

(No Model.)

2 Sheets—Sheet 1.

M. F. CONNORS.
PAPER BAG MACHINE.

No. 534,313.

Patented Feb. 19, 1895.

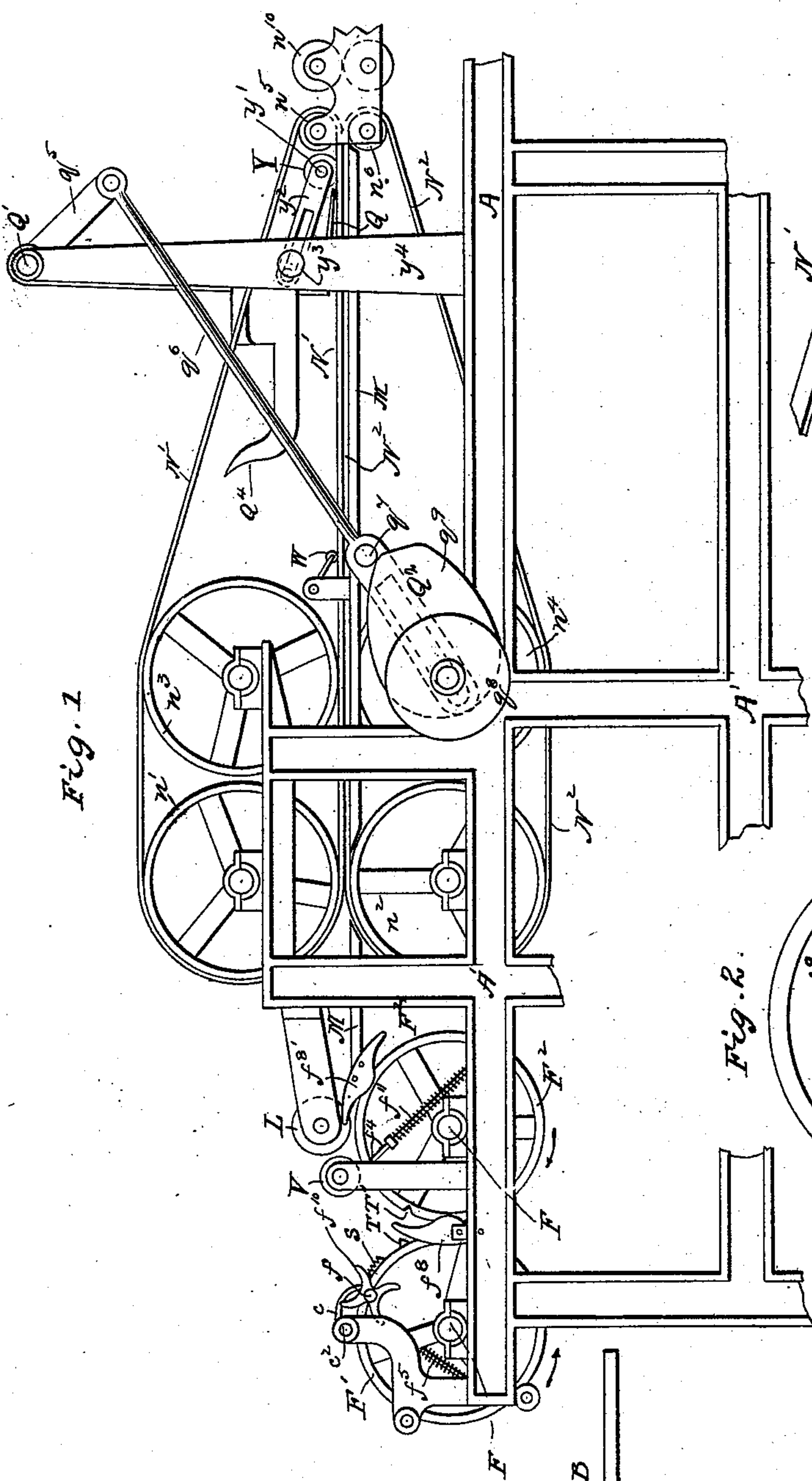


Fig. 1

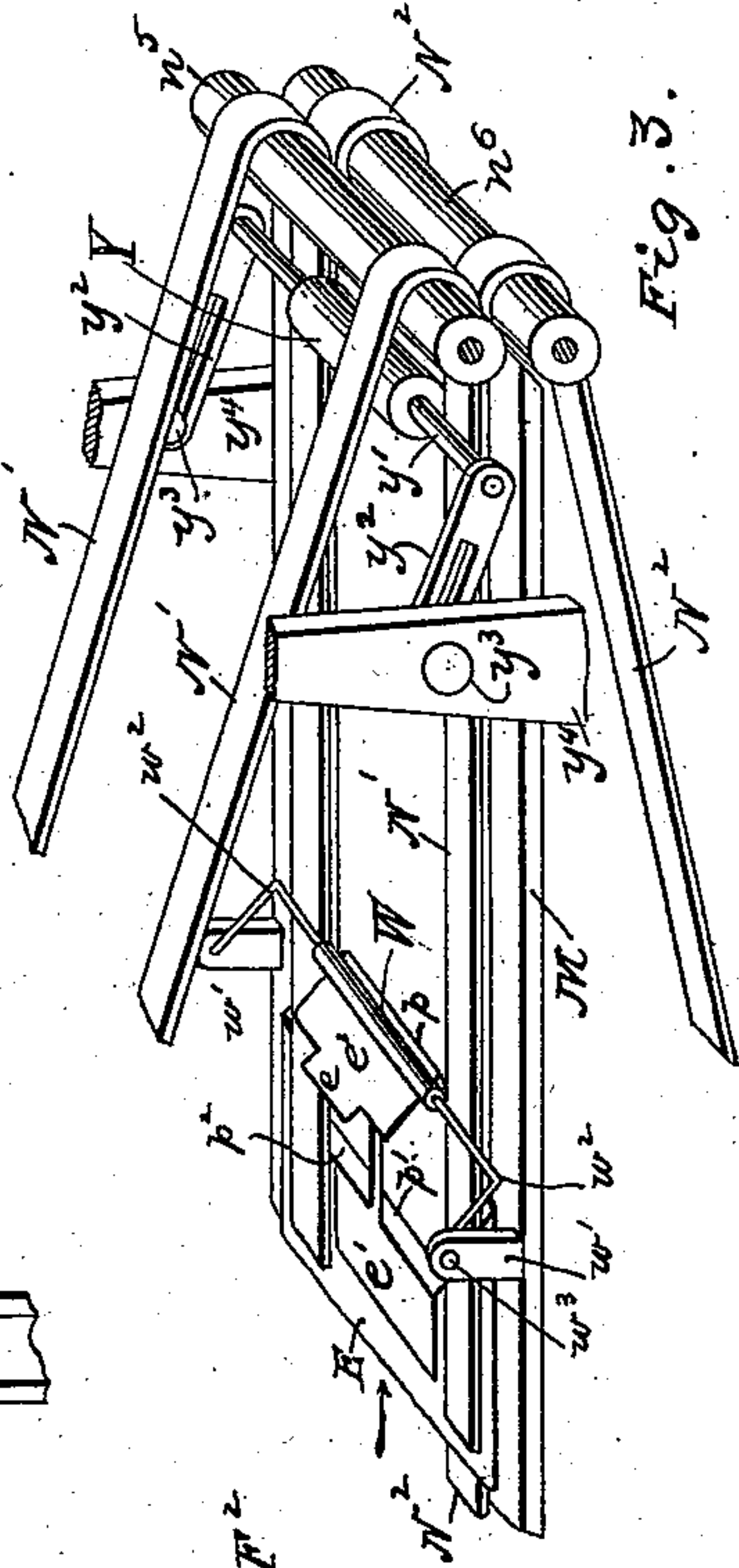
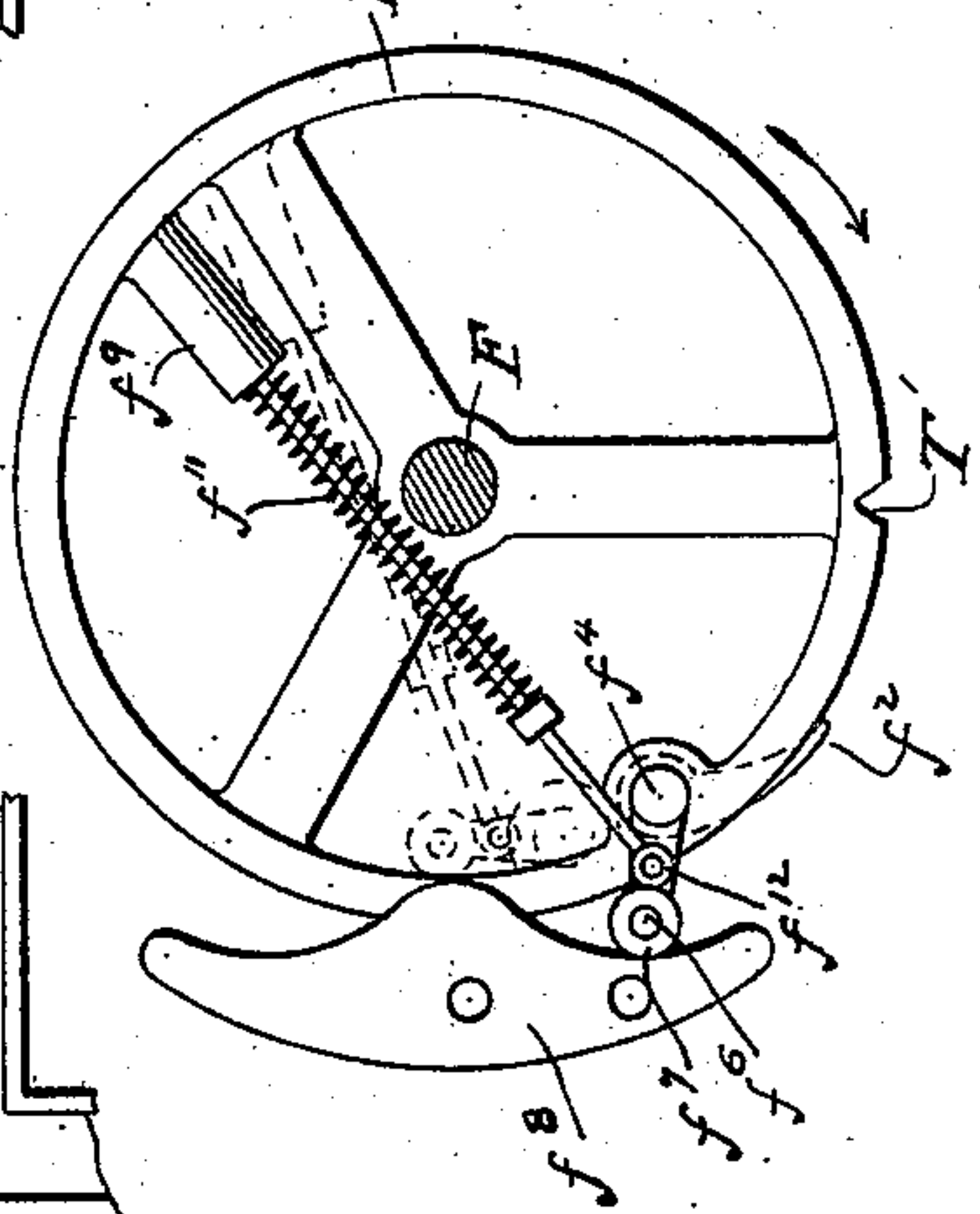


Fig. 3.

Fig. 2.



WITNESSES:

Frank S. Ober.
Wm. Carter Dick

INVENTOR

Michael F. Connors

BY

Walter H. Arnold

ATTORNEY.

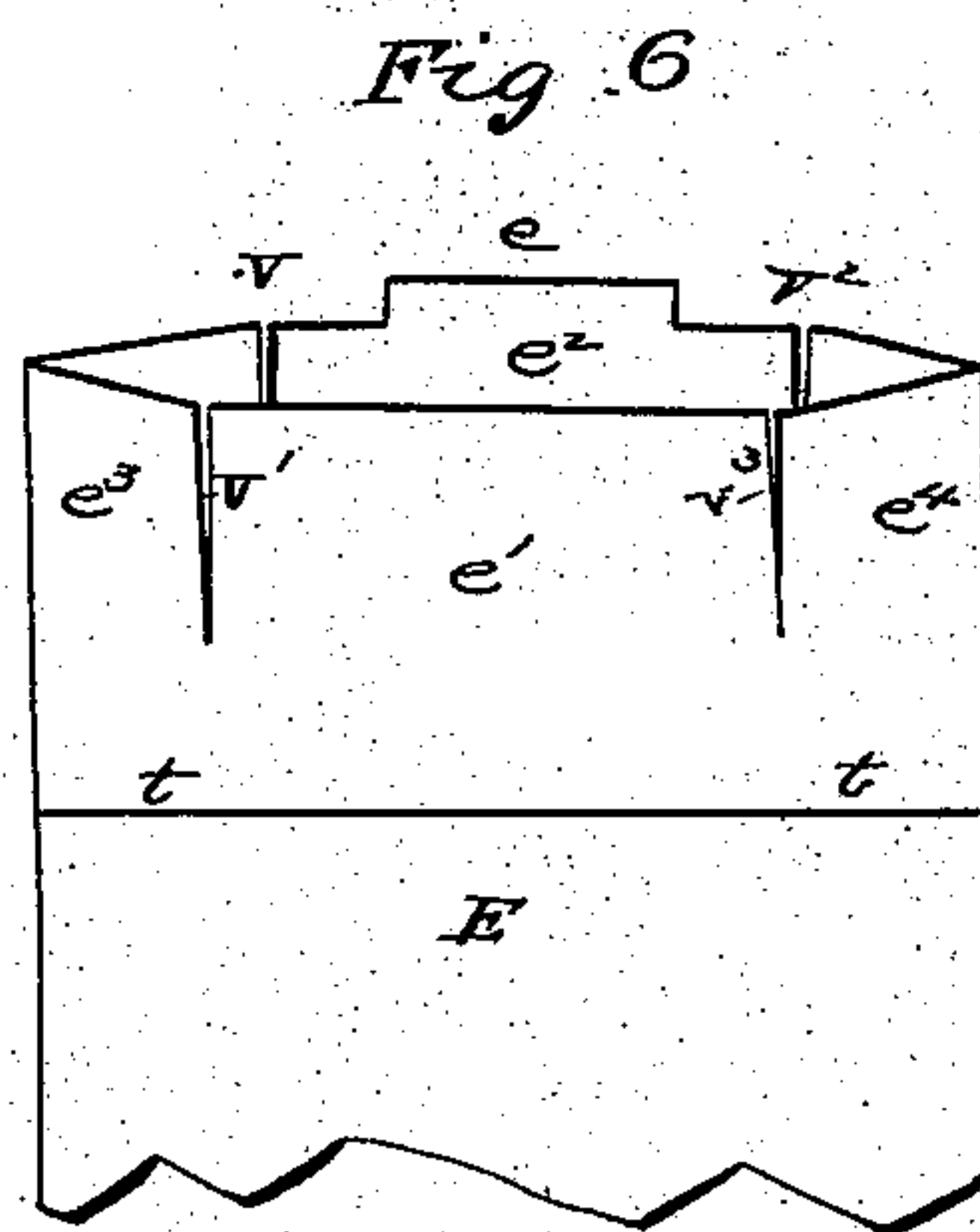
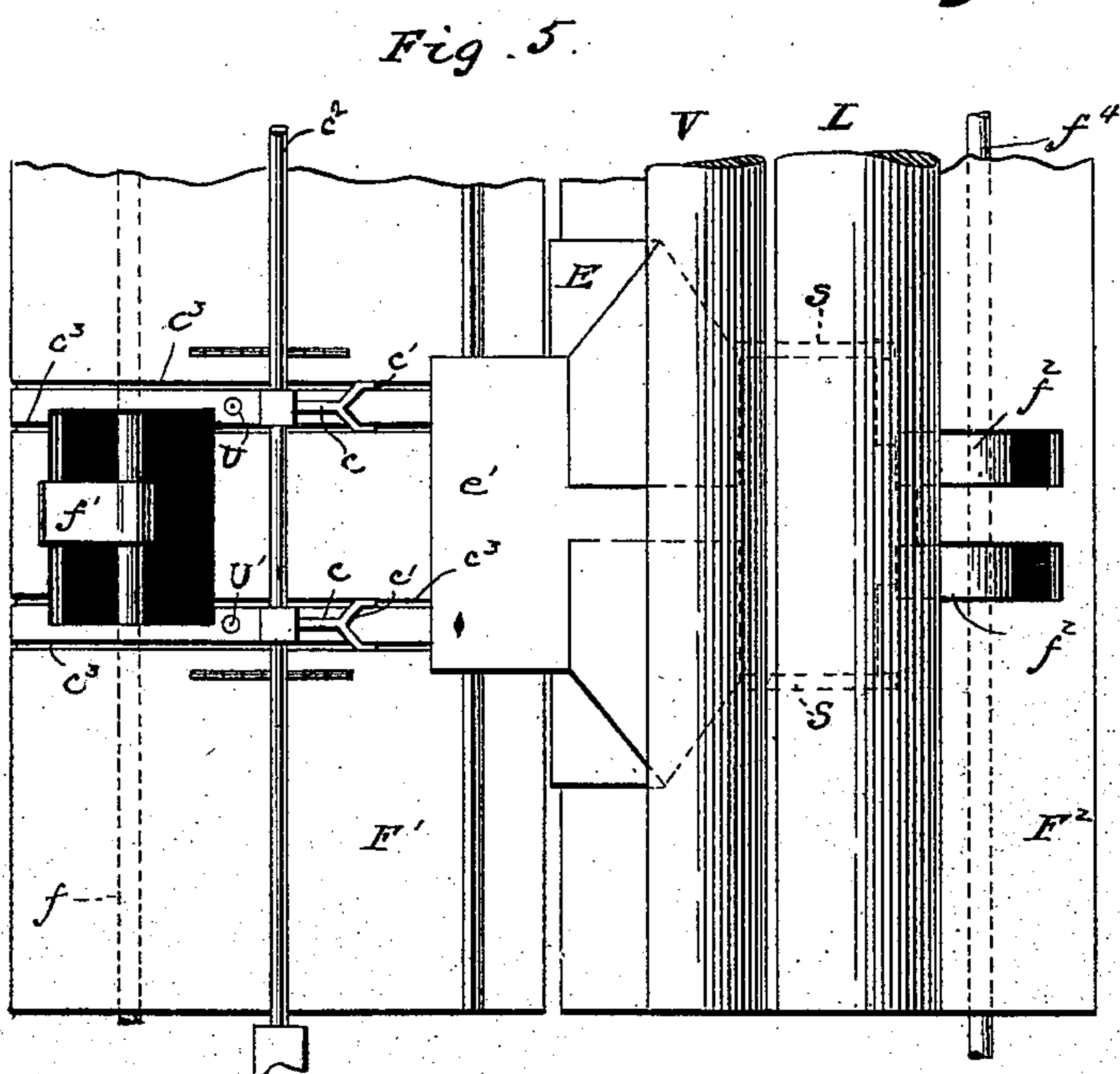
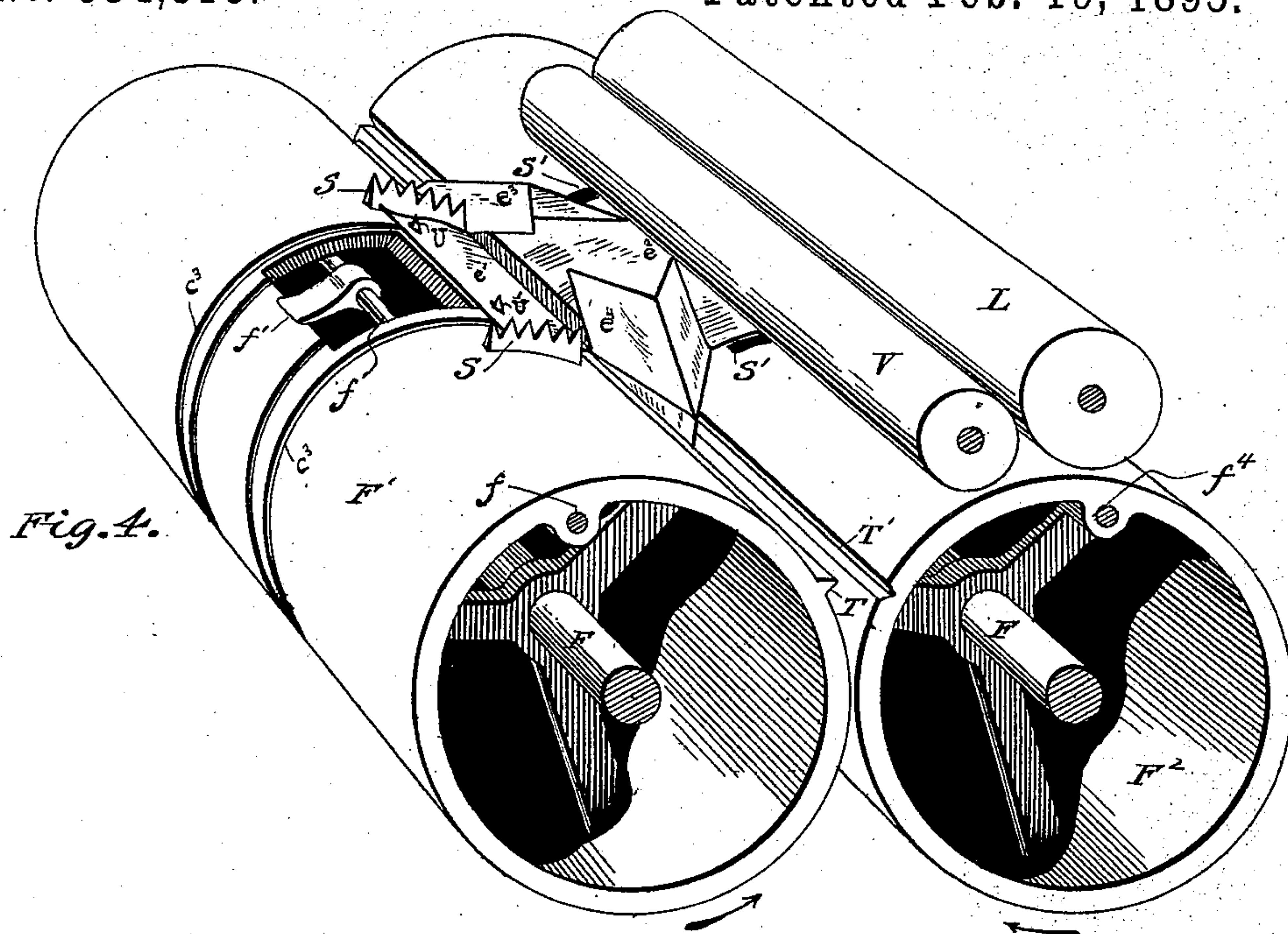
(No Model.)

2 Sheets—Sheet 2.

M. F. CONNORS.
PAPER BAG MACHINE.

No. 534,313.

Patented Feb. 19, 1895.



WITNESSES:

Frank S. Obed.
Wm. C. H. Obed.

INVENTOR

Michael F. Connors

BY

Walter Edmunds
ATTORNEY.

UNITED STATES PATENT OFFICE.

MICHAEL F. CONNORS, OF NEW YORK, N. Y., ASSIGNOR TO DAVID S. WALTON AND GEORGE WEST, OF SAME PLACE.

PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,313, dated February 19, 1895.

Application filed April 11, 1892. Serial No. 428,567. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL F. CONNORS, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a full, clear, and exact description.

My improvements relate to machinery employed in the manufacture of what are designated in the trade as "satchel bottom paper bags."

The object of my invention is to provide improved methods and means whereby certain of the parts of blank, finally formed into the bag bottom, may be automatically gripped, slit, creased and folded down or brought into the positions required in manufacture, and I attain these objects by the novel mechanical parts and the treatment of the bag bottom hereinafter described, and shown in the accompanying drawings, in which—

Figure 1, is a side elevation of such portions of a paper bag machine as are sufficient to show the operation of my said improvements. Fig. 2 is a side elevation of a detail showing method of actuating the gripper of one cylinder. Fig. 3 is a perspective view of a detail showing belts and my folding rods or rollers. Fig. 4 is a detail perspective view showing relation of gripping cylinders, toothed cutters, creaser, holding points, and front folding roller. Fig. 5 is a plan view of Fig. 4, showing gripping cylinders somewhat advanced in their rotation beyond the part shown in Fig. 4. Fig. 6 is a view of a bag bottom previous to its being folded and pasted.

My improvements are adapted to be used in most paper bag machines but I have illustrated and shall describe them as applied to one well known type of such machines upon which my experiments have been principally conducted, to wit, that described in Letters Patent to W. Liddell, for paper bag machine, No. 455,407, dated July 7, 1891.

In my drawings I have omitted, as those skilled in the art will understand, many parts of said machine which are not essential to an understanding of the operation of my improvements, and also those parts rendered unnecessary by my improvements.

Bag blanks adapted to be operated upon by my improvements are fed as usual into the machine in tubular shape, open at both ends, and provided with a lip *e*, Fig. 6.

Generally speaking my improvements consist of novel mechanism for opening the forward end of such tubular bag blank; for holding the same; for producing therein the slits *v*, *v'*, *v''*, *v'''*, Fig. 6; for folding inwardly and downwardly into proper position the portions *e''*, *e'''*, for lifting, and setting, into proper position, and for folding backwardly toward the front of the machine the final flap or portion of the bag *e''*.

Referring to Fig. 1, *A'* is a portion of the frame of a machine provided with my improvements. From a table *B*, upon which the bag blanks are laid flat upon that one of their sides which is provided with a lip *e*, they are fed and carried upward and forward in any convenient and usual manner so as to be brought into position to be clutched by the gripper *f'* of the gripping cylinder *F'*. This gripper is mounted upon an oscillating rod *f* by which it is caused to swing nearly half a circle by the action of a properly shaped head, against studs (not shown) and springs *f''* so placed as to cause the opening and closing of the grippers at the required points in the rotation of the cylinder *F'*, in the well known manner described in said patent to Liddell.

The gripper *f'*, is shown in its reversed or open position in Fig. 4. Both thicknesses of the bag are pressed against the cylinders *F* by the lip of the gripper and thus clutched and carried along by the cylinder's rotation.

S, *S'* are toothed cutting knives secured to the cylinder *F'*. These toothed knives are stationary, but may be arranged in any well known way so as to be adjustable to various stationary positions upon the cylinder according to the size and shape of the bag.

S', *S'* are recesses in the cylinder *F''*, arranged to coact with, and within which portions of the cutting teeth of *S*, *S*, pass during the rotation of the cylinders.

T is a longitudinal blade projecting radially from the periphery of cylinder *F'*.

T' is a creasing groove upon the cylinder *F''*, which coacts with, and within which *T* passes during the rotation of the cylinders.

On the other gripping cylinder F I use a pair of grippers f^2 . They are both mounted upon the same oscillating rod f^4 and are actuated thereby simultaneously. To one end of this rod is fastened an arm f^{12} , Fig. 2. This arm is provided with a stud f^6 , and stud roller f^7 , placed so as to engage against a fixed cam f^8 , $f^{8'}$. To the arm f^{12} , is pivoted a rod, which slides in socket f^9 , and is kept normally projected by spring f^{11} . The grippers f^2 , are thus kept normally closed with their clutching edges or lips pressing upon the surface of the cylinder F. They are opened, as will be readily understood, by the pressure of the cam upon the roller stud, whereby the rod is driven into its socket f^9 , and thus oscillation is effected of the rod f^4 bearing the grippers. One of these cams is situated so as to operate upon the grippers at that point in their revolution in which they are required to seize the bag. Another of such cams is placed as shown in Fig. 1, at the point in the revolution of the gripping cylinder in which these grippers are required to release the bag.

The gripper f' , is mounted in a recess or opening in the surface of the cylinder F' so wide as to admit of the grippers f^2 , f^2 , projecting within this recess on either side of the gripper f' at that point in the revolution of the cylinders when the grippers are crossing the line uniting the centers of said cylinders and the gripper f' has been or is being opened and reversed whereby simultaneously the lips of the grippers f^2 , f^2 , as they project from the surface of the cylinder F², in the act of closing are enabled to seize the edges of the lip e of the blank and press or clutch it against the surface of said cylinder F².

U, U', are a pair of stationary holding pins fixed to and projecting from the surface of the cylinder F'.

c, c, are a pair of lifters having lifting toes c' , c' . These lifters are secured to a rod c^2 , supported by any convenient bearings, and preferably in bearings so arranged as to admit of the rod being moved backward and forward so as to adjust the toes to various positions required to free various sizes and qualities of the blank at the requisite point. For instance a blank of smaller diameter requires to be freed from the points earlier in the rotation of the cylinder F', than does a blank of greater width.

The lifting toes c' , c' , are adjusted so as to travel within the grooves c^3 , c^3 , with which the cylinder F' is provided. The ends of the toes are thus passed underneath the edge of the paper blank as the latter is brought toward them by the rotation of the cylinder F' and the continued rotation of the cylinder causes the blank to be lifted over the toes and thus off of the stationary pins U, U'.

V is my improved folder or flattener. It consists of a rotatable cylinder of light weight constructed preferably of wood or sheet metal and loosely journaled in any convenient bearings so as to extend parallel with and in prox-

imity to the gripping cylinder F². The surface of V thus yields readily to a slight touch from the unstable projecting portions e^2 , e^3 , of the blank, but this yielding is limited to rotation whereby the said portions are gradually and deftly pressed and folded by the help of the slits v v' v^2 , v^3 , and the creaser t into the required shape and position as the blank is fed forward by the continued rotation of the cylinder F².

L is the stretching roller, same as that used in Liddell's machine, aforesaid.

M is the table upon which the bags are carried after leaving the gripping cylinders.

N', N², are belts arranged to carry the bags along said table.

n' , n^2 , n^3 , n^4 , are wheels performing the same functions as corresponding wheels in Liddell's said machine.

Q' is a rocker-shaft caused to oscillate by the motion conveyed thereto through arm q^5 , rod q^6 , cam Q², contacting with bowl q^7 . To said shaft Q' is secured so as to be operated thereby and for the purpose of folding the bag blank upon the line p' , Fig. 3, the same well known folding plate and connections which are illustrated in said Liddell's machine, and described in his drawings and specification, and which I deem it unnecessary to show in my drawings.

n^5 , n^6 , are rolls carrying the said belting and performing the same functions as the correspondingly lettered parts in Liddell's said drawings.

n^{10} , are an additional pair of rolls which assist in pressing down the folded and pasted portions of the bag blanks so as to cause the desired adhesion between them.

I have not illustrated in the drawings accompanying this specification the well understood devices for producing transverse creases p' , p^2 , Fig. 3, upon which certain portions of the bag are folded. This creasing mechanism is well understood and is also illustrated in Liddell's said machine. Neither have I shown in my drawings the mechanism for automatically elevating the platform B and for facilitating and giving accuracy to the feed of the blanks, nor the well understood pasting mechanism, because none of these are essential to an understanding of the operation of my inventions.

W is my deflector which consists of a rod supported in any convenient manner, as for instance, upon studs w' , w' , secured to the frame of the machine and is preferably constructed with an elbow w^2 , rotatable in bearings w^3 , in said studs which may be provided with a thumb screw or any other well known device for the purpose of fixing the position of the said deflector at any required height above the table. It may also prove convenient to provide the deflector with a roller w^4 , which should be constructed like my folder V of wood or other light material.

Y is my final folder. It is mounted so as to rotate upon or with the rod y' , which is in

turn journaled in slotted arms y^2, y^2 , through the slots of which pass screw bolts y^3, y^3 , carried upon uprights y^4, y^4 , secured to the table A, and whereby the elevation and position of my folding roller may be adjusted.

The operation of my invention is as follows: Both thicknesses of the bag blank having been seized by the gripper f' are carried onward and upward by the rotation of the cylinder F' and encounter as they traverse the line connecting the centers of the two cylinders F', F^2 , my improved toothed cutters which produce therein the slits v, v', v^2, v^3 , without undesirably compressing together the two thicknesses of the blank as occurs with plain edged cutters acting against underlying soft metal plates and whereby the proper opening of the folding of the parts e^3 , and e^4 , was greatly interfered with. The movement of the cylinders also causes the pins U, U', to perforate at least one side or thickness of the bag blank as shown in Fig. 4. As the forward edge of the blank passes between the centers of the cylinders F', F^2 , the grippers f^2, f^2 , which straddle, and operate independently of, the gripper f' , close down upon and grip the lip e just released by the gripper f ; after which one side or thickness of the blank is held to the cylinder F' by the pins U, U', and thus the continued rotation of the cylinders operates to open the blank as shown in Fig. 4. As the blank passes between the cylinders the score or crease t , Fig. 6, is produced by the action of the creaser T and its corresponding groove T'. The continued rotation of the cylinders causes the continued opening of the blank, draws inward toward the center thereof the portions e, e , and the lifting toes c', c' , having encountered the edge of the blank and the latter having been lifted off of the pins U, U', in the manner already described, finally draws the blank under the folder or flattener V, whereby, owing to the slits v, v', v^2, v^3 , and crease t the portions e^3, e^4 , are flattened down into their proper position and accurately folded smoothly into place. The blank is then carried under a spreading roller L of usual form and operation. The grippers f^2, f^2 , release their hold of the blank on reaching cam f^8 , and the blank is carried forward in the usual way over the table M until it is seized by the belts N', N^2 , and carried forward thereby to receive paste and the creases p', p^2 , in the well known manner pointed out, for instance, in Liddell's said patent. After receiving paste in the aforesaid creases it is desirable that the portion e^2 of the blank should be folded backward upon the crease p^2 . This I effect by my deflector W already described. The part e^2 , is carried forward by the belts at a small angle with the plane of the table, usually the reverse of that in which it is shown in Fig. 3. The forward movement of the blank thus carries e^2 , over the deflector, which latter engages therewith and as the blank continues to advance causes part e^2 to bend over backward upon the crease p^2 as

shown in Fig. 3. After passing my deflector W the opposite portion of the blank e' , is folded forward over the crease p' , in any convenient manner, such, for instance, as by the use of the well known folding plate and connections contained in Liddell's said machine and described in his drawings and specification and to which I have already referred herein. It now remains to finally fold down closely upon the remainder of the blank the portion e^2 , and this is accomplished by my final folder Y, which engages with and presses closely down upon the remainder of the blank and into the required position the part e^2 as the blank is carried forward under said roller by the continued action of the belts. Afterward the blank may be finally pressed and smoothed into permanent shape in any of the numerous well known ways as, for instance, by passing it through one or more pairs of rolls.

The rollers with which my improved folders and deflector are preferably provided should be constructed of light material and so as to turn readily in their bearings.

By my said improvements I am, as will be recognized by those skilled in the art, enabled to dispense with much complicated and expensive machinery heretofore required in this class of machines, and to produce a better and more uniformly accurately folded bag bottom.

I am aware that a roller has hitherto been used for the purpose of so-called "breaking down" the blank into the folds required, as for instance in the specification of Patent No. 279,505 to Charles B. Stillwell. Therefore I do not wish to be understood as broadly claiming the application of all rolls for such purpose.

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

1. In a paper bag machine the combination of a pair of oppositely rotating cylinders, the one provided with a creasing blade T, the other with means for co-operating with said blade to form a score, the first of said cylinders provided with a gripper to seize the bag and impale the side thereof nearest said last mentioned cylinder upon pins, the other of said cylinders provided with a gripper to seize the other side of the bag on its release by the first mentioned gripper, and secure said last mentioned side to that one of said cylinders to which said last mentioned gripper is secured, substantially as and for the purposes described.

2. In a paper bag machine the combination of said rotatory roller shaped folder or flattener V, a rotating cylinder carrying an automatic gripper f' , and a projecting creaser T, another rotating cylinder carrying a pair of automatic grippers, f^2, f^2 , straddling f' , and also carrying means for cooperating with said projecting creaser T in order to form a crease, substantially as and for the purpose described.

3. In a paper bag machine the combination of said rotatory roller-shaped folder or flat-

tener V, a rotating cylinder carrying automatic grippers f' , a projecting creaser T and a pair of peripherally projecting cutters, with another rotating cylinder carrying a pair of automatic grippers f^2, f^2 , adapted to straddle f' , and also carrying means for cooperating with said projecting creaser T in order to form a crease, substantially as and for the purpose described.

4. In a paper bag machine the combination of a pair of oppositely rotating cylinders, the one provided with an automatic gripper f' , the other with a pair of straddling automatic grippers f^2, f^2 , with cutters S, S, projecting creaser T, means for cooperating therewith to form a crease, the said folder and flattener V, stationary pins U, U' and lifting toes c, c' , substantially as and for the purpose described.

5. In a paper bag machine the combination of a pair of oppositely rotating cylinders, the one provided with pins for engaging that side of the blank which is nearest thereto, and a gripper for holding the other side of the blank, and the other cylinder having a gripper to take up that side of the blank released by the first gripper and hold it to the other cylinder, substantially as and for the purposes described.

6. In a paper bag machine the combination of a pair of oppositely rotating cylinders, the one provided with pins and with automatically closed and opened grippers to seize the entire blank and press the side of it which is

nearest the first cylinder upon said pins, the other cylinder provided with a pair of automatically closed and opened grippers to seize, while passing centers, the side of the blank not held by said pins and secure it to the second cylinder, whereby the bag is opened substantially as and for the purpose described.

7. In a paper bag machine the combination of a pair of oppositely rotating cylinders, the one provided with pins for engaging that side of the blank which is nearest thereto, and a gripper for holding the other side of the blank, and the other cylinder having a gripper to take up that side of the blank released by the first gripper and hold it to the other cylinder, and a pair of lifting toes c' , substantially as and for the purposes described.

8. In a paper bag machine a deflector or folder consisting of an independent rotatory roller loosely journaled in bearings positively fixed relatively to the main rolls $F' F^2$ to touch the blank passing thereunder and so light as to be turned by and correspondingly with the passage of such blank, whereby the latter is folded or deflected by the sole movement of feeding it forward on the machine, substantially as and for the purposes described.

MICHAEL F. CONNORS.

Witnesses:

WM. COTTER DICK,
HENRY CHAS. SCHWARZ.