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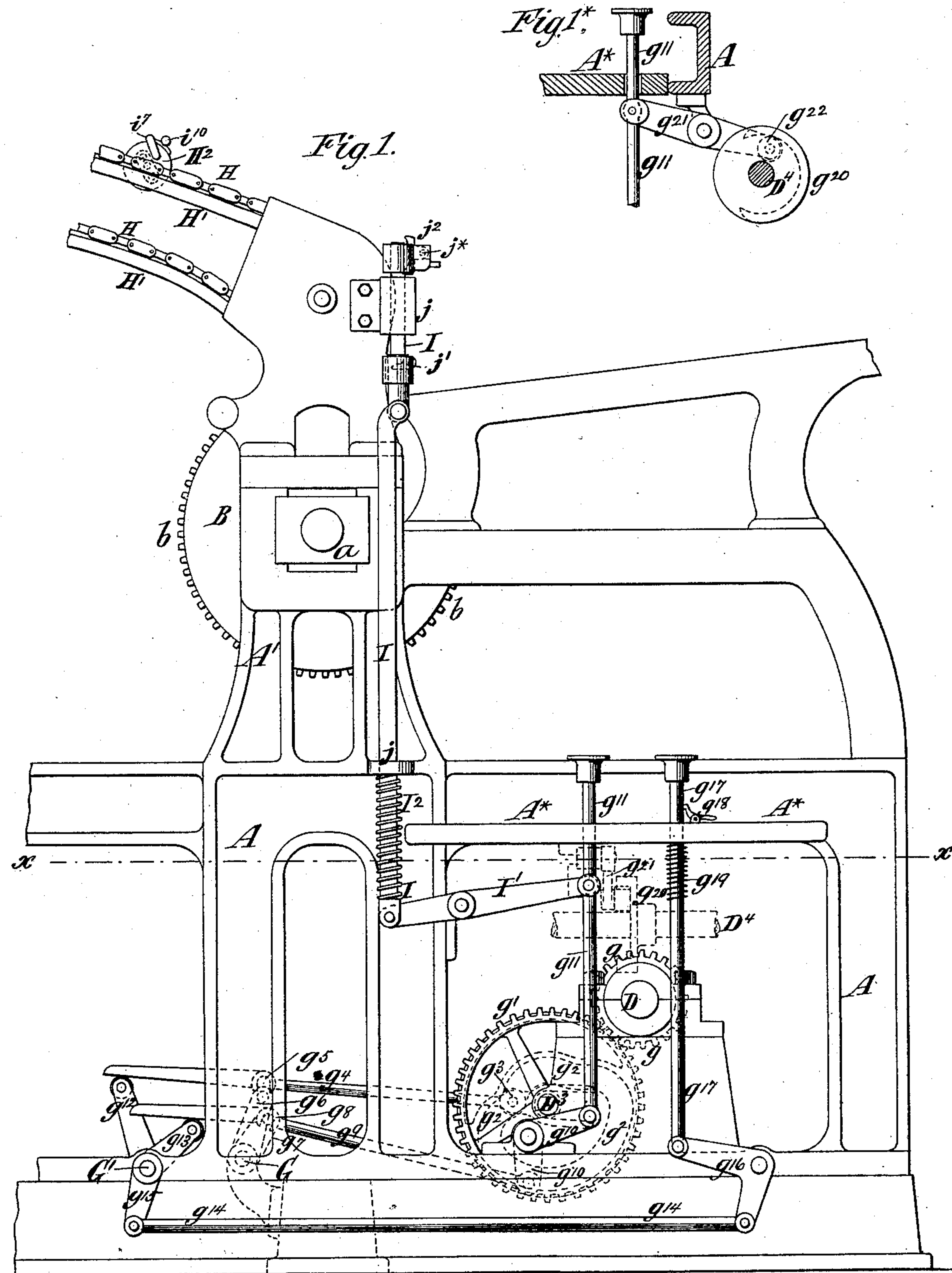
4 Sheets—Sheet 1.

C. B. COTTRELL.

STOP CYLINDER PRINTING MACHINE.

No. 338,390.

Patented Mar. 23, 1886.



Witnesses:

O. Sundgren
Emil Hertz

Inventor:

Calvert B. Cottrell
Lyman A. Lyman
Brown & Hall

(No Model.)

4 Sheets—Sheet 2.

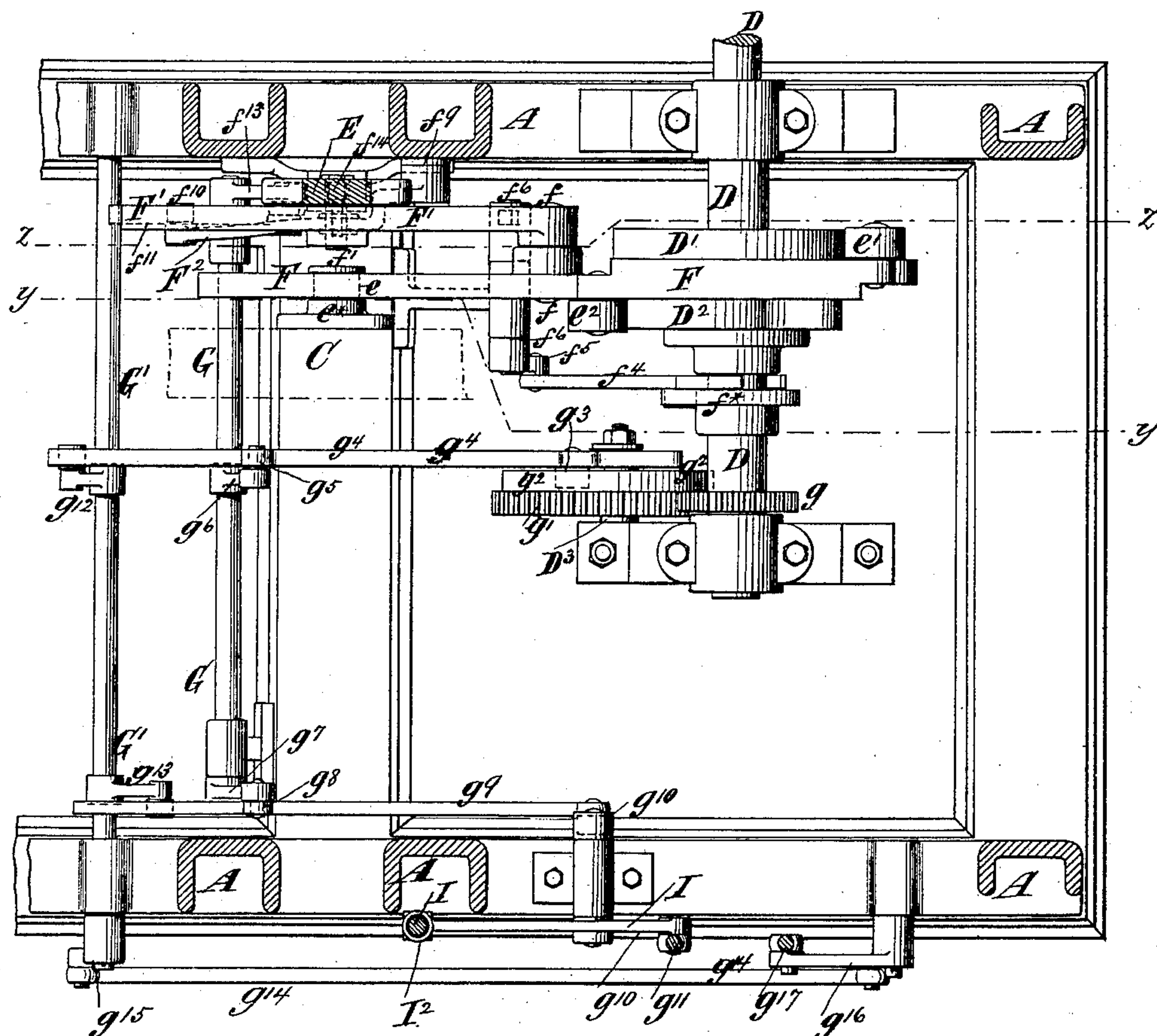
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Fig. 2.



Witnesses:

O. Sundgren
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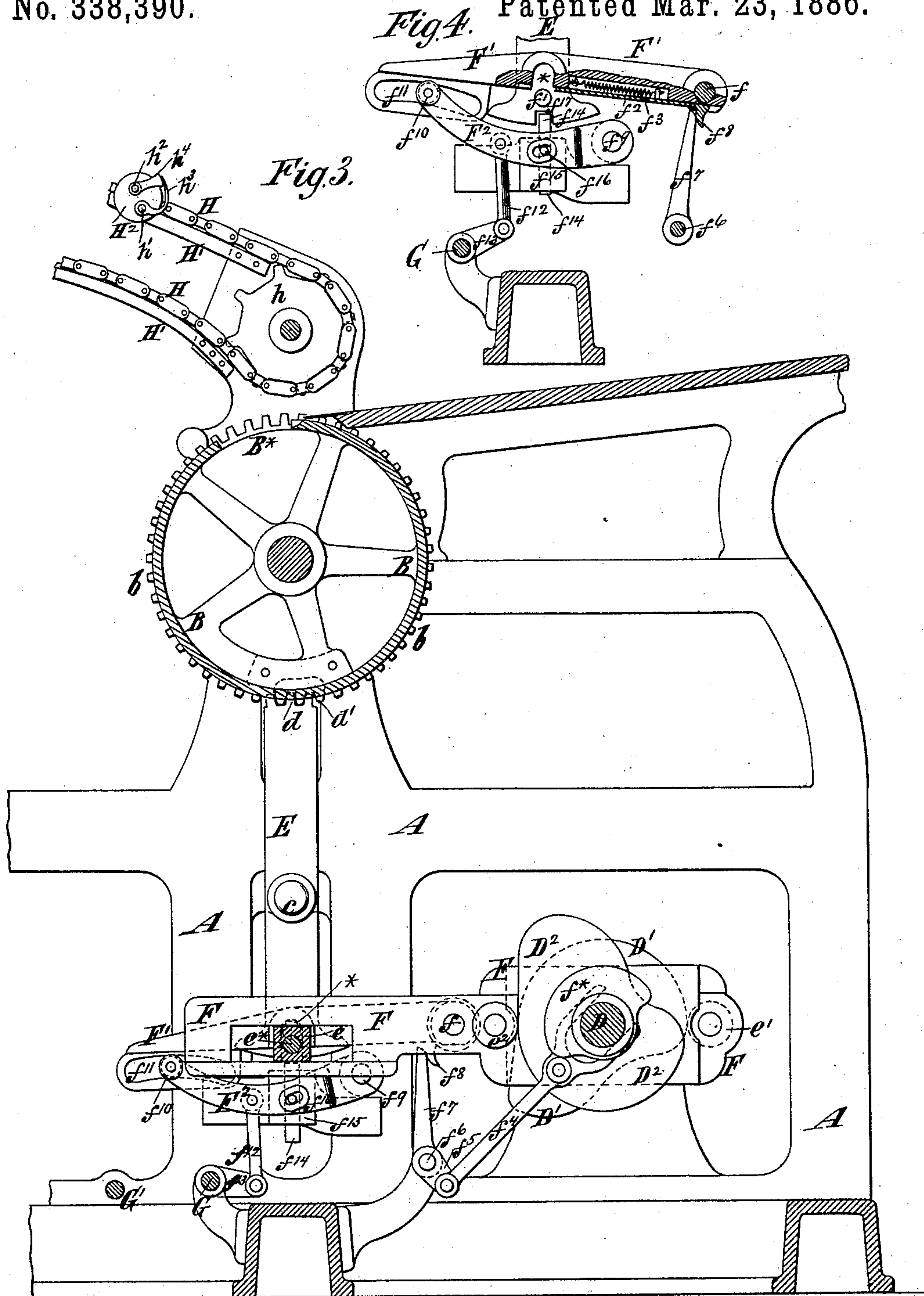
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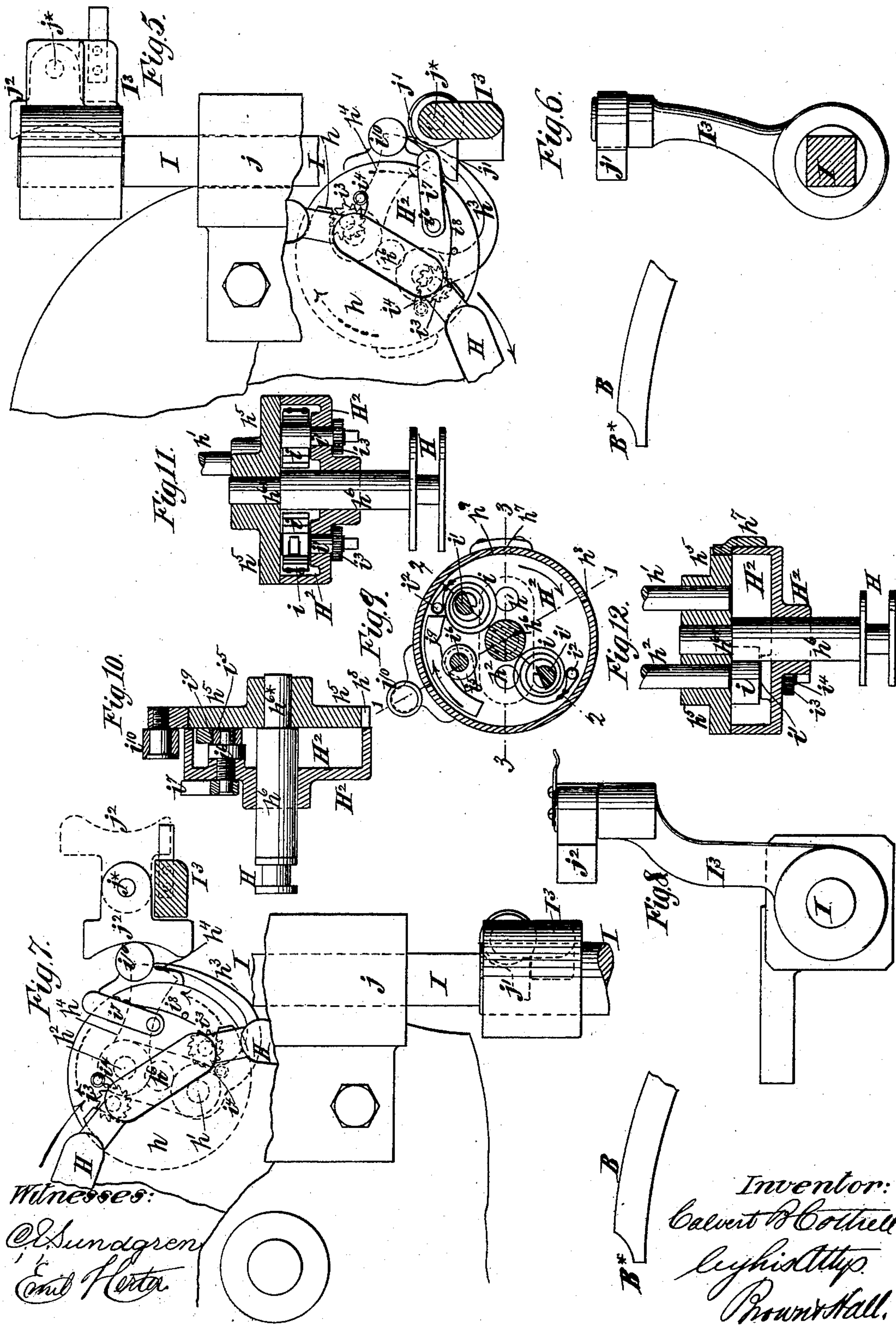
4 Sheets—Sheet 4.

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STOP CYLINDER PRINTING MACHINE.

No. 338,390.

Patented Mar. 23, 1886.



N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

CALVERT B. COTTRELL, OF STONINGTON, CONNECTICUT.

STOP-CYLINDER PRINTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 338,390, dated March 23, 1886.

Application filed July 18, 1885. Serial No. 171,926. (No model.)

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Stop-Cylinder Printing-Machines, of which the following is a specification.

In stop-cylinder printing presses or machines the impression-cylinder makes one complete turn to each double movement or forward movement and return of the bed when operating with single rolling of the form, and the bed is operated commonly by a crank-shaft, which makes one revolution to produce a double movement or complete excursion of the bed. In such presses the impression-cylinder is operated during printing by a rack on the bed engaging with a gear-segment on the cylinder, but at the end of the forward movement of the bed its rack runs out of gear with the impression-cylinder and the bed moves back while the cylinder remains stationary. When the bed commences its next forward movement, the cylinder must be turned slightly and at exactly the proper time in order to bring its segment-gear properly and quietly into gear with the bed-rack, and this preliminary turning movement of the cylinder is usually performed by a starting-lever, which is provided with a toothed sector for engaging a toothed segment on the cylinder, the lever being swung at exactly the proper time by means of a cam-actuated bar or rod having an open notch or gab-hook engaging a pin on the said starting-lever.

To stop the cylinder and allow the bed alone to move it is only necessary to raise the cam-actuated bar or gab-hook off the pin on the starting-lever, and then the cylinder will not be started forward at the proper time to be put into gear with the bed-rack.

In presses or machines as heretofore constructed mechanism has been provided for lifting the cam-actuated bar or gab-hook off the pin on the starting-lever at each second forward movement of the bed, so that the cylinder will only be rotated at alternate forward movements of the bed and double-rolling of the form will be performed. Provision has also been afforded for throwing the gab-hook off the cylinder-starting lever to enable the bed to make an indefinite number of move-

ments without the cylinder when it is desired that the cylinder remain stationary for any purpose.

An important object of my invention is to afford provision for conveniently tripping the cylinder when the parts have reached the desired position and when the cylinder is stationary, and also to enable the operator or pressman to do all that is necessary to "throw in" the cylinder-operating mechanism at any time or when the parts are moving in either direction, and then to allow the parts to move idly one over another, and to engage automatically when they come to the proper positions.

In carrying out the invention I employ, in connection with the impression-cylinder and its starting-lever, a reciprocating gab-hook or bar for engaging with a stud on said lever, and a guard having a reciprocating motion independent of and upon the gab-hook or bar, whereby it is traversed along the gab-hook to cover and uncover the notch or opening therein at the proper times, and I also employ mechanism whereby the gab-hook may be raised to disengage it from the cylinder-starting lever when the notch or opening is uncovered by the guard, and by which the gab-hook may be lowered at any time, and without reference to the position of parts, so that the said gab-hook with its guard-covered notch will ride idly on the lever-stud until such time as the guard shall move to uncover the notch, whereupon the gab-hook will drop into engagement with said stud and the cylinder will be started.

In presses in which the delivery of the printed sheet is effected by means of delivery-grippers, which are fixed upon a gripper-rod extending between two endless chains arranged in front of the cylinder, as is shown and described in my two United States Letters Patent Nos. 305,797 and 305,798, dated September 30, 1884, the delivery-grippers, as they come to a position to take the sheet, move at the same speed as the cylinder, and are received in the gripper-recess of the cylinder. Consequently, if the cylinder be stopped and the grippers retain their operative position, they would jam against the cylinder in passing around adjacent thereto. To prevent this I interpose between the gripper-rod and the

chain a spring or springs, and provide a locking device whereby the gripper-rod is held in operative position with the spring or springs under tension, and I also provide means whereby the locking device will be tripped and the spring or springs released, and allowed to throw the gripper-rod and its grippers into an inoperative position as the grippers pass adjacent to the tripped cylinder. I also provide means whereby the gripper-rod and grippers will be again moved forward into their operative position on their first coming adjacent to the cylinder, after the mechanism for "throwing in" the cylinder has been set by the operator for that purpose.

The invention consists in novel combinations of parts, hereinafter described, and pointed out in the claims, whereby the desired results are secured.

In the accompanying drawings, Figure 1 is a side elevation of such parts of a press as are necessary to illustrate my invention. Fig. 1* is a detail view, hereinafter described. Fig. 2 is a horizontal section on the plane of the dotted line $x x$, Fig. 1. Fig. 3 is a vertical section on the plane of the dotted line $y y$, Fig. 2. Fig. 4 is a similar section on the plane of the dotted line $z z$, Fig. 2, and showing the gab-hook or bar raised out of engagement with the stud on the cylinder-starting lever. Fig. 5 is a sectional elevation on a larger scale, showing a part of the mechanism for operating the delivery-grippers, a cam which is shown as adjusted to a position to trip the locking device which holds the grippers in operative position, and a second cam, which may be moved to again set the grippers in operative position after the cylinder is "thrown in." Fig. 6 is a plan of the cam for "throwing off" or tripping the delivery-grippers. Fig. 7 is a view of the gripper mechanism and gripper tripping and setting cams similar to Fig. 5, but showing the gripper-setting cam adjusted to operative position. Fig. 8 is a plan of the gripper-setting cam. Fig. 9 is a sectional view in a plane transverse to the gripper-rod of a spring box or case, whereby the gripper rod and bar are connected with the gripper-carrying chain at one side of the press. Fig. 10 is a sectional view of the spring box or case on the plane of the dotted line 1 1, Fig. 9. Fig. 11 is a sectional view on the plane of the dotted line 2 2, Fig. 9; and Fig. 12 is a sectional view on the plane of the dotted line 3 3, Fig. 9.

Similar letters of reference designate corresponding parts in all the figures.

A designates the usual side frames of the press, and A' the uprights therefrom or cylinder-frames in which are fitted the journal-boxes a of the impression-cylinder B. The impression-cylinder is provided with the usual gear-segment, b , through which it is rotated by engagement with the bed-rack during the forward movement of the bed. I have not shown the bed, as it forms no part of my invention. It may be of the usual or any suit-

able form, and reciprocated along the usual bearers or ways. It may be operated in the usual way from the continuously-rotating crank-shaft D, which makes one turn to each double movement or forward and backward movement of the bed.

E designates the usual lever for starting forward the cylinder B and bringing it into gear with the bed-rack. It is fulcrumed at c to one of the side frames, A, and has at its upper end a sector, d , engaging with a short gear-segment, d' , on the cylinder B.

F designates a bar, which is yoked to straddle or embrace the crank-shaft D, and which is slotted at its end to embrace or receive a box or square sleeve, e , secured by a pin or stud, e^* , to a fixed support, C, which may consist of one of the bearers for the bed, and which is shown in Fig. 2. The bar F is guided in its direct reciprocating movements by the shaft D and box or sleeve e , and has only a rectilinear movement.

On the shaft D are two cams, $D'D^2$, between which the bar F lies, and by acting on two rollers or trucks, $e' e^2$, on the bar F the cams produce a forward and backward movement of said bar.

F' designates a gab-hook or notched bar, which is pivoted at f to the reciprocating bar F, and is adapted to engage with a stud, f' , on the lever E, as shown in Figs. 2, 3, and 4. The hook F' receives the reciprocating movements of the bar F, and when in engagement with the stud f' imparts a regular swinging movement to the lever E and starts the cylinder B forward and brings it into proper gear with the bed at each forward movement of the bed.

In Fig. 4 the gab-hook F' is represented as lifted off the stud f' .

To the under side of the gab-hook F' is fitted a slide or guard, f^2 , which is best shown in Fig. 4, and which, when not otherwise moved, is drawn forward by a spring, f^3 , to cover the notch or opening * of the gab-hook F'.

On the shaft D is a cam, f^4 , and f^4 is a rod or bar, which is reciprocated by the cam, and is attached to an arm, f^5 , on a rock-shaft, f^6 . The rock-shaft f^6 also has an arm or toe, f^7 , which engages with a projection or shoulder, f^8 , on the guard f^2 . Once during each revolution of the shaft D, the rod f^4 , acting through the rock-shaft and toe $f^6 f^7$, draws back the guard f^2 to uncover the notch or opening in the gab-hook F'; but at all other times the spring f^3 keeps the notch closed by the guard, and so prevents the gab-hook from being lifted off the pin or stud f' , or prevents the gab-hook from engaging with the stud if it has before been lifted off, the gab-hook in the latter case sliding or riding idly over the stud f' .

Below the bar F is an arm or lever, F^2 , which is fulcrumed at f^9 to one of the side frames A, and has at its other end a roller, f^{10} , engaging with a slot, f^{11} , in the forward portion of the gab-hook F'. This arm F^2 has connected with it a rod, f^{12} , which, by an arm, f^{13} ,

on a rock-shaft, G, is actuated to raise and lower the arm F^2 and the gab-hook F' .

In order to hold the cylinder locked against accidental turning when the gab-hook F' is disconnected from the lever E, I employ a locking-bolt, f^{14} , which slides upward and downward in a guide, f^{15} , and has a slot-and-pin connection, f^{16} , with the arm F^2 . When the said arm is raised to lift the gab-hook off the pin or stud f' , the bolt f^{14} is moved upward into a notch, f^{17} , in the lower end of the lever E, and locks it and the cylinder against turning, and when the arm F^2 is moved down the locking-bolt f^{14} is disengaged from the lever.

When it is desired to operate the press with double rolling, the cylinder should be tripped at every second reciprocation of the bed, and to effect this I have represented a second or double-rolling shaft, D^3 , which is so connected with the cam-shaft D by gears g, g' as to make only one revolution for each two revolutions of the shaft D. The gear-wheel g' has formed with it a cam, g^2 , which operates on a roller or truck-roll, g^3 , pivoted on a rod, g^4 , which is slotted or forked to embrace the shaft D^3 . The rod g^4 has a gab-hook, g^5 , and when the latter is in engagement with an arm, g^6 , on the rock-shaft G the latter will be turned at each second complete reciprocation of the bed to trip the cylinder and allow the press to operate with double rolling. The shaft G also carries an arm, g^7 , which is operated upon by a gab-hook, g^8 , on a rod, g^9 , and said rod is operated through a bell-crank lever, g^{10} , from a vertically-movable foot-rod, g^{11} , arranged adjacent to the foot-board or platform A*, on which the press-feeder or operator stands. When the gab-hook g^8 is in engagement with the arm g^7 , the cylinder may be tripped by simply pressing down on the foot-rod g^{11} , when the guard f^2 has been moved to uncover the notch in the gab-hook F' ; and in the absence of any pressure on the foot rod the bed and cylinder will continue their normal operation. In case the gab-hook g^8 is raised out of engagement with the arm g^7 , and the gab-hook g^5 is in engagement with the arm g^6 , the cylinder is tripped so as to prevent alternate revolutions, and the press is operated with double rolling.

In order to control the engagement of the gab-hooks g^5, g^8 with the arms of the rock-shaft G, I employ a second rock-shaft, G' , having arms g^{12}, g^{13} , which are under the gab-hooks g^5, g^8 , and which, when the shaft G' is turned in one or other direction, raise one of the said hooks out of engagement with its arm and lowers the other hook so that it will come into engagement with its arm. The rock-shaft G' is turned by a rod, g^{14} , connected with an arm, g^{15} , thereon, and connected through a bell-crank lever, g^{16} , with a vertically-movable foot-rod, g^{17} . When the foot-rod g^{17} is depressed, the arm g^{13} raises the gab-hook g^8 off from the arm g^7 , and the arm g^{12} recedes from and allows the gab-hook g^5 to

drop into engagement with the arm g^6 to operate the press with double rolling. When the foot-rod g^{17} is pressed down, it is there held by engagement with a catch, g^{18} , and after said catch is withdrawn by the foot, the rod g^{17} will be raised by a spring, g^{19} , applied thereto, as shown in Fig. 1.

It will be understood that when the gab-hook F' is raised out of engagement with the pin f' , the arm F^2 is held in an elevated position by the slot f^{11} in the gab-hook, engaging its roller f^{10} , and through the connections $f^{12}, f^{13}, G, g^7, g^9, g^{10}$ the foot-rod g^{11} is held down until such time as by the reciprocating movement of the gab-hook F' its notch * is brought opposite the stud f' on the lever E, and again drops into engagement therewith.

If it is desired to prevent the operation of the cylinder for any length of time, the foot should be kept pressed down upon the rod g^{11} , for as long as the rod is kept pressed down by the foot the gab-hook F' cannot drop into engagement with the stud f' ; but if the foot is removed from the foot g^{11} after the gab-hook has been first raised, that rod, by the connections above described, will be held down until such time as the notch * in the gab-hook F' comes opposite the stud f' and drops into engagement therewith.

In lieu of employing the slot f^{11} to hold up the arm F^2 , I may employ the mechanism shown in dotted lines in Fig. 1 and in the detail view in Fig. 1*, which represents the foot-rod g^{11} and appurtenances in a plane at right angles to the plane of Fig. 1.

D^4 designates a shaft, which extends lengthwise of the press and carries a cam, g^{20} , which is continuous through about one-half the circumference thereof. The foot-rod g^{11} has connected with it a lever, g^{21} , having at the end a roller, g^{22} . The cam g^{20} should be so timed that when the guard f^2 on the gab-hook F' uncovers the notch * therein the opening between the ends of the cam g^{20} will be uppermost, and then the end of the lever g^{21} , with which the cam engages, will be raised when the foot-rod g^{11} is pressed down, and the cam g^{20} , running under the roller g^{22} thereon, will hold the foot-rod g^{11} depressed.

I will now describe the gripper-carrying mechanism and the mechanism for tripping and setting the grippers with reference to Figs. 1, 3, and 5 to 12, inclusive. Mounted above the impression cylinder B are chain-wheels h , over which pass endless chains H one at each side of the press, and extending forwardly from the frames or housings, wherein these wheels are journaled, are tracks or ways H' . Between the two chains extend a gripper-rod, h' , and a gripper-bar, h^2 , the rod being provided with grippers or gripper-fingers h^3 , which close on gripper rests or pads h^4 on the bar h^2 . At one end of the gripper rod and bar h', h^2 , I interpose between them and the chain H a spring box or case, H^2 , which I will now describe in detail. It consists of a cylindric box or case, H^2 , open on the inner side, and there fitted

with a cover or disk, h^5 , in which the ends of the rod and bar $h' h^2$ are fast. A link of the chain H has an integral stud, h^6 , projecting inward from it, as shown in Figs. 10 and 12, and on this stud or pin is secured fast the body of the box or case H^2 . The inner end of the pin or stud h^6 is preferably reduced in diameter and shouldered at h^{6*} , and thereon is fitted loosely the disk or cover h^5 , which can therefore turn relatively to the body H^2 of the box or case. In order to limit this turning movement, I provide the box H^2 with a tongue or projection, h^7 , which extends across the edge of the cover or disk h^5 and forms a stop against which may strike one or other of two shoulders, $h^8 h^9$, on the cover or disk h^5 when the latter turns. The body H^2 of the box or case and the disk or cover h^5 are connected by a spring or springs, two coiled springs, i , being here shown. These springs i have their inner ends secured fast in axles or short shafts i' , which are journaled in the head of the body H^2 , and the outer ends of the springs are attached to studs or pins i^2 , which project inward from the cover or disk h^5 .

On the outer ends of the short shafts i' are small ratchet-wheels i^3 , with which engage pawls i^4 , pivoted to the exterior of the box or case. The ends of these short shafts i' are squared or otherwise formed for the engagement of a wrench, by which the springs i may be wound up or have tension applied to them, and they will then operate on the pins or studs i^2 to turn the cover or disk h^5 in the direction indicated by the arrows, Fig. 9.

In order to lock the cover or disk h^5 against turning, and to hold the springs under tension, I employ a locking-pawl, i^5 , which is fixed on a short shaft, i^6 , journaled in the head of the box or case H^2 , and on the outer end of the shaft i^6 is a lever or arm, i^7 , which is acted upon by a spring, i^8 , to hold the pawl i^5 in engagement with a locking-notch, i^9 , in the cover or disk h^5 . By pressure on the arm i^7 the pawl i^5 may be disengaged from the notch i^9 , as shown in Fig. 9, and the cover or disk will then be turned by the springs i to the position shown in Fig. 9.

On the cover or disk h^5 is secured a roller or projection, i^{10} , and by pressure thereon the cover or disk h^5 may be turned in a direction the reverse of that indicated by the arrow in Fig. 9, in order to bring the locking-notch i^9 again into position to receive the locking-pawl i^5 , and to put tension on the springs i .

I designate a vertically-sliding bar, which is fitted to bearings j , as shown in Fig. 1. This bar is connected by a lever, I' , with the foot-rod g^{11} , so that when the latter is pressed down said bar will be raised, and when the rod g^{11} rises the bar I will be drawn down by a spring, I^2 , applied thereto, as shown in Fig. 1.

On the bar I are cams $j' j^2$, which are respectively below and above the center of the chain-wheels h , and are pivoted at j^* , so that they will resist any pressure upon them in a downward direction, but will freely yield to

upward pressure and swing over, as shown by the dotted lines of the cam j^2 in Fig. 7. When the foot-rod g^{11} is pressed down to trip the cylinder, the bar I and its cams $j' j^2$ will be raised sufficiently to bring the cam j' in the path of the arm i^7 , for tripping the grippers as the latter are carried by the chains H in the direction indicated by the arrows in Figs. 5 and 7, and then as said grippers approach a position adjacent to the stationary impression-cylinder B, the arm i^7 strikes the cam j' , as shown in Fig. 5, and thereby disengages the locking-pawl i^5 from the notch i^9 and allows the spring i to turn back the cover or disk h^5 , as indicated by the dotted arrow in Fig. 5, so that the grippers will clear the surface of the cylinder and will not jam against the same. When the foot-rod g^{11} rises and the cylinder is again thrown in, the bar I falls and brings the cam j^2 into the position shown in Fig. 7, so that on the next approach of the grippers to the cylinder the roller or projection i^{10} will strike the cam j^2 , as shown in Fig. 7, and thereby the cover or disk h^5 and grippers will be turned in the direction indicated by the dotted arrow in Fig. 7, so that the springs i will be tightened or wound up, and the locking-notch i^9 will be returned to a position for the pawl i^5 to engage with it. By thus moving the grippers ahead and into operative position they will be made to register with the gripper-recess B^* in the cylinder B as they come to a position to take the sheet. It is desirable that the cams $j' j^2$ should be pivoted, because then they will yield to the action of the arm i^7 and roller i^{10} if the said arm and roller are brought against them in backing up the press and will not trip or set the grippers.

As here shown, the cams $j' j^2$ are carried by arms I^3 , fast on and projecting horizontally from the vertically sliding bar I , as shown in Figs. 6 and 8.

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

1. The combination, with the impression-cylinder and its starting-lever, arranged to operate as described, of a reciprocating gab-hook or bar for engaging with a stud on said lever, and a guard having a reciprocating movement independently of the gab-hook or bar, whereby it is traversed along the gab-hook or bar, to cover and uncover the notch or opening therein, substantially as herein described.

2. The combination, with the impression-cylinder and its starting-lever, arranged to operate as described, of a cam-actuated bar having a direct reciprocating motion, a gab-hook pivoted to said bar and engaging with a stud on said lever, and an independently-reciprocating guard working on said gab-hook, to cover and uncover the notch or opening therein, substantially as herein described.

3. The combination, with the impression-cylinder and its starting-lever, arranged to operate as described, of a reciprocating gab-hook for engaging with a stud on said lever,

an independent reciprocating guard working on said gab-hook, to cover and uncover the notch therein, a locking-bolt for locking said lever, and mechanism, substantially such as described, for simultaneously raising said gab-hook and moving the locking-bolt to lock said lever, substantially as herein set forth.

4. The combination, with the impression-cylinder and starting-lever, arranged to operate as described, of the reciprocating gab-hook for engaging a stud on said lever, a guard on the gab-hook, a spring for moving the guard in one direction, and a cam-actuated rod for moving said guard in the other direction, whereby the guard is reciprocated to cover and uncover the notch or opening in the gab-hook, substantially as herein described.

5. The combination, with the impression-cylinder and its starting-lever arranged to operate as described, of the reciprocating gab-hook F' , with its independently-reciprocating guard f^2 , the pivoted arm or lever F^2 , arranged below the gab-hook for raising the same, and the rock-shaft G and connections for operating said arm or lever, substantially as herein described.

6. The combination, with the impression-cylinder and its starting-lever, arranged to operate as described, of the reciprocating gab-hook F' , with its independently-reciprocating guard f^2 , the locking-bolt f^{14} , pivoted arm or lever F^2 , connected with the locking-bolt and arranged below the gab-hook, and the rock-shaft G and connections for actuating the arm or lever F^2 , substantially as herein described.

7. The combination, with the impression-cylinder and starting-lever, arranged to operate as described, of the gab-hook F' , having a slot, f^{11} , the arm or lever F^2 , provided with a roller, f^{10} , fitting said slot, and a rock-shaft and connections for actuating said arm or lever to raise the gab-hook, substantially as herein described.

8. The combination, with the impression-cylinder and starting-lever, arranged to operate as described, of a reciprocating gab-hook for engaging a stud on the lever, and provided with an independently-reciprocating guard, whereby its notch or opening is covered and uncovered, a rock-shaft and connections for raising the gab-hook, a rod or connection having a reciprocating movement for double-rolling, and an arm on said rock-shaft with which the double-rolling connection may be engaged, substantially as herein described.

9. The combination, with the impression-cylinder and its starting-lever, arranged to operate as described, of the reciprocating gab-hook and independently-reciprocating guard, the rock-shafts G G' , and connections between the shaft G and gab-hook for raising the latter, the arms g^6 g^7 on the shaft G , the double-rolling rod g^4 and hook g^5 , and the rod g^9 and hook g^8 , the foot-rod g^{11} and connections for operat-

ing the hooked rod g^9 , the arms g^{12} g^{13} on the shaft G' , for raising the hooked rods g^4 g^9 , and the foot-rod g^{17} and connections for operating the shaft G' , substantially as herein described.

10. The combination, with the impression-cylinder, its starting-lever, and mechanism, substantially as described, for tripping the cylinder, of the endless chains, and a gripper-rod extending between the chains and provided with delivery-grippers, a spring or springs interposed between one of the chains and said rod, and which act when released to turn the rod and grippers into an inoperative position so that they will clear the cylinder, a locking device, substantially as described, for holding the rod and grippers in an operative position against the force of the spring or springs, and cams whereby the locking device will be thrown off to release the spring or springs, and the latter afterward wound up or put under tension, substantially as herein set forth.

11. The combination, with the impression-cylinder, and means, substantially as described, of starting and tripping the same, of endless chains, and automatically-tripped delivery-grippers carried by said chains, whereby the grippers will be enabled to clear the cylinder in passing it while the cylinder is stationary, substantially as herein set forth.

12. The combination, with the impression-cylinder and endless delivery-chains H , of the gripper-rod, and bar h' h^2 , extending between the chains, the spring-box H^2 , fast on a chain, and its cover h^5 , in which are fixed the rod and bar h' h^2 , and which can turn relatively to the box or case, and is provided with a roller or projection, i^{10} , the spring or springs interposed between the box or case and its cover, a locking device, substantially as described, connecting the box or case and its cover, and cams which are movable to bring them into positions for tripping the locking device and for the engagement of the roller or projection i^{10} , to wind up the spring or springs, substantially as herein set forth.

13. The combination, with the impression-cylinder, of the delivery-chains H , the spring-box H^2 and its cover h^5 , provided with a roller or projection, i^{10} , and a locking-notch, i^9 , the chain-stud h^6 , on which the box-body H^2 is secured and on which the cover h^5 may turn, the gripper-rod, and bar h' h^2 , provided with grippers, and to which the cover h^5 is secured, the springs i , connecting the body H^2 and cover h^5 , the locking device i^5 i^6 i^7 , and the sliding bar I , with its pivoted or movable cams j' j^2 , for engaging the arm i^7 of the locking device and the roller or projection i^{10} of the cover, substantially as herein described.

C. B. COTTRELL.

Witnesses:

FREDK. HAYNES,
EMIL HERTER.