

F. O. Degener. Sheet 1. 2. Sheets.
Printing Press.

N^o 2672.
33.676.

Patented Nov. 5. 1861.

Fig. 1.

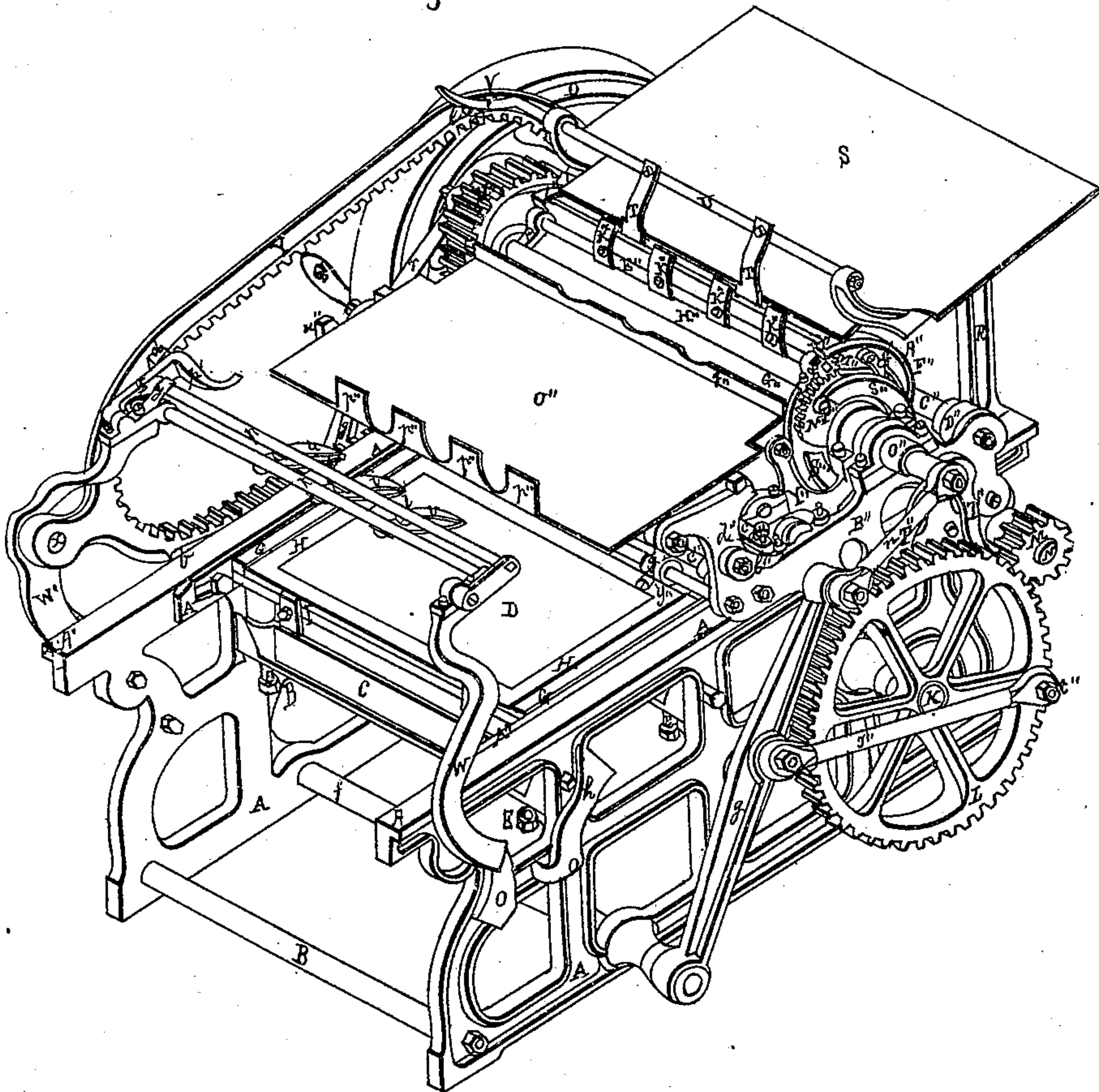
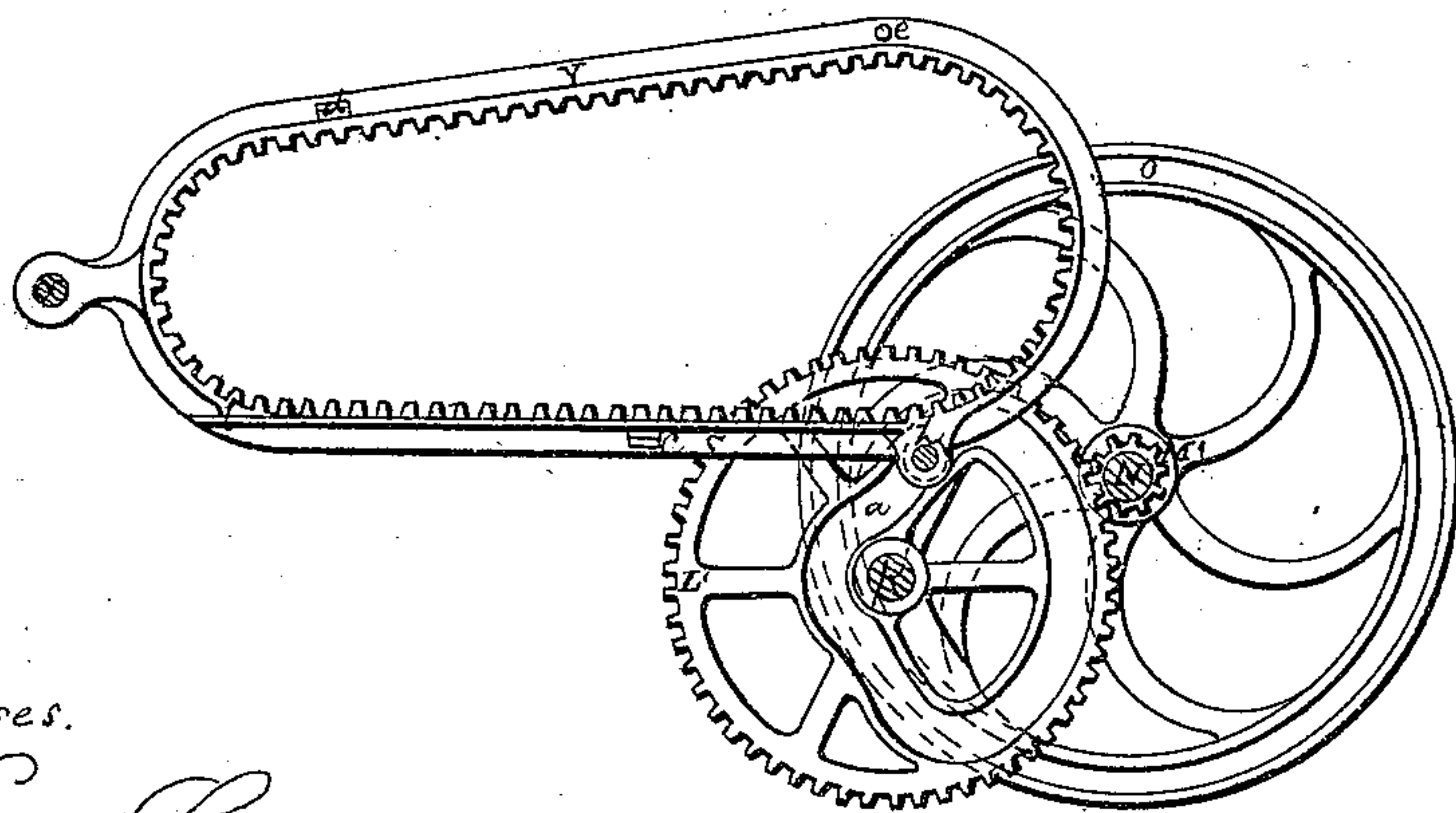


Fig. 3.



Witnesses.

Edmund Ludlow
J. H. Heiler

Inventor
Fred. Otto Degener.

*F. O. Degener. Sheet 2. of 2 Sheets.
Printing Press.*

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Fig 2.

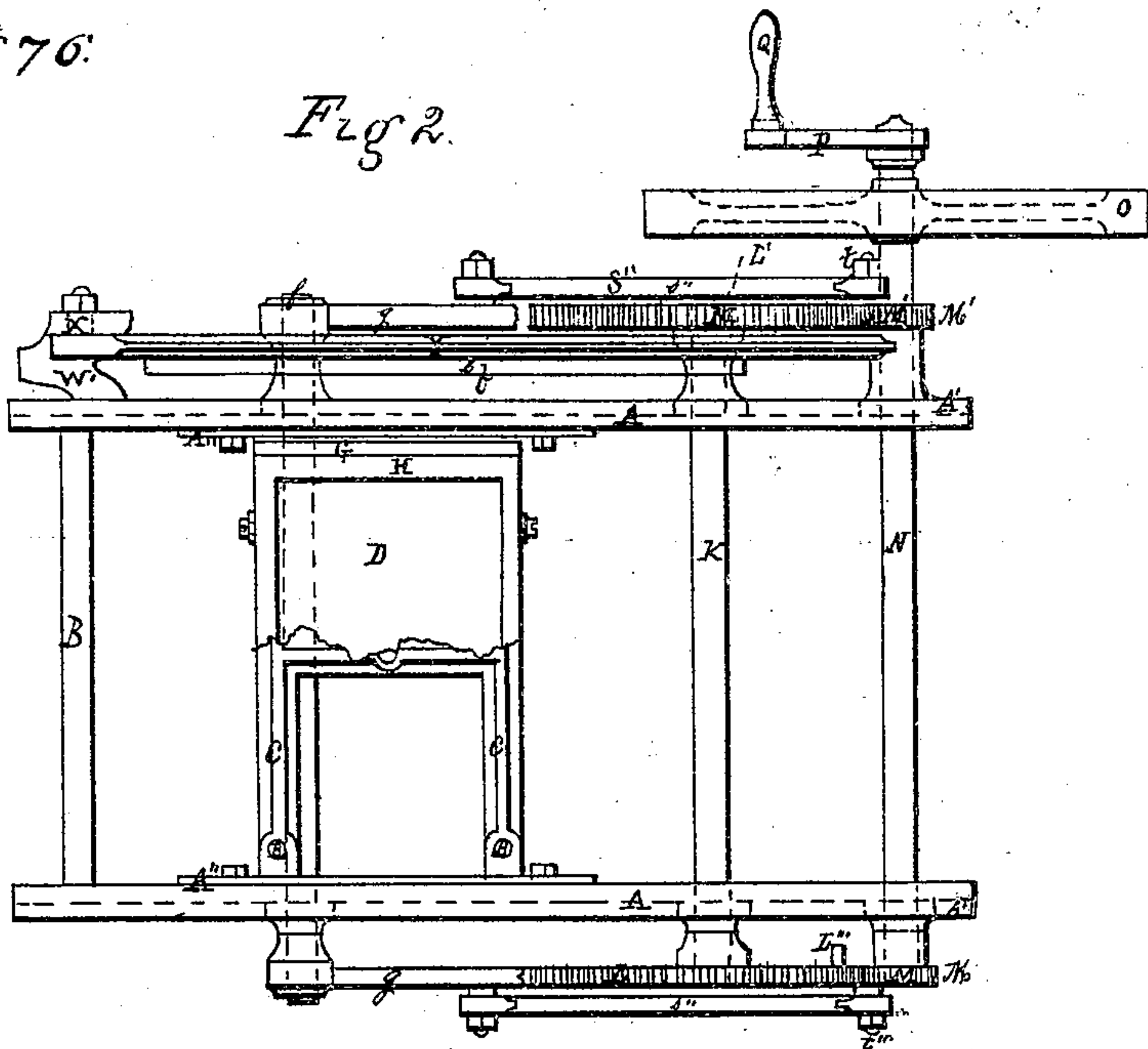


Fig 9.

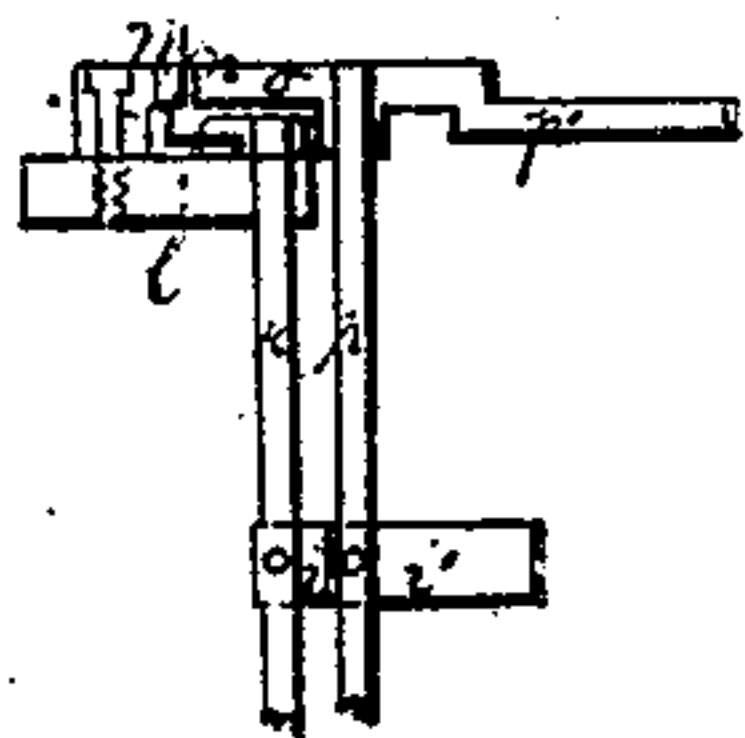


Fig 8.

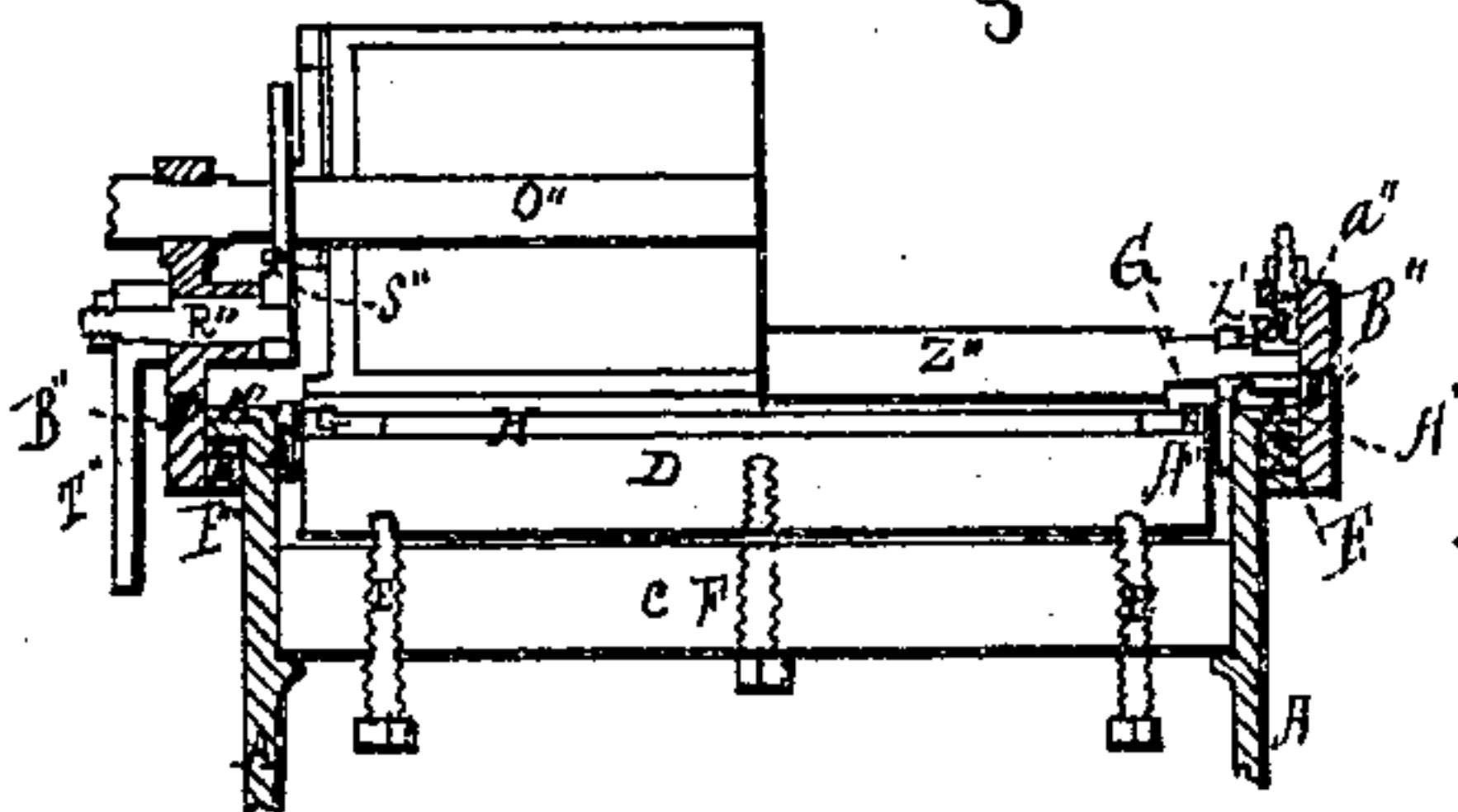


Fig 4.

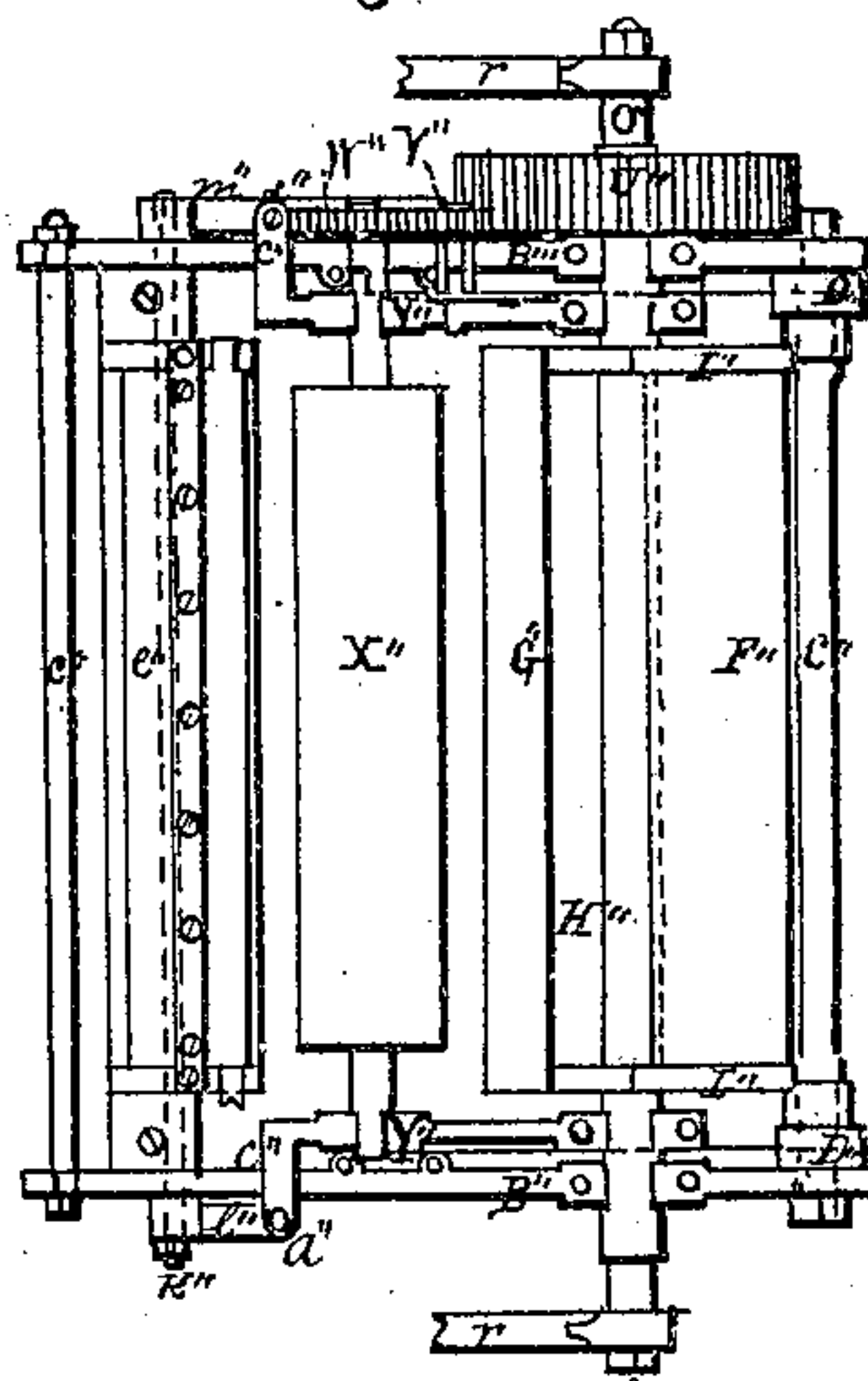


Fig 7.

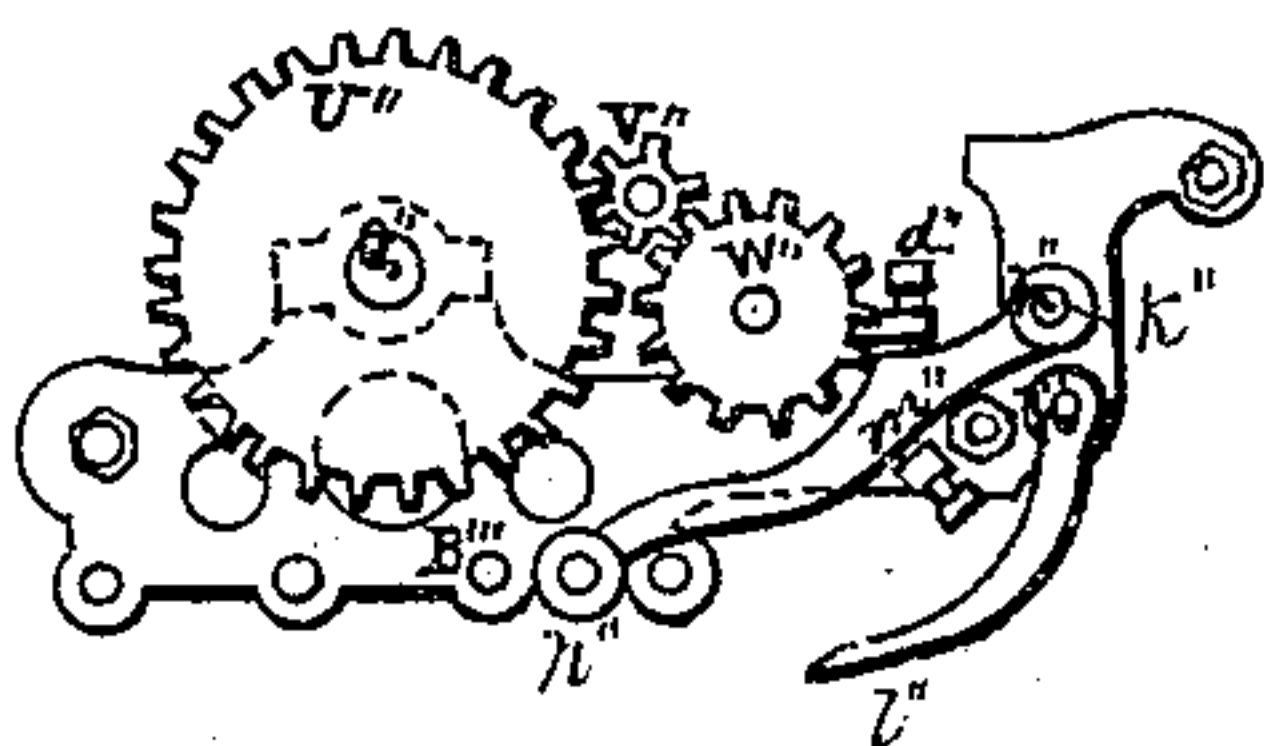


Fig 6.

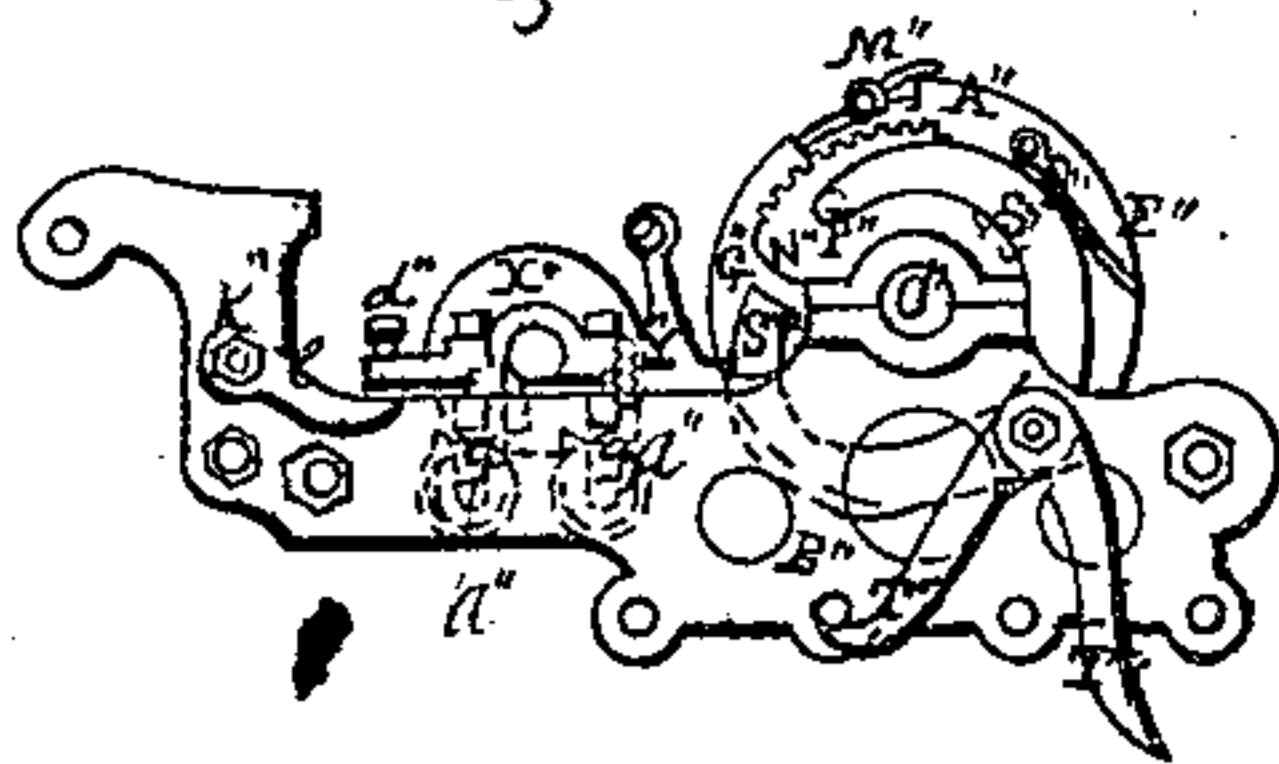
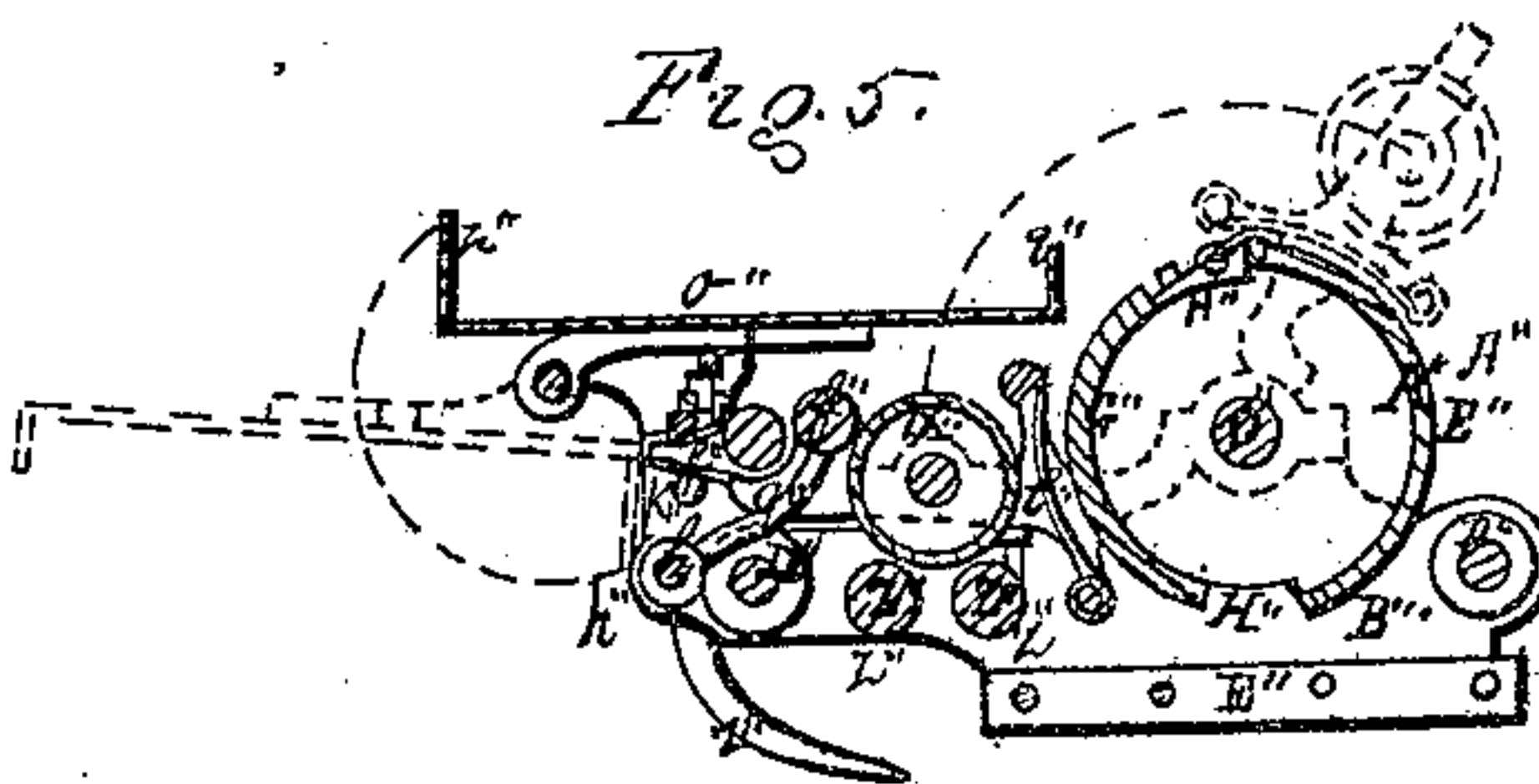


Fig 5.



Witnesses:

*Edward Luden
G. H. Heiles.*

Inventor:

Fred. Otto Degener.

UNITED STATES PATENT OFFICE.

FRED. OTTO DEGENER, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF, AND
PETER WEILER, OF BELLEVILLE, NEW JERSEY.

CYLINDER PRINTING-PRESS.

Specification forming part of Letters Patent No. 33,676, dated November 5, 1861.

To all whom it may concern:

Be it known that I, FRED. OTTO DEGENER, of New York, in the county and State of New York, have invented certain new and useful Improvements in Cylinder Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings and letters of reference thereon, all of which form a part of this specification, the same letter of reference always designating the same object or part of the machine in all the figures.

Of the drawings, Figure 1 is an isometrical perspective view of the press. Fig. 2 is a ground plan of the press-frame and driving parts, with a part of the type-bed and part of the traverse-pieces on which the type-bed rests. Fig. 3 is a face view of a tapering endless vibrating rack working at one end in a grooved cam of a main wheel geared with a pinion and to be driven by a fly-wheel. Fig. 4 is a ground plan of the impression-cylinder carriage, the impression-cylinder, the ink-cylinder frame, the ink-cylinder, and the ink-fountain, with the gearing to give motion to the impression-cylinder and ink-cylinder. Fig. 5 is a transverse section of the impression-cylinder carriage and parts which it carries. Fig. 6 is an end view of the impression-cylinder carriage at the left-hand side of the press. Fig. 7 is an end view of the cylinder-carriage at the right-hand side of the press. Fig. 8 is a longitudinal section of the type-bed, part of the impression-cylinder, part of an inking-roller with bearer, and cross-section of a part of the press-frame and the cylinder-carriage frame. Fig. 9 is a part of the stationary piling-gripper arrangement.

The details of the drawings I shall fully explain in the construction and operation of the press.

The nature of my invention consists in a cylinder printing-press so constructed by the introduction of original mechanical devices and other new combinations and arrangements of different mechanical parts as to render the press a very simple and likewise a very perfect machine.

To enable others skilled in the art to make and use my invention, I shall now describe its construction and operation.

The material used in the construction of this press is metal, and principally cast-iron, of which I provide a frame for supporting the working parts of the press, said frame consisting of the two sides A, Figs. 1, 2, and 8, each side having at the upper edge a side flange A', Figs. 1, 2, and 8, projecting outward. These sides are connected by stretchers or traverse-pieces B, Figs. 1 and 2. Between these two sides A, and supported by and fastened to them, are two other traverse-pieces C, Figs. 1, 2, and 8, which form the base or support for the bed D, Figs. 1, 2, and 8. This bed rests on four screws E, Figs. 1, 2, and 8, by means of which the type-bed D can be raised or lowered or the impression be adjusted as occasion may require. This bed (or "type-bed," as it is called sometimes) is held down to the four corner screws by the center screw F, Figs. 2 and 8. Said bed is provided with bearers G, Figs. 1, 2, and 8, one on each end of the bed. Between these bearers the chase or frame H, Figs. 1, 2, and 8, which is to hold the type, is placed, and held by means of clutches I, Figs. 1 and 2.

To the sides A of the frame, inside, opposite each end of the bed D, I attach an adjustable bearer A'', Figs. 1, 2, and 8. Near the front end of the press-frame the main shaft K, Figs. 1, 2, and 3, runs through both sides and has attached at each end a main wheel L L', Figs. 1, 2, and 3. The main wheel L, I provide with a pin L'', Fig. 2, on the inside. Into each of these wheels is geared a pinion M M', Figs. 1, 2, and 3, attached to a driving-shaft N, Figs. 1, 2, and 3. Said shaft I provide with a fly-wheel O, Figs. 1, 2, and 3, and crank P, Fig. 2, with a handle Q, Figs. 1 and 2. Near the front end of the press-frame are also two uprights R, Fig. 1, one on each side, which support the feeding-table S, Fig. 1, and also the gages T, Fig. 1, attached to a shaft U, Fig. 1. Said shaft has a short arm V, Fig. 1, on the right-hand end.

Near the back end of the press-frame outside I attach two bent uprights W W', Fig. 1, one at each side. To the upright W', Figs. 1 and 2, at X, Figs. 1 and 2, is swiveled by the narrow end a tapering endless rack Y, Figs. 1, 2, and 3, having teeth on the inner edge. At the broad end of the rack, near the lower edge, is a roller Z, Fig. 3, attached, which fits

into a grooved cam *a*, Fig. 3, of the main wheel *L'*, Fig. 3. Each end of the rack *Y*, Figs. 1, 2, and 3, forms a segment of a circle. This rack *Y* has a flange *b*, Figs. 1, 2, and 3, on the lower part inside. The rack *Y* is also provided near this flange with a projecting piece *c*, Fig. 3, and at the upper part, inside, toward the back end with a projecting piece *d*, Figs. 1 and 3, and toward the front end with a projecting pin *e*, Figs. 1 and 3. A shaft *f*, Figs. 1 and 2, passes through the frame near the bottom back of the main wheels. To each end of this shaft *f* is attached an upright *g*, Figs. 1 and 2. A projecting piece *h*, Fig. 1, is attached to the left-hand side of the frame toward the back end. The two bent uprights *W W'*, Fig. 1, support a set of stationary grippers *i i'*, Fig. 1. These grippers are so constructed that the motion of the upper grippers shall control the motion of the lower grippers, or vice versa, viz: To the shaft *k*, Figs. 1 and 9, which holds the lower grippers *i*, is affixed a short arm *l*, Figs. 1 and 9, with a pin *m*, Fig. 9, which fits into a slit *n*, Fig. 9, of the arm *o*, Figs. 1 and 9, attached to the shaft *p*, Figs. 1 and 9, of the upper grippers *i'*, Figs. 1 and 9. A spring *y*, Fig. 1, attached to the bent upright *w'*, Fig. 1, so as to bear upon the shaft *p* of the upper grippers *i'*, causes the set of grippers to close with firmness. The arm *o*, Figs. 1 and 9, has a bent piece *p'*, Figs. 1 and 9, attached on the inside, extending downward and forward.

The impression-cylinder *A''*, Figs. 1, 5, and 6, is supported in a traveling carriage by the shaft *O''*, Figs. 1, 5, 6, and 7. The sides *B''* and *B'''*, Figs. 1, 4, 5, 6, 7, and 8, of the impression-cylinder carriage are connected by traverse-pieces *C''*, Figs. 1 and 4. This cylinder-carriage is supported by and travels on the sides *A A* of the press-frame by means of roller-bearers *D''*, Figs. 1, 4, and 5.

The sides of the impression-cylinder carriage pass outside of the frame-flanges *A'*, Figs. 1, 2, and 8, and each side has a piece *E''*, Figs. 5 and 8, attached to impinge under the flanges *A'*, Figs. 1, 2, and 8, of the press-frame *A*.

The impression-cylinder consists of two parts—the part *F''*, Figs. 1, 4, 5, and 6, which gives the impression, and which does not take quite one-half of the periphery, and the part *G''*, Figs. 1, 4, 5, and 6, which has a shorter radii than the impression part and constitutes a counterbalance to it. Both parts are separated at the periphery by longitudinal openings *H''*, Figs. 1, 4, and 5. The whole may be cast in one piece, or may be cast in two pieces and then be put together, at the option of the manufacturer. The impression part of the cylinder *F''* has two slight projections *I''*, Figs. 1 and 4, one at each end, which are to impinge on the bearers *G*, Figs. 1 and 2, of the bed when the impression is being given. Between the two projecting parts *I''*, Figs. 1 and 4, the “blanket,” as it is called, or tympan-sheet is placed, upon which

the paper is taken and receives the impression. The blanket is attached on one side by means of pins projecting inside of the cylinder, and on the other side of the cylinder it is fastened to a shaft running longitudinally through the cylinder, by which it can be drawn tight and held by means of a ratchet and pawl. This is a well-known method.

The impression-cylinder is provided with grippers *K''*, Fig. 1, attached to a shaft *L''*, Fig. 1, running longitudinally with and on one side of the impression part of the cylinder, and supported in eyes, one at each end of the cylinder. At the left end of this gripper-shaft a segment-gear *M''*, Figs. 1 and 6, is attached, gearing into a larger segment *N''*, Figs. 1 and 6, which turns or is swiveled on the axis or shaft *O''* of the cylinder. The segment-gear *N''* is provided with a projecting pin *P''*, Figs. 1 and 6, near its gear. A clutch, *Q''*, Figs. 1 and 6, catching into notches of the segment *N''*, gives firmness to the grippers *K''*, Fig. 1. Below the center of the impression-cylinder, a little sidewise, a short shaft *R''*, Fig. 8, passes through the left side of the cylinder-carriage. To the inside end of this shaft two bent arms *S'' S'''*, Figs. 1 and 6, are attached. These two arms are of such length that the pin *P''*, Fig. 1, will strike against their ends when the pin *P''* is brought upward by the revolving of the impression-cylinder. To the outside end of this shaft *R''*, Fig. 8, I attach two arms *T'' T'''*, Figs. 1 and 8, running downward, or nearly so. To the right-hand end of the impression cylinder shaft *O''*, I attach a wheel *U''*, Figs. 1 and 7, of the proper diameter to gear into the rack *Y*. This wheel *U''*, I make thicker than the rack *Y*, so that it will project, and I gear into the projection of this cylinder-wheel *U''* an intermediate wheel *V''*, Fig. 7, attached to the ink-cylinder frame. This wheel *V''* also gears into the wheel *W''*, Fig. 7, of the ink-distributing cylinder *X''*, Figs. 4, 5, and 6. The ink-cylinder *X''* is held in a separate frame *Y''*, Figs. 1, 4, and 6, which is swiveled on the axis or shaft *O''* of the impression-cylinder, so that it can be raised or lowered, so as to be brought into proper contact with the inking-rollers *Z''*, Figs. 5 and 8, or can be turned upward, as shown by dotted lines in Fig. 5, so as to admit of access to the inking-rollers, and keeping at the same time in gear.

The inking-rollers *Z''*, Figs. 5 and 8, are provided at each end with roller-bearers *z'*, Fig. 8, and held in their places by means of adjustable hooks or supports *a''*, Figs. 6 and 8, attached to the impression-cylinder carriage, so that they can be raised or lowered for the purpose of being brought into proper contact with the type-form. I also attach the paper-guards *b''*, Fig. 5, to the traverse rods or connecting-shafts of the ink-cylinder frame.

The ink-cylinder frame *Y''*, Figs. 1 and 4, has two projections *c''*, Figs. 1 and 4, one on each side, projecting over the sides of the

impression-cylinder carriage, each projection being provided with a set-screw d'' , Figs. 1, 4, and 6, by which the ink-cylinder can be regulated so as to come in proper contact with the inking-rollers. I attach an ink-fountain e'' , Figs. 4 and 5, to the impression-cylinder carriage back of the ink-distributing cylinder, the ink-fountain being constructed according to any well-known method. Between the ink-cylinder X'' and the ink-fountain e'' I place a distributing-roller f'' , Fig. 5. This roller is supported in two arms g'' , Figs. 1 and 5, attached to a shaft h'' , Figs. 5 and 7, passing through the impression-cylinder carriage. Said shaft h'' is provided at the right-hand end with a bent arm i'' , Figs. 5 and 7, turning downward and forward. Below the ink-fountain is another shaft k'' , Figs. 4, 5, 6, and 7, passing through the impression-cylinder carriage. This shaft k'' has on the left-hand end a short arm l'' , Figs. 1, 4, and 6, on which the left-hand set-screw d'' of the ink-cylinder frame rests. On the right-hand side the shaft k'' has a longer arm m'' , Figs. 4 and 7, provided at the lower end with a roller n'' , Fig. 7, and near the upper end the right-hand set-screw d'' , Figs. 4 and 6, of the ink-cylinder frame rests.

The back end of the impression-cylinder carriage I provide with a table o'' , Figs. 1 and 5, which is to receive the printed sheets. This table o'' I swivel or hinge to the carriage so that it can be turned over, as shown by dotted lines in Fig. 5, and thus admit of access to the ink-fountain, ink-cylinder, and inking-rollers. This table o'' may be constructed of strips of wood in the shape of the well-known fly-frame and may be made to deliver each printed sheet singly upon a stationary table placed at the end of the press. The upper back edge of this table o'' , I provide with projections p'' , Figs. 1 and 5, which are to pass through the stationary grippers during the working of the press, so as to deliver the sheet out of the stationary grippers upon the traveling pile-board or fly-frame o'' . The pile-table o'' , Figs. 1 and 5, has a projecting ledge q'' , Figs. 1 and 5, toward the front. At the right-hand side of the pile-table o'' I provide the carriage with a projecting piece u'' , Fig. 1. The ends of the impression-cylinder shaft O'' , Fig. 1, I connect with the upper ends of the uprights g , Fig. 1, by means of connecting-rods r , Fig. 1.

The uprights or arms g I connect at or near their center with the two main wheels $L L'$ by means of connecting-rods s'' , Figs. 1 and 2, swiveling on pins or studs t'' , Figs. 1 and 2, set eccentrically on the main wheels $L L'$, Figs. 1 and 2.

Operation: All the different parts being constructed and adjusted as described, then when the fly-wheel or pinion-shaft is set in motion this will communicate motion to the main wheels $L L'$. These, by means of the connecting-rods s'' , the uprights g , and the connecting-rods r , will give motion to the im-

pression-cylinder carriage, which will thus be driven forward and backward over the form-bed D , while the impression-cylinder will have a continuous rotary motion, caused by the cylinder-wheel U'' being in gear with the lower part of the rack Y during the motion from the front to the back and being in gear with the upper part of the rack Y during the return movement of the carriage, the rack Y being raised when the cylinder-wheel U'' passes from the upper to the lower part of the rack and the rack being lowered when the wheel U'' passes from the lower to the upper part of the rack, the raising and lowering of the rack Y being accomplished by means of the roller Z of the rack playing in the grooved cam a of the main wheel L' . While the rack is changing its position the cylinder-wheel U'' passes through one of the geared segments of the rack Y , thus keeping continually in gear, which gives to the cylinder a steady rotary movement, while the axis of the cylinder has a rectilinear reciprocating motion. When the impression-cylinder moves toward the back of the press, then the impression part of the cylinder passes over the type form or bed, and the projecting parts I'' of the impression-cylinder will impinge on the bearers G of the bed, thus preventing any slurring of the impression. When the carriage returns, the lower part or counter-balance of the cylinder passes over the type-bed without touching the type. When the impression-cylinder begins to move toward the type-bed and the rack rises, then the flange b of the rack Y raises the arm m'' , and with it the arm l'' , which impinge under the set-screws d'' of the projections c'' on the ink-cylinder frame, and thus raises or withdraws the ink-cylinder X'' from the inking-rollers Z'' , so as to allow these inking-rollers to pass over the type-form without being in contact with the ink-cylinder, as the revolving motion of the inking-rollers Z'' , passing toward the back of the press over the type, is contrary to the motion which would be imparted to them if they were in contact with the ink-cylinder during this passage of the carriage, as the ink-cylinder (being geared with and driven by the impression-cylinder gear) has a continuous rotary motion, and the inking-rollers have a rotating reciprocating motion during the working of the press. At or near the same time that the ink-cylinder is withdrawn from the inking-rollers the projecting piece c of the rack Y strikes under the bent arm i'' and raises it, by which means the distributing-roller f'' is carried from the ink-cylinder X'' to the ink-fountain e'' , where it takes a fresh supply of ink and then falls back again and distributes it upon the ink-cylinder. When the carriage returns and the rack drops, then the ink-cylinder is brought in contact with the inking-rollers and remains in contact with them during the return passage of the carriage. Thus the inking-rollers receive a continuous supply of ink while they are inking

the form during this passage of the carriage, and after they have left the form they continue to receive a supply of ink until the ink-cylinder is withdrawn from the inking-rollers, when the ink-cylinder will then receive another fresh supply and distribution of ink. This constitutes a very efficient and thorough inking arrangement and a very compact one, which could not be obtained if the ink-fountain were not attached to and traveled with the carriage. When the ink-cylinder X'' is withdrawn from the inking-rollers Z'' , the roller-bearers z' of the inking-rollers as they enter on the adjustable bearers A'' will impart a rotary motion to the inking-rollers before the said inking-rollers touch the type. This will prevent the type getting clogged or filled with ink on the side where the inking-rollers first touch. If a sheet of paper is placed on the feed-table S against the gages T and the cylinder-grippers are, through the motion of the carriage, brought into the proper position to take the sheet onto the cylinder, then, as the pin P'' passes from under the arm S'' to the end of it the pin L''' , Fig. 2, of the main wheel L will strike the outside arm T'' and throw it forward, and thus give motion to the arm S'' , pressing against the pin P'' of the segment N'' , which gives motion to the segment M'' of the gripper-shaft L'' , and thus brings the grippers K'' down, which grip the paper upon the edge of the impression-cylinder A'' . When the sheet has been taken by the cylinder-grippers, then, as the rack Y rises, the projecting pin e of the rack Y strikes against the arm V of the gage-shaft U , thus lifting the gages T from the feed-table and allowing the paper to pass under them. The cylinder then carries the paper to and over the type form or bed D , and after the impression has been given the cylinder-grippers K'' are brought in juxtaposition with the stationary grippers $i i'$, with the edge of the paper between the lower grippers i and the upper grippers i' . This stationary set of grippers is held in an open position by means of the projecting piece d of the vibrating rack Y , said rack being in the raised position, and the piece d pressing under the arm o of the upper grippers i' , which it has raised, and by means of the slit n and the pin m on the short arm l the lower grippers have been depressed. Now as the rack Y drops the stationary grippers will close and grip the edge of the paper before the cylinder-grippers K'' will release it. The impression-cylinder being in this position, the pin P'' of the segment N'' is brought into close proximity with the end of the bent arm S''' , attached to the shaft R'' , said shaft having another arm T''' attached to it on the outside of the carriage. This arm T''' is now retained on the projecting piece h of the press-frame until, through the motion of the impression-cylinder, the arm S''' has moved the segment N'' to its former

position, and thus through the segment M'' of the gripper-shaft L'' has withdrawn the cylinder-grippers K'' from the paper. The paper is retained in the stationary grippers $i i'$ until the pile-table or its equivalent o'' is brought under it, when then the projection u'' (at the right-hand side of the pile-table) will strike the bent piece p of the arm o and open the stationary grippers just while the projections p'' of the traveling pile-table are passing through between the stationary grippers $i i'$ and strike against the edge of the paper, which is thus deposited upon the traveling pile-table o'' , printed side upward, and brought directly in front and before the eyes of the operator, where he can examine it without leaving his place. When the rack Y drops, then the gages T fall down upon the edge of the feeding-table S , on which the succeeding sheet may now be placed.

Having thus fully described my improved cylinder printing-press, what I claim therein as new and as my invention, and desire to have secured to me by Letters Patent, is—

1. The vibrating tapering endless rack for giving a rotary motion to a rectilinear reciprocating impression-cylinder.

2. Supporting the ink-cylinder in a frame separate from the impression-cylinder carriage and swiveling the ink-cylinder frame on the axis of the impression-cylinder, for the purpose as herein fully described.

3. Giving a rotating motion to an ink-cylinder by and through the rotary motion of a rectilinear reciprocating impression-cylinder.

4. Giving to an ink-cylinder operated as described a motion to and from the inking-rollers, for the purpose as herein specified.

5. Giving to the ink-cylinder the motion to and from the inking-rollers by and through the motion of the vibrating rack.

6. The combination of the adjustable ink-cylinder with the adjustable inking-roller supporters when the ink-cylinder and inking-rollers are carried by and travel with the impression-cylinder carriage, for the purpose as herein set forth.

7. The combination of the adjustable inking-roller supporters on a traveling carriage with an ink-cylinder having a motion to and from the inking-rollers and the adjustable bearers of the frame, for the purpose as herein described.

8. In combination with a rectilinear reciprocating impression-cylinder having a rotary motion, the described mechanical arrangement for operating the impression-cylinder grippers, said arrangement consisting of the inside arm or trip S'' , the shaft R'' , and the outside arm or trip T'' , operated by a pin or roller of the main wheel (or any other means) for closing the grippers when they are taking the sheet to be printed onto the cylinder, and the inside arm or trip S''' , the shaft R'' , and the outside arm or trip T''' , operated by the fixture h or its equivalent for opening the

grippers, so as to relieve the sheet from the cylinder, whether constructed in the precise manner as described or in an equivalent way.

9. Attaching the two inside arms or trips and the two outside arms or trips to one and the same shaft.

10. The stationary grippers, in combination with an impression-cylinder, for the purpose as herein set forth.

11. The traveling pile-table or equivalent, in combination with stationary grippers, for the purpose as specified.

12. In combination with a traveling pile-table or equivalent and stationary grippers, the projections of the pile-table, for the purpose as herein described.

13. The combination of a traveling pile-table with an impression-cylinder or its equivalent.

14. Governing the lower set of stationary grippers by and through the motion of the upper grippers, or vice versa, by means of

the arm *l*, arm *o*, slit *n* or its equivalent, and pin *m* or equivalent.

15. Opening the stationary grippers so as to receive the printed sheet and allowing the grippers to close and hold the sheet and relieve it from the impression-cylinder by and through the motion of the vibrating rack.

16. Opening the stationary grippers so as to release the printed sheet and pile it by and through the motion of the carriage.

17. Operating the paper-gages by and through the motion of the vibrating rack.

18. Constructing a cylinder printing-press in such a manner that the printed sheet after it has been taken from the cylinder and deposited on the pile-table shall be brought in front and before the eyes of the operator, for the purpose as herein fully described.

FRED. OTTO DEGENER.

Witnesses:

EDWARD LUDECUS,
F. M. WEILER.