

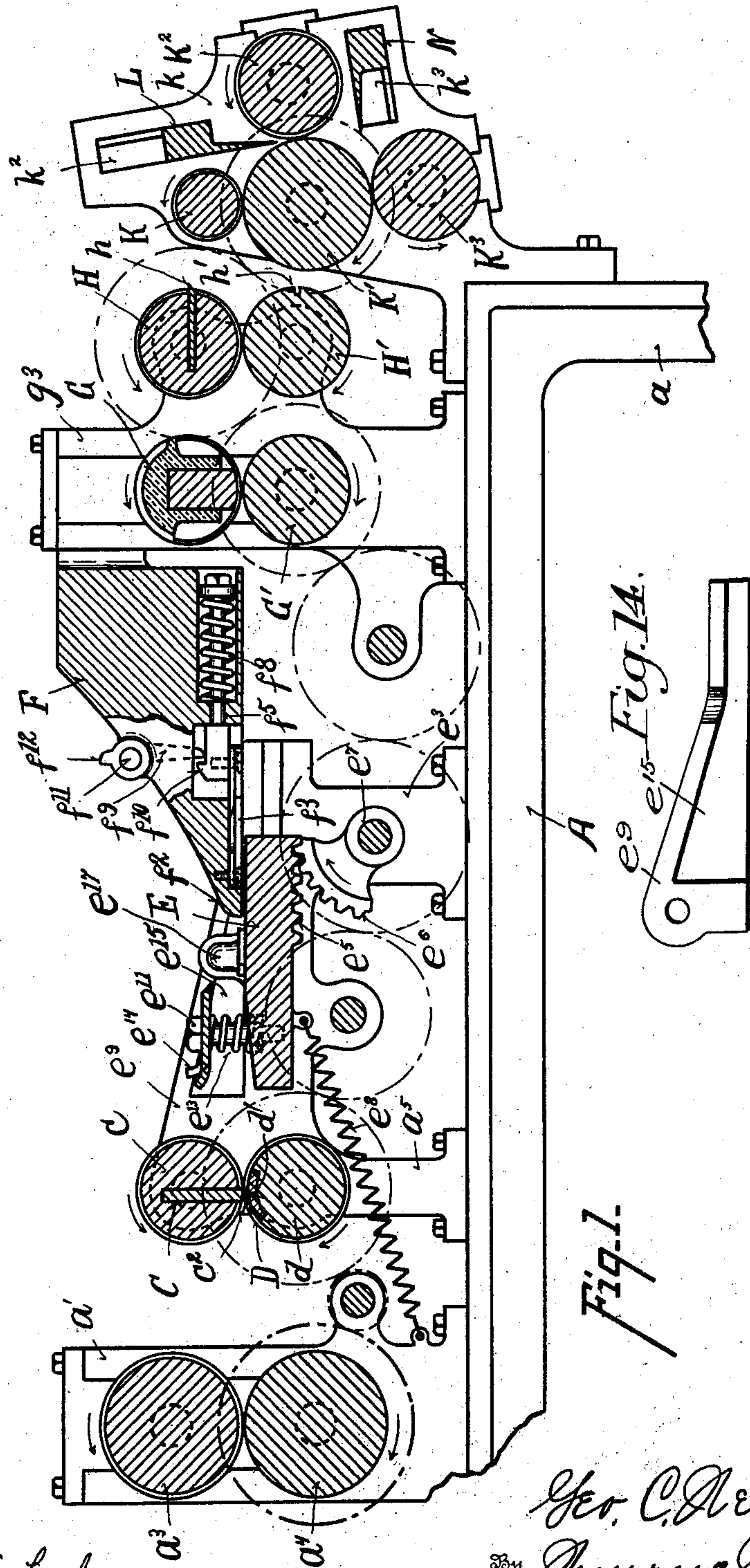
No. 691,795.

Patented Jan. 28, 1902.

G. C. NELSON.
PAPER BAG MACHINE.
(Application filed Sept. 4, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses
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Inventor
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Attorneys

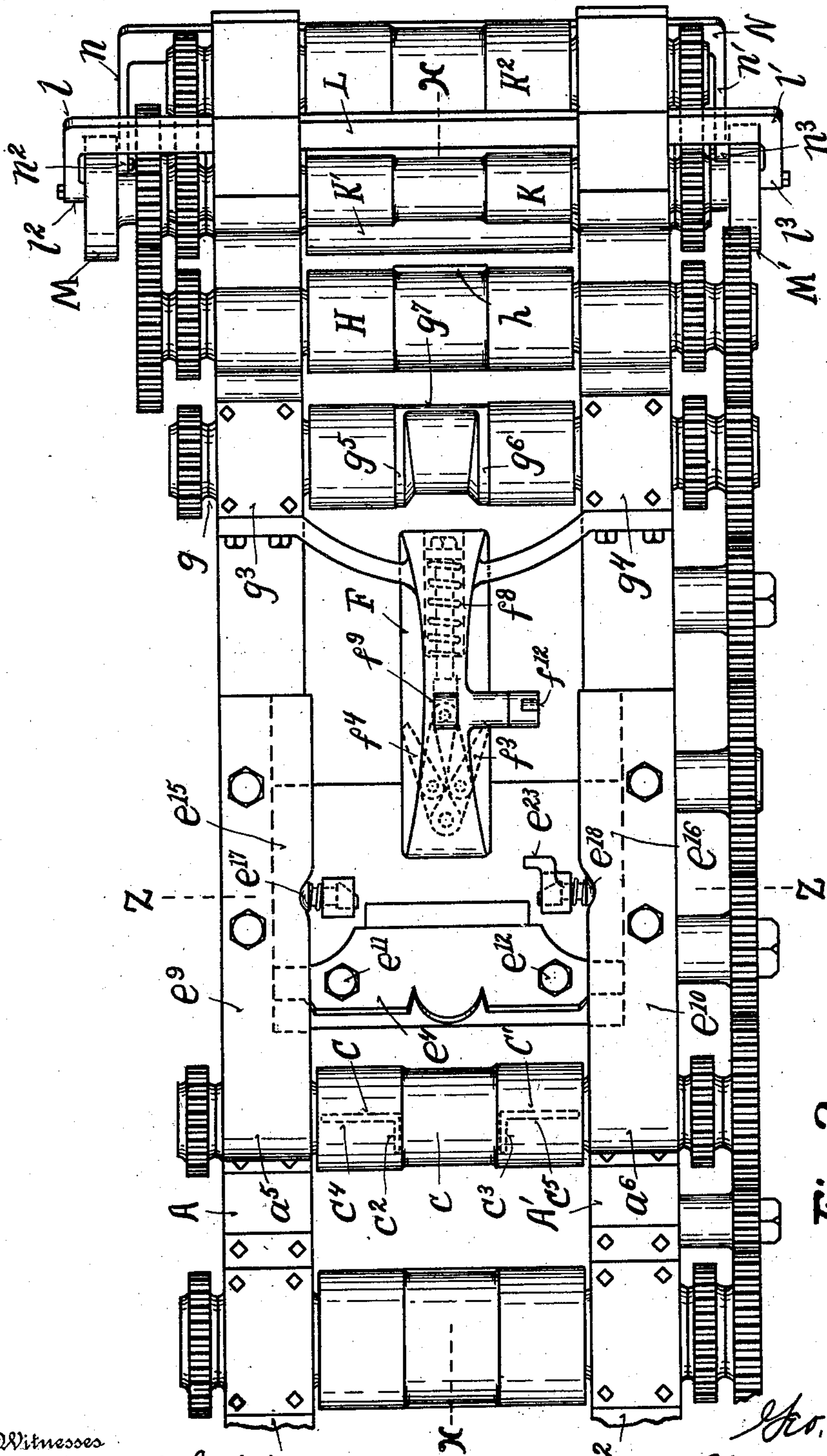
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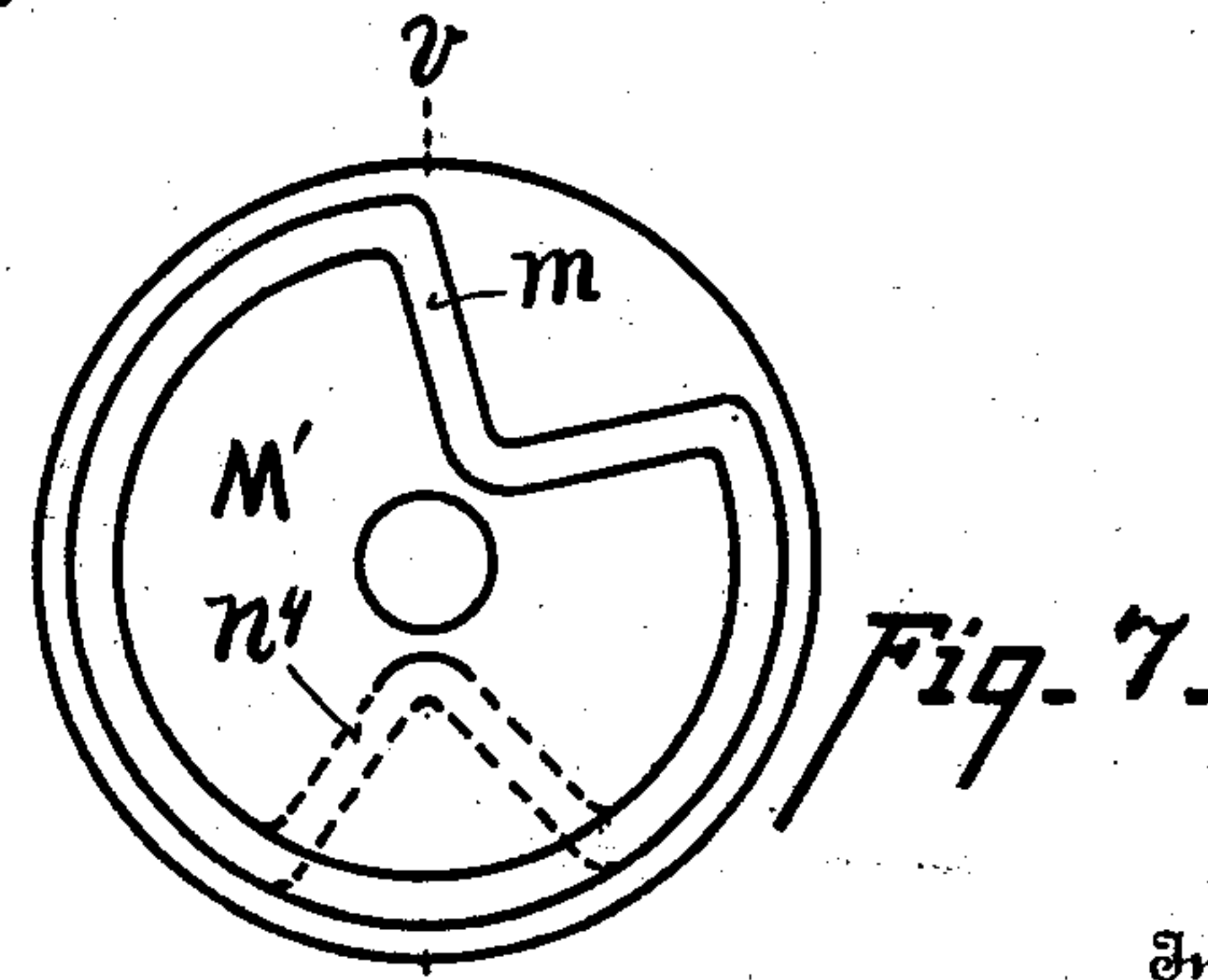
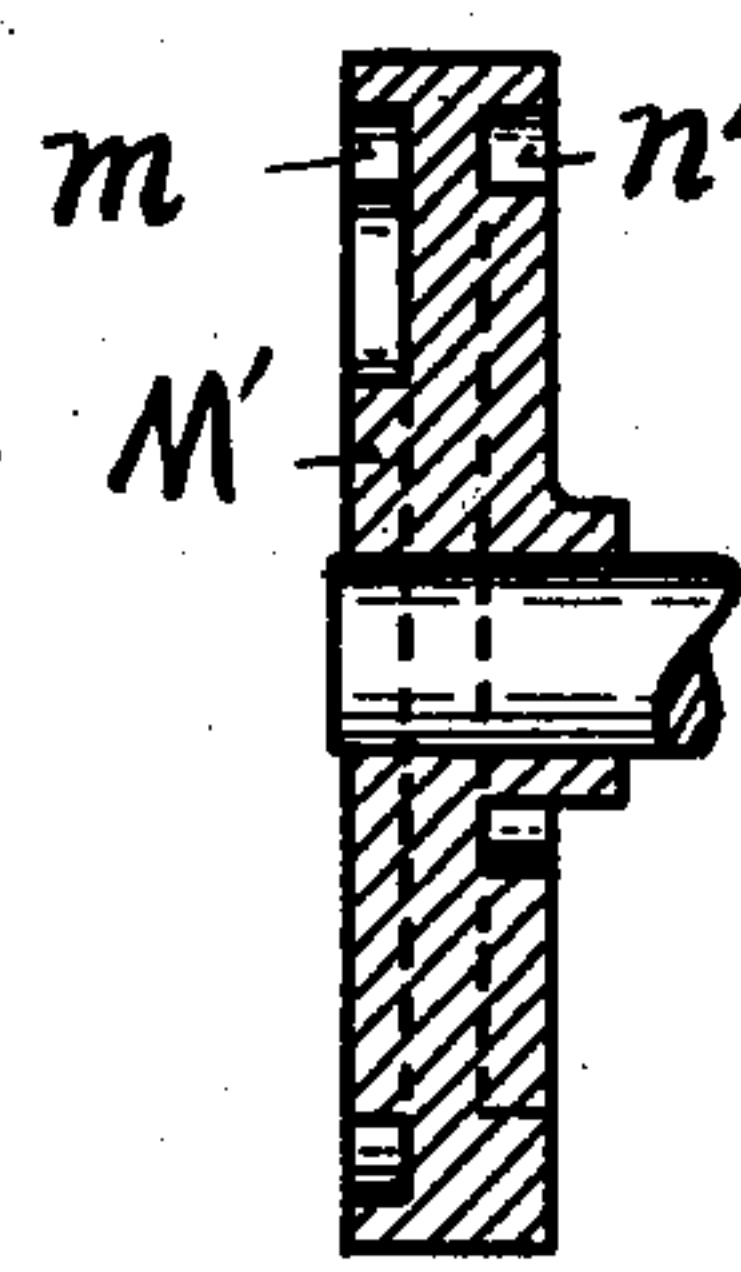
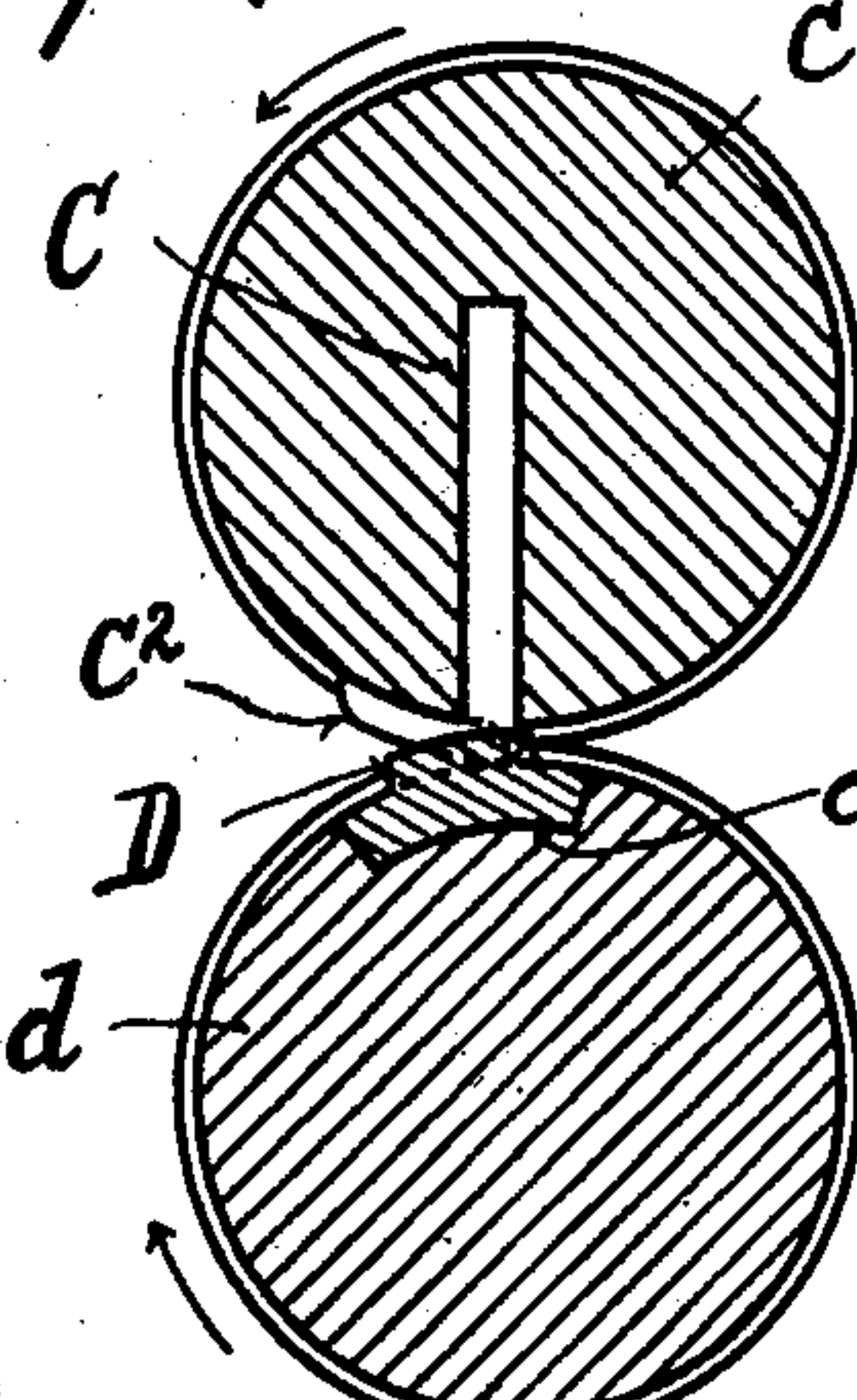
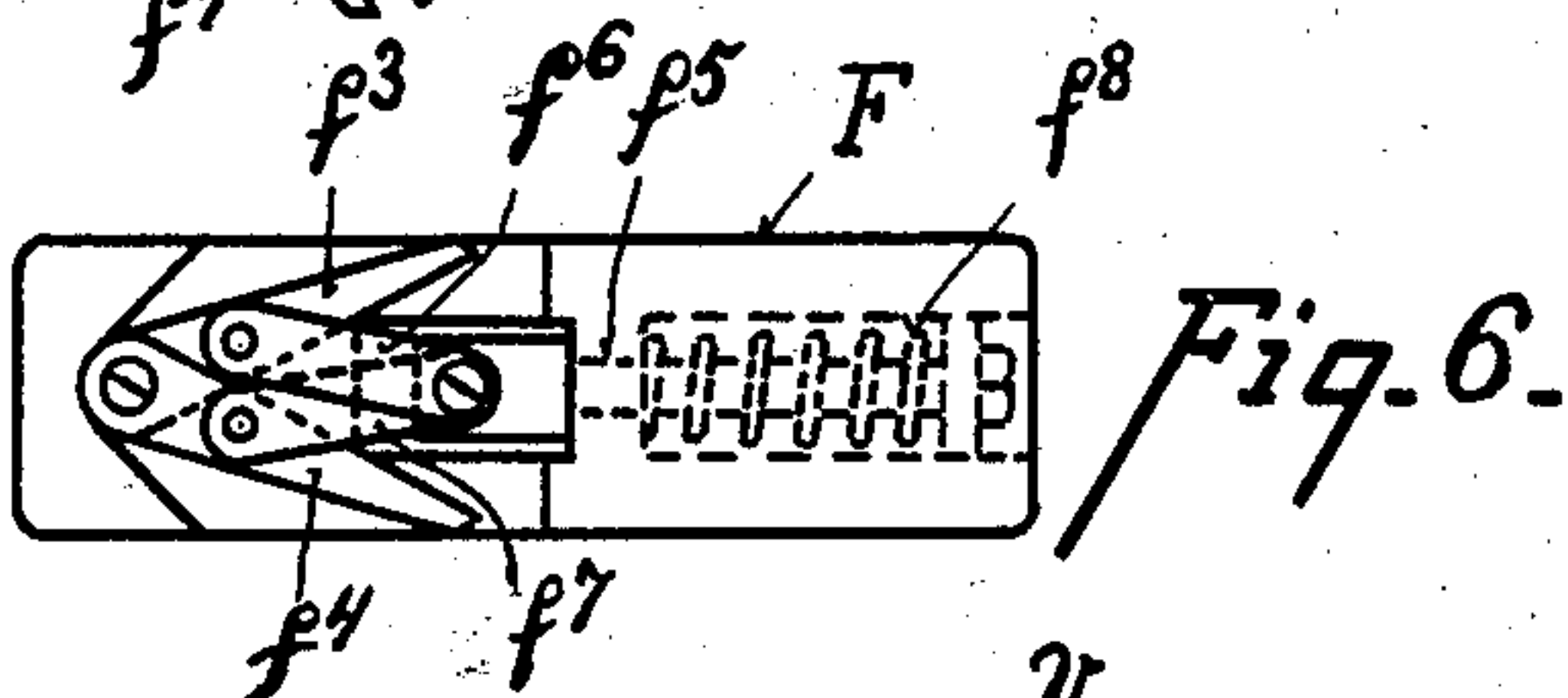
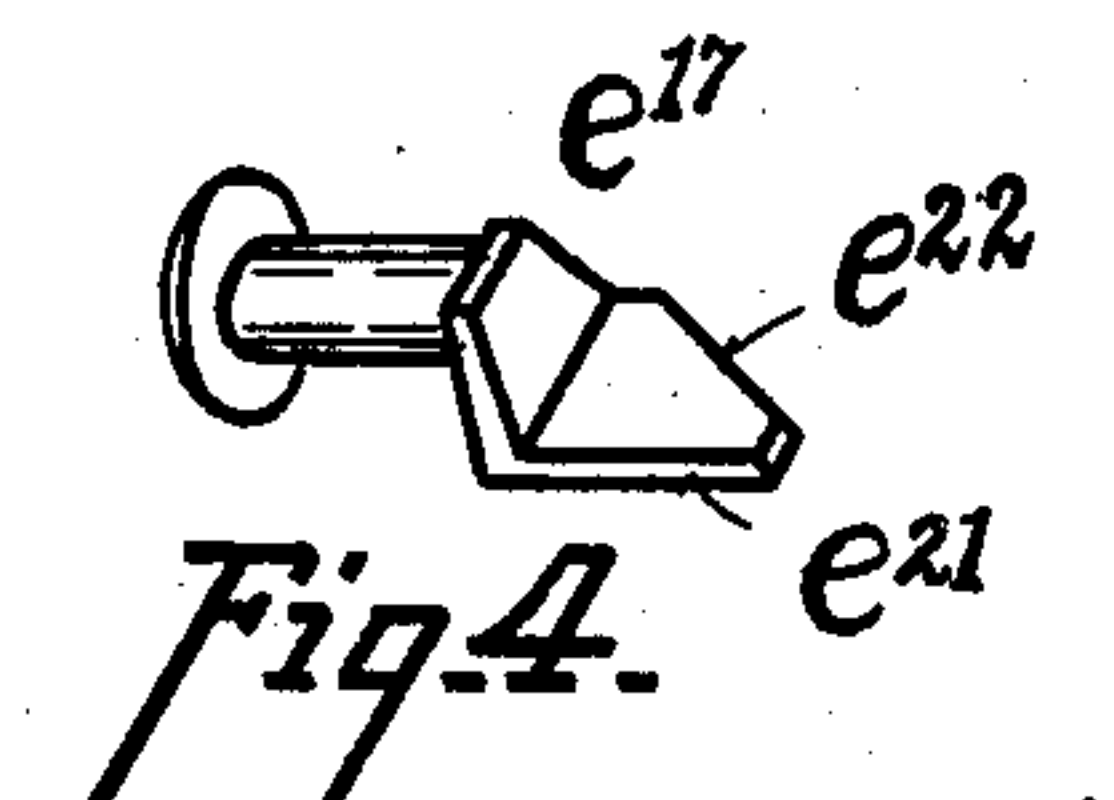
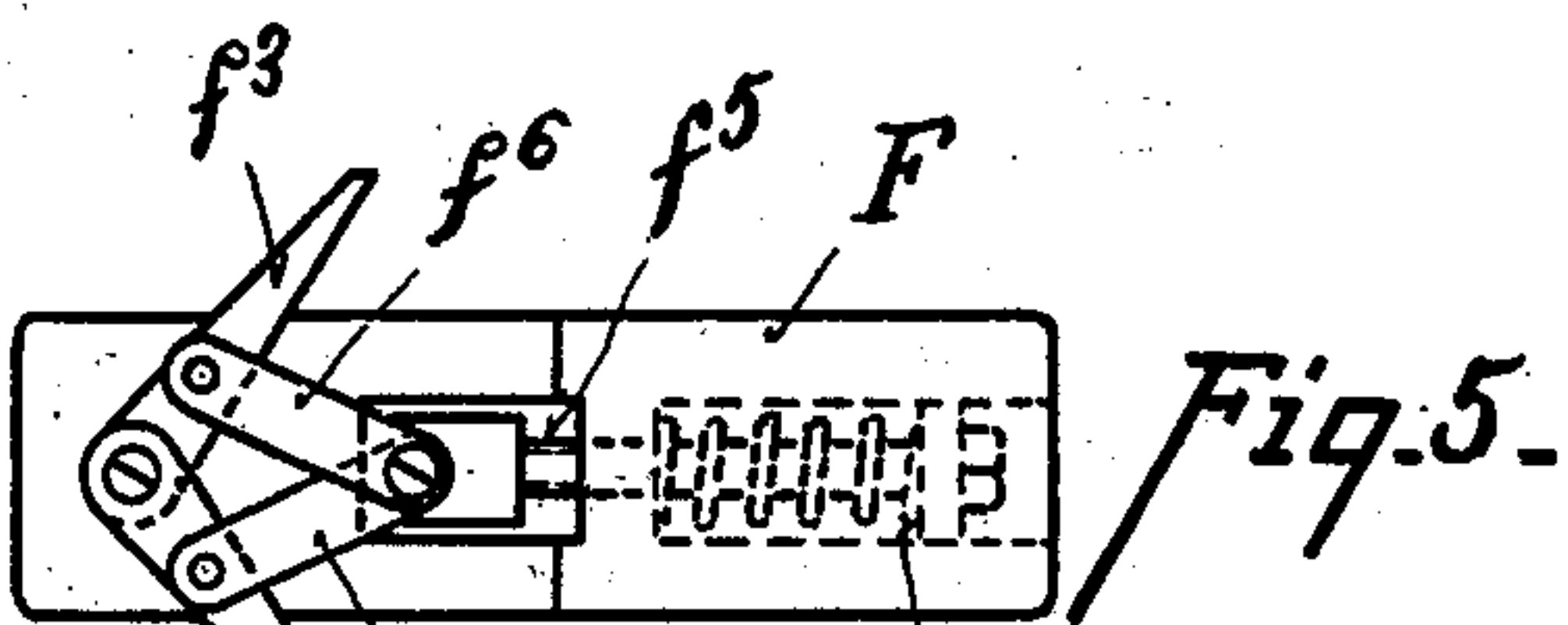
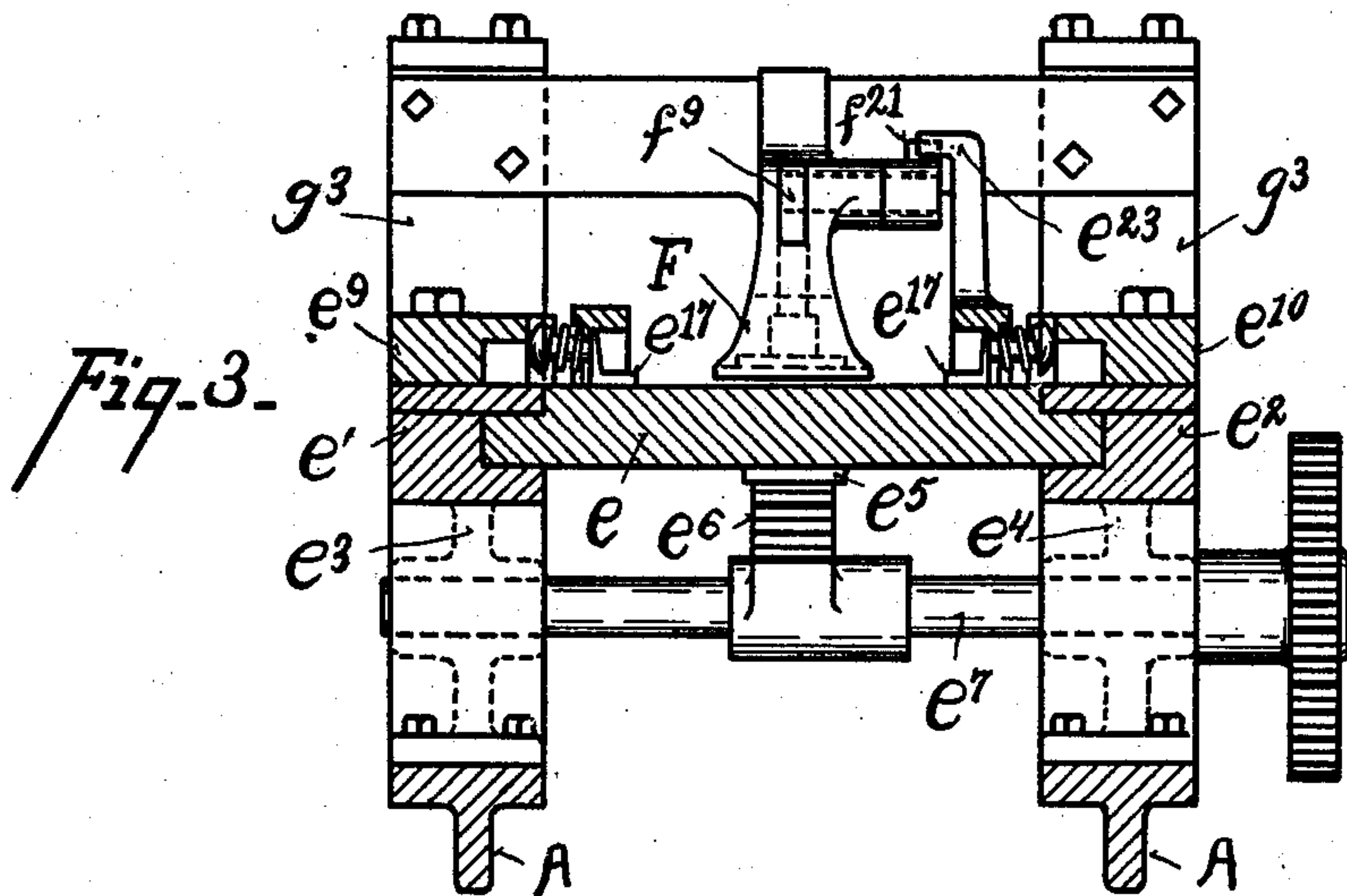
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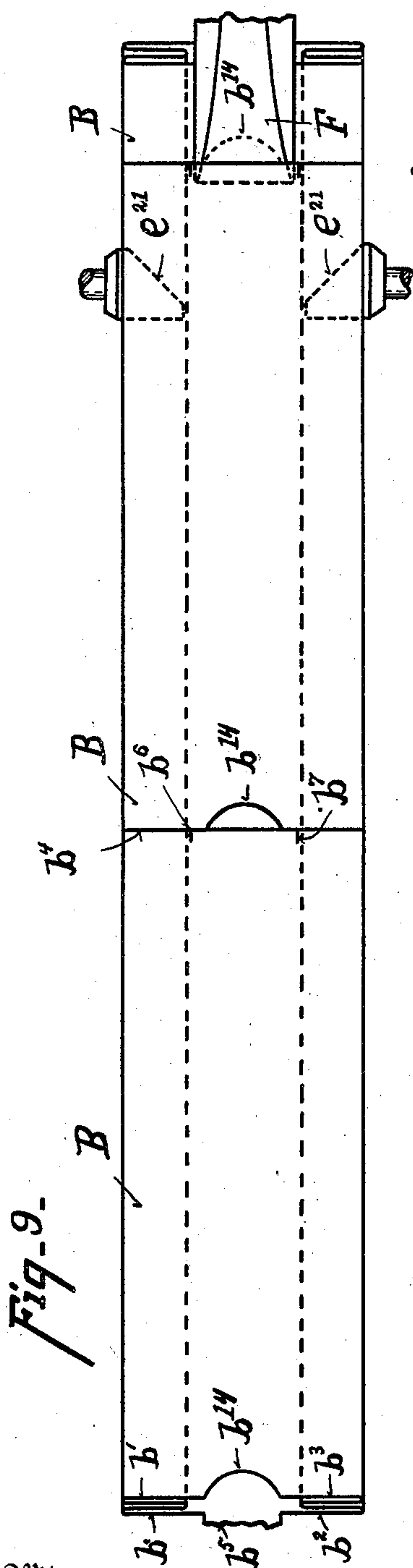


Fig-9-

Witnesses

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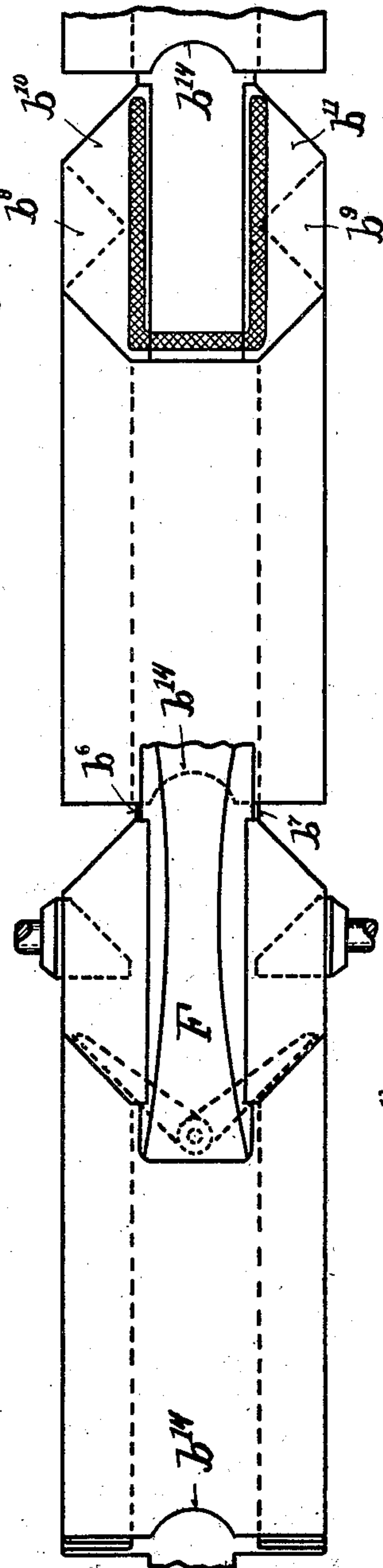


Fig. 10.

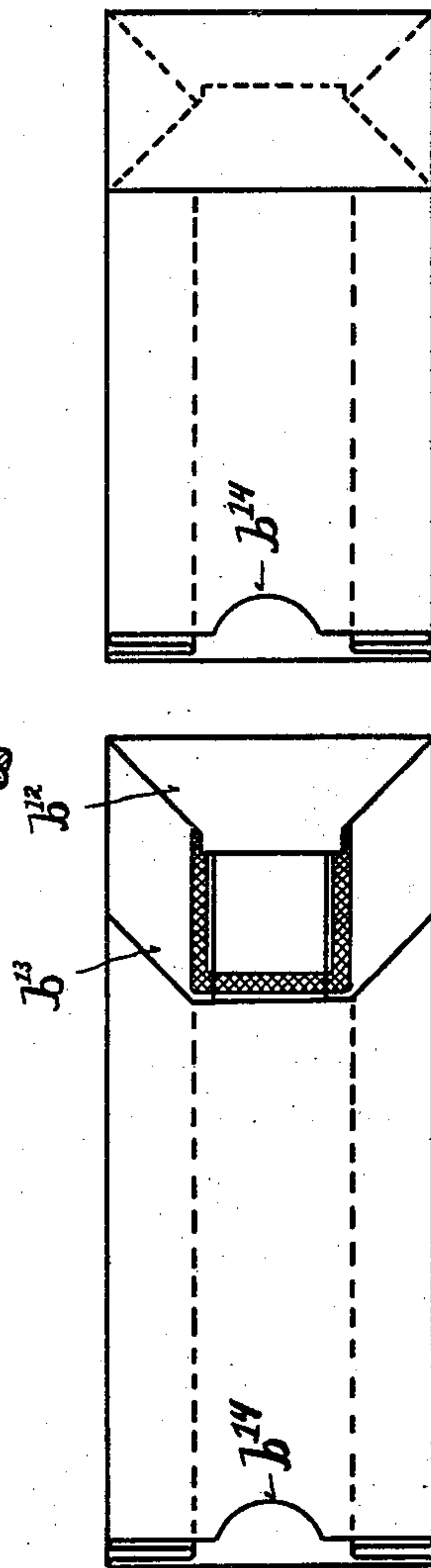


Fig. 11.

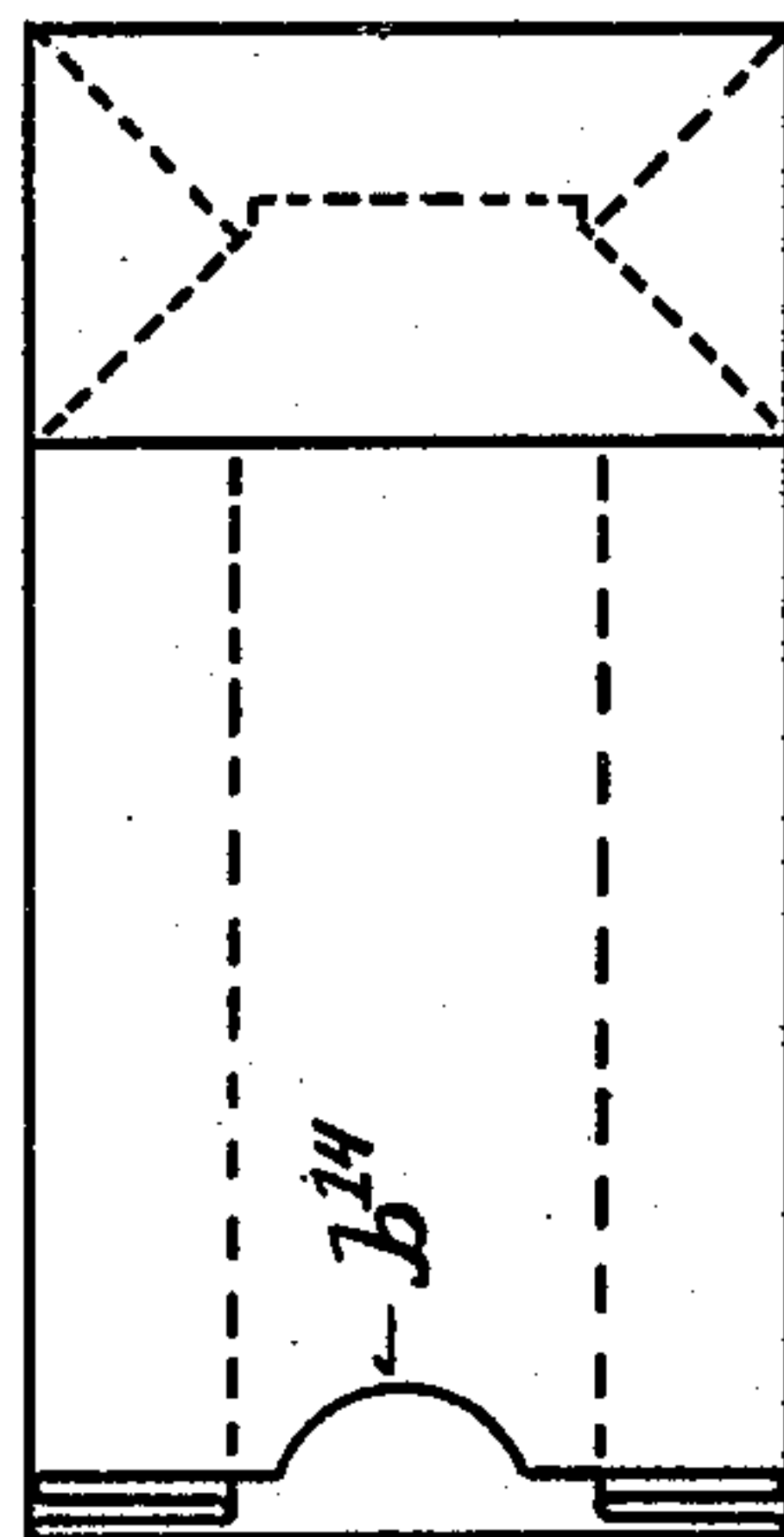


Fig. 12.

Inventor

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UNITED STATES PATENT OFFICE.

GEORGE C. NELSON, OF CINCINNATI, OHIO.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 691,795, dated January 28, 1902.

Application filed September 4, 1901. Serial No. 74,296. (No model.)

To all whom it may concern:

Be it known that I, GEORGE C. NELSON, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

The object of my invention is a machine for forming square-bottomed bags, such as are the subject of Reissue Letters Patent No. 10,083, from a continuous bellows-sided tube of paper that is fed into the machine, which is simple of construction and effective in operation. This object is attained by the means described in the specification and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical sectional view of a machine embodying my invention, taken upon line $x x$ of Fig. 2. Fig. 2 is a plan view of the same. Fig. 3 is a vertical sectional view taken upon line $z z$, Fig. 2. Fig. 4 is a detail perspective view of one of the fingers which are mounted upon the reciprocating carriage. Fig. 5 is a detail inverted plan view of the nose which enters and spreads the end of the paper tube in forming the bottom of the bag, showing it with the arms, which are pivoted to it, spread out. Fig. 6 is a similar view showing the arms drawn inward. Fig. 7 is a detail front view of the cam for actuating the tuckers. Fig. 8 is a sectional view of the same, taken upon line $v v$ of Fig. 7. Fig. 9 is a detail plan view of a section of paper tubing scored for forming two bags, the forward section being shown in the position just as the nose enters its forward end. Fig. 10 is a similar view showing the wings of the nose spread out in one section and the paste applied to a section in a more advanced stage of the process. Fig. 11 is a similar view showing one of the folds pasted down. Fig. 12 shows the complete bag in the form in which it is discharged from the machine. Fig. 13 is a detail longitudinal sectional view of the scoring-blades. Fig. 14 is a detail elevation of one of the longitudinal plates having ways for engaging the movable plate on the carriage.

I will now describe the folds that are given to each bag-section in the machine embody-

ing my invention, afterward describing the parts which make the folds.

One end of a bellows-sided paper tube B, having double plaits $b b' b^2 b^3$ upon its edges, is opened out and turned back flat, as shown in Fig. 10, forming upon each side the well-known inner triangular folds $b^8 b^9$ and laps b^{10} and b^{11} , then laps b^{12} and b^{13} are turned inward and pasted down, as shown in Figs. 11 and 12.

Referring to the drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views, the operative parts are secured to a frame which consists of two parallel horizontal angle-bars A A', themselves supported upon standards a . Mounted upon the forward ends of bars A A' are two standards $a' a^2$, between which are journaled two feed-rolls $a^3 a^4$, by which tube B, having sectoral notches b^{14} at intervals upon its upper face, is fed forward to rotating cylinders c and d . Cylinder c carries scoring-blades C C', the longitudinal cutting edges $c^2 c^3$ of which are at a distance apart equal to the width of notch b^{14} , and the transverse cutting edges $c^4 c^5$ extend thence outward at right angles. Cylinder d carries a plate d' , with a raised portion D to come between blades C C', and slots into which cutting edges $c^2 c^3 c^4 c^5$ enter, edges $c^4 c^5$ forming transverse cut b^4 in the tube, which, together with notch b^{14} , sever it, except a narrow strip b^5 , and edges $c^2 c^3$ forming longitudinal slits $b^6 b^7$ therein meeting cut b^4 . From cylinders c and d tube B passes on to a reciprocating carriage E, which consists of a horizontal plate e , sliding in horizontal ways formed in side bars $e' e^2$, supported upon standards $e^3 e^4$, supported upon bars A A'. Plate e has a rack e^5 upon its under side to mesh with a toothed segment e^6 , which is secured upon a shaft e^7 , journaled in side bars $e' e^2$ to advance the carriage, which is returned by a coiled spring e^8 , secured at one of its ends to the forward end of the carriage and at the other end to the supporting-frame. Segment e^6 is of a length such that after one bag-section has been fed under nose F it releases rack e^5 for carriage E to take the next bag-section.

Mounted upon bars $e' e^2$ are vertical longitudinal plates $e^9 e^{10}$. Plate e has secured

near its forward end two vertical pins having nuts e^{11} e^{12} at their upper ends, between which and coiled springs e^{13} is carried a horizontal plate e^{14} , whose ends project into ways e^{15} e^{16} in side plates e^9 e^{10} , inclined from the front, so that as carriage E is advanced plate e^{14} is drawn down toward it to rest upon tube B a certain distance back of one of cross-cuts b^4 of the bag-section upon the carriage. At a point just in front of nose F, where plate e^{14} has been lowered an amount sufficient to cause it to bear down upon the bag-section, ways e^{15} and e^{16} become horizontal, as shown in Fig. 1, and extend thence horizontally to the end of plates e^9 e^{10} , as shown in dotted lines, Fig. 2.

Upon plate e opposite the rear edge of plate e^{14} are likewise secured two vertical plates in which are mounted horizontal tapering fingers e^{17} e^{18} , whose outer ends are held by springs e^{19} e^{20} in contact with side plates e^9 e^{10} , which have inwardly-projecting edges to push the fingers inward to rest upon plaits b and b^2 . The front edges e^{21} of fingers e^{17} e^{18} are straight, and the rear edges e^{22} form angles therewith.

Secured near the rear end of bars A A' are two standards g^3 g^4 , to which is secured a rigid nose F, which projects forward centrally over the path of carriage E at a distance above it slightly greater than the thickness of plate e^{14} . Nose F is of a width equal to or less than the distance between the plaits upon one side of tube B and those upon the other side and tapers down to the front edge f^2 , which enters the end of the bag-section, and as the section is carried onward turns the upper half back over plate e^{14} . Strip b^5 being held down beneath nose F, edges e^{22} of the fingers form one side of triangular folds b^8 b^9 .

Upon the under side of nose F, near its forward end, arms f^3 f^4 are pivoted. Situated in a longitudinal recess, likewise upon the under side of said nose, is a sliding rod f^5 , at the forward end of which are pivoted two links f^6 f^7 , the other ends of which are pivoted one to arm f^3 , the other to arm f^4 . When rod f^5 is pushed forward, arms f^3 f^4 are spread apart, as shown in Fig. 5, and when the rod is drawn backward by spring f^8 the arms are drawn together, as shown in Fig. 6. Rod f^5 is carried forward by an arm f^9 , contacting a lug f^{10} on the rod. Arm f^9 extends down through a central slot in nose F and is journaled at its upper end upon a shaft f^{11} , which is supported by the nose. Arm f^9 has an upwardly-projecting lug f^{12} , which as carriage E moves forward is contacted by an arm e^{23} , which is secured to plate e^{14} , thereby rotating arm f^9 upon its shaft, carrying rod f^5 forward, and spreading arms f^3 f^4 , which in spreading complete triangular folds b^8 b^9 and laps b^{10} b^{11} . After arm e^{23} has passed lug f^{12} spring f^8 draws arms f^3 f^4 inward, and the bag passes on underneath nose F to paste-roll G and paste-pad G', which are mounted upon shafts g g' , which are journaled in standards g^3 g^4 , which are mounted upon bars A A'. Paste-

roll G has sectoral ridges g^5 g^6 , which apply paste along the inner edges of laps b^{10} b^{11} , and a transverse ridge g^7 , which applies paste across the outer edge of lap b^{13} .

Tube B passes on from the paste-rolls between rotating cylinders H H', the upper one of which carries a cutter-blade h and the lower one a recess h' , into which the blade projects to sever strips b^5 after the bag-section has entered between feed-rolls K K', journaled one above the other in standards k , which are secured upon the ends of bars A A'. Back of roller K' and journaled in standards k is a cylindrical roller K², and beneath roller K' and similarly journaled in standards k is another cylindrical roller K³. Rollers K² and K³ revolve in a direction opposite to the rotation of roller K', as indicated by arrows in Fig. 1. Above rollers K' K² is a tucker-blade L, which is mounted in slots k^2 in standards k , beyond which the ends of the blades are bent down into vertical arms l l' , which at their ends have pins l^2 l^2 , which project into cam-shaped slots m upon the exterior faces of disks M M', which are mounted upon the opposite ends of the shaft of roller K'. Beneath roller K² is a second tucker-blade N, which is mounted in slots k^3 in standards k , beyond which blade N is likewise bent in arms n n' , which pass upon the inside of disks M M' and have outwardly-projecting pins n^2 n^3 to fit into cam-shaped slots n^4 in the cams.

The bag-section after passing between rollers K K' has one end resting on roller K², tucker-blade L being raised. Said blade descending strikes the bag-section at the base of lap b^{12} , bends it over, and feeds it thus bent between rollers K' and K², which paste the lap down, and whence it passes down to a point opposite roller K³, tucker-blade N being withdrawn. When blade N advances, it bends the entire bag over along the base of lap b^{13} and feeds it between rollers K' and K³, which paste down lap b^{13} , and whence the completed bag drops out.

What I claim is—

1. In a machine for forming square-bottomed bags from bellows-sided tubes, the combination of a reciprocating carriage means for feeding the tube upon the carriage, a plate upon the carriage to descend upon the tube at a distance from its end, fingers upon the carriage to rest upon the lower plaits of the bellows between said plate and the end of the tube, a rigid nose to enter the end of the tube to turn its upper part back as the carriage advances to form the laps and the triangular folds, substantially as shown and described.

2. In a machine for forming square-bottomed bags from bellows-sided tubes, the combination of a reciprocating carriage means for feeding the tube upon the carriage, a plate upon the carriage to descend upon the tube at a distance from its end, fingers upon the carriage to rest upon the lower plaits of the bellows between said plate and the end of the tube, a rigid nose to enter the end of the tube,

arms pivoted to the end of the nose upon its under side, means for retracting the arms when the nose enters the end of the tube, and means for spreading them to assist in forming the triangular folds and laps, and in retracting them as the tube passes onward beneath the nose, substantially as shown and described.

3. In a machine for forming square-bottomed bags from bellows-sided tubes the combination of rigid side bars having ways formed therein, a reciprocating carriage sliding in said ways, pins mounted upon the carriage a plate upon the pins, fingers mounted upon the sides of the carriage, plates upon the side bars having both inclined slots into which the ends of the plate upon the carriage project to carry it down upon the tube and inward projections to abut against the fingers to carry them over the lower plaits of the bellows, a nose fixed upon the side bars centrally over the carriage to enter the end of the tube and turn the upperside thereof back over the plate and fingers to form therein the triangular folds and laps, substantially as shown and described.

4. In a machine for forming square-bottomed bags from bellows-sided tubes the combination of rigid side bars having ways formed therein, a reciprocating carriage sliding in said ways, pins mounted upon the carriage, a plate upon the pins, fingers mounted upon the sides of the carriage, plates upon the side bars having both inclined slots into which the ends of the plate upon the carriage project to carry it down upon the tube and inward projections to abut against the fingers to carry them over the lower plaits of the bellows, a nose fixed upon the side bars centrally over the carriage, arms pivoted upon the under side of the nose, a lever fulcrumed in the nose for spreading the arms, and an arm upon the carriage for contacting the lever to actuate it to spread the arms after the nose has entered the end of the tube to assist in forming the triangular folds and laps therein, substantially as shown and described.

GEORGE C. NELSON.

Witnesses:

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