

No. 649,492.

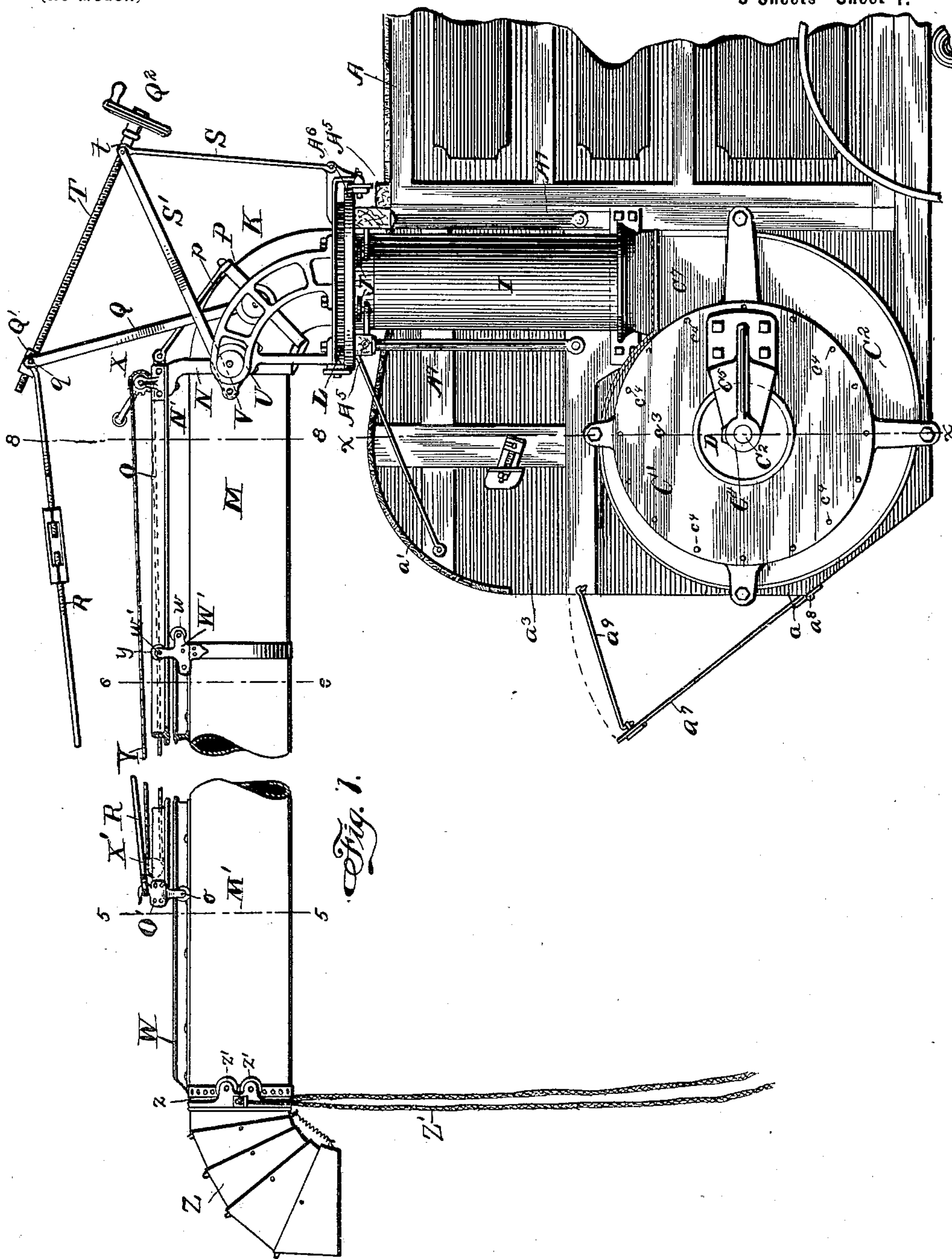
Patented May 15, 1900.

W. N. SPRINGER.
PNEUMATIC STACKER.

(Application filed Apr. 16, 1896.)

(No Model.)

5 Sheets—Sheet 1.



Witnesses
Wm H. Edwards
Arthur L. Bryant

Inventor
William N. Springer
By H. H. Bliss
Attorney

No. 649,492.

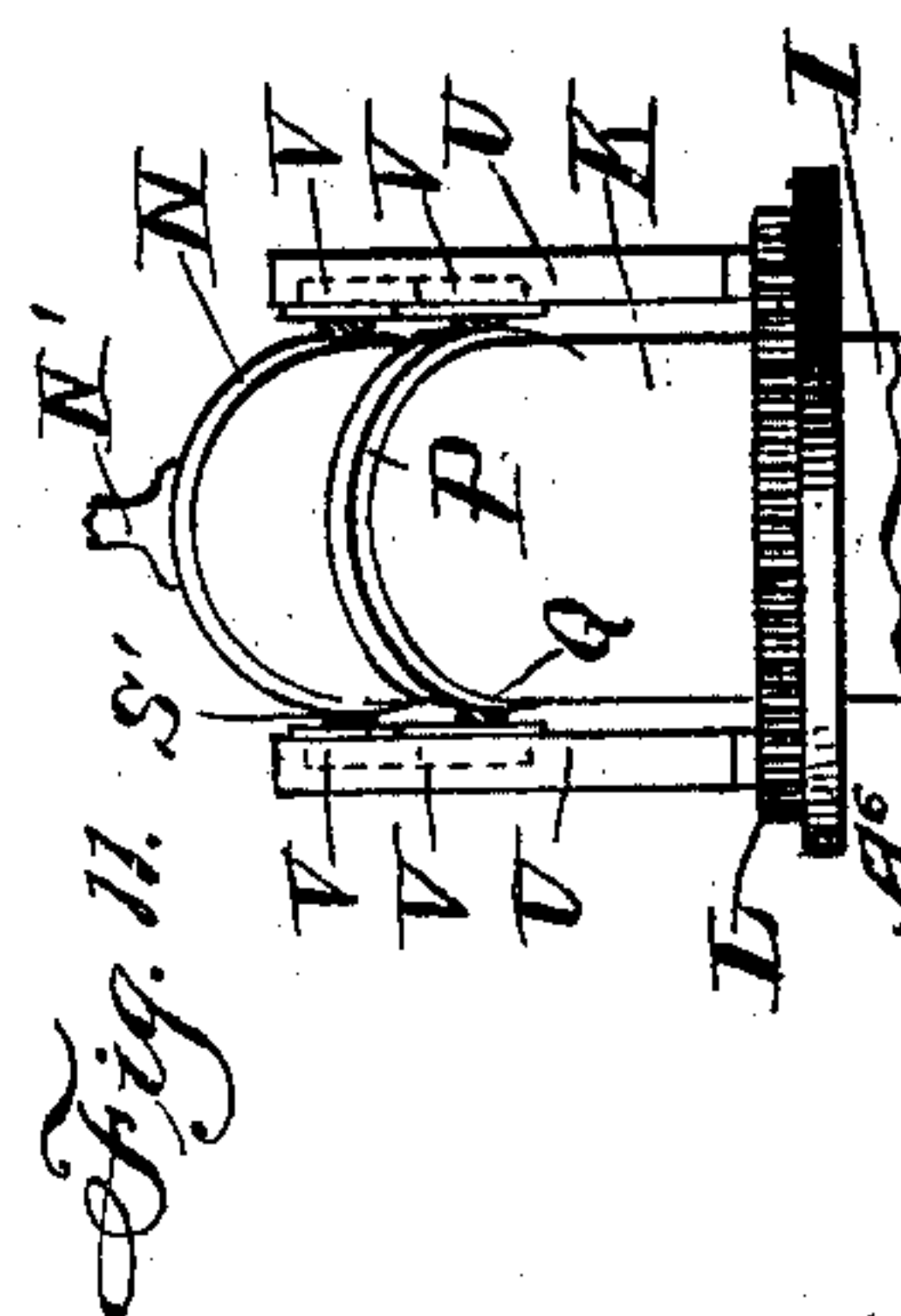
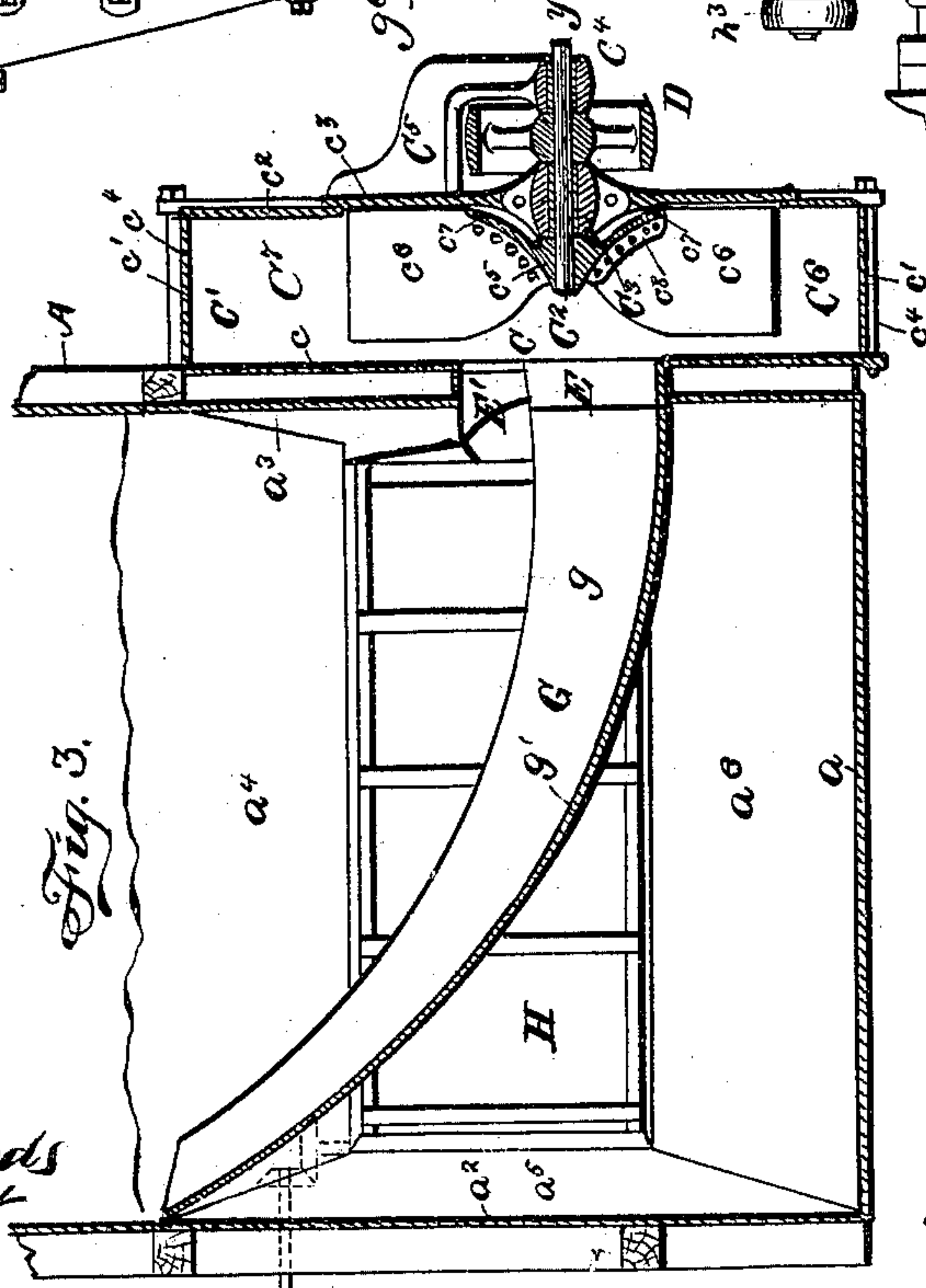
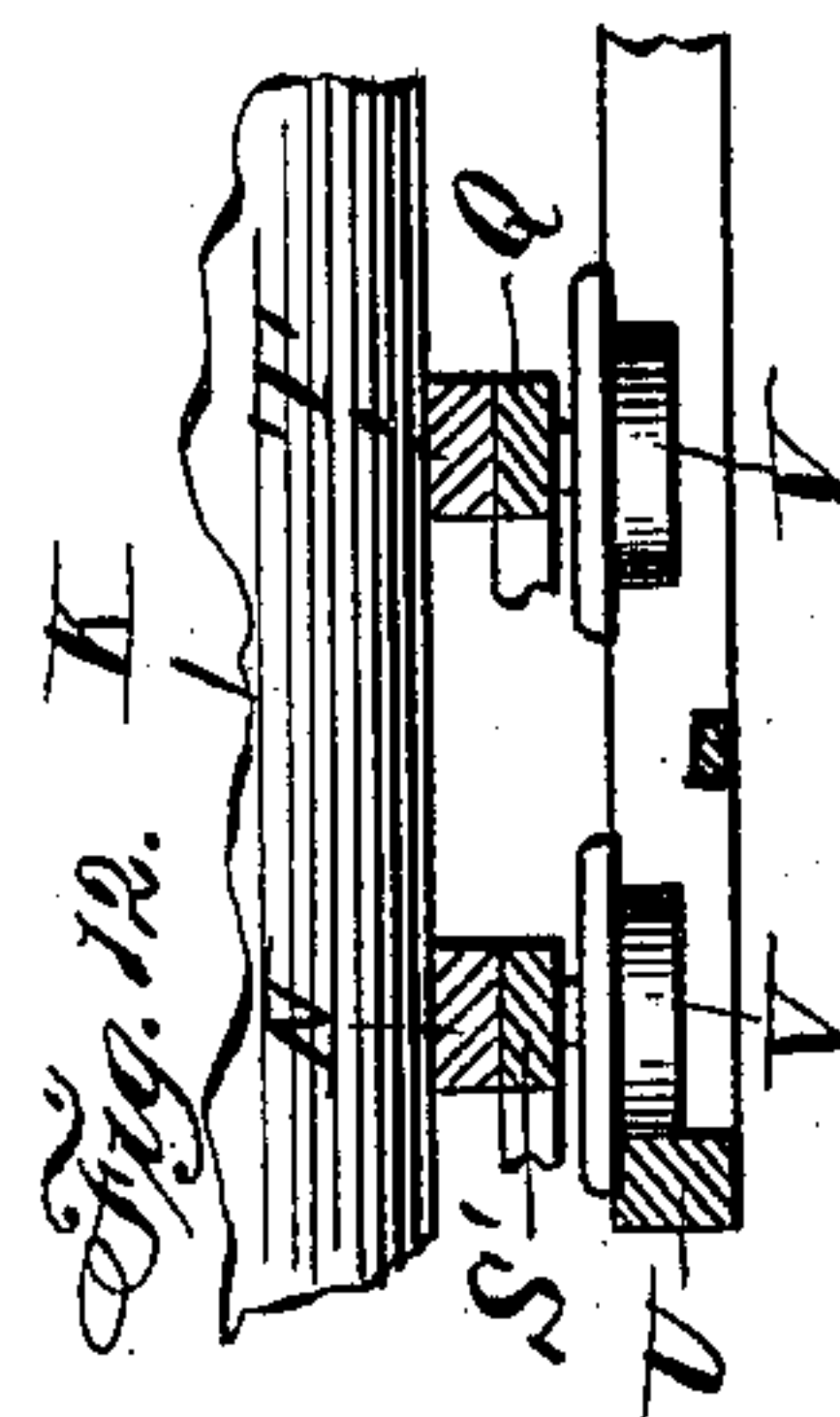
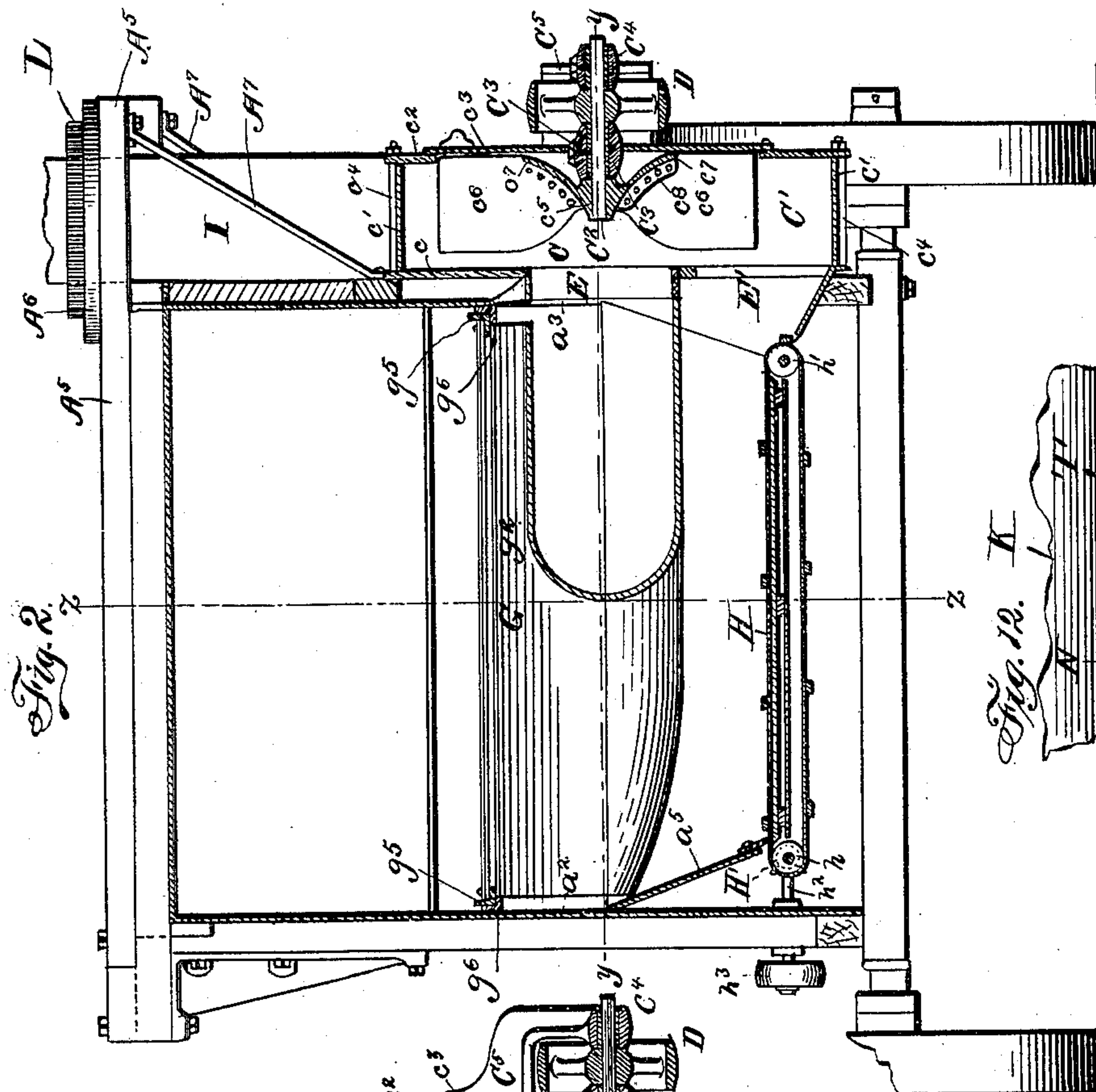
Patented May 15, 1900.

W. N. SPRINGER.
PNEUMATIC STACKER.

(Application filed Apr. 18, 1896.)

(No Model.)

5 Sheets—Sheet 2.



Witnesses
H. H. Edwards
Arthur B. Boyd

Inventor
William N. Springer
By H. H. Bliss
Atty.

No. 649,492.

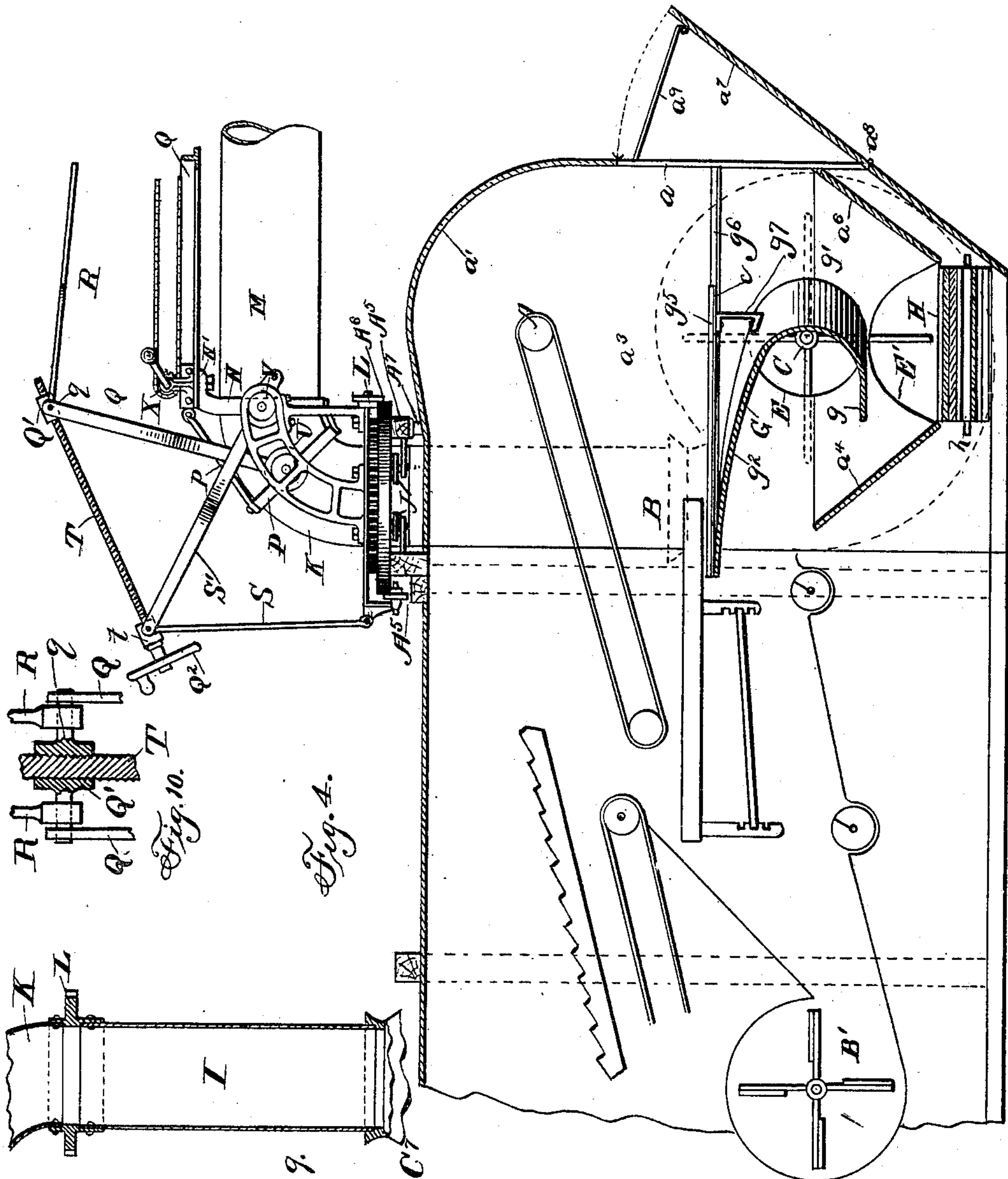
Patented May 15, 1900.

W. N. SPRINGER.
PNEUMATIC STACKER.

(Application filed Apr. 16, 1896.)

(No Model.)

5 Sheets—Sheet 3.



Witnesses
W. H. Edwards.
Arthur L. Bryant

Inventor
William N. Springer
By H. H. Bliss
Atty.

No. 649,492.

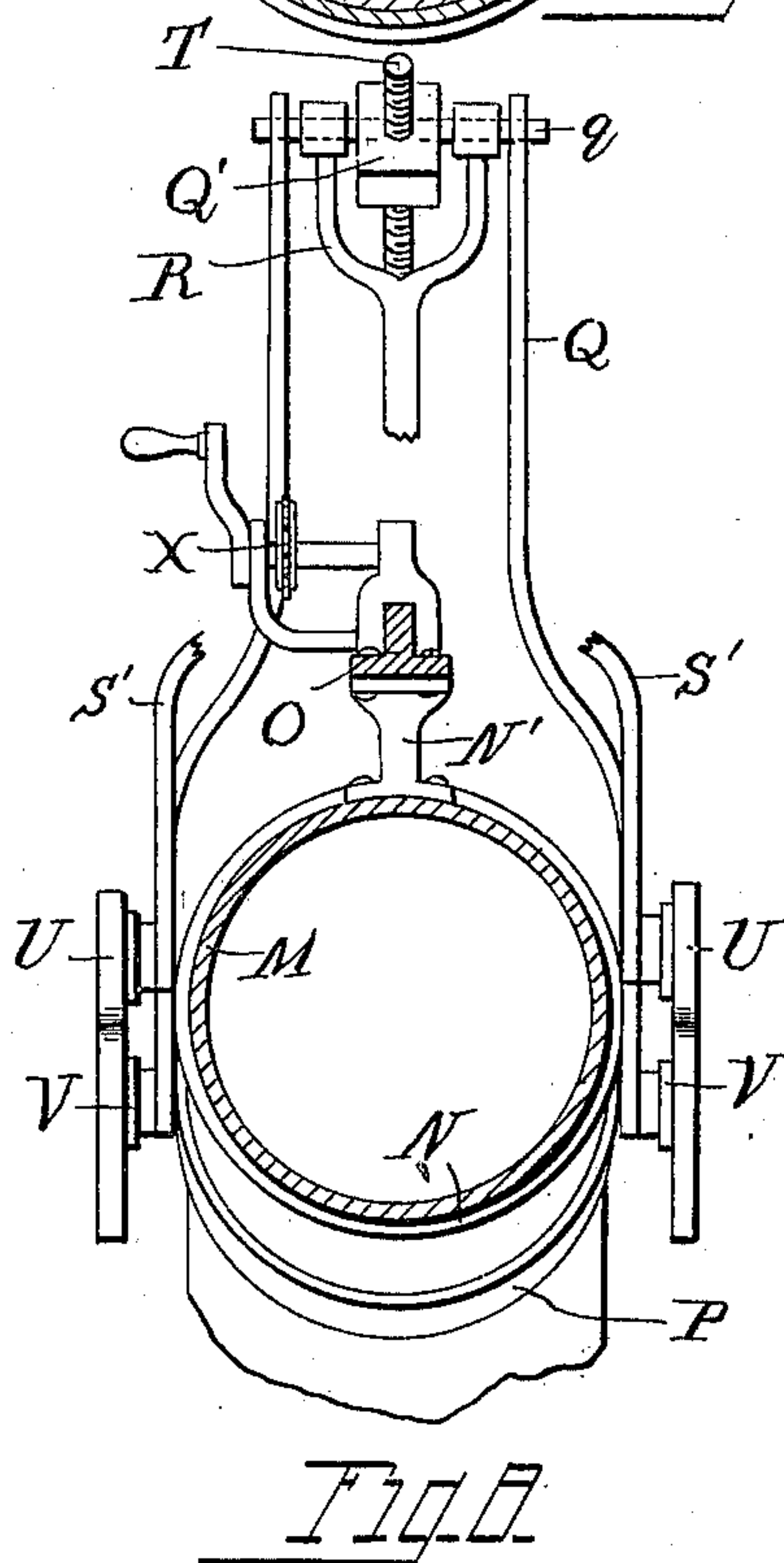
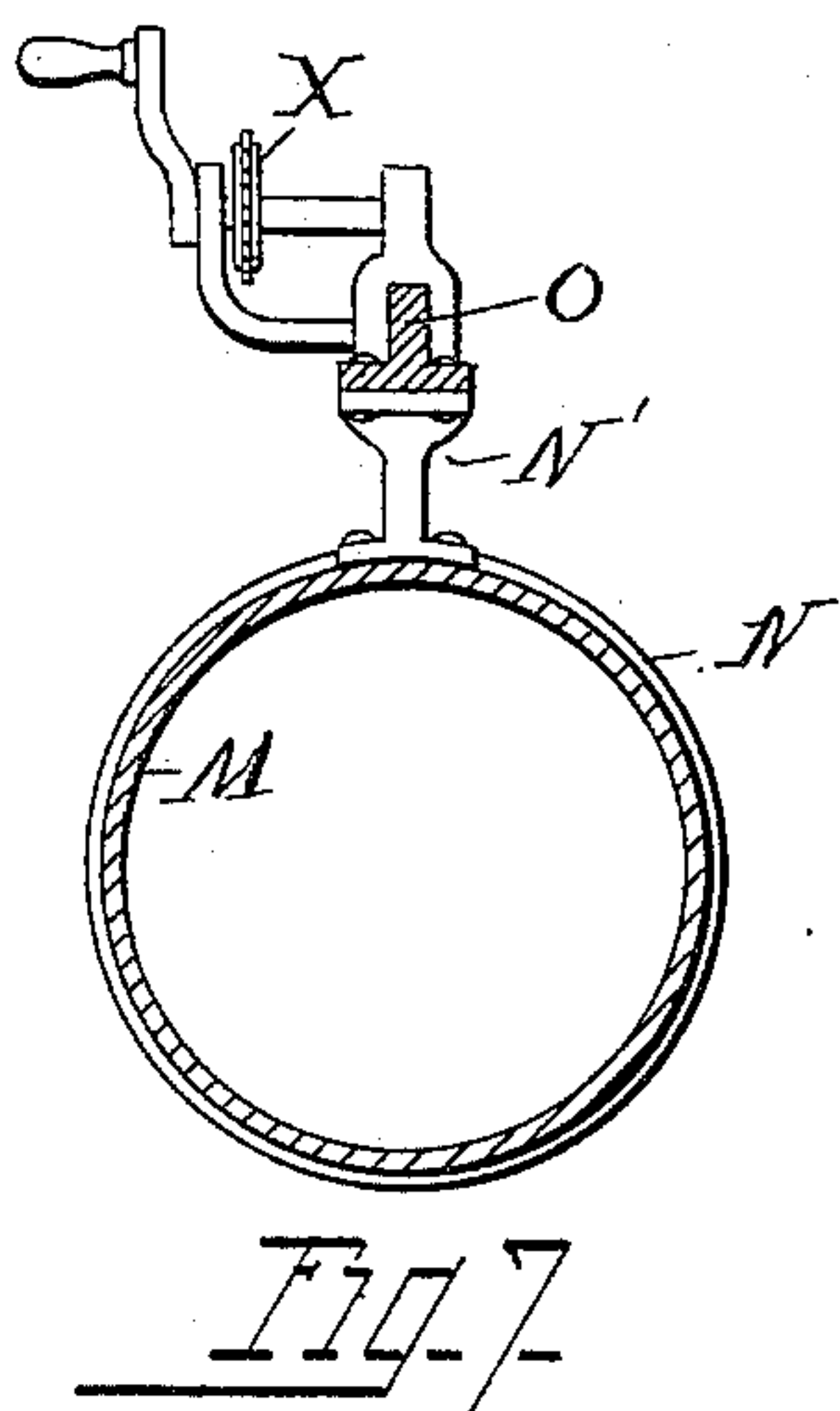
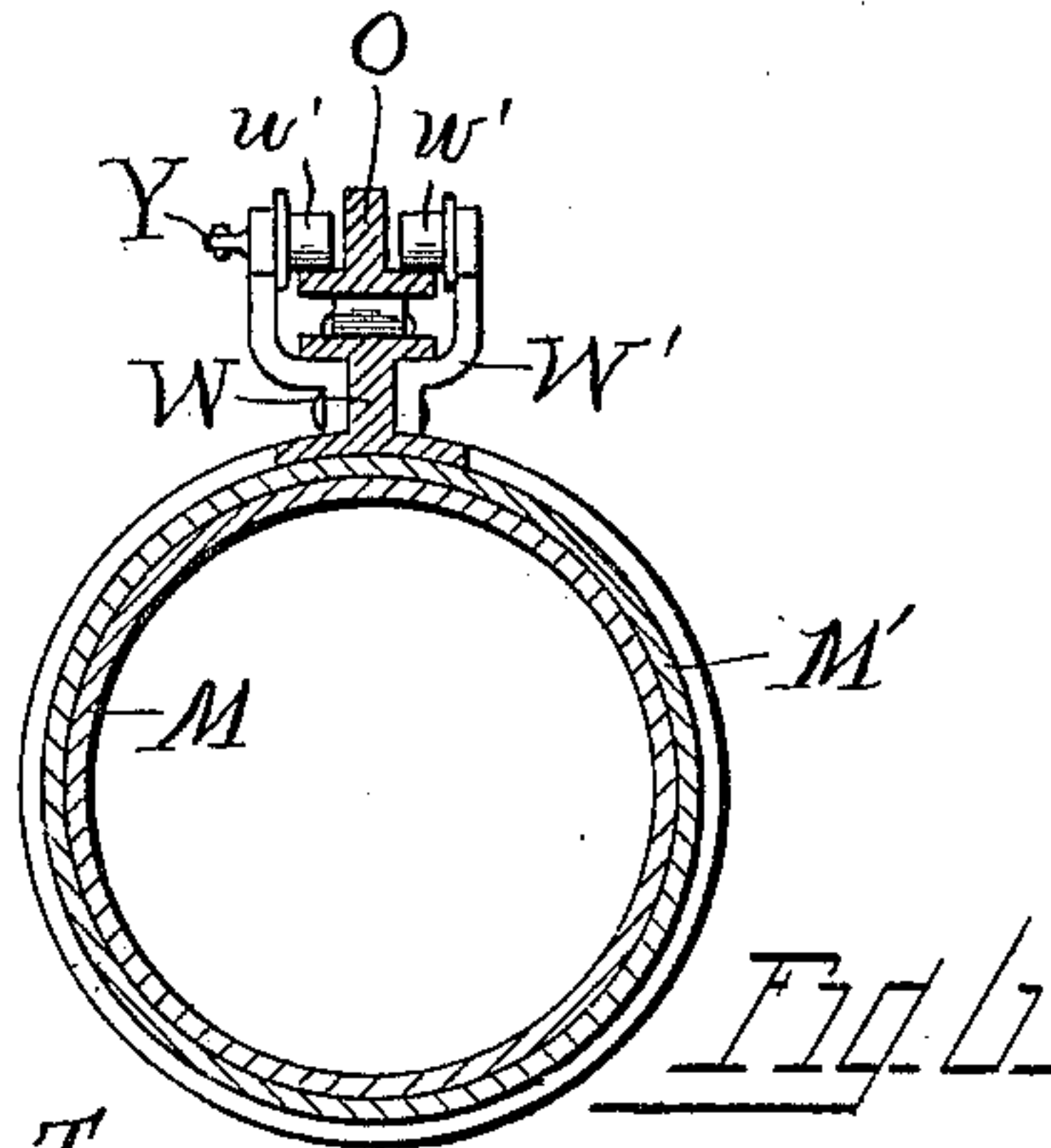
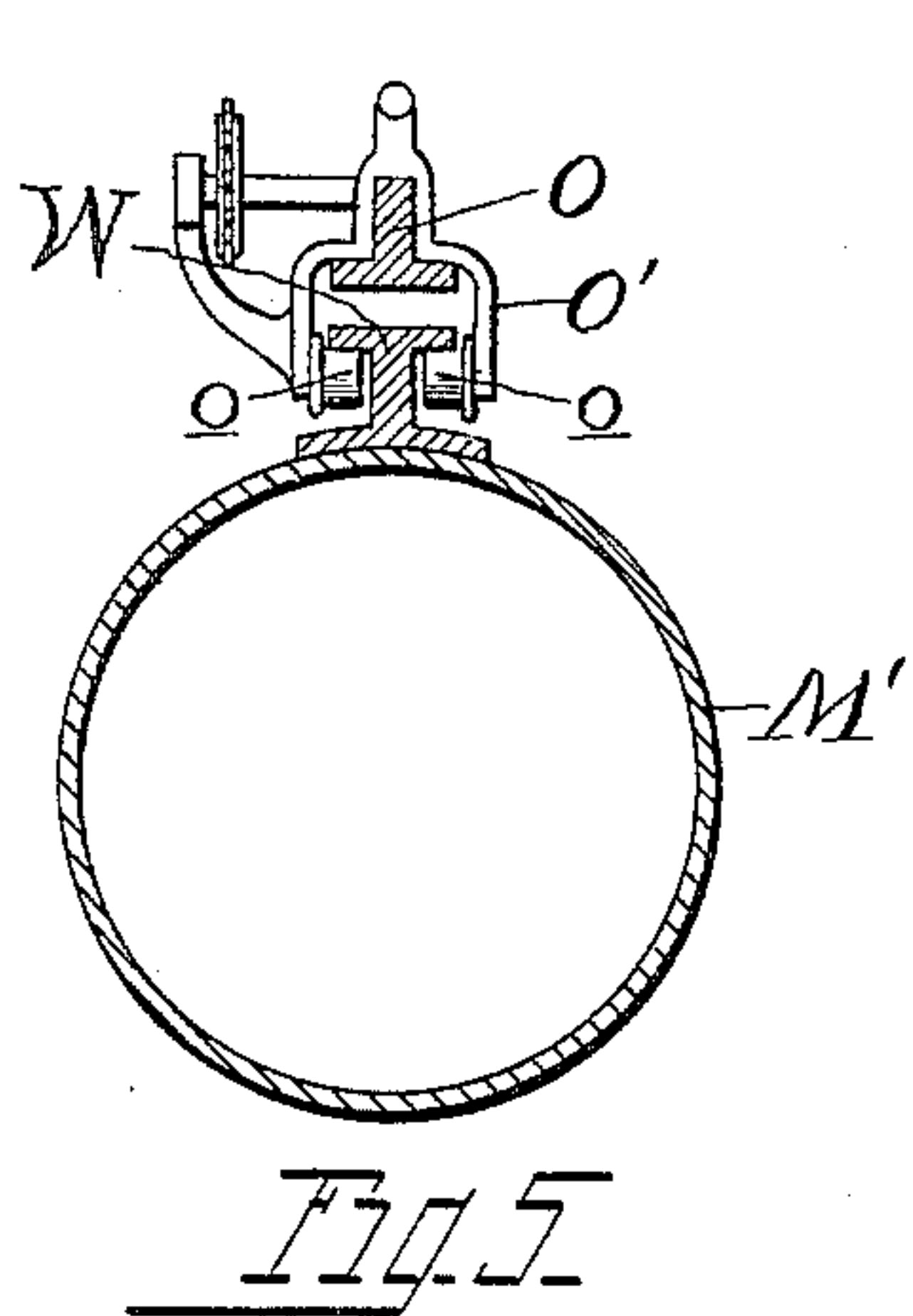
Patented May 15, 1900.

W. N. SPRINGER.
PNEUMATIC STACKER.

(Application filed Apr. 18, 1896.)

(No Model.)

5 Sheets—Sheet 4.



WITNESSES

Carroll J. Webster.
Arthur L. Bryant.

INVENTOR

William N. Springer
By J. H. Bliss
Atty.

No. 649,492.

Patented May 15, 1900.

W. N. SPRINGER.
PNEUMATIC STACKER.

(Application filed Apr. 16, 1896.)

(No Model.)

5 Sheets—Sheet 5.

Fig. 13.

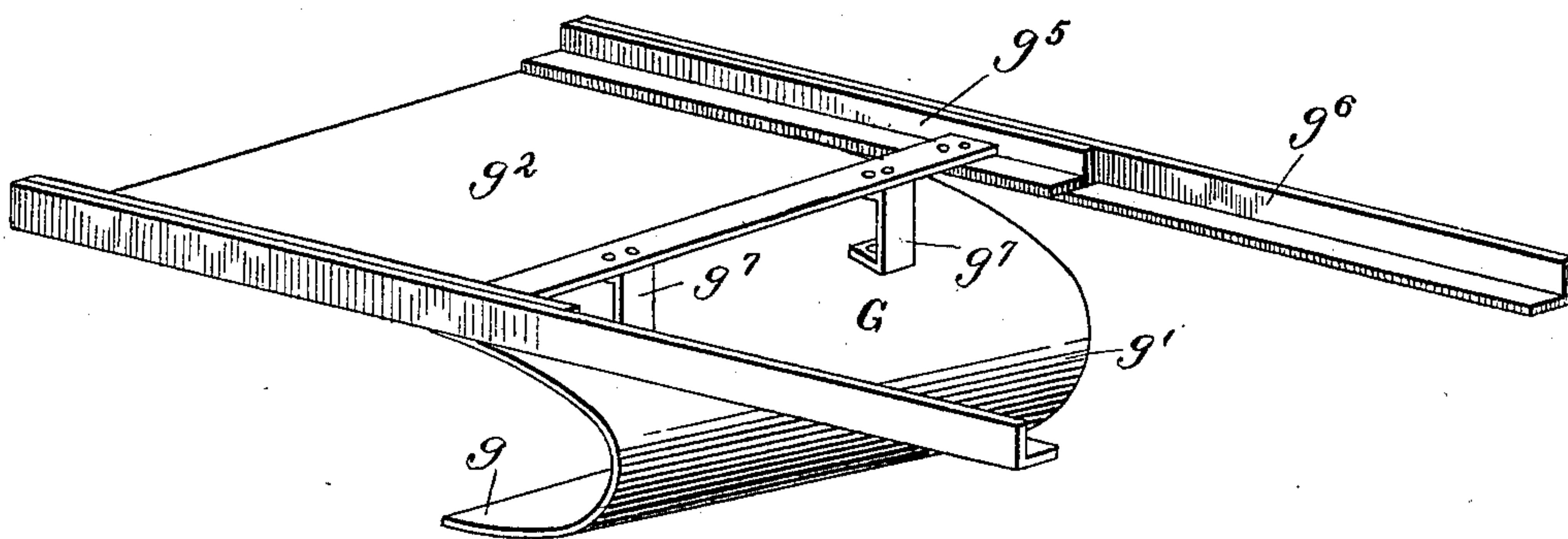
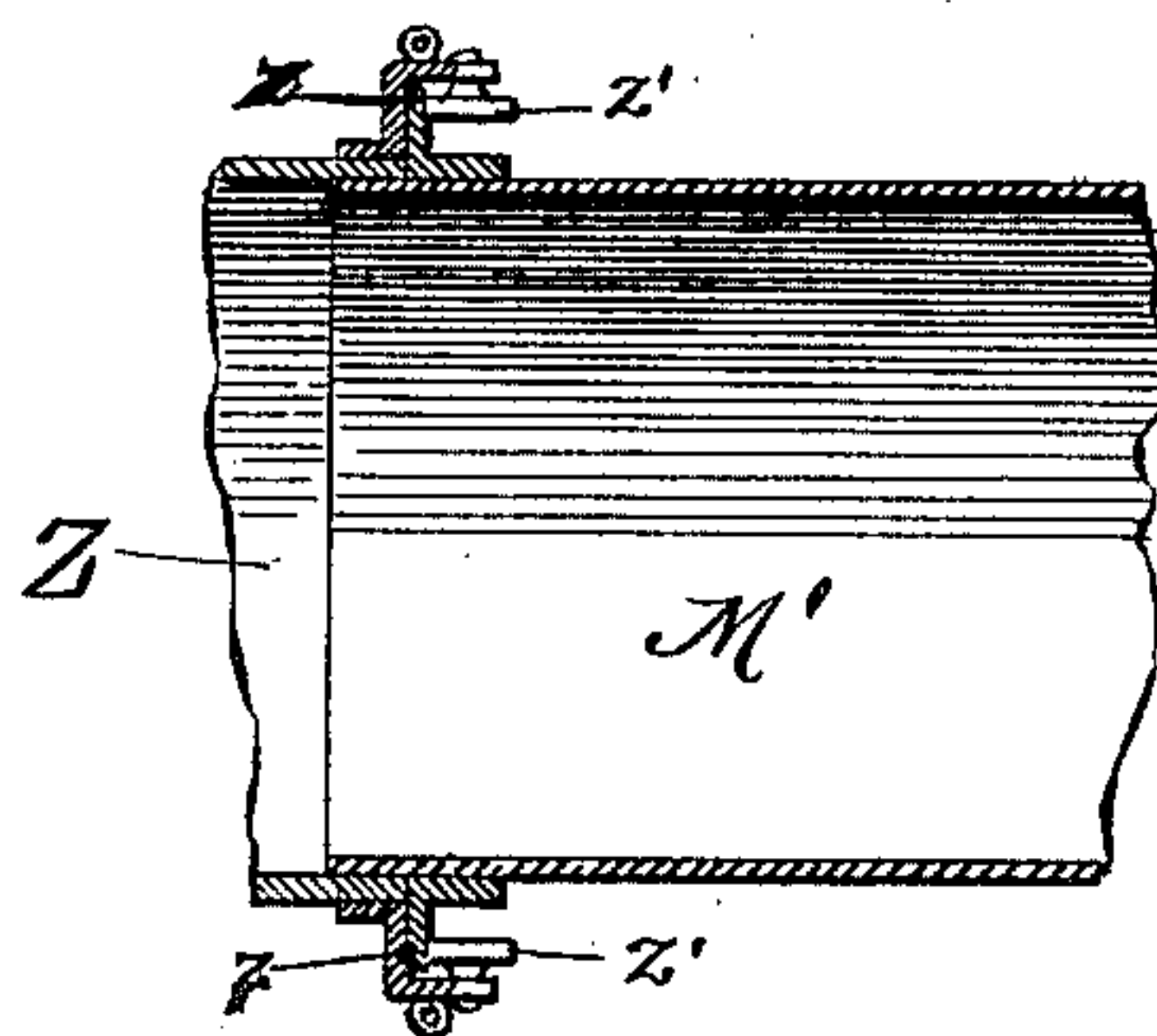


Fig. 14.



Witnesses
W. H. Edwards
Arthur L. Bryant

Inventor
William N. Springer
By *J. W. H. King* Attorney

UNITED STATES PATENT OFFICE.

WILLIAM N. SPRINGER, OF PEORIA, ILLINOIS, ASSIGNOR TO JOHN B. BARTHOLOMEW, OF SAME PLACE.

PNEUMATIC STACKER.

SPECIFICATION forming part of Letters Patent No. 649,492, dated May 15, 1900.

Application filed April 16, 1896. Serial No. 587,833. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. SPRINGER, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Pneumatic Stackers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation showing a portion of a threshing and separating mechanism and also my improved straw-stacking devices. Fig. 2 is a vertical cross-section on the line $x x$, Fig. 1. Fig. 3 is a horizontal section on the line $y y$, Fig. 2. Fig. 4 is a vertical section on the line $z z$, Fig. 2. Fig. 5 is a sectional view on the line 5 5 of Fig. 1. Fig. 6 is a similar view on the line 6 6 of Fig. 1. Fig. 7 is a sectional view taken on a line near the inner end of the discharge-duct. Fig. 8 is a sectional view on the line 8 8 of Fig. 1. Fig. 9 is a longitudinal sectional view through the vertical duct connecting the fan-chamber with the discharge-tube. Fig. 10 is a detail view of the connection between the adjusting threaded rod and the parts acting therewith for varying the elevation of the stacker-duct. Fig. 11 is an elevation of the rear or inner curved section of the delivery-duct. Fig. 12 is a sectional view of a portion of the guiding devices for the rear portion of the section M of the delivery-duct. Fig. 13 is a detail perspective view of the chaff and dust deflector and means for supporting the same. Fig. 14 is a longitudinal section through the outer portion of the stacker spout or trunk and the inner portion of the deflectorhood thereon.

In the drawings, A indicates a portion of the casing of a separating mechanism at the rear end. The thresher parts and the separating devices proper may be of any suitable sort. As shown, the straw is finally delivered from the table B ready for withdrawal from the machine.

At B' is situated the winnowing shoe and fan.

In the rear end of the casing there is constructed a hopper-like receptacle which receives the straw from the table B, this receptacle having the rear end wall a , the curved top a' , the side walls a^2 and a^3 , and also interior sloping or inclined walls a^4 , a^5 , and a^6 . Preferably that portion of the rear wall indicated by a^7 is hinged at a^8 , so that it can be swung outward more or less as desired and for purposes to be described.

The fan is indicated as a whole by C. It is mounted in a casing C', which is situated at the side and outside of the separator-casing A. The fan-casing is constructed with an inner plate c , a peripheral wall c' , and an outer plate c^2 , adapted to be fastened securely, and a removable outer plate c^3 . The plates c c^2 and the peripheral wall c' are fastened together by the bolts c^4 , which are also utilized to secure them to the framework. The detachable plate c^3 is utilized to support the fan. The latter is mounted on a shaft C², which is held in a bearing at C³, cast with the said plate. A second bearing is provided at C⁴ by a bracket C⁵, which is bolted in place, as shown in Fig. 1. Between the bearings C³ and C⁴ is situated the driving-belt wheel D. The shaft C² projects through the bearing C³ far enough to carry the fan. The latter comprises the hub part c^5 and the wings c^6 , the hub having a disk-like plate c^7 with ribs c^8 , to which the wings are riveted.

The fan is not arranged centrally in the chamber C⁶, but eccentrically, its axis being considerably above and behind the center or axial line of the fan-chamber.

The fan is provided with two eyes or entrances through the inner plate c , one of these eyes—that at E—being substantially similar to the ordinary fan-eye, but that at E' being at the bottom of the fan-chamber. The purpose is to deliver to the fan the straw from the separating-table and the chaff, dust, &c., from the winnowing-shoe in two independent masses.

G is a cut-off shield or partition of the shape shown in Figs. 2, 3, and 4. It has the lower horizontal part g , the curved vertical part g' ,

and the upper inclined part g^2 . The parts g g' are connected to the fan-casing on a line adjacent to and around the upper eye E. They extend across the machine to the opposite wall of the separator-chamber. The upper part g^2 of this shield or partition also extends across to the opposite wall and has its forward and upper edge as close as possible to the table or floor below the straw-carrier at B. It will be seen that I thus provide effectually for cutting off the stream of dust, chaff, &c., which is thrown out by the winnowing-shoe from interfering with the movement of the straw and the proper delivery of the latter to the fan. Such chaff, dust, or the like and the air-currents which carry them from the winnowing-shoe will impinge upon the shield or deflector G and be guided directly to the upper fan-eye E.

The straw which is delivered from the carrier B drops behind the shield or deflector G to the bottom of the receptacle above described. From this receptacle it is taken in through the eye or aperture E' at the bottom of the fan-casing. To insure the advance of the straw to the casing, I prefer to employ positively-acting mechanism. I have shown an endless carrier H, mounted upon rollers h h' , one in close proximity to the aperture E' and the other near the opposite wall of the casing. This conveyer may be an ordinary canvas carrier with cleats or chain-belt with attachments or other suitable device. It is driven by a gearing at H' , actuated by the shaft h^2 and belt-wheel h^3 .

There will be more or less tendency for the air to be drawn in through the eye E' ; but owing to the peculiarities of the present construction there will be a reduced draft, partly because of the fact that the air-currents from the winnowing-fan are mostly delivered through the upper eye E and partly because of the fact that the constant advance of straw will tend to keep the eye E' more or less closed. To compensate for this, the positively-acting carrier is employed, which insures a continual advance of the straw into the lower part of the fan-chamber. The currents of air are powerfully propelled upward by the fan, and these currents, together with the fan-plates, acting positively as an ejector, will cause the straw to pass continuously upward through the inner side of the casing and the duct at I. If at any time it is necessary to still further lower within the receptacle the pressure of the air from the winnowing-fan, this can be done by dropping the above-described door-like section a^7 of the rear wall and supporting it either by hooks or hangers at a^9 , which permit it to be adjusted as desired. By lowering this part a^7 to the fullest extent access can be readily obtained to the sieves of the shoe or the other interior parts. The shield or deflector G is made removable for this purpose. To permit of being thus withdrawn, the said shield or deflector is in the embodiment of the invention herein illustrated con-

nected to and supported by supporting-bars g^5 , which are fitted to guides g^6 , formed on the side walls a^2 a^3 of the aforesaid casing at the rear of the thresher. The forward ends of the guide or supporting bars g^5 are connected directly with the said shield, while braces g^7 are interposed between said bars and shield near the rear end of the bars.

The uptake-duct I is not mounted stationarily, as has been customary in machines of this class, but rotates with the upper or delivery part of the duct and is mounted and supported as follows: The cross-girths A^5 and the frame are extended out some distance beyond the separator-casing, and upon the extended parts is placed a table-ring A^6 , these parts thus forming a centrally-open frame. This frame is strengthened by downwardly and inwardly inclined braces A^7 . The duct I is fitted in the tube C^7 , which terminates the delivery part of the fan-chamber and arranged to rest on the same. Its upper end is in the framework above described and is held in place by means of a series of rollers J, which are mounted on bearings attached to the framework. The delivery portion of the duct is formed in sections. The inner section is a short curved pipe K. At its lower end it is rigidly secured by rivets or otherwise to the upper end of the duct I, preferably by means of a flanged ring L, interposed between them and secured to both. This ring is shown in Figs. 1, 2, 4, and 9 and is formed with geared teeth. Horizontal reciprocation can be imparted to it in the usual manner and to the devices connected with it. The ring constitutes a table-like carrier both for the duct, the adjustable parts, and the adjusting devices which actuate them. The delivery-duct proper consists of the inner section M and the outer section M' . These are telescopically joined, so that the outer one can slide longitudinally along the inner one to lengthen or shorten the total duct. Near the inner end of the inner section M there is a ring N. It carries an upwardly-projecting arm N' . To this is fastened a guide-iron O, preferably T-shaped in sections.

P is a ring at the inner end of the section M. To it there is secured a rod p , which extends upward and forward, as shown, and is attached at its upper outer end to the aforesaid guide-iron O. Q Q are rods extending also from the ring P to higher points, and at their upper ends they are connected by a cross-bar q , to which is connected or with which is formed the swinging nut Q' .

R is a stay and truss rod which is connected to the cross-rod q and extends forward and downward to a suitable point of attachment to the guide-iron O.

S S are standards which rise from the rotary support above described, and S' S' are brace-rods which extend forward and downward from the upper ends of the standards S S.

At t there is a pivoted bearing in which there is mounted a screw-shaft T. The lat-

ter passes through the nut Q' and is provided with a hand-wheel Q^2 , by which it can be rotated in such a way as to draw the nut Q' downward and inward, and thereby elevate the outer end of the parts $M M'$, or, on the other hand, it can be so turned as to let the end move farther out and depress the said parts $M M'$. The flexible connection of the part M with the hood K can be provided by an ordinary hinged joint or by means of the device which I have shown. The latter consists of curved guides U , rigidly secured to the rotary base, and rollers V , mounted on stud-shafts, secured to the rings N and P and fitted in the said curved guides U . The curvature of the guides corresponds to that of the hood K , and the parts $M M'$ can swing vertically at their outer ends under the control of the guides and the rollers at V .

The longitudinal adjustment for telescopic movement of the section M' on the section M is effected as follows: The angle guide-bar O extends outward to a point beyond the inner end of the section M' . At its outer end it is provided with a bracket O' , which at its lower end carries rollers o and at its upper end is connected to the above-mentioned stay-rod R . The upper section M' is provided with a guide-bar W , which is preferably a light angle-iron I-shaped in cross-sections. This at its inner end carries a bracket W' , which latter has a roller w , that lies under the angle-guide O , and rollers w' , which lie above the last said guide. It will be seen that the section M' is thus firmly held by means of a truss-frame formed of the parts N , O , and R and at the same time is free to move out and in because of the antifriction devices which connect together the two guide-irons O and W .

X is a chain-wheel mounted on a shaft which is provided with a crank, this being at the inner end of the section M , and X' is a chain-wheel at the outer end of the guide-bar O .

Y is a chain passing around these wheels, and at y it is secured to the bracket W . When the shaft and wheel at X are turned in one direction, the draft of the chain forces the section M outward, the rollers at o and w turning freely and relieving the chain Y from strain, and, vice versa, when the wheel at X is turned in the opposite direction the point w' is moved rearwardly and the section M' is drawn inward.

The hood or delivery-section at Z is adapted to rotate axially on the telescopic section M' . z is a flange on the part M' , and $z' z'$ are rollers carried by the section Z and lying inside of and bearing against the flange or ring. By means of ropes Z' , extending down to within reach from the ground, the mouthpiece Z can be rocked to the right or left, as desired.

What I claim is—

1. In a straw-stacking mechanism, the combination with the separator, and the winnowing mechanism, of the discharge-fan, the guideway or duct for the chaff and dust from

the winnower to the fan, and a chamber or passage for the straw having an entrance to the fan-chamber below the entrance for the chaff and dust, substantially as set forth.

2. In a straw-stacking mechanism, the combination with the separator and the winnowing device, of the uptake-duct, the fan, the fan-casing having two eyes or inlet-apertures, one for the chaff and dust from the winnower and one for the straw from the separator, the partition, shield or deflector interposed between the path of the air-currents from the winnower and the path of the straw and adapted to guide the chaff and dust to one of said entrances to the fan, and means for guiding the straw from the separator to the other entrance to the fan, substantially as set forth.

3. In a pneumatic straw-stacker, the combination with the separator, the winnowing mechanism, and the uptake-duct of the fan, the deflector for guiding the chaff and dust from the winnowing mechanism to the fan-chamber, the chamber or receptacle below the separator for the straw, having an aperture for the entrance of said straw to the fan-chamber separate from the entrance to said chamber for the chaff or dust, and a carrier for positively advancing the straw toward the fan-chamber, substantially as set forth.

4. In a straw-stacking mechanism, the combination with the separator, the winnowing mechanism, and a discharge-duct, of a fan-casing communicating with the discharge-duct and having two inlet-apertures in one of its walls, a deflector or shield arranged to contact with the fan-casing between the two inlet-apertures therein to separate the currents of air from the winnowing mechanism from the straw delivered from the separator, and a fan arranged within the fan-casing, substantially as set forth.

5. In a straw-stacking mechanism, the combination with a separator, a winnowing mechanism, and a discharge-duct, of a fan-casing communicating with the discharge-duct and having two independent inlet-apertures, a deflector adapted to guide chaff and dust from the winnowing mechanism to one of said inlet-apertures in the fan-casing and to guide straw from the separator to the other of said inlet-apertures, and a fan arranged within said fan-casing, substantially as set forth.

6. In a straw-stacking mechanism, the combination with a separator, a winnowing mechanism, and a discharge-duct, of a fan-casing communicating with said duct and having two independent inlet-apertures, a deflector or shield arranged in the path of the air-currents from the winnowing mechanism and curved to extend concentric with one of the inlet-apertures in the fan-casing, and at one side of the other inlet-aperture, and a fan arranged within the fan-casing, substantially as set forth.

7. In a straw-stacking mechanism, the combination with the separator, the winnowing devices, the main casing inclosing said parts,

and the discharge-duct, of a fan-casing communicating with said duct and having two independent inlet-apertures in one of its side walls, supporting-bars, g^5 , arranged at the side of the fan-casing, a deflector or shield connected to said bars and adapted to guide the straw from the separator to one of the inlet-apertures in the fan-casing and the chaff and dust from the winnowing devices to the other of said inlet-apertures, a door at the rear of the main casing, and a fan arranged within the fan-casing, substantially as set forth.

8. In a pneumatic straw-stacker the combination with the delivery-duct having telescoping sections $M M'$, of the guide-bar O , the adjustable truss-frame for supporting said guide-bar, the guide-bar W secured to the outer section and the antifriction-roller bearings interposed between the said guide-bars O and W , substantially as set forth.

9. In a pneumatic straw-stacker, the combination with a delivery spout or duct having two telescoping sections, of two overlapping guide-bars, each connected with one of said duct-sections, antifriction-rollers mounted on each of said guide-bars and contacting with the other of said bars, and means for positively moving one of said duct-sections and its attached guide-bar longitudinally of the other section and its guide-bar, substantially as set forth.

10. In a pneumatic straw-stacker, the combination with a delivery spout or duct having two telescoping sections, of an angle-iron guide-bar having its inner end supported on one of said duct-sections, and its forward end projecting beyond the end of said duct-section, another guide-bar secured to and extending

longitudinally of the other duct-section, an antifriction-roller supported from the forward end of the first said guide-bar and engaging with the last said guide-bar to assist in supporting the duct-section connected therewith, antifriction-rollers carried by the last said duct-section and arranged to run on the first said guide-bar, and means for moving the last said duct-section longitudinally of the first said duct-section, substantially as set forth.

11. In a pneumatic straw-stacker, the combination with a delivery duct or spout having two telescoping sections, M, M' , an angle-iron guide-bar arranged at one side of and projecting beyond the end of the duct-section M , devices on said guide-bar for loosely supporting the duct-section M' , antifriction rollers or wheels mounted on the last said duct-section, M' , and arranged to run along the aforesaid guide-bar, and power devices supported on the inner duct-section, M , and adapted to positively move the outer duct-section, M' , longitudinally, substantially as set forth.

12. In a pneumatic straw-stacker, the combination of the outer duct-section, M' , having an annular flange, z , at its outer end, of the rotary mouthpiece fitted about said duct-section, M' , and having guide-wheels bearing against said flange z , and means for positively moving said mouthpiece, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM N. SPRINGER.

Witnesses:

HENRY C. ROBERTS,

JOHN B. BARTHOLOMEW.