

No. 847,325.

PATENTED MAR. 19, 1907.

A. J. FARMER.
MACHINE FOR ATTACHING SHEETS OF PAPER TOGETHER.

APPLICATION FILED JULY 19, 1906.

3 SHEETS—SHEET 1.

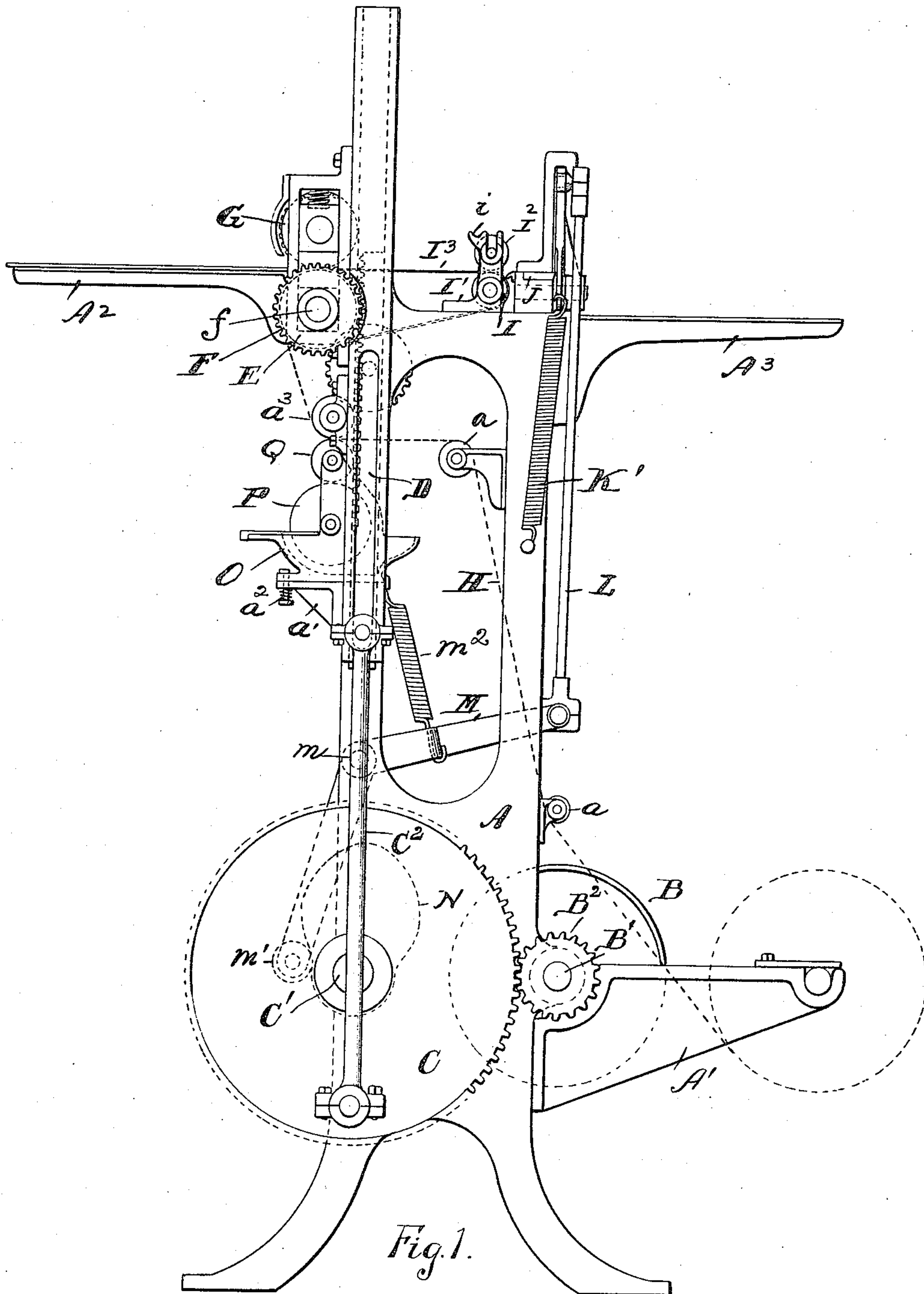


Fig. 1.

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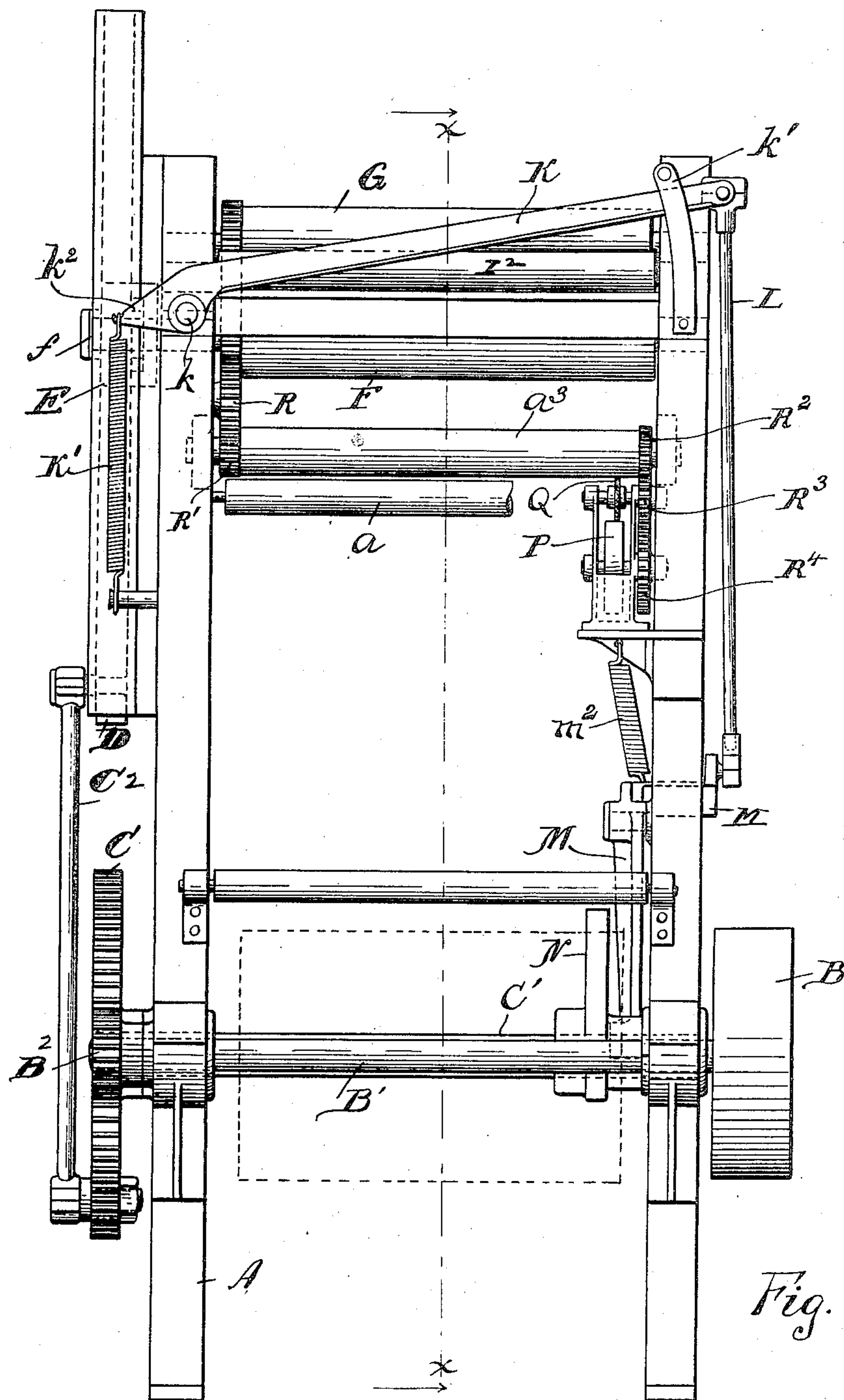


Fig. 2.

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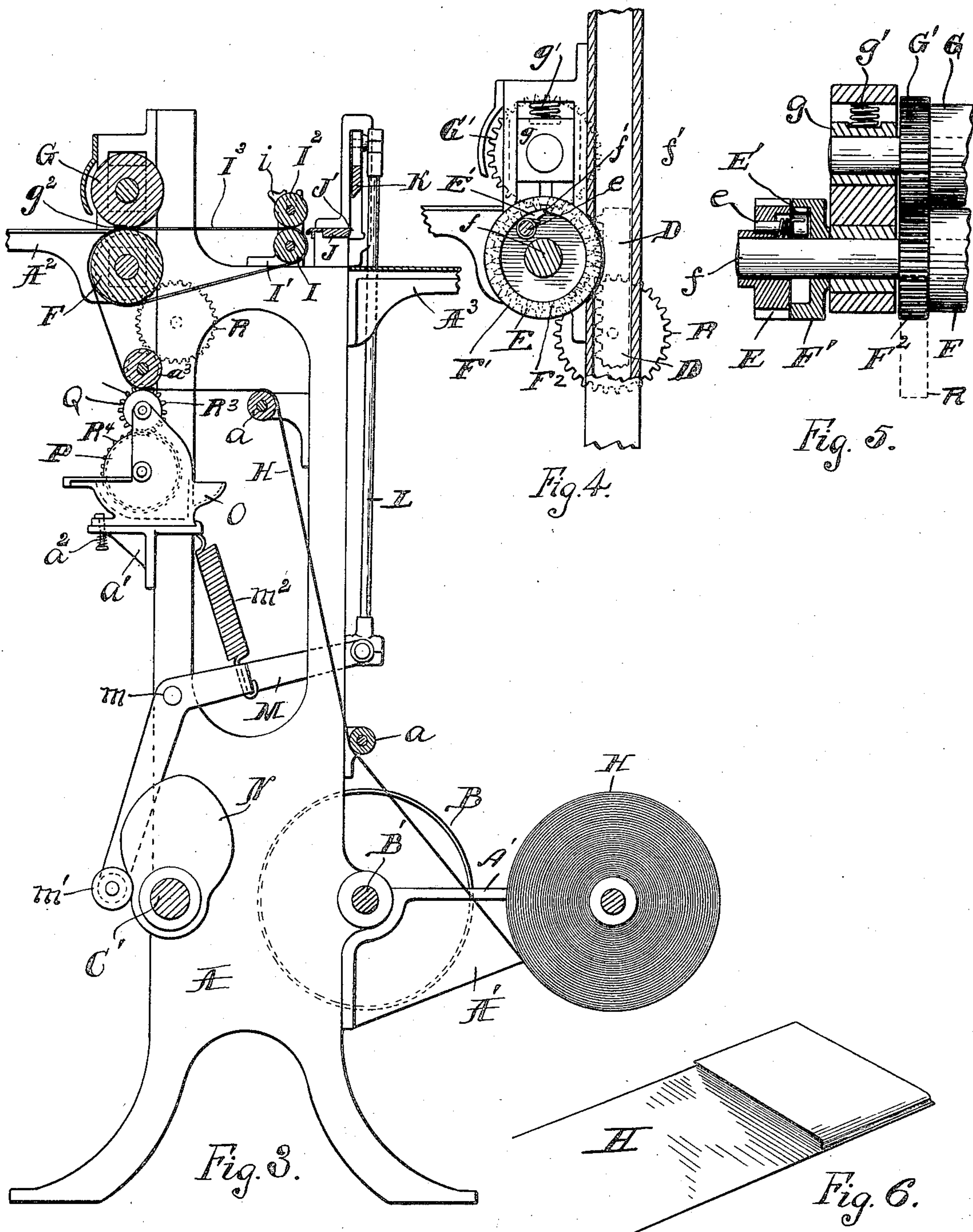
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ARTHUR J. FARMER, OF DETROIT, MICHIGAN.

MACHINE FOR ATTACHING SHEETS OF PAPER TOGETHER.

No. 847,325.

Specification of Letters Patent.

Patented March 19, 1907.

Application filed July 19, 1906. Serial No. 326,868.

To all whom it may concern:

Be it known that I, ARTHUR J. FARMER, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Machines for Attaching Sheets of Paper Together; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to an improvement in machines designed to secure together sheets of paper by automatically applying an adhesive substance along their edges while passing through the machine, the construction being such that one of the sheets may be a continuous roll, afterward severed into sheets corresponding in size with that of the sheets of paper attached thereto.

Referring to the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a rear elevation. Fig. 3 is a vertical cross-sectional view on line xx of Fig. 2 looking in the direction of the arrow. Fig. 4 is a detail view of the clutch mechanism controlling the feed-rolls. Fig. 5 is a sectional view of the same. Fig. 6 is a perspective view of the ribbon of paper, showing a sheet attached to one edge as it would appear before being separated from the roll of paper by the cutting-knife.

The object of my invention is to construct a machine capable of attaching together sheets of paper along one of their edges by an adhesive substance automatically applied to the paper as it travels through the machine, the construction being such that the paper is cut into sheets of predetermined size before being discharged from the machine. The uses to which these attached sheets of paper are put demand that one of the sheets shall be relatively lighter or more transparent than the other, and in designing this machine it has been determined that the lighter or more transparent paper should be in the form of a continuous ribbon or roll, while the heavier or more opaque paper is preferably in the form of cut sheets of a size corresponding with that into which the ribbon of paper is cut before being discharged from the machine. It is apparent, however, that both the opaque and transparent papers may be continuous rolls to be cut into sheets of predetermined size before being discharged by the machine.

Referring to the letters of reference shown in the drawings, A denotes the frame of the machine, and B a driving-pulley mounted on the shaft B', journaled in bearings supported in the frame A.

B² is a pinion mounted on the shaft B', meshing with the driving-gear C on the shaft C', also journaled in the frame A.

C² is a pitman connecting the driving-gear C with a reciprocating rack-bar D, traveling in suitable guides.

E is a gear loosely mounted on a shaft f of the feed-roll F.

E' is a spring-actuated dog supported on a short shaft e in the gear E.

F' is the sleeve of a clutch keyed on the shaft f and provided with a shoulder f' , with which the spring-actuated dog E' engages when the rack-bar D, meshing with the gear E, moves downward.

G is another feed-roll located directly above the roll F and mounted in adjustable bearings g , supported in the frame of the machine, which are forced to the limit of their movement by the springs g' .

g^2 denotes a shoulder formed in the roll G, serving as an abutment or guide against which the edges of the loose sheets are placed before being pasted to the ribbon of paper H as they are fed through the machine. F² is a gear on the roll F, which, meshing with the gear G' on the roll G, drives the latter.

I is a roll journaled in the bracket I', supported in the frame of the machine, and I² is a removable roll mounted above the roll I and likewise supported in said bracket.

I³ is a belt passing around the roll I and driven by the roll F, serving as a support for the paper and means whereby the auxiliary rolls I and I² are operated.

i are arms in the bracket I' to support the roll I² when it is desired to lift the latter out of contact with the roll I.

J is a support for the paper as it passes from the auxiliary feed-rolls I and I², and J' is a shearing edge for the knife K, pivoted at k in the frame of the machine.

L is a pitman connecting the swinging end of the knife K to the rocking arm or bell-crank lever M, pivoted at m in the frame.

k' is a sleeve secured to the frame of the machine in which the swinging end of the knife travels.

K' is a spring one end of which engages the projecting end k^2 of the knife, while the other is secured to a stud on the frame of the

machine, the object being to lift the knife to the limit of its upward movement after operating the blade.

N is a cam mounted on the shaft C', serving to operate the rocking arm M' by contacting with the friction-roll m' on its lower end.

m^2 is a spring one end of which engages the frame and the other the rocking arm M' to assist in holding the friction-roll m' in contact with the cam N.

A' is a bracket secured in the frame of the machine and supporting the roll of paper H, and a a are idlers around which the ribbon of paper passes on its way to the feed-rolls F and G.

O is a well to receive a suitable liquid adhesive substance mounted on a bracket a' , supported by the frame of the machine.

a^2 is a locking-bolt mounted in the bracket a' to secure the fountain or well to the bracket.

P is a feed-roll mounted on a shaft journaled in the walls of the fountain O to convey the liquid adhesive to the gumming-wheel Q.

a^3 is a guide-roll around which the paper passes on its way to the feed-rolls, which also serve to bring the paper in contact with the gumming-roll Q.

R R' R² R³ R⁴ are a train of gears driven by the gear F², which operates the guide-roll a^3 , the gumming-wheel Q, and the feed-roll P.

A² is a feed-table, and A³ is a delivery-table, both of which are secured to the frame of the machine.

The operation of the machine will be readily understood. The roll of paper H having been mounted in the bracket A', the end of the ribbon of paper is threaded around the idlers a a , between the gumming-roll Q and the guide-roll a^3 , between the feed-rolls G and F, along the belt I², and between the auxiliary feed-rolls I and I² to a point on a line with the cutting edge J'. The loose sheets to be attached to the ribbon of paper are laid on the delivery-table A³ and fed manually sheet by sheet to the feed-rolls F and G, the shoulder g^2 of the feed-roll G serving as an abutment or guide against which the sheet is forced. The machine having been put in operation, the rack-bar D, which is reciprocated by means of the pitman C² engaging with the driving-gear C, travels upward, causing the gear E to rotate. This gear, being loosely mounted on the shaft f of the feed-roll F, causes the spring-actuated dog E', secured thereto, to travel within the clutch-sleeve F' until the dog rides over the shoulder f'' , formed in the sleeve. This movement is so timed that the rack-bar has now reached the limit of its upward travel, while the shoulder g^2 of the feed-roll G has been brought to the position shown in Fig. 3 of the drawings. The spring-dog having engaged the sleeve F', which is keyed to the

shaft f , the rack-bar in its downward movement causes the clutch to rotate the gear F², which in turn, meshing with the gear G', operates the roll G in like manner. As the roll G rotates the circular portion of its periphery immediately following the shoulder g^2 engages the loose sheet between it and the roll F, gripping and feeding it forward to the auxiliary feed-rolls, through which the sheets pass to the cutting-knife K. At this point the knife K, operated by means of the bell-crank lever M, controlled in turn by the cam N, forces the knife downward, severing the sheets from the ribbon of paper and delivering them upon the table A³. As the paper passes around the guide-roll a^3 the gumming-wheel fed from the well O applies along its edge the liquid adhesive, by which the loose sheet is attached to the ribbon of paper.

The operation of the machine just described clearly sets forth the method of attaching the sheets of paper together, and a further description of the latter will be unnecessary.

Having thus described my invention, what I claim is—

1. In a machine of the class described, a frame, main feed-rolls, auxiliary feed-rolls, a gumming-roll, a knife pivoted at one end to the frame, a reciprocating rack-bar coöperating with one of the main feed-rolls, an operative connection between the main feed-rolls, a shaft, a gear upon the shaft, means for operating the shaft and its gear, a pitman connecting the gear and rack-bar, and means operated by said shaft to operate the knife.

2. In a machine of the class described, a frame, main feed-rolls, auxiliary feed-rolls, a gumming-roll, a knife pivoted at one end to the frame, a reciprocating rack-bar coöperating with one of the main feed-rolls, an operative connection between the main feed-rolls, a shaft, a gear upon the shaft, means for operating the shaft and its gear, a pitman connecting the gear and rack-bar, a rock-arm, a pitman connected to the free end of the knife and to one end of said rock-arm, a cam mounted upon said shaft to rock the rock-arm and to operate said knife.

3. In a machine of the character described, a frame, feed-rolls, a gumming-roll over which the paper to be coated is passed, the gumming material being applied to the edge of the paper, a knife pivoted upon the frame, a shaft, a gear upon the shaft, a rack-bar coöperating with the feed-rolls, a pitman connection between the rack-bar and gear, a rock-arm, a pitman having connection with the rock-arm and knife, and a cam upon said shaft to operate the rock-arm and knife.

4. In a machine of the character described, a frame, feed-rolls, a shoulder in one roll and a clutch mechanism associated with the other roll to coöperate with the said shoulder, a gear carried by the said roll, a shaft, a gear

mounted upon said shaft, a reciprocating rack-bar for mesh with the gear of the said second roll, a pitman connection between the second-mentioned gear and said rack-bar, and means for operating the second gear to reciprocate the rack-bar and operate the feed-rolls.

5. In a machine of the character described, a frame, feed-rolls, a shoulder in one roll and a clutch mechanism associated with the other roll to cooperate with the said shoulder, a gumming mechanism, a gear carried by the said roll, a shaft, a gear mounted upon said shaft, a reciprocating rack-bar for mesh with the gear of the said second roll, a pitman connection between the second-mentioned gear and said rack-bar, and means for operating the second gear to reciprocate the rack-bar and operate the feed-rolls.

6. In a machine of the character described, a frame, feed-rolls, a shoulder in one roll and a clutch mechanism associated with the other roll to cooperate with the said shoulder, a gumming mechanism, a gear carried by the said roll, a shaft, a gear mounted upon said shaft, a reciprocating rack-bar for mesh with the gear of the said second roll, a pitman connection between the second-mentioned gear and said rack-bar, means for operating the second gear to reciprocate the rack-bar and operate the feed-rolls, a pivoted knife, a spring-controlled rock-arm carrying a friction-wheel at one end, a pitman connection between the knife and one end of the rock-arm, and a cam mounted upon the second shaft to engage the friction-wheel of the rock-arm to rock the latter to operate the knife.

7. In a machine of the character described, a frame, feed-rolls, a gumming-roll over which the paper to be coated along one edge is passed, a pivoted knife, a spring having connection with the knife at one end, a spring-controlled rock-arm, means carried by the frame to rock the arm, and a connection between the rock-arm and knife to operate the latter against the action of its spring.

8. In a machine of the character described, a frame, feed-rolls, one of the rolls having a shoulder forming a guide, the other roll having a clutch mechanism associated therewith, and means for throwing the clutch mechanism into operation to operate the rolls and to time the movement of said guiding-shoulder for cooperation with the paper fed through the machine.

9. In a machine of the character described, a frame, feed-rolls, one of the rolls having a shoulder forming a guide, the other roll having a clutch mechanism associated therewith, means for throwing the clutch mechanism into operation to operate the rolls and to time the movement of said guiding-shoulder for cooperation with the paper

fed through the machine, a knife, and means for operating the knife.

10. In a machine of the character described, a frame, feed-rolls, one of the rolls having a shoulder forming a guide, the other roll having a clutch mechanism associated therewith, a gumming mechanism, means for throwing the clutch mechanism into operation to operate the rolls and to time the movement of said guiding-shoulder for cooperation with the paper fed through the machine, a knife, and means for operating the knife.

11. In a machine of the character described, a frame, feed-rolls, a gumming mechanism, means for operating the feed-rolls, a spring-controlled cutting-knife, a spring-controlled rock-arm, a connection between the rock-arm and knife and means carried by the frame to rock the arm against the action of its spring to operate the knife against action of the spring of the latter.

12. In a machine of the character described, a frame, feed-rolls, a gumming mechanism, a shaft mounted in the frame, a knife, and means having engagement with said shaft to operate the feed-rolls and knife automatically.

13. In a machine of the class described, a frame, feed-rolls, one of the rolls having a shoulder forming a guide, the other roll having a clutch mechanism associated therewith, means for throwing the clutch mechanism into operation to operate the rolls and to time the movement of said guiding-shoulder for cooperation with the paper fed through the machine, and a gumming mechanism operating upon the paper in its passage through the machine.

14. In a machine of the class described, a frame, feed-rolls, one of the rolls having a shoulder forming a guide, the other roll having a clutch mechanism associated therewith, means for throwing the clutch mechanism into operation to operate the rolls and to time the movement of said guiding-shoulder for cooperation with the paper fed through the machine, auxiliary feed-rolls cooperating with the aforesaid rolls, and a gumming mechanism operating upon the paper in its passage through the machine.

15. In a machine of the class described, a frame, feed-rolls, a gumming mechanism, a knife, a reciprocating element for operating one of the feed-rolls, a cooperative connection between the feed-rolls, a shaft, means for operating the shaft, a connection between the shaft and reciprocating element, and means for operating the knife.

In testimony whereof I sign this specification in the presence of two witnesses.

ARTHUR J. FARMER.

Witnesses:

WALTER J. PILGRIM,
W. J. GENTSCH.