

No. 637,582.

Patented Nov. 21, 1899.

E. HETT.
PRINTING PRESS.

(Application filed Jan. 31, 1898.)

(No Model.)

8 Sheets—Sheet 1.

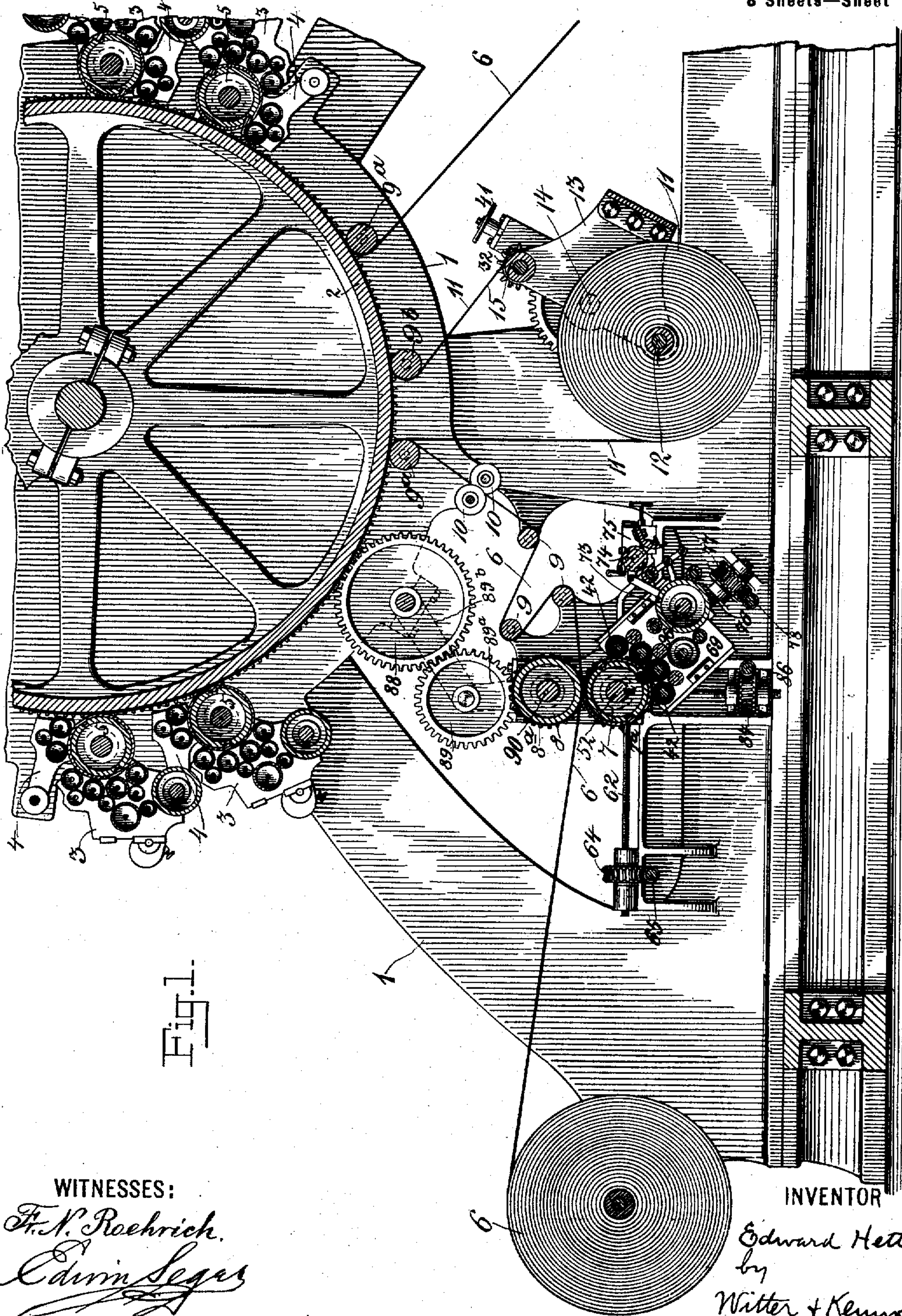


Fig. 1.

WITNESSES:

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Edwin Segas

INVENTOR

Edward Hett
by
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ATTORNEYS

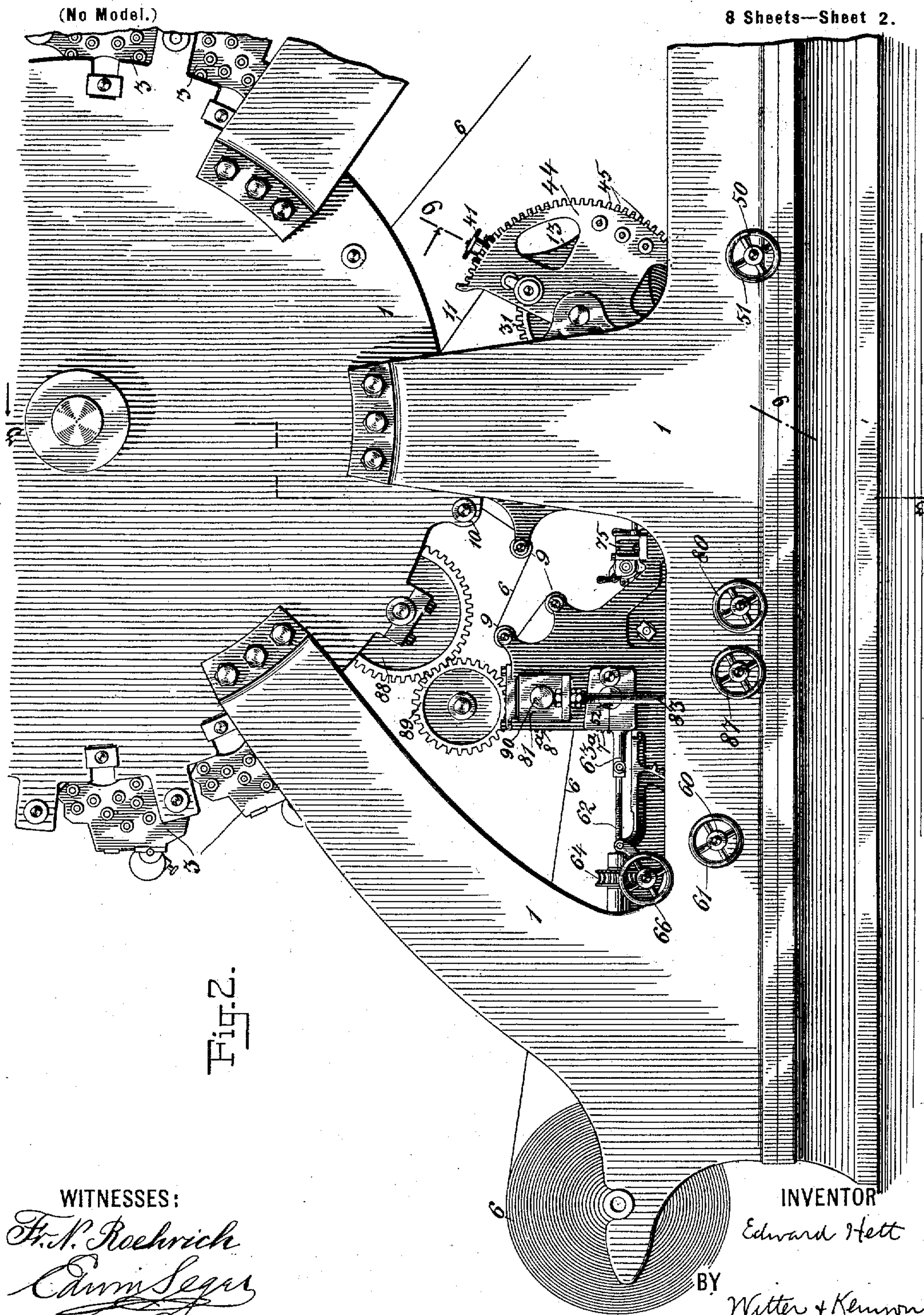
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8 Sheets—Sheet 2.



WITNESSES:

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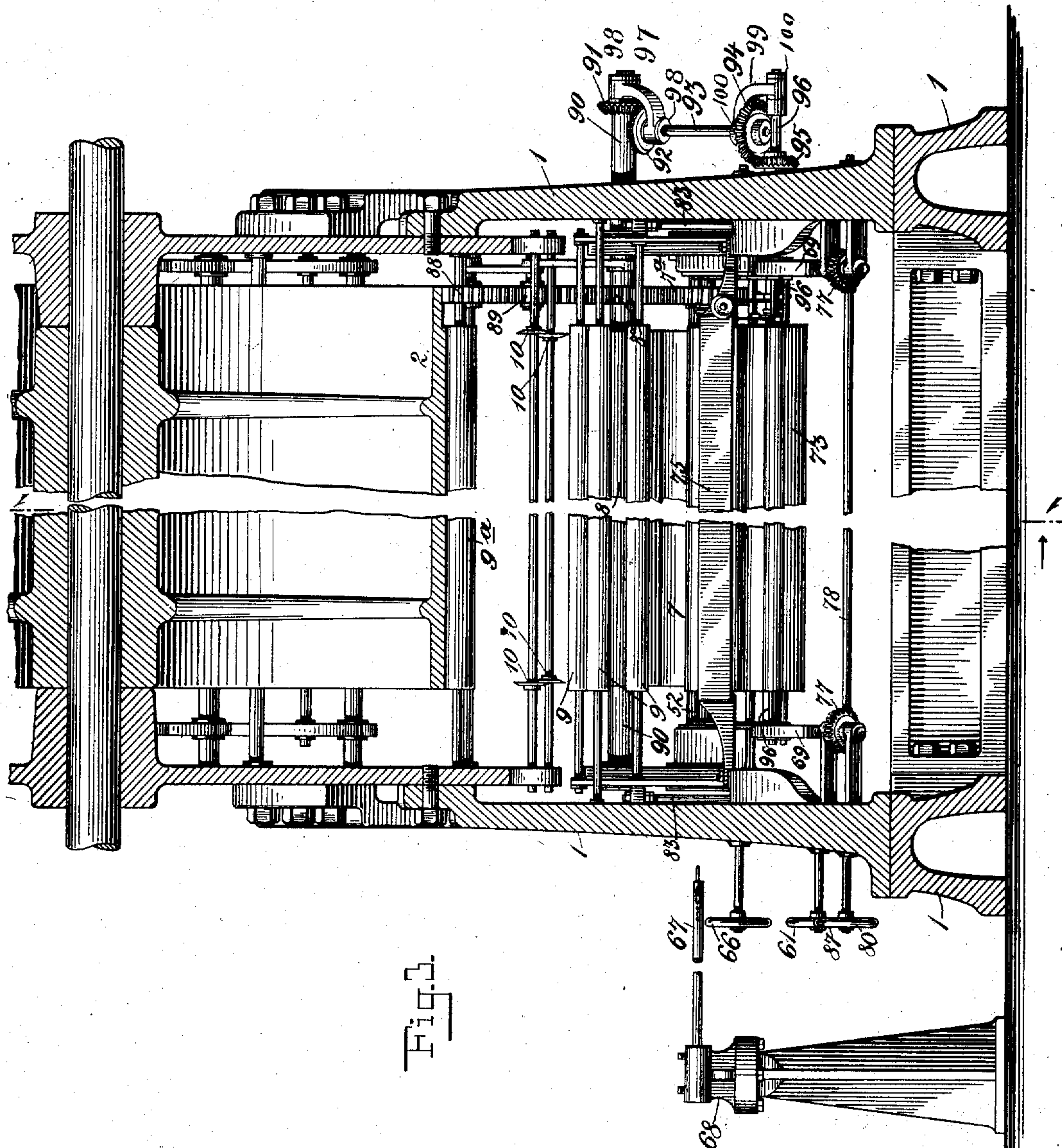


Fig. 3.

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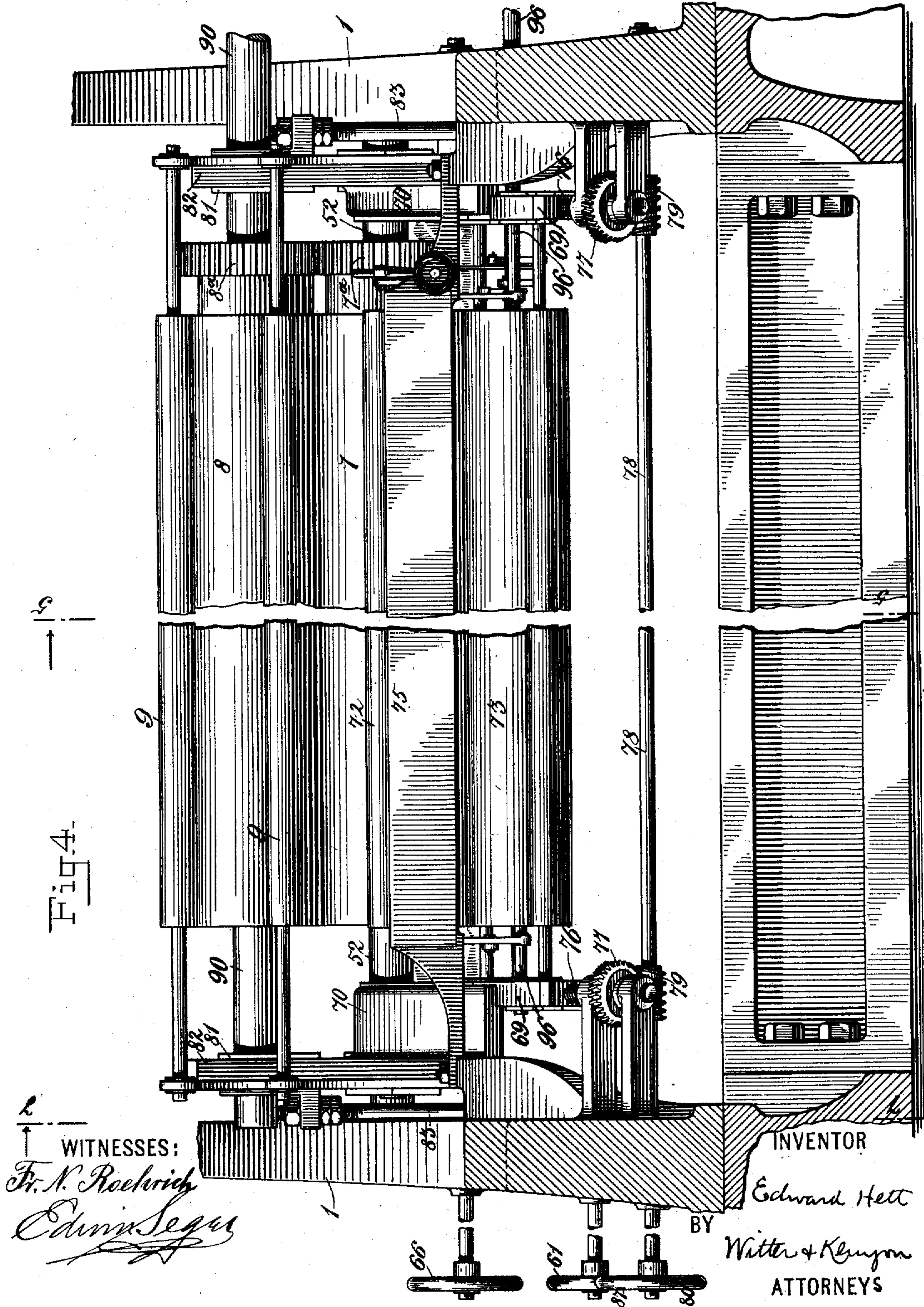
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8 Sheets—Sheet 4.



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8 Sheets—Sheet 5.

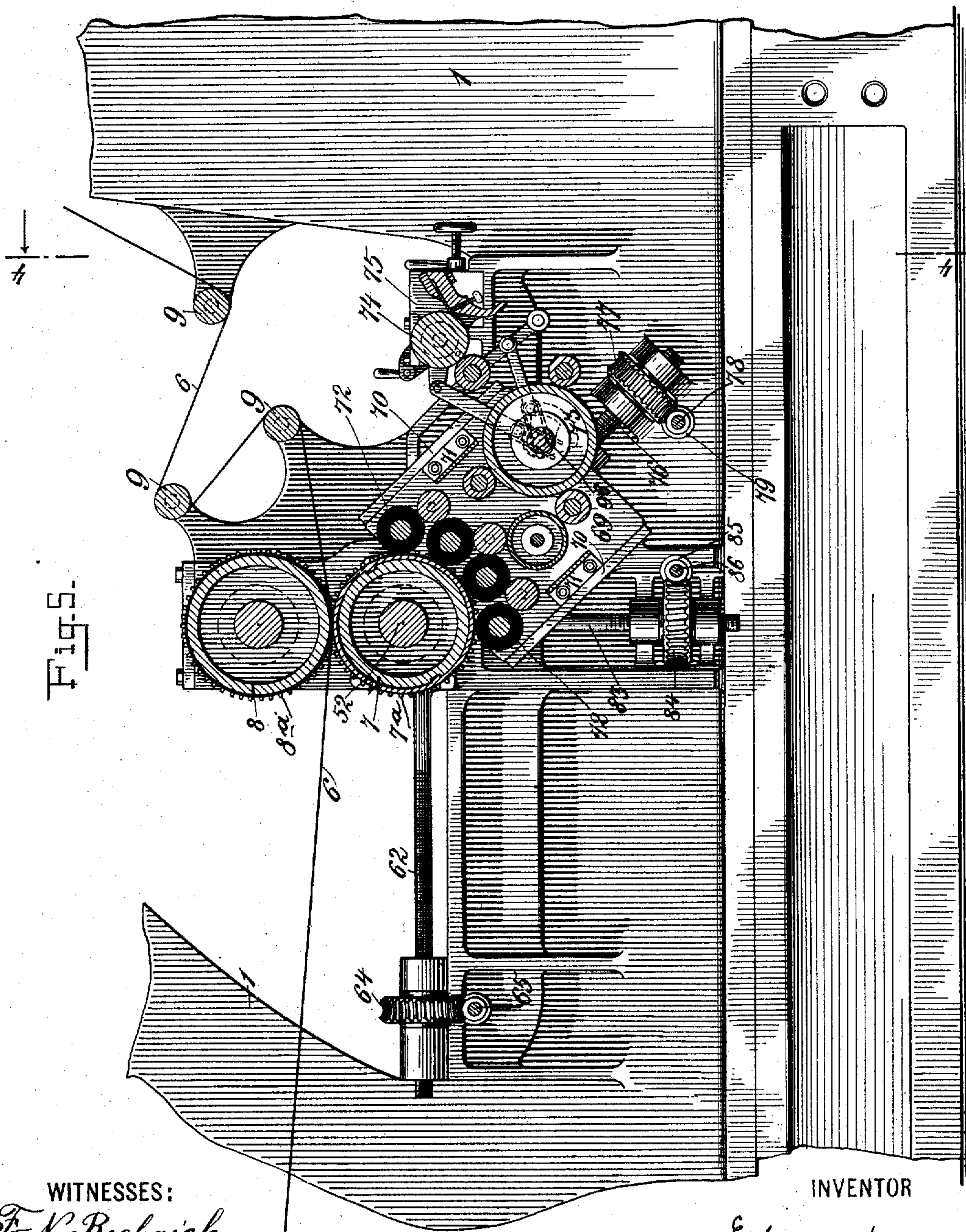


Fig. 5.

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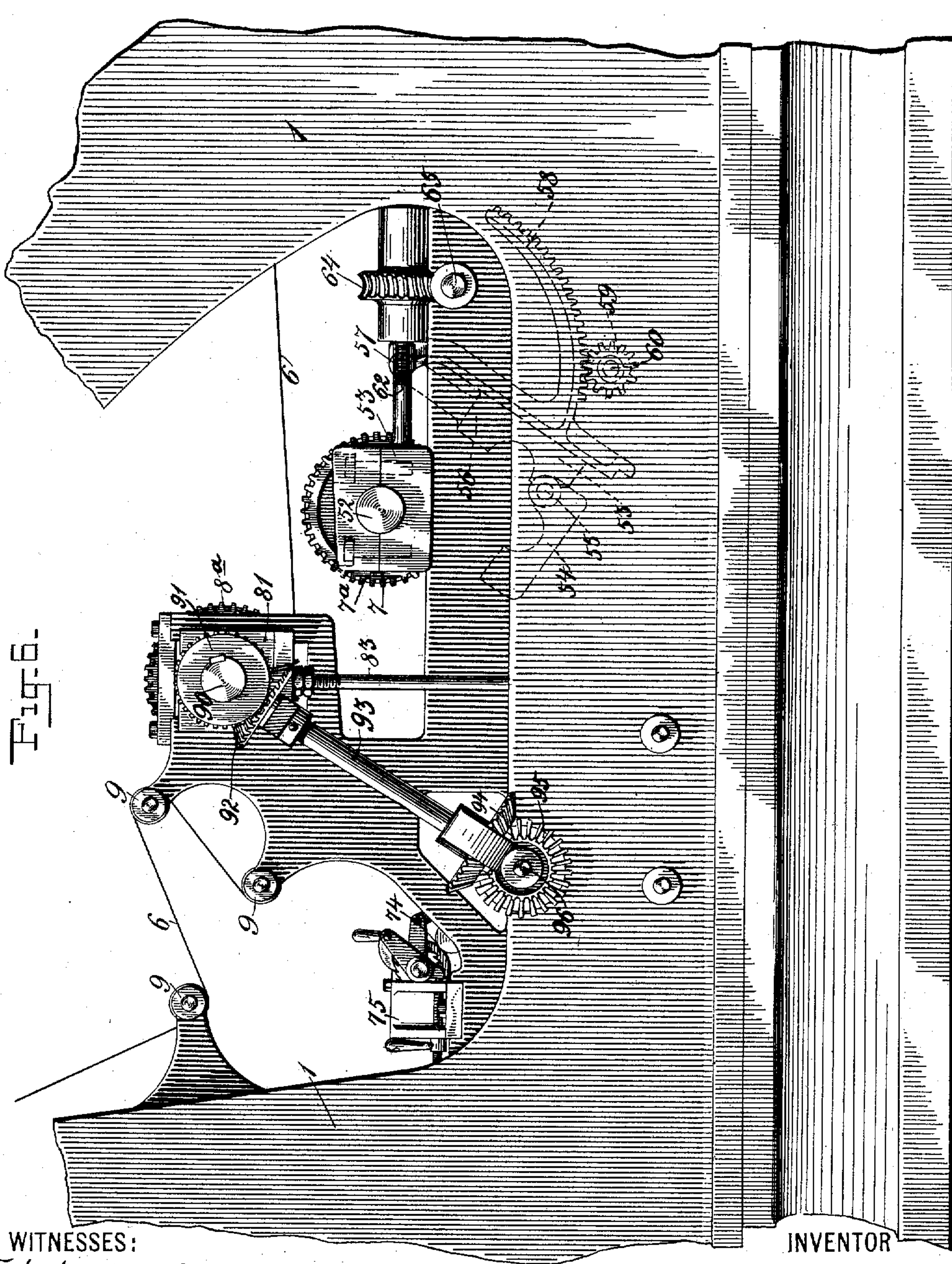
Patented Nov. 21, 1899.

E. HETT.
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(Application filed Jan. 31, 1898.)

(No Model.)

8 Sheets—Sheet 6.



WITNESSES:

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(Application filed Jan. 31, 1898.)

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8 Sheets—Sheet 7.

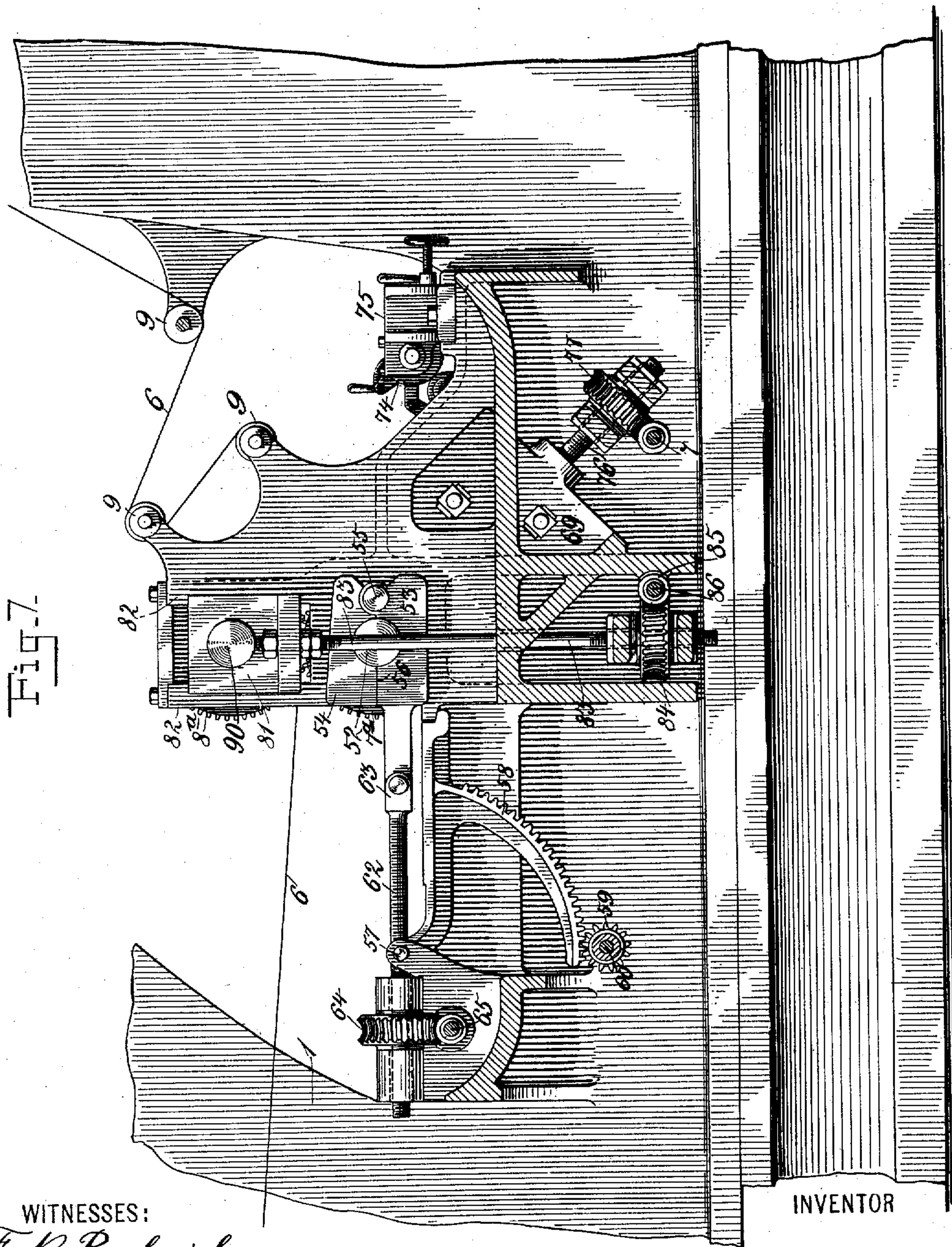


Fig. 7

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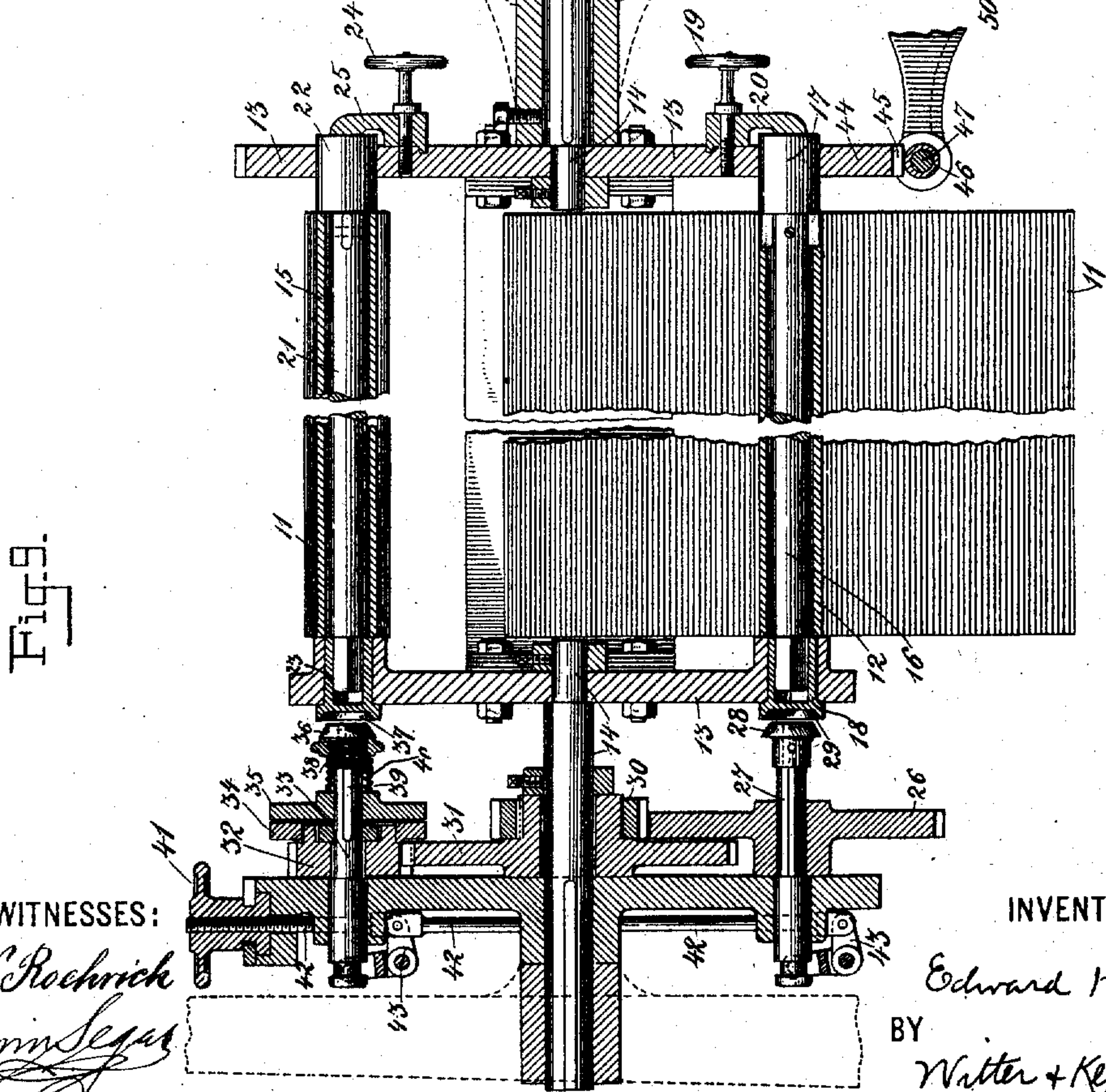
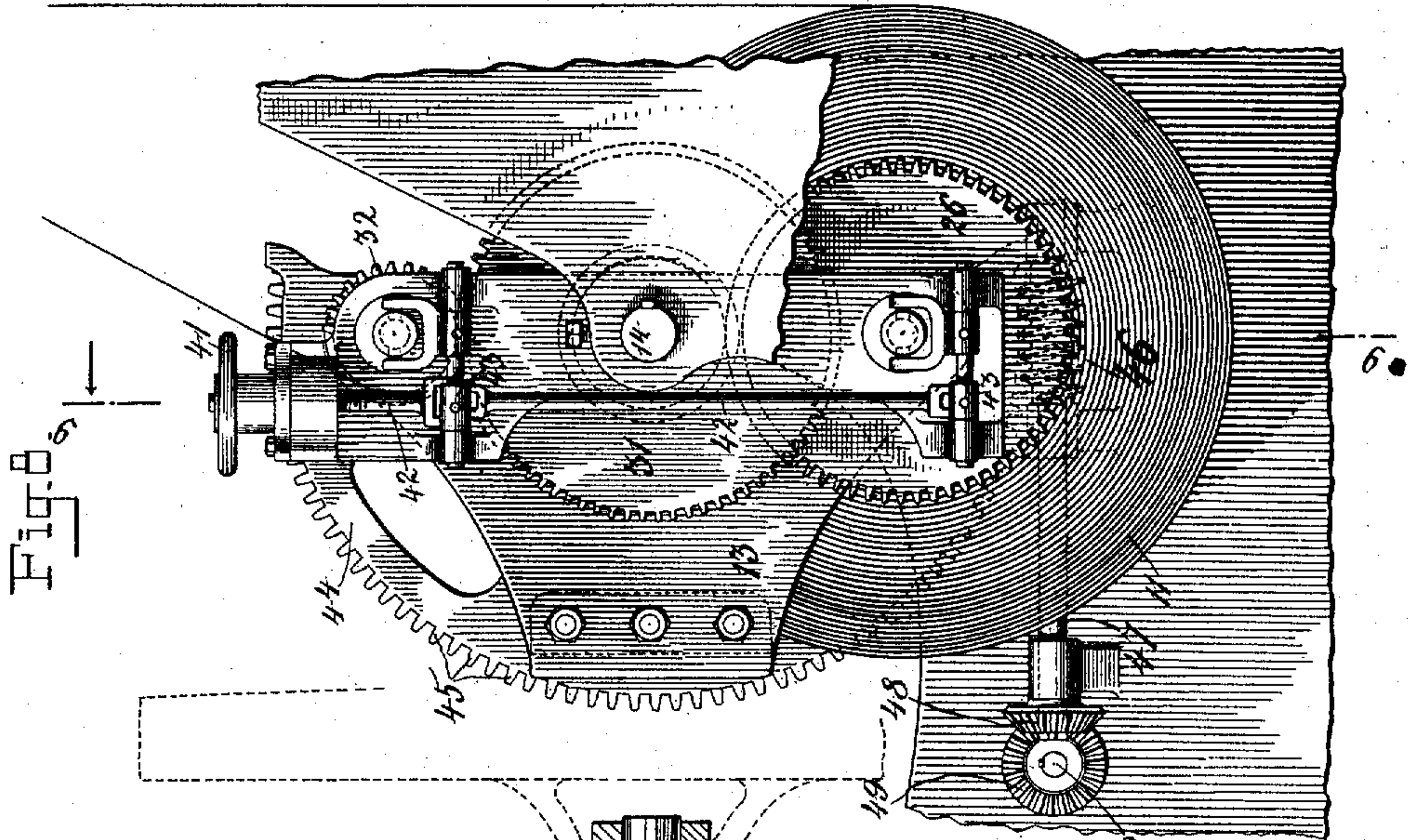
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PRINTING PRESS.

(Application filed Jan. 31, 1898.)

(No Model.)

8 Sheets—Sheet 8.



WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD HETT, OF NEW YORK, N. Y.

PRINTING-PRESS.

SPECIFICATION forming part of Letters Patent No. 637,582, dated November 21, 1899.

Application filed January 31, 1898. Serial No. 668,589. (No model.)

To all whom it may concern:

Be it known that I, EDWARD HETT, a citizen of the United States, and a resident of New York, (New Dorp,) in the county of Richmond,
5 State of New York, have invented certain new and useful Improvements in Printing-Presses, of which the following is a specification.

My invention relates to printing-presses,
10 and more particularly to lithographic-printing presses.

It has for one object to print lithographically upon one side of the web in a lithographic-printing press and in one and the
15 same operation to print typographically or lithographically advertising or other matter upon the reverse side of the web and to provide improved means for shifting the respective positions of the feeding and receiving
20 rolls of the offsetting-web and for regulating the movement of said rolls and of said web from one roll to the other; also, to provide improved means for removing and replacing the printing-cylinder.

25 It consists of certain features of construction and combination of parts, which will be hereinafter described and claimed.

In the accompanying drawings, which form a part of this specification and to which reference is made, Figure 1 is a longitudinal
30 section of the press, looking from the left. Fig. 2 is a side elevation from the left of the press. Fig. 3 is a transverse vertical section taken about the middle of the drum, looking
35 from the front of the press. Fig. 4 is a front elevation, and Fig. 5 is a longitudinal vertical section, through the printing-cylinder, its impression-cylinder, and its connecting mechanism, the view in Fig. 4 being taken
40 as looking in the direction of the arrow in Fig. 5. Fig. 6 is a side elevation from the right of the press of the same mechanism, showing the printing-cylinder in course of removal. Fig. 7 is a longitudinal section, viewed
45 from the left, through the same parts with the outside frame of the press omitted. Fig. 8 is a side elevation, viewed from the right, of the offsetting-roll and its connecting mechanism. Fig. 9 is a vertical section, viewed
50 from the rear, as shown in the direction of the arrow in Fig. 8.

Similar numerals of reference in the different figures represent corresponding parts.

Heretofore whenever it was desired to print lithographically upon one side of paper or
55 similar material and to print advertising or other matter upon the reverse side it has been found necessary to print lithographically upon sheets and to do the lithographic work upon one side of the sheet and the printing
60 upon the other side of the sheet in and by separate and distinct operations, the sheet being left long enough between the operations to dry thoroughly. By my improved devices both the printing upon the one side
65 and the lithographing upon the other side are done upon a continuous web and in one continuous operation.

Heretofore in presses where an offsetting-web has been employed it has generally been
70 found necessary to remove the feeding-roll when it has been emptied and to replace it with a fresh full roll and to remove the receiving one when filled and to replace it with an empty one. By my improved device the
75 receiving-roll when filled is swung into the place of the feeding-roll, and the feeding-roll when emptied is swung into the place of the receiving-roll by a simple act of the operator, as by turning a hand-wheel.
80

I will now proceed to describe the preferred form of my improved device, referring to the drawings, wherein similar characters represent corresponding parts in the different
85 figures.

My improved devices are shown in the drawings as used in connection with a multicolor lithographic press, although as is evident they may be used upon other kinds of presses. 1 is the framework, 2 the drum, 3 the frames
90 containing the inking mechanism, 4 the frames containing the damping mechanism, and 5 the printing-cylinders, of the multicolor-press. The particular form or arrangement of these parts may be varied without departing from the present invention, as they form
95 no part of it. The construction of these parts, as shown in the drawings, is the same as that shown and described in my application for a patent, Serial No. 593,796, filed June 1, 1896,
100 for lithographic-printing press, and will not be herein further described.

6 is the web. It runs from the feeding-roll between the printing-cylinder 7 and its impression-cylinder 8, around rollers 9 9, between slitters 10 10, by which it is trimmed to the proper width, around roller 9^a, drum 2, roller 9^a, whence it goes to the usual cutting and delivery devices. As these form no part of my invention, they are not shown or described. 7, a printing-cylinder, and 8, its impression-cylinder, print upon the under side of the web advertising matter or such other matter as is desired. The printing-cylinder 7 may be either lithographic or typographic. I have shown it in the drawings as typographic. In the preferred form of my invention I use a printing-cylinder composed of a hollow tube having on its outer face a smooth continuous electrically-deposited zinc lithographic surface and fitting over and upon another hollow cylinder mounted upon a shaft, called the "form-cylinder," although in other forms of my invention any suitable printing-cylinder may be employed.

The rollers 9 9 are regulating-rollers for causing the web to advance evenly and smoothly and are sufficient in number and are so arranged that the web shall be even, smooth, and taut when it reaches drum 2.

11 is a web of paper or other suitable fabric adapted to receive the offset from the printed matter upon the under side of the web. This web 11 will hereinafter be spoken of as the "offsetting-web." It unwinds from the feeding-roll 12, passes around drum 2, under the web 6, during which time it receives the offset from web 6, and then around roller 9^b, and thence to the receiving-roll 15, upon which it is wound. Both rolls 12 and 15 are journaled in a swinging frame 13, swinging on pivot 14, in the manner to be hereinafter described.

In the operation of my improved device, as shown in the drawings, advertising or other matter is first printed upon the under side of the web by means of cylinders 7 and 8, and then the lithographic impression is made upon the face of the web by means of drum 2 and printing-cylinders 5 5, the printing upon the under surface and the lithographing upon the face of the web being both done upon a continuous web and in one continuous operation.

My improved devices for feeding and receiving the offsetting-web and for changing the relative places of the feeding and receiving rolls are shown in detail in Figs. 8 and 9. 13 is a swinging frame pivoted at its center upon shaft 14 and adapted when free, as hereinafter described, to swing around, so that the feeding-roll 12 can be swung into the place of the receiving-roll 15 and the receiving-roll into the place of the feeding-roll. The feeding-roll 12 is a hollow cylinder, upon which the offsetting-web 11 is wound. It is supported upon core 16, which is a cylindrical shaft journaled at one end in the stationary cylindrical bearing 17, forming part of frame 13, and secured at the other end, as by a

four-sided head, in the revoluble bearing 18. Roll 12, with its web, revolves, carrying with it core 16 and bearing 18. It can be removed from frame 13 by unscrewing wheel 19, removing locking-piece 20, and then withdrawing core 16. Roll 15 is similarly supported upon core 21, the latter similarly journaled in stationary bearing 22 and revoluble bearing 23. Hand-wheel 24 and locking-piece 25 in a like manner lock core 21 in operative position, and when removed allow core 21 to be removed. Offsetting-web 11 is unwound from roll 12 by means of the pull exerted upon the said web by drum 2 and is then wound upon roll 15. Motion is imparted to the latter roll from roll 12 by the following-described mechanism: 26 is a gear-wheel mounted fixedly upon shaft 27. This shaft has an enlarged head 28, having the form of a truncated cone and adapted to fit into a seat 29 of corresponding shape in the end of bearing 18. Gear-wheel 26 meshes with gear-wheel 30, loosely mounted upon shaft 14. Fixedly secured to gear-wheel 30 is gear-wheel 31, the latter meshing with gear-wheel 32, loosely mounted on shaft 33. Gear-wheel 32 has secured to it a disk 34. Shaft 33 has fixedly mounted upon it disk 35, adapted to make frictional contact at times with disk 34, as hereinafter described. Shaft 33 has an enlarged head 36 of the shape of a truncated cone, and bearing 23 has a seat 37 of a corresponding shape adapted to receive the enlarged head 36. Head 36 is splined to shaft 33 by means of a pin 38 working in a slot 39 in shaft 33. A spring 40, coiled around shaft 33, tends to separate head 36 from disk 35, keeping them normally at such a distance apart that when head 36 is upon its seat 37 disk 35 will be in frictional contact with disk 34, thus forming a frictional clutch between the two parts. The pin 38 in the slot 39 imparts to head 36 the rotation of shaft 33, at the same time allowing it a little longitudinal motion along the shaft. Both shafts 27 and 33 are movable longitudinally in their bearings and can be thus moved by means of hand-wheel 41, screw-threaded shaft 42, and bell-cranks 43, each of the latter pivotally secured to shaft 42, and one pivoted at its other end to shaft 27 and the other to shaft 33. By turning hand-wheel 41 in one direction shafts 27 and 33 will be moved so as to cause heads 28 and 36 to make contact with their seats 29 and 37, while turning it in the other direction will withdraw them from such contact. Frame 13 has on one side a segment 44, having teeth 45, which mesh with a worm 46 on shaft 47. At the end of shaft 47 is a beveled gear-wheel 48, meshing with beveled gear 49 on shaft 50, the latter having at its end a hand-wheel 51, Fig. 2.

The operation of my improved offsetting devices is as follows: Hand-wheel 41 is turned so as to force heads 28 and 36 down upon their seats 29 and 37. The rotation of drum 2 pulls offsetting-web 11 and rotates feeding-roll 12,

and this through frictional contact of head 28 with seat 29 causes shaft 27 to rotate. This drives gears 26, 30, 31, and 32 and disk 34. The latter by frictional contact drives disk 35, and this rotates shaft 33, and through slot 39 and pin 38 rotates head 36, the frictional contact between head 36 and seat 37 thereby rotating core 21 and receiving-roll 15. The various gears are so arranged that the receiving-roll rotates at such a speed as would tend to make it wind up web 11 a little faster than it is unwound from feeding-roll 12, thereby always keeping the web taut. If the strain upon web 11 becomes excessive at any time, the frictional contact between shoulders 35 and 34 will permit a slowing-up of the rotation of roll 15 by the slipping of the two shoulders upon each other. Such excessive pressure is also guarded against by the slipping, when necessary, of heads 36 and 28 upon their respective seats 39 and 29. As soon as the feeding-roll is emptied hand-wheel 41 is turned, withdrawing heads 28 and 36 from their seats 29 and 37, the offsetting-web is cut between each roll and the drum, hand-wheel 51 is turned, and worm 46, meshing with segment 44, thereby causes frame 13 to swing upon shaft 14 as a pivot until receiving-roll 15 is in the position formerly occupied by feeding-roll 12 and the latter is in the position formerly occupied by the former. The receiving-roll has now become the feeding-roll. The end of each roll is pasted to the cut ends of the offsetting-web hanging from the drum, and the offsetting apparatus is ready for use again.

My improved devices for removing or inserting printing-cylinder 7 are shown in Figs. 2, 3, 6, and 7. 52 are the projecting ends of the axis of printing-cylinder 7. They rest in bearings 53. The bearing 53 at the left of the press has its upper part 54 pivoted at 55, so as to permit it to be swung upward, as shown in Fig. 6. This bearing at the left is borne upon an arm 56, pivoted at 57, so that the arm carrying the bearing can be swung downward away from the cylinder, as shown in dotted lines, Fig. 6, or upward into supporting position, as shown in Fig. 7. A rack-segment 58 is secured to arm 56, the teeth meshing with gear-wheel 59, mounted upon shaft 60, the latter carrying hand-wheel 61 at its end. 62 is a screw-threaded shaft pivotally secured to arms 63, which are connected to bearings 53. Shaft 62 engages with an interiorly-screw-threaded opening through the center of worm-wheel 64, said worm-wheel engaging with a worm upon shaft 65. 66 is a hand-wheel upon the latter shaft. The operation of these devices is as follows: Whenever it is desired to remove printing-cylinder 7, hand-wheel 66 is turned, and this through the worm, worm-wheel, and shaft 62, and arms 63 pulls the cylinder forward into the position shown in Fig. 6. Cover 54 of the left bearing 53 is then raised, the left-hand end of the cylinder is supported upon shaft 67 of

standard 68, arm 56 is turned downward, and the cylinder is then removed. The means for this removal may be of any suitable construction—such, for instance, as are shown in my application for a patent, Serial No. 552,641, filed June 13, 1895, renewed July 12, 1898, Serial No. 685,764, and they are accordingly not further described here. Whenever it is desired to insert a printing-cylinder, the operation is proceeded with in the reverse order.

My improved devices for moving the inking or damping mechanism into or out of operative position are shown in Figs. 5 and 2. As printing-cylinder 7 is a typographic one, only inking mechanism is of course shown in the drawings, although, as is evident, a lithographic cylinder with its damping as well as inking mechanism could be used without departing from my invention, in which case the sliding frame hereinafter described would carry both damping and inking mechanism. 69 is a sliding frame adapted to slide upward and downward in guides 70 70 of the framework. 71 71 are strengthening-bars running across the machine from one side to the other, connecting the two opposite heads or ends of frame 69. Secured to this frame are the ink-rollers 72 72, the distributing-roller 73, the ink-fountain roller 74, the ink-fountain 75, and the various other rollers used in conveying ink from the ink-fountain to the printing-cylinder. The particular form and arrangement of the parts of the inking mechanism form no part of my invention, as any suitable form and arrangement can be employed, and they will therefore not be further described. Secured to sliding frame 69 at each side of the press is a screw-threaded shaft 76, which engages with an interiorly-screw-threaded orifice through the center of worm-wheel 77. Upon a shaft 78 are two worms 79, each engaging with one of the worm-wheels 77. The shaft has also a hand-wheel 80. As this hand-wheel is rotated in one direction or the other the sliding frame 69 moves upward or downward, moving the inking mechanism into or out of operative position.

My improved devices for regulating the pressure between printing-cylinder 7 and impression-cylinder 8 are shown in Figs. 1, 2, 5, and 7. Impression-cylinder 8 is supported by bearings 81. These bearings are movable, being capable of vertical motion, sliding upon guides 82 82 of the framework. They are supported upon rods 83 83. These rods are screw-threaded at their lower ends, where they pass through interiorly-screw-threaded openings in worm-wheels 84. These worm-wheels engage with worms 85, cut upon a shaft 86, the latter having at its end a hand-wheel 87. The pressure between cylinders 7 and 8 is regulated by turning hand-wheel 87, thus through the worm-shaft, worm-wheels, and rods 83 raising or lowering impression-cylinder 8. This method of regulating the pressure is much simpler and better than the old method of moving the printing-cylinder,

causes no disturbance to the inking or damping mechanism, and is capable of the most delicate adjustment.

Motion is imparted to the typographic printing and impression cylinders and to the distributing ink-roller and thence to the other parts of the inking mechanism by the following-described mechanism: Gear-wheel 88 meshes with teeth on the periphery of drum 2 and through gear-wheel 89 conveys motion from the drum to gear-wheel 8^a, mounted on the shaft of impression-cylinder 8. Gear-wheel 89 is supported in bearings in arms 89^a and 89^b, the former pivotally mounted on shaft 90 and the latter pivotally secured to the frame 1 of the press, as shown in Fig. 1. These arms 89^a and 89^b are shown in dotted lines in Fig. 1. Gear-wheel 8^a meshes with gear-wheel 7^a, mounted upon the shaft of printing-cylinder 7. In this way the impression and printing cylinders are driven. At one end of shaft 90 of impression-cylinder 8 is a beveled gear-wheel 91, which meshes with bevel gear-wheel 92 upon shaft 93, mounted in bearings at the side of the press, as shown in Fig. 3. The shaft 93 carries a bevel-wheel 94 at its other end, meshing with bevel gear-wheel 95 on the shaft 96 of distributing ink-roller 73. Motion is imparted from distributing ink-roller 73 to the other parts of the inking mechanism in the ordinary way.

Play in the gearing between the impression-cylinder and inking-roller 73 to permit movement of the inking apparatus is provided for by the following means: A curved arm 97 has a collar 98 at each end, one loosely encircling shaft 90 and the other loosely encircling shaft 93. Beveled gear-wheel 92 is splined to shaft 93 in the ordinary way, so as to rotate with the shaft, but is free to slide longitudinally thereon. Shaft 93 is connected to shaft 96 by means of curved arm 99, the ends of the latter forming collars 100, loosely encircling shafts 93 and 96, respectively. Curved arms 97 and 99 keep gear-wheels 91 and 92 and 94 and 95 in mesh with each other. These curved arms form the bearings for the shaft 93, so that the shaft has a play between cylinders 96 and 90. As impression-cylinder 8 is raised or lowered shaft 93 is tilted and gear 92 slides along shaft 93, thus keeping the various gears meshing together in every position of impression-cylinder 8.

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

1. In a printing-press, the combination with the rolls for feeding and receiving the offsetting-web, of a swinging frame, cores for said rolls mounted in bearings in said frame, shafts carrying heads adapted to engage with or be freed from said cores, and means for swinging said frame whereby the respective positions of the feeding and receiving rolls can be reversed, substantially as set forth.

2. In a printing-press, the combination with the rolls for feeding and receiving the offsetting-web, of a swinging frame, cores for

said rolls mounted in bearings in said frame, shafts carrying heads adapted to engage with or be freed from said cores, means for moving said heads into or out of, engagement with the cores, and means for swinging said frame whereby the respective positions of the feeding and receiving rolls can be reversed, substantially as set forth.

3. The combination in a printing-press with a swinging frame for holding the rolls of the offsetting-web, having revoluble bearings adapted to receive the cores of the rolls, of shafts carrying heads adapted to engage frictionally with said revoluble bearings, means for causing said heads and bearings to engage with or separate from, each other, substantially as set forth.

4. The combination with a swinging frame for holding the rolls of the offsetting-web in a printing-press, of shafts carrying heads adapted to engage with the cores of said rolls, to transmit motion from one roll to the other, the shaft and head engaging with the core of the receiving-roll having a spring-pressed frictional clutch, whereby when the pressure upon the web, being wound upon the receiving-roll, becomes excessive, the clutch will slip, substantially as set forth.

5. The combination with a swinging frame for holding the rolls of the offsetting-web in a printing-press, of shafts carrying heads, adapted to engage with the cores of said rolls, to transmit motion from one roll to the other, the shaft and head engaging with the core of the receiving-roll having a spring-pressed frictional clutch, whereby when the pressure upon the web being wound upon the receiving-roll becomes excessive, the clutch will slip, and means for throwing said heads into or out of engagement with the cores of the rolls, substantially as set forth.

6. The combination with a swinging frame for holding the rolls of the offsetting-web in a printing-press, of removable cores for supporting the rolls, means for locking the same in position, revoluble bearings for receiving the cores, adjustable heads adapted to engage with the revoluble bearings, means for moving the heads into or out of engagement with the bearings, gearing connecting the shaft and head with the other, and a spring-pressed frictional clutch upon the shaft and head engaging with the revoluble bearing of the core supporting the receiving-roll, to relieve the pressure upon said roll when it becomes excessive, substantially as set forth.

7. In a printing-press, a bearing for a printing-cylinder consisting of an arm pivoted at one end and adapted to swing into and out of supporting position, substantially as set forth.

8. In a printing-press, a bearing for a printing-cylinder consisting of an arm pivoted at one end and adapted to swing into and out of supporting position, a segment forming part of said arm provided with a rack, and a shaft, operated by a hand-wheel and having a gear-

wheel meshing with the teeth of said rack for swinging said arm into or out of position, substantially as set forth.

9. In a printing-press, the combination of
5 bearings for a cylinder having their upper
portions pivoted and adapted to swing up-
ward to permit the removal of the cylinder
from the bearings, an arm supporting one of
said bearings pivoted at one end and adapted
10 to swing said bearing into or out of its sup-

porting position, and means for swinging said
arm into or out of supporting position, sub-
stantially as set forth.

In testimony whereof I have signed my
name to this specification in the presence of 15
two subscribing witnesses.

EDWARD HETT.

Witnesses:

SIDNEY MANN,
EDWIN SEGER.