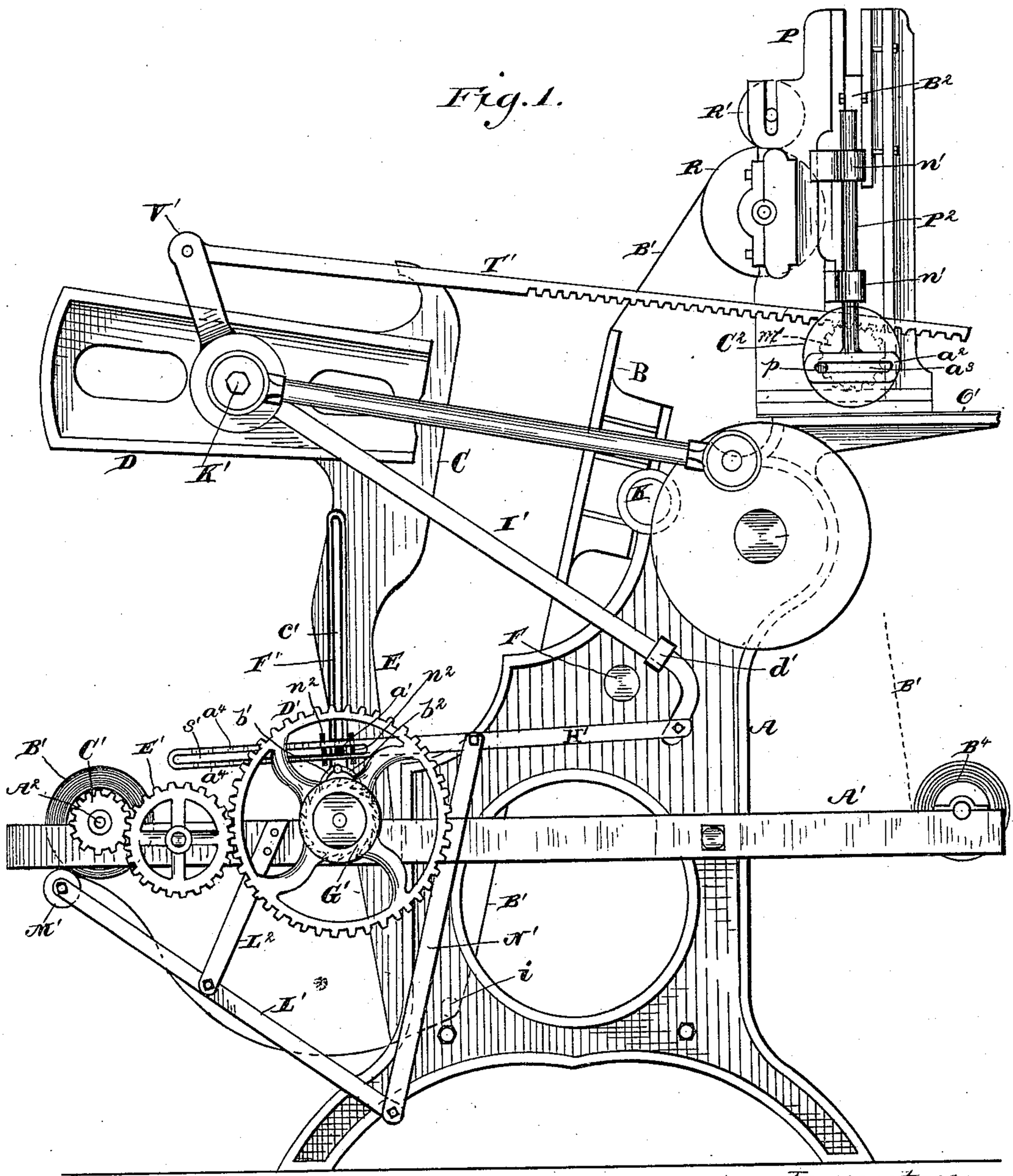
(No Model.) 6 Sheets—Sheet 1.

C. E. CLEMENT.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING PRESSES.

No. 287,239. Patented Oct. 23, 1883.

Fig. 1.



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(No Model.) 6 Sheets—Sheet 2.

C. E. CLEMENT.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING PRESSES.

No. 287,239. Patented Oct. 23, 1883.

Fig. 13.

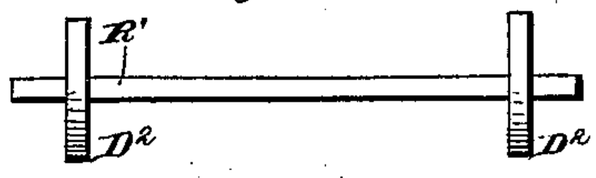

Fig. 2.

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(No Model.) 6 Sheets—Sheet 3.

C. E. CLEMENT.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING PRESSES.

No. 287,239. Patented Oct. 23, 1883.

Fig. 3.

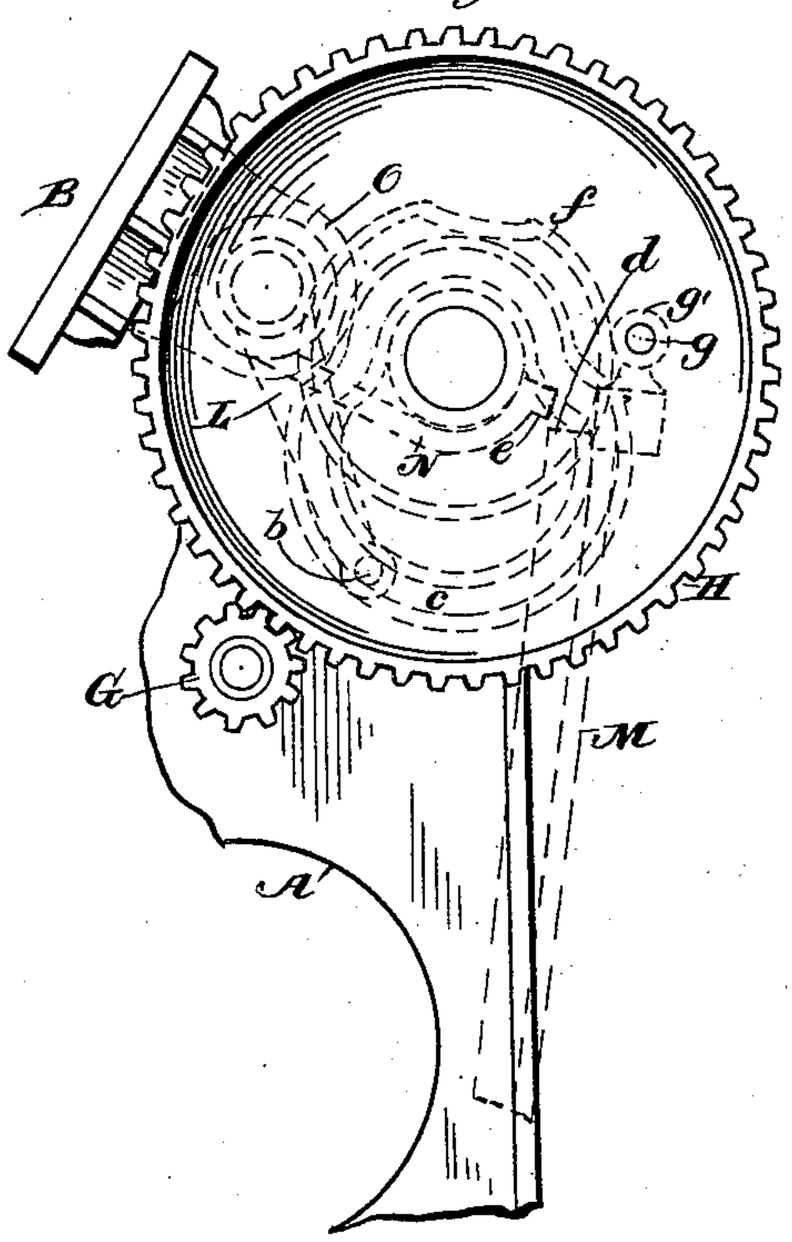


Fig. 4.

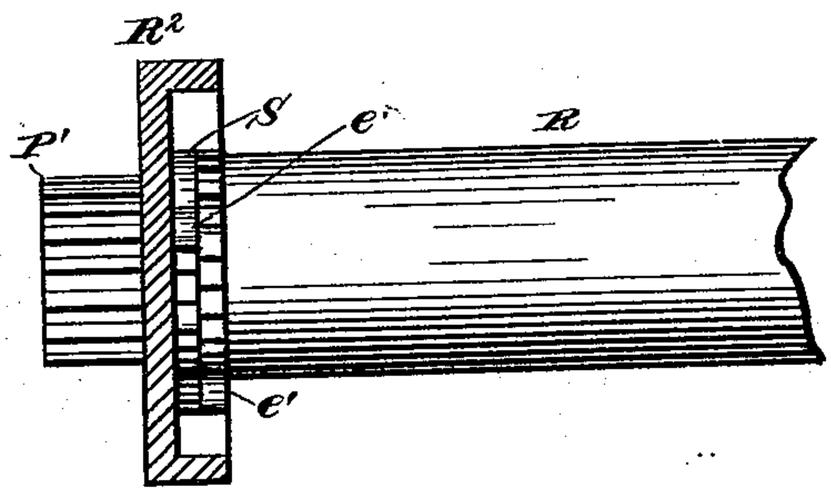


Fig. 5.

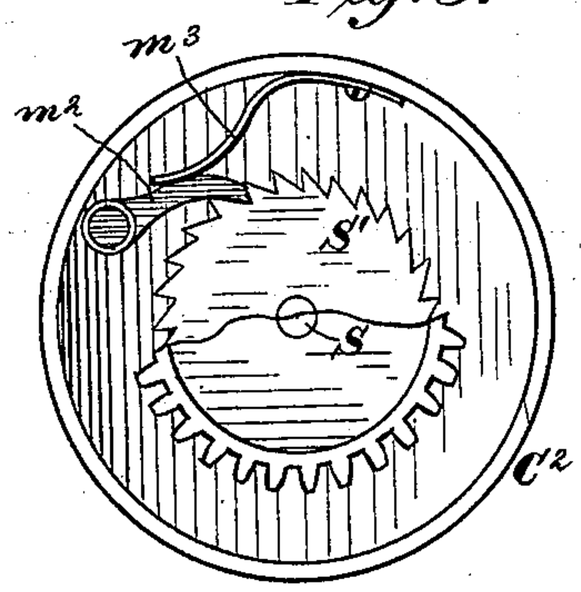


Fig. 6.

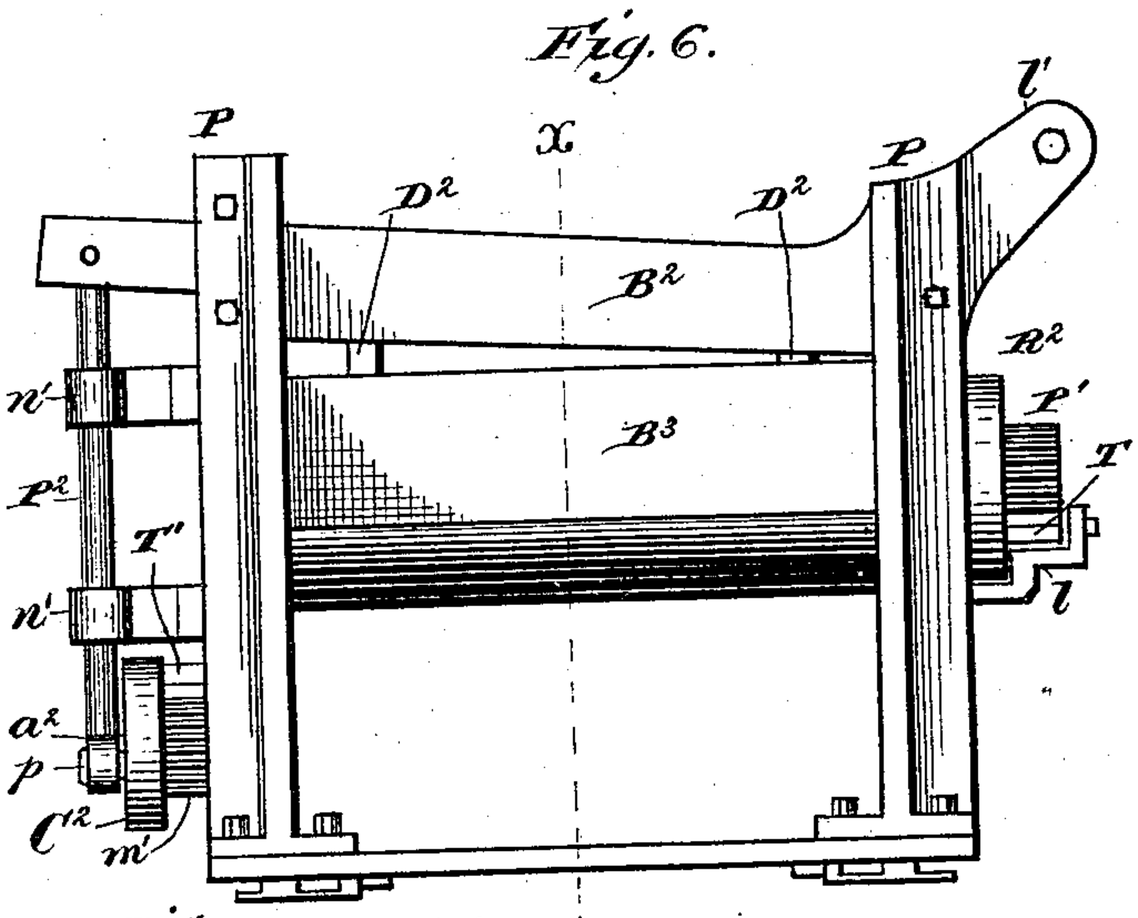
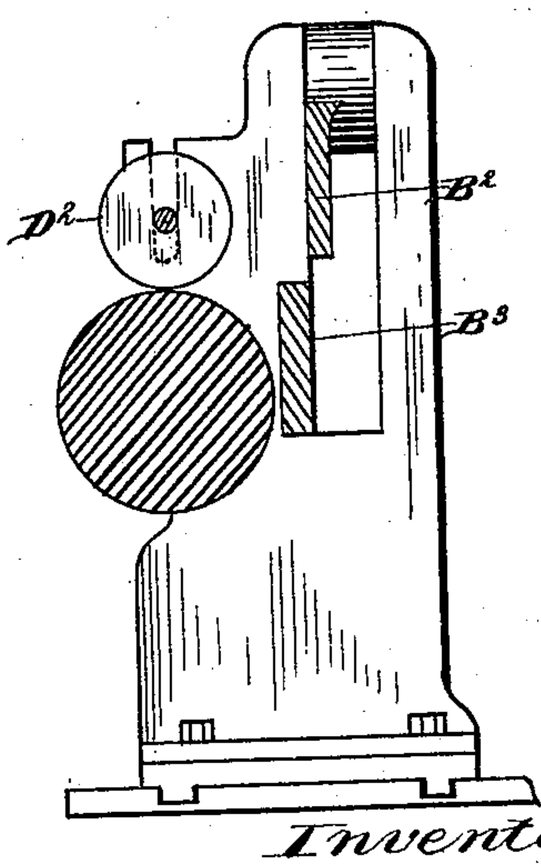


Fig. 7.



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(No Model.) 6 Sheets—Sheet 4.

C. E. CLEMENT.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING PRESSES.

No. 287,239. Patented Oct. 23, 1883.

Fig. 8.

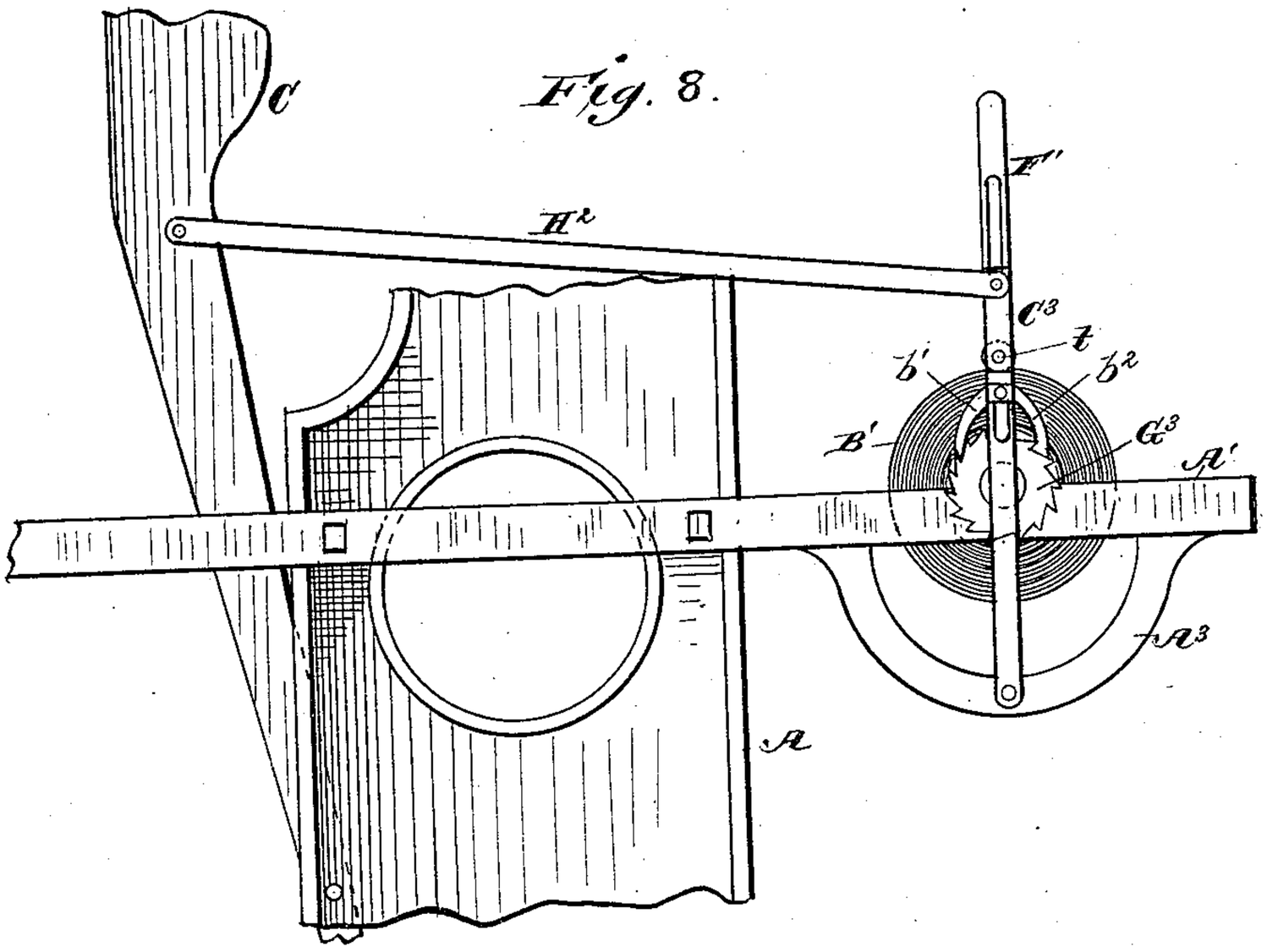
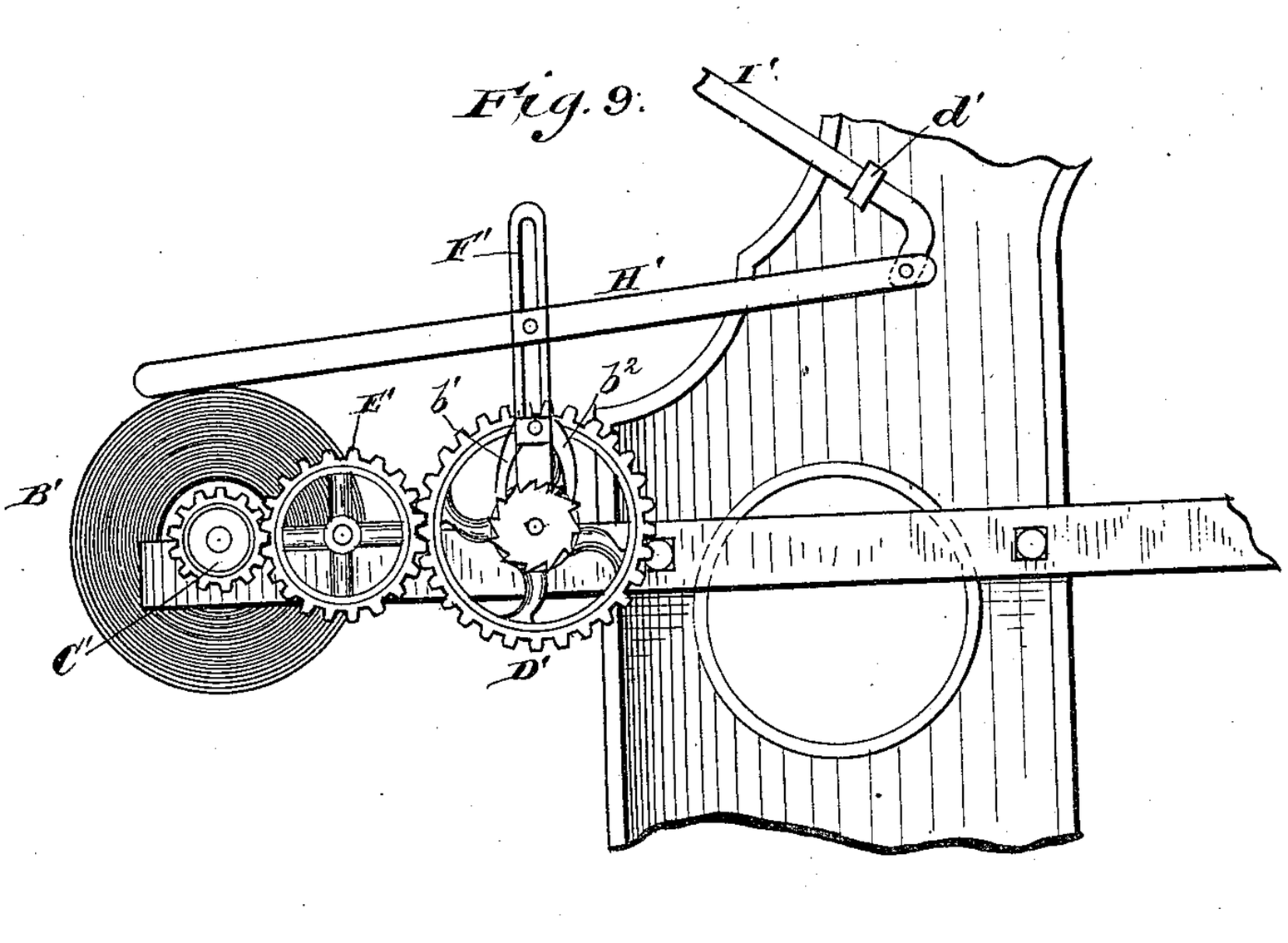


Fig. 9.



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(No Model.) 6 Sheets—Sheet 5.

C. E. CLEMENT.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING PRESSES.

No. 287,239. Patented Oct. 23, 1883.

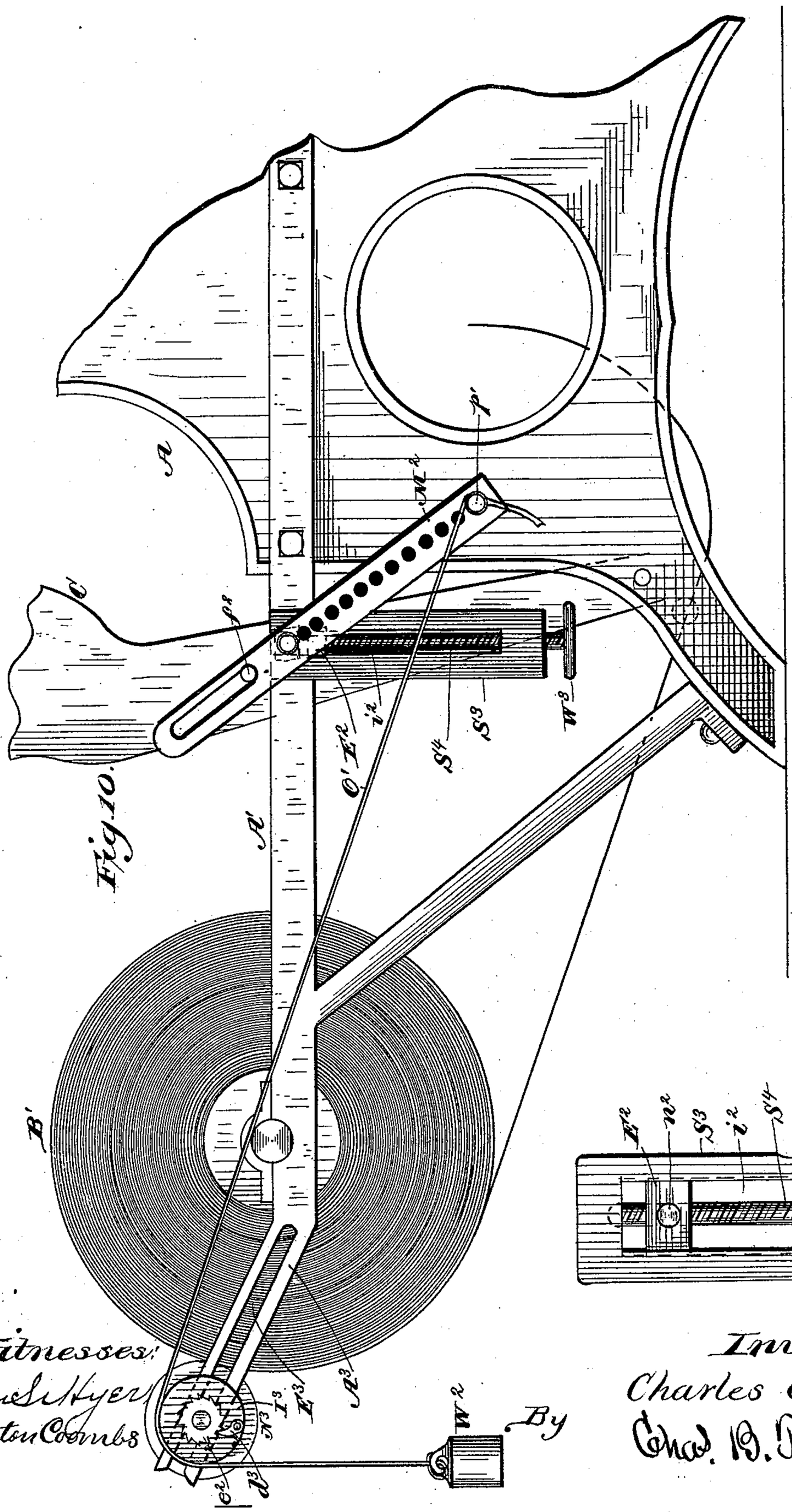

Fig. 10.

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(No Model.) 6 Sheets—Sheet 6.

C. E. CLEMENT.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING PRESSES.

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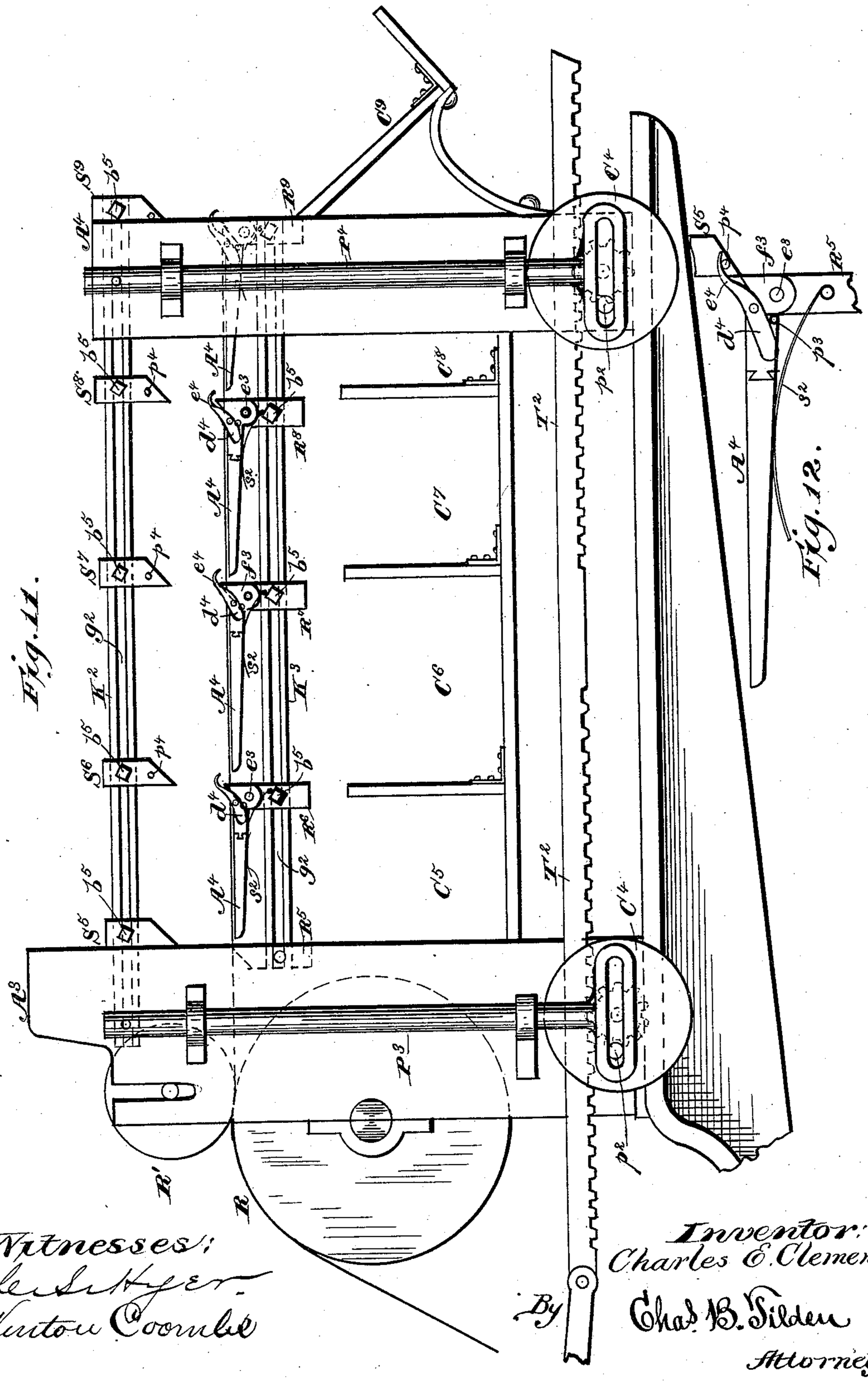

Fig. 11.

Fig. 12.

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UNITED STATES PATENT OFFICE.

CHARLES E. CLEMENT, OF NASHUA, NEW HAMPSHIRE, ASSIGNOR OF TWO-FIFTHS TO CHARLES W. HOITT, OF SAME PLACE.

AUTOMATIC CUTTING AND FEEDING ATTACHMENT FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 287,239, dated October 23, 1883.

Application filed August 8, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. CLEMENT, a citizen of the United States, residing at Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Automatic Cutting and Feeding Attachments for Printing-Presses, of which the following is a specification.

My invention relates to printing-presses, and especially to that class of presses known for many years as the "Gordon," or, as it is often called, Gordon's "Franklin Press."

My invention consists, first, in an attachment for presses of this or a substantially similar construction, whereby the hand-fed press may be converted at pleasure into an automatically-fed press, the paper used being taken from a continuous web, and being automatically cut, after it is impressed, to any desired length, according to the amount of printed matter and the depth of margin required.

My invention consists, secondly, in a novel construction and combination of parts, whereby I am able to regulate the rotation of the pay-off roll from which the continuous web is taken, in order to increase its speed in proportion to the decrease in diameter of said roll as the paper is taken from it, thereby preserving the necessary slack between the feed-rolls and said pay-off roll to prevent tearing or injuring the web.

My invention consists, finally, in a novel construction and combination of parts for cutting apart, after each impression, several sheets of different sizes at a single stroke of the adjustable cutters, together with devices for receiving the several cuttings and depositing each in a separate compartment or receptacle.

Referring to the drawings forming part of this application, Figure 1 is a side elevation taken from the left-hand side of the press, with the pulley and fly-wheel omitted. Fig. 2 is a side elevation taken from the right-hand side. Fig. 3 is a detail illustrating the platen, and showing in broken lines its operating and locking devices. Fig. 4 is a detail view of one of the feed-rolls, with its ratchets, ratchet-case, and actuating-pinion. Fig. 5 is a detail view of the ratchet-case which operates the shear, together with its interior parts. Fig. 6 is a front elevation of the cutting-shears and feed-rolls, together with the devices operating each. Fig. 7 is a transverse vertical section in the plane *x x*, Fig. 6. Figs. 8 and 9 are partial views in side elevation, each showing a modified arrangement of devices for regulating the rotation of the pay-off roll. Fig. 10 is a view, partly in side elevation and partly in detail, of a modified form of apparatus for preserving the slack in the web. Fig. 11 is a side elevation, showing a series or "gang" of adjustable cutters, the parts operating the same, and the devices for receiving and depositing the cut sheets. Fig. 12 is a detail illustrating the method of operating the parts last named. Fig. 13 is an elevation of the upper roll for feeding the paper.

As already mentioned, my invention is shown as applied to the old and well-known Gordon press, which has been manufactured and sold in this country for more than thirty years. As its construction and operation are familiar to all persons skilled in the art, no detailed description of its parts is necessary, and I have shown in the annexed drawings the principal portions only of the quarto-medium job-press with my invention attached.

A in said drawings indicates the frame of the press, in which the operative parts are supported.

B indicates the platen, and C the bed which carries the form.

D represents the inking-roller arms, (the inking-rolls and table not being shown in the drawings,) and E indicates the vibrating arms which carry the bed C.

F represents the main shaft, which has a small pinion, G, meshing with the large gear H, the latter having a crank-pin, *a*, which operates the connecting-rod I, by which the bed C is vibrated.

The platen B is mounted upon a rock-shaft, K, by which it is moved, when the press is fed by hand, from the position of receiving the sheet to the point where the impression is given. This shaft is rocked by an arm, L, (shown in broken lines in Fig. 3,) which is rigid with said shaft, and is provided at its end with a pin, *b*, which runs in a channeled cam, *c*, formed upon the inner face of the large gear H. When the platen is thrown forward

into position to receive the impression, it is locked in position by a rocking frame, M, pivoted to the side frames, A. Upon the upper end of the frame M is formed a shoulder, *d*, which is thrown beneath an offset, *e*, upon an arm, N, which is rigidly connected with the support O, upon which the platen is mounted. By these devices the platen is rigidly locked in position to receive the impression from the form carried by the vibrating bed. After this is effected the shoulder *d* is withdrawn from beneath the offset *e* by means of the cam *f*, which acts upon a pin, *g*, having a friction-roll, *g'*, bearing upon the cam, said pin being placed upon the end of the vibrating frame M.

In applying my attachment to this press, it is desirable to first lock the platen permanently in the position which it occupies when receiving the impression, my invention providing for the automatic feed of the paper, and therefore obviating the necessity of rocking the platen. I accomplish this by simply removing from the arm L the pin *b*, which engages with the cam *c*, and thereby imparts motion to the platen. The pin *g*, with its friction-roll *g'*, is also removed from the extremity of the rocking frame M, and the motion of the latter is thereby arrested. This being done, the platen will drop into place, and the locking-frame, which is thrown inward by a leaf-spring, (not shown in the drawings,) will move under the offset upon the arm N, and remain permanently in that engagement.

A' (see Figs. 1 and 2) represents a strong supporting-frame, of metal or wood, which is securely bolted to the lower portion of the frame of the press, and projects a suitable distance beyond each end of said frame. One of such strips is placed upon each side of the press, and in their upper edges, near the rear ends, are formed bearings for the journals of a shaft, A^2. This shaft carries a roll or core, upon which is wound a continuous web of paper, B', of any desired width. When the press is in operation, the paper is taken from this roll, carried over the platen, where it receives the impressions from the vibrating bed, and thence it passes to the feed-rolls, by which it is fed between the cutters.

The action of the feed-rolls being necessarily intermittent, and the roll of paper being of considerable weight, it is necessary, both to prevent tearing the web and to secure perfect accuracy of feed, to constantly maintain a slack portion between the roll of paper B' and the feed-rolls, said slack being of somewhat greater length than the portion of the web taken up by the feed-rolls between each impression from the form. Moreover, as the roll of paper upon the shaft A^2 is constantly decreasing in diameter as the web is paid off, it is evident that there must be a definite acceleration of the speed of rotation of the shaft upon which the web is coiled in order to preserve the required slack. For this purpose, therefore, I key upon the end of the shaft A^2 a small pinion, C', which receives motion from a large gear, D', through an intermediate, E', both the latter being journaled in the frame A'. The gear D' receives motion from a lever, F', which is pivoted at its lower end upon the shaft of said gear, and which carries two pawls, *b'* and b^2, both engaging with a ratchet, G', rigidly mounted upon the shaft of the gear D'. One of these pawls is a push-pawl and the other a hook-pawl. From the point where they are pivoted to the lever F' the latter is slotted nearly to its upper extremity. It is vibrated by a rod, H', which is connected with said lever by means of a pin, *a'*, adapted to move freely in the slot *c'* in said lever, the rod H' being reciprocated by a pitman, I', which is hooked at one end over the shaft K', upon which the ink-roller arms D turn. The other end of said pitman passes through a keeper, *d'*, attached to the frame of the press, and is connected with the end of the rod H'. This pitman is actuated by the vibrating bed of the press, and it produces, through the connections described, an intermittent rotation of the gear D', the pawls *b'* and b^2 meshing with the ratchet G' upon the rearward stroke of the lever F'. Now, it is evident that as the pin *a'*, which forms the connection between the rod H' and the lever F', is raised in the slot *c'*, formed in said lever, the throw of the latter will be decreased, whereas when the connecting-pin sinks in said slot and approaches the pivotal point of the lever it will cause the latter to describe a greater arc, and will proportionately increase the rotation of the gear D', and consequently the movement of the shaft A^2, upon which the paper web is coiled, will be greater in the same degree. In order to effect this adjustment automatically and in exact proportion to the decrease in diameter of the paper roll, I hang beneath the frame A' a bar, L', pivoting it, not far from its center, to a support, L^2, so that one end will extend a little beyond the axis of the paper roll. Upon this end of the bar is placed a friction-roll, M', having its axis parallel with the axis of the paper roll and bearing against its periphery, as shown in Fig. 1. The other end of said bar is pivoted to a connecting-rod, N', which supports the rod H', being pivoted thereto at any suitable point. As the web is paid off the shaft A^2 the roll M' will gradually approach said shaft, depressing the other extremity of the bar L', and thereby drawing the pin *a'* in the slotted lever F' down toward the pivotal point of said lever. As already explained, this increases the throw of the latter, and consequently the rotation of the shaft A^2. This increase being in exact proportion to the decrease in diameter of the paper roll upon said shaft, the quantity of the web paid off at each operation of the gear D' will be the same. After leaving the roll the paper passes over a small guide-roll, *i*, set within the frame of the machine, and about in the same plane with the

inclined face of the platen. It passes upward over the platen and between the rolls by which its feed is controlled. These rolls, which are shown in Figs. 1, 2, and 6, are journaled in uprights P, which are bolted to a solid base-piece, O, and the whole structure is set upon that portion of the press-frame which ordinarily supports the table, the latter being removed for this purpose. It may, however, be supported upon extension arms or slides bolted to the table-support, and thus be adjusted backward and forward as circumstances may require.

The roll R, over which the web passes, is the one to which motion is directly imparted. It is considerably larger than the roll R′, resting upon it, and is set in closed bearings, (see Fig. 1,) while the journals of the upper roll lie in open bearings, and can be removed at the pleasure of the operator. Upon the right-hand side of the press the shaft of the roll R is prolonged, and a double ratchet, S, is keyed thereon, as shown in Fig. 4. Outside this ratchet is placed a pinion, P′, having a ratchet-case, R^2, formed solid with it, and both adapted to turn freely upon the shaft of the roll. In the double ratchet S the teeth of one alternate with those of the other, and two independent pawls, *e′ e′*, are pivoted within the ratchet-case R^2, one for each ratchet. The pinion P′, with the ratchet-case or pawl-carrier R^2, is operated by a rack, T, meshing with said pinion, and sliding in a support, *l*, attached to the upright P. This rack is reciprocated by the vibrating bed of the press, its end being attached to an arm, V, rigidly mounted upon the shaft of the inking-roller arms. This shaft K′ is rigid with the bed, as the inking-arms merely turn upon it. The arm V, which, by being extended above the rocking bed, gives a little greater throw to the rack, is forked at its upper extremity, and provided with a pin, *m*, which passes from one arm of the fork to the other. The end of the rack-bar T is slotted, as shown at *n*, Fig. 2, and the pin *m* passes through the slot *n*. Apertures *d′* are pierced in the slotted portion of the bar at equal distances to receive pins *f′*, which cross the slot *n*, one being placed before and the other behind the pin *m*, which is adapted to slide in the said slot, except as it is stopped by the pins *f′*. By adjusting these pins toward or from each other, the reciprocation of the rack T may be so controlled that the rotation of the roll R and the length of the sheet fed by it may be controlled with great accuracy. The apertures *d′* are placed in alternate or zigzag order in the rack-bar T, and may thereby be approached closely together without any danger of weakening the bar, and by simply changing the position of said pins the rate of feed of the continuous sheet may be almost instantly adjusted to any desired degree. In order to secure the most perfect accuracy of feed, I employ the double ratchet S, the teeth of one alternating with those of the other, and each having an independent pawl. In this manner I avoid the small variations caused by the failure of the pawl to engage with the first tooth, or by its retrograde movement ceasing, with the end of the pawl resting upon the point of the tooth, instead of dropping behind it. I may, however, effect the same result by using a single ratchet, and using two or more independent pawls, so arranged as to operate alternately, or, if there are more than two, successively, with the teeth of the ratch.

The roll R′ consists merely of a weighted shaft, having at each end a disk, D^2, adjustable on said shaft. These disks, which bear directly upon the lower roll, may be covered with felt, or with rubber, to give frictional contact, and the same material may be applied to the lower roll. The disks D^2 are made adjustable upon their shaft toward and from each other, in order to accommodate different widths of paper, as it is intended they shall bear upon the edges of the continuous web, and thereby avoid the ink upon the impressed portion. The entire weight of the upper roll is supported by these disks, and not by the journals of said roll.

Directly in front of the rolls R R′, and mounted in the same uprights, are the cutting-blades B^2 B^3. (See Figs. 2, 6, and 7.) They consist of two straight blades of steel, of which the lower is stationary. The end of the upper blade is curved sharply upward and pivoted to an extension, *l′*, of one of the uprights P. At the other end it extends outward through a vertical guide-slot formed in the upright, and is secured by a pin to a pitman, P^2, which moves in guides *n′*, attached to the upright. At its lower end this pitman is provided with an attachment, a^2, having a slot cut therein at right angles to the axis of the pitman. This slot a^3 receives a pin, *p*, (see Fig. 1,) which is placed eccentrically upon the exterior face of a disk or cap, C^2, Figs. 5 and 6, which is in all respects similar to the ratchet-case R^2. (Shown in Fig. 4.) By the rotation of this disk, the pin *p* reciprocates the pitman P^2, and thereby operates the upper shear-blade. The disk C^2 is actuated by a rack, T′, (shown in Fig. 1,) which is similar to the rack T, from which the feed-roll takes its motion. It is connected to an arm, V′, upon the vibrating bed, and meshes with a pinion, *m′*, having a ratchet, S′, rigid with it, and both loosely set upon a stud-bearing, *s*, projecting from the standard P. The cap C^2, which is independently mounted upon the end of the bearing, has a pawl, m^2, which engages with the ratchet S′, pivoted to its inner face, and thrown against the ratchet-teeth by a spring, m^3. As the pinion *m′* is rotated in one direction by the rack T′ the pawl and ratchet will engage, and the cap C^2 will be rotated with them. As the rack moves in the opposite direction the ratchet will merely run beneath the pawl, and the cap C^2 will remain motionless. The arrangement is such that the feed-rolls and the shears shall act alternately, the

former operating between the impressions, and the latter during the time the bed is moving forward to give the impression. In other words, the forward vibration of the bed actuates the shears, but leaves the rolls stationary. The rearward stroke of the bed operates the feed-rolls, thereby removing from the platen the portion of the web just impressed and bringing up a fresh portion. The cutters remain inoperative during this action of the feed-rolls. The shaft A^2 being placed in its bearings, with the web B′ wound upon it, a sufficient quantity of paper is drawn off the roll to allow the web to be carried under the guide-roll *i*, thence over the face of the platen and between the feed-rolls R R′. The paper roll is then turned until the necessary "slack" is paid off. The pins *f′ f′* in the rack-bar T are so placed as to give said bar the required movement, in order to feed the length of sheet to be printed, the chase containing the form is secured to the bed, and the press is started. As the bed C moves toward the platen B the rack-bars T and T′, one upon each side of the press, are thrown forward. The rack T′ rotates its pinion *m′*, together with the ratchet and cap C^2, thereby operating the shears, whereas the rack T, although rotating the pinion with which it meshes, together with the attached ratchet-case R^2, merely draws the pawls *e′ e′* over the ratchets upon the end of the feed-roll, and producing no motion of the feed-rolls. The paper sheet is thus held immovable, resting against the face of the platen, in position to receive the impression from the approaching form. Upon the retrograde vibration of the bed the action of the parts is reversed, as already described. Simultaneously with the rearward movement of the bed the pitman I′ throws the connecting-rod H′ and lever F′ toward the rear, and the pawls *b′* b^2 being in engagement with their ratchet G′, the gear D′ is rotated, thereby giving motion, through the intermediate, to the shaft A^2, and paying off a sufficient quantity of the web to replace the slack portion previously taken from the roll. In this manner fresh slack is paid off at the same time that the feed-rolls are taking up the portion previously paid off, thereby preventing the accumulation of an inconvenient quantity of the web between the paper roll and the guide-roll *i*.

It should be noticed that I have provided a construction whereby the throw of the lever F′ may be controlled in the same manner that the movement of the rack-bar T is regulated. It will be seen that the rod H′ is provided with a longitudinal slot, *s′*, extending both ways from the point of its connection with the slotted lever F′. This slotted portion of the rod is pierced with apertures a^4, placed at regular intervals, to receive pins n^2 n^2, one being placed upon each side of the connecting-pin *a′*. By separating these pins from each other, the throw of the lever F, and consequently the rotation of the shaft A^2, may be diminished to any degree. By placing both close to the connecting-pin *a′*, as shown in Fig. 1, the greatest possible throw of the lever will be obtained. It will readily be understood that this adjustment must correspond with that made by the pins *f′ f′* in the slotted end of the rack-bar T, since the amount of slack paid off by the action of the lever F′ must correspond with the quantity of the web fed by each movement of the rack T.

By the construction described, the parts may be adjusted to feed and pay off a sheet from one inch in length up to twenty-four inches, and upon larger presses this may be increased to any desired extent. By alternating the perforations which receive the pins, the feed and pay-off may be adjusted to the fractional part of an inch. After the adjustment is made in each the machine may be allowed to run without further attention, except to see that the supply of ink is sufficient, and to remove the cut sheets as they accumulate.

The description heretofore given relates to printing upon one side of the sheet only. It is frequently necessary, however, to print upon both sides, and I accomplish this in the following manner: It is evident that in printing upon both sides it will be necessary to make the entire series of impressions upon one side without cutting, after which the web may be turned over, and as the successive impressions are made upon the reverse face it may be run from the feed-rolls between the shears, which will separate the sheets. In printing the first series of impressions, convenience requires that the web shall pass from the feed-rolls to a take-up roll, upon which it may be wound, and from which it may be fed for the second series of impressions upon the other side. The principal difficulty encountered in this operation results from the fact that as the ink dries slowly it is liable to smut the blank face of the web as it is wound upon the take-up roll. I have devised a method of obviating this objection, which will be hereinafter described.

In order to wind the sheet as it is printed, the web is led from the feed-rolls R R′ directly to a take-up roll, B^4, which is journaled in the forward end of the frame A′, as shown in Fig. 2. This roll is driven by gearing which is actuated by a lever, F^2, which is actuated by a pitman, I^2, reciprocated by the vibrating bed. The lever is slotted, and the pin c^3, which connects it with the pitman, is raised and dropped in the slot by a rod, L^3, pivoted to the frame, having a friction-roll at one end bearing against the periphery of the take-up roll, and having its other end connected by a rod, L^4, with the pitman I^2. The lever F^2 carries pawls b^3 b^4, which engage with a ratchet, G^2, rigidly mounted upon the gear D^3. The construction and operation of this portion of the mechanism is substantially similar to that already described in connection with the pay-off roll B′. It is evident that as the web is wound upon the take-up roll the friction-roll N^2, which bears upon its periphery, will be lowered, the other end of the bar L^3 will rise, thereby lifting the pitman I^2 and raising the

connecting-pin c^3 in the slot of the lever F^2. This will gradually decrease the throw of the lever, and consequently the movement of the take-up roll, and thereby the amount of web taken up by the latter will be the same at each action of its operating-lever.

It is my object to so far dry the ink before it reaches the roll as to prevent offset upon the blank or unprinted face of the web. For this purpose I remove the upper feed-roll, R′, and in its place I substitute a roll having contact with the web over its entire width. This roll should be either made of heavy material, or it should be forced against the lower roll, R, by spring-pressure. Over the roll which is substituted for the roll R′, and between it and the printed surface of the web, is passed a thick web of any suitable absorbent material. This latter web may be taken from a roll above the press, as shown by dotted lines in Fig. 2. It may consist of a web or strip of equal length with the web being printed, or it may be a continuous band of any suitable length, its ends being joined together. In the former case it will be convenient to take it from one roll and, after passing it between the feeding-rolls, wind it upon a second roll. In the latter case it may simply run over rolls placed in any suitable position. This absorbent web (shown at W, Fig. 2) should be of such material as to easily absorb the ink. It may be of cloth of cheap quality, or of paper; and it may also be formed of many other materials. By applying to the roll substituted for the feed-roll R′ sufficient pressure to insure perfect contact between the absorbent and surface of the printed web, the ink may be so far removed—that is to say, the surplus ink—that the sheet will dry during the time it is passing from the feed-rolls to the take-up roll B^4. In order, however, to render this result certain of accomplishment, I propose to apply heat to the surface of the web after it leaves the feed-rolls, by which the ink not taken up by the absorbent web may be sufficiently dried, so that it will not offset upon the unprinted surface. This may easily be accomplished by a hot-air or steam chest, which may be secured to the table of the press, as shown at W′, Fig. 2. This chest is made of tin, or any suitable metal, and may be temporarily suspended from the table-support of the press in such a position that its broad flat surface shall lie close to and almost touching the printed surface of the web. It may easily be heated by pipes leading from the steam-boiler of the engine which works the press, and by the heat thus imparted a continuous current of air will flow upward between the steam-chest and the web. By these means offset can be easily avoided.

Instead of the steam-chest, heated rolls may be used, or a current or blast of hot air may be driven over the face of the web.

In Figs. 8, 9, and 10 of the drawings I have illustrated modified forms of the devices for regulating the speed of the pay-off roll. For example, I may connect the vibrating bed directly with the pawl-carrying lever. Such an arrangement is shown in Fig. 8, where C is the bed, F′ the actuating-lever carrying the pawls b' b^2, and H^2 the connecting-rod. The lever is pivoted upon a support, A^3, and the ratchet G^3 is mounted upon the shaft of the pay-off roll. The connecting-rod is fastened to a sliding support, C^3, mounted upon the lever, and having a pin, *t*, upon the inner end of which is mounted, a friction-roll, which rests upon the surface of the paper in the roll B′. As the latter decreases in diameter the support C^3 drops and carries the connecting-rod H^2 nearer to the point upon which the lever oscillates, thereby increasing its stroke; or the connecting-rod H′ (shown in Fig. 1) may be extended, as illustrated in Fig. 9, so that its end may rest upon the periphery of the paper roll. In this way I may dispense with the balance-rod (shown in Fig. 1) by which the rod H′ is raised or lowered, the other parts remaining substantially the same.

Fig. 10 illustrates a form of unreeling devices which is in many respects preferable. In this figure, A indicates the frame of the press, of which part only is shown. A′ is the frame supporting the apparatus for paying off the web. C is the vibrating bed of the press, and B′ the roll of paper. This roll is journaled in the frame A′, near its end, and a slotted arm, A^3, is formed upon or secured to the extremity of each of the strips A′. This arm is inclined from its outer end downward toward the end of the frame. The slots E^3, formed in said arms, are open at the ends, and in them are placed the journals of a roll, N^3, having its surface, which may be faced with rubber, if necessary, bearing against the periphery of the paper roll B′. Upon one end of its shaft is placed a cord-pulley, I^3, which turns freely upon said shaft, and carries a pawl, d^3, adapted to engage in one direction with a ratchet, e^2, which is rigidly mounted upon the shaft. Around the pulley I^3 is geared a cord, O′, to the end of which is attached a weight, W^2. The other end is attached to the lower extremity of a lever, M^2. This lever is pivoted to a vertically-adjustable block, E^2, and a portion of said lever extending above the pivotal point is slotted, and engages with the vibrating bed C by means of a pin, f^2, which is attached to the bed C, and plays in said slot. The block E^2 is set in a vertical support, S^3, attached to the frame A′. A central slot, i^2, is formed in this support, within which the block E^2 slides. A screw, S^4, extends longitudinally from end to end of the slot i^2, passing through a threaded aperture in the block E^2, and having bearings at each end in the support S^3. The screw projects below the lower end of the latter, and is provided with a hand-wheel, W^3, by which it may be operated. Part of the construction is shown in the detached detail view annexed to Fig. 10. Below the pivotal bearing n^2 the lever M^2 is perforated at intervals, to receive an adjustable pin, p', to which the cord O′ is attached.

The mode of operation is as follows: As the bed C vibrates, the pin f^2 oscillates the lever M^2, throwing its lower end, to which the cord is attached, toward the paper roll B′. The weight W^2 keeps the cord taut and rotates the pulley I^3, carrying the pawl d^3, the latter running over the ratchet-teeth without engaging with them. This is the action as the bed C moves forward to give the impression. As it moves toward the rear the lower end of the lever draws upon the cord O′ and rotates the cord-pulley I^3 in the opposite direction. The pawl d^3 now engages with its ratchet e^2, and motion is thereby imparted to the roll N^3, which bears against the paper roll, thereby rotating the latter, and causing it to pay off an amount of web which is measured upon the circumference of the roll N^3. By adjusting the pivot bearing block E^2 upward or downward, the stroke of the lever M^2 may be increased or diminished, and by the adjustment of the pin p' toward or from said pivot n^2 the rotation of the pulley I^3 may be regulated so that the latter will effect the pay-off of a shorter or a longer portion of the web.

In attaching my invention to job-presses it is necessary to provide means whereby, in certain classes of work, several different impressions of varying size may be cut apart, and those of each kind kept separate from the rest. This is especially the case with labels, where a number of different forms of all sizes are locked up in one chase and all printed by a single stroke of the press. In order to cut these apart and keep each kind by itself, I have devised the apparatus shown in Figs. 11 and 12.

In Fig. 11, A^3 indicates the standards in which the feed-rolls R and R′ are journaled. P^3 is the pitman moving in guides attached to one of said standards, and reciprocated vertically by a pin, p^2, upon the cap C^4, the latter being rotated by a rack-bar, T^2, the construction and operation of these parts being substantially similar to that already described. A^4 indicates a second pair of standards placed at some distance from the first pair, and, like them, provided with a pitman, P^4, constructed and operated precisely like the pitman P^3, and operated by a continuation of the rack-bar T^2. Between the pitmen P^3 P^4, and secured to their upper portion, extends upon each side a strip, K^2, having a longitudinal slot, g^2. This strip supports several independent shear-blades, S^5 S^6 S^7 S^8 S^9, which are connected thereto by bolts b^5, which enter the slot, in which they are horizontally adjustable. Upon a second strip, K^3, placed a little below the first, and similarly constructed, are arranged a second series of blades, R^5 R^6 R^7 R^8 R^9, which are secured to said support in the same manner as the upper blades. Each end of the supporting-strip K^2 is secured to one of the pitmen P^3 and P^4, and as the two latter are operated at the same time the whole series of cutters upon the upper strip will descend simultaneously and co-operate with the lower blades upon the strip K^3, thereby severing a sheet laid between the two series into as many parts as there are cutters. As both the upper and lower blades are independently adjustable, it is evident that the sheet may be divided into pieces of different lengths. To each of the lower blades is attached a shelf, A^4. (Shown in detail in Fig. 12.) This shelf is thin and light, and has an ear-plate, f^3, which is pivoted upon each end of the blade at e^3. A spring, s^2, bears against the under side of said shelf and supports it in a horizontal position. Upon the ear-plate f^3 is pivoted a dog, d^4, having a weighted end which rests upon a pin, p^3, and a curved or hooked extremity, e^4, which projects over the cutting-edge, or the vertical plane thereof. Upon each of the upper blades, at the end thereof, is formed a pin, p^4. When the upper blade descends, this pin strikes the hooked end of the dog, raising its weighted end and depressing the hooked extremity e^4 until the pin p^4 slips past it, when the weighted end drops and comes again into contact with the pin p^3. As the blade rises after making the cut the pin p^4 engages with the hooked end of the dog and draws it upward, and as its other extremity is in contact with the pin p^3 upon the plate f^3 the shelf A^4 is turned upon its pivot e^3 against the spring s^2 until the pin p^4 passes out of engagement with the hooked end of the dog, whereupon the elasticity of the spring s^2 restores the shelf to a horizontal position. Each of these shelves receives its own separate cuttings, and as each is tilted in the manner described the slip cut by the shear and deposited thereon is slid off and dropped into one of a series of boxes or compartments, C^5 C^6 C^7 C^8, below said shelves. A receptacle for the slips cut by the extreme blade of the series may be formed as shown at C^9. It is evident that any one or more of these cutters may be wholly removed or their distance from each adjusted according to the requirements of the case. The paper is fed between the rolls R R′, and at each operation thereof the sheet containing as many separate impressions as there are pairs of cutters is projected over the entire series of shelves, and to such a distance beyond the standards A^4 that the impression upon the extreme end of the web will be severed by the cutters S^9 R^9. The other cutters are so adjusted as to cut between the remaining impressions. By this arrangement the prints of each kind are cut and separately accumulated, thereby avoiding the labor of cutting by hand and then separating or assorting the different kinds.

My invention is not a press, nor an improvement in a press. It consists wholly in an attachment for a press, whereby the latter may be converted, without change, into an automatically-fed press, or reconverted into a hand-fed press. By it all the advantages of an automatically-fed press can be obtained at a moderate price, since, instead of buying an entire press, the purchaser need only obtain the parts forming my attachment. Moreover,

by my invention I accomplish two things never yet effected in automatically-fed presses. I provide an automatic adjustment for the pay-off, whereas heretofore it has been necessary to constantly regulate the mechanism by hand in order to preserve the slack. I also provide means whereby the web may be printed first upon one side and then upon the other, the web being wound upon a take-up roll between the two operations without using an offset-web.

Having thus described my invention, what I claim is—

1. An automatic cutting and feeding attachment for printing-presses, substantially as described, in combination with a self-adjusting pay-off apparatus, substantially as described, whereby the necessary slack in the continuous web is constantly maintained, substantially in the manner and for the purpose set forth.

2. In a printing-press, the combination of a vibrating bed with a pay-off roll driven by gearing actuated by a pawl-carrier which is moved by the vibrating bed of the press, the bed being connected with said pawl-carrier by a rod automatically moved toward or from the pivotal point of the latter, and thereby increasing or diminishing the throw of the pawls, substantially in the manner and for the purpose described.

3. The combination, with the feeding-roll, of a rack-bar actuating said roll and reciprocated by the vibrating bed of the press, said rack-bar having a slot which engages with an arm upon the bed, and being pierced with openings to receive pins which cross said slot, and are adapted to be set at any desired distance from each other, whereby the throw of the bar, and consequently the feed movement of the roll, is regulated, substantially in the manner and for the purpose set forth.

4. An automatic feeding and cutting attachment for printing-presses, consisting of a pay-off roll having its speed of rotation accelerated by automatic mechanism, substantially as described, said rate of acceleration being controlled by and in proportion to the pay-off of the continuous web, feed-rolls driven by a rack-bar which is reciprocated by the vibrating bed, the amount of feed being regulated by means substantially as described, and cutters which operate between the feed movements of the continuous web, and which act thereon as it comes from the feed-rolls, all substantially as and for the purpose set forth.

5. The method herein described of printing upon a continuous web without offset, said method consisting in taking the web from a pay-off roll, carrying it over the platen to the feed-rolls and there subjecting the printed surface to the action of an absorbent web, thence passing the printed surface in close contiguity to a heat-radiator, and finally winding the web upon a take-up roll, the heat being used to dry the residue of ink after the action of the absorbent sheet, substantially in the manner set forth.

6. The combination, with the pay-off roll, of a friction feed-roll resting against its periphery, having its journals supported in inclined slotted bearings, whereby contact with the pay-off roll is constantly maintained, a lever oscillated by the vibrating bed of the press, and a cord leading from said lever to a cord-pulley loosely mounted upon the shaft of the friction-roll, with a ratchet upon the shaft of the feed-roll engaging with a pawl mounted upon the loose cord-pulley, substantially as and for the purpose set-forth.

7. The combination, in a self-feeding press, of a pay-off roll, a weighted friction-roll resting thereon, a ratchet rigid with the shaft, and a cord-pulley loosely mounted thereon and carrying a pawl which engages with said ratchet, and an oscillating lever having an adjustable pivot-bearing and vibrated by a stud upon the bed of the press, engaging with a slot in said lever, above its pivotal point, substantially as and for the purpose set forth.

8. The combination, with the feed-rolls, of a series of adjustable cutters operated simultaneously, and a corresponding series of shelves, one being pivoted to each of the lower blades and supported by a spring, each shelf being tilted by lifting the upper shear-blade after the cut is made, substantially in the manner set forth.

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

CHAS. E. CLEMENT.

Witnesses:
L. L. TILDEN,
ANNIE N. TILDEN.