring mechanism comprising the roll C' and knives C, of a roll G, shaft G', tripping-wheel H, turning loosely on said shaft, spring-actuated segment acting conjointly with said roll to engage a passing sheet of cardboard, a pushing-plate, a rotating crank connected with said pushing-plate, and a clutching device by which said crank is connected with the driving power, said clutching device being operatively connected with said tripping-wheel H, whereby the passage of a sheet of cardboard will cause said tripping-wheel to oscillate and bring said clutching device into action, substantially as described.

13. In a machine for scoring cardboard, the combination with scoring mechanism and feeding mechanism for feeding a sheet of cardboard thereto, of an oscillating tripping-wheel H operatively connected with said feeding mechanism, said tripping-wheel having a recess H', a radially-sliding segment H<sup>2</sup> held in said recess, guide-plates H<sup>3</sup> and a spring H<sup>4a</sup> by which said plate is pressed outward, substantially as described.

14. In a machine for scoring cardboard, the combination with a table A<sup>2</sup>, and scoring mechanism placed at one side of said table, of a bar

A<sup>7</sup> held in a fixed position slightly above the surface of said table and parallel with and adjacent to said scoring mechanism with a clear space beneath said bar to receive a sheet of cardboard, feeding mechanism by which a sheet of cardboard is fed upon said table A<sup>2</sup> in a line parallel with, and beneath said bar, and a pusher-plate capable of a reciprocating motion at right angles to said bar, by which the sheet of cardboard is moved transversely to said bar and toward said scoring mechanism.

15. In a machine for scoring cardboard, the combination with a scoring mechanism of a receiving-table A' upon which the sheet of cardboard is fed to said scoring mechanism, a table A<sup>2</sup> upon which the scored sheet is delivered from said scoring mechanism, a feeding mechanism consisting of the roll G, shaft G' and disks G<sup>2</sup> attached to said shaft placed behind the scoring mechanism by which the sheet of cardboard is fed upon the table A<sup>2</sup>, after it has left the scoring mechanism, a second scoring mechanism by which the sheet of cardboard is cross-scored, a reciprocating pushing-plate by which the sheet of cardboard is moved on table A<sup>2</sup> toward said second scoring mechanism, means for actuating said reciprocating pushing-plate comprising a clutching mechanism and a tripping-wheel H mounted upon said shaft G' operatively connected with said clutching mechanism, substantially as described.

Dated this 5th day of July, 1893.

CLARENCE W. HOBBS.

Witnesses:

RUFUS B. FOWLER,  
EMMA KESTER.