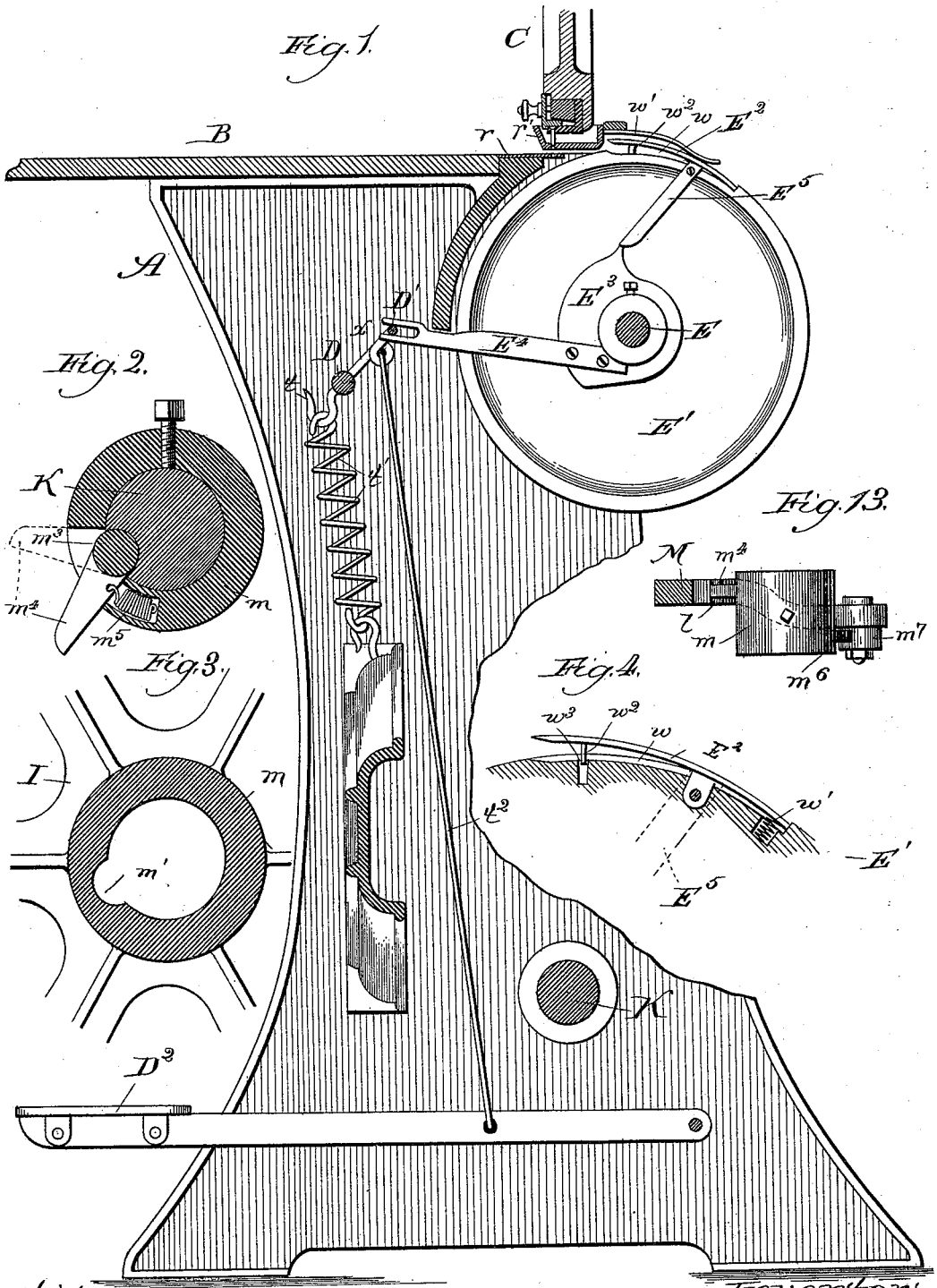
(No Model.) 4 Sheets—Sheet 1.

F. P. ROSBACK.

PERFORATOR.

No. 421,765. Patented Feb. 18, 1890.

Fig. 1.



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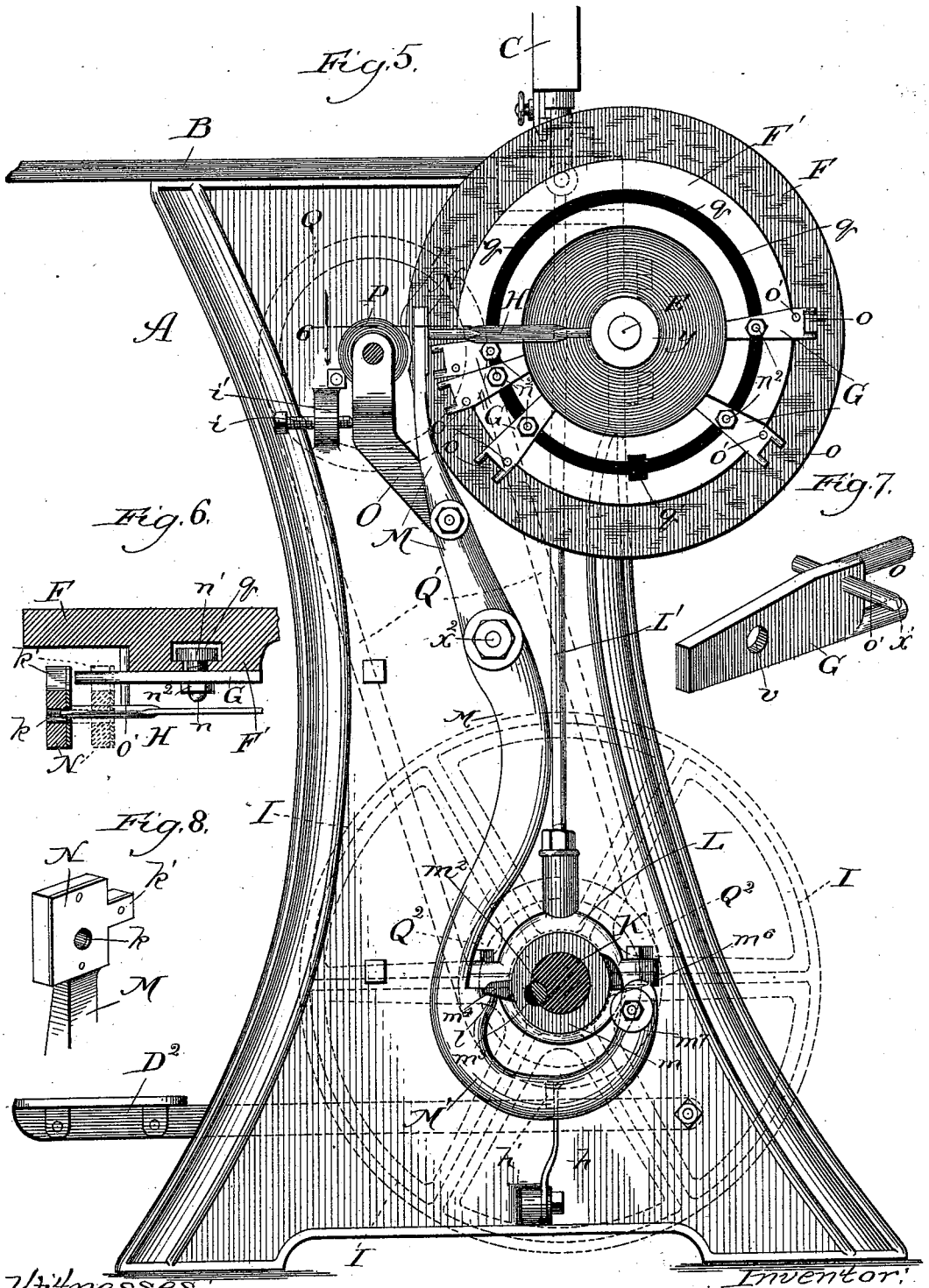
(No Model.) 4 Sheets—Sheet 2.

F. P. ROSBACK.

PERFORATOR.

No. 421,765. Patented Feb. 18, 1890.



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(No Model.) 4 Sheets—Sheet 3.

F. P. ROSBACK.

PERFORATOR.

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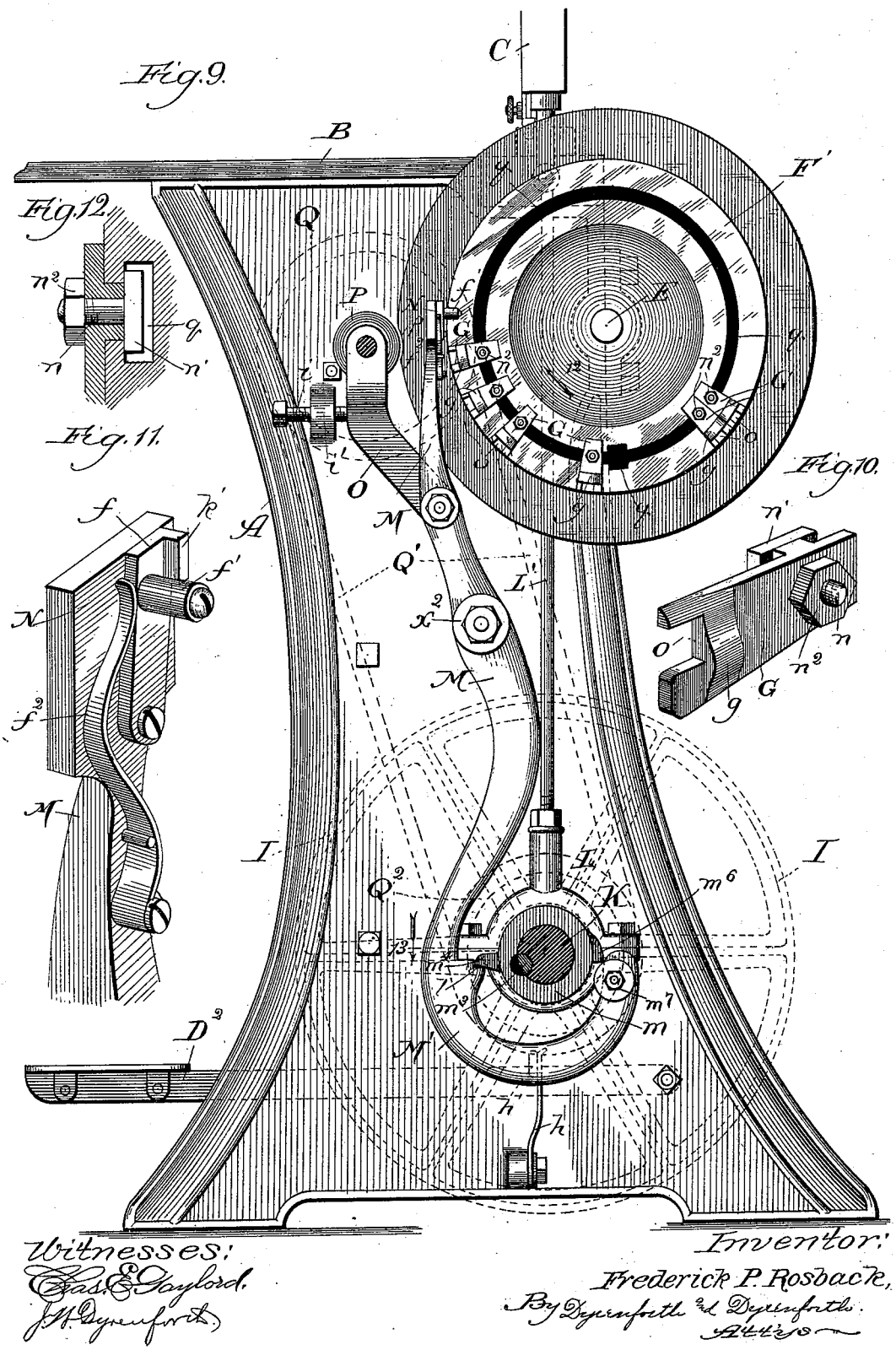

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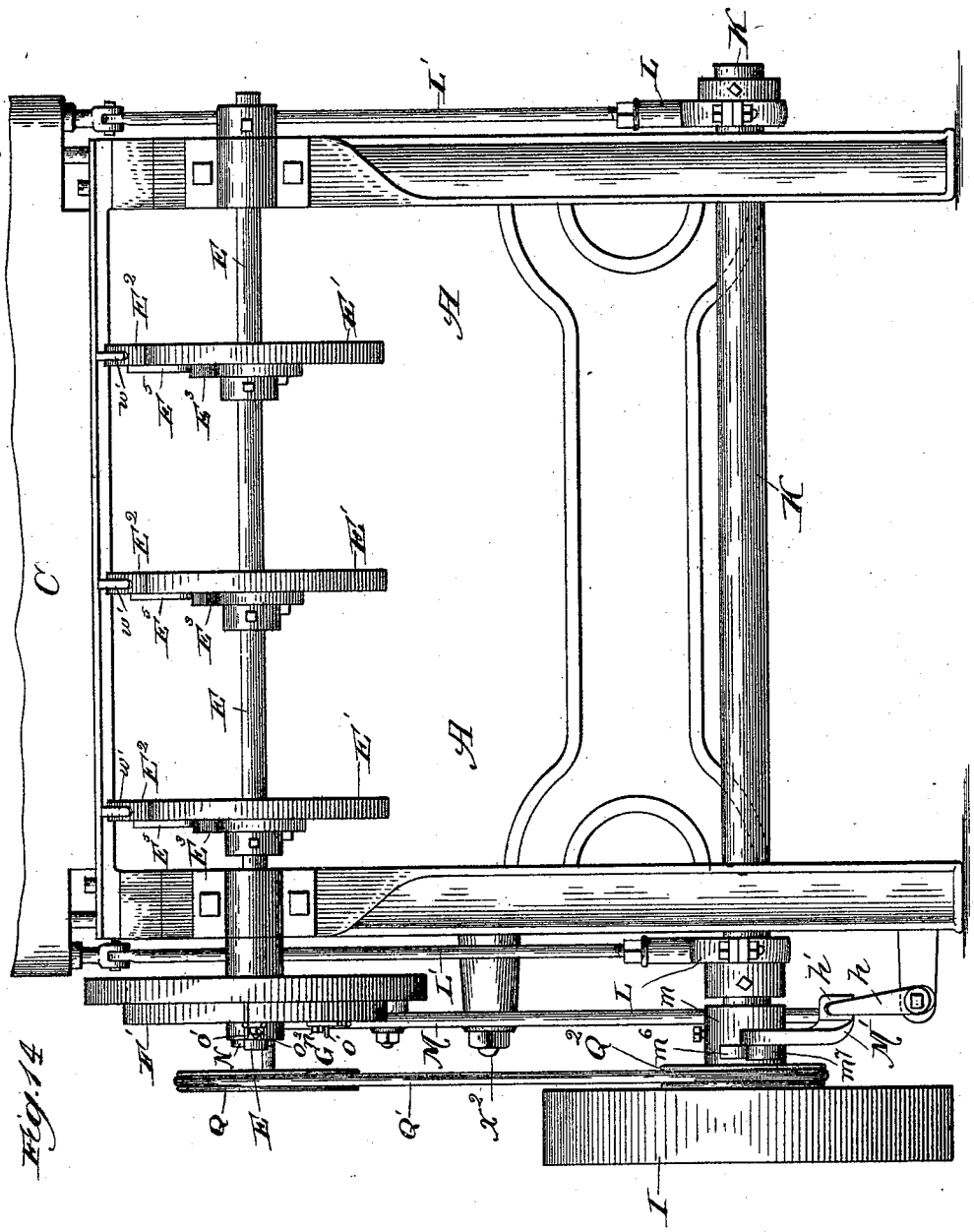
(No Model.) 4 Sheets—Sheet 4.

F. P. ROSBACK.

PERFORATOR.

No. 421,765. Patented Feb. 18, 1890.



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UNITED STATES PATENT OFFICE.

FREDRICK P. ROSBACK, OF CHICAGO, ILLINOIS.

PERFORATOR.

SPECIFICATION forming part of Letters Patent No. 421,765, dated February 18, 1890.

Application filed August 25, 1888. Serial No. 283,724. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK P. ROSBACK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Perforators, of which the following is a specification.

My object is to provide means whereby the perforating operations of a perforating-machine may be performed with the utmost accuracy at equal or unequal intervals and automatically both as to the feeding of the material to be perforated and as to location of the perforated lines on a sheet or web by merely adjusting an automatic gage previous to operating the machine.

Hitherto perforating-machines have been provided with gages on their tables set to stop the paper with the first line thereon at which the perforating was to be performed under the line of punches, or to guide the eye of the operator to permit stoppage of the paper at desired intervals, in the former instance requiring adjustment of the gage for each line to be perforated, and in both instances necessitating the gaging to be performed by the operator in feeding the sheet by hand, thus requiring the utmost care to be exerted to attain only approximate accuracy, the attainment of perfect accuracy in the intervals between the lines of perforations where the eye of the operator is depended on being at best unreliable and at the expense of time. Besides, no form of gage hitherto employed on perforating-machines has, without resetting the gage for the purpose, permitted gaging of other than equal intervals on a sheet to be bounded by the perforated lines.

By means of my improvement when a sheet to be perforated has been introduced to the feed and the gage set (to cause the lines of perforations to be produced at equal or unequal intervals, as desired, on the sheet) the perforating operation is entirely automatic and accurate—so accurate, in fact, that if the same sheet, after being perforated, be again passed through the machine the punches will strike the same holes on the successive lines of perforations produced in the previous operation up to the discharge of the sheet, which is also effected automatically.

In the accompanying drawings, Figure 1 is a vertical section taken near a side of the frame of my improved machine in elevation, with a part of the frame broken away to make room for another figure, and illustrates the automatic feed and the mechanism for starting the operations of the machine. Fig. 2 is a sectional view of the driving-shaft, taken at the inner end of the hub of the wheel on said shaft, enlarged, and showing an old form of clutch device for producing engagement and disengagement automatically of the mechanism for actuating the cross-head carrying the punch-bar. Fig. 3 is a broken enlarged view of the drive-wheel, showing the hub in section and adapted to afford part of the clutch. Fig. 4 is an enlarged view showing a portion of a feed-wheel with the spring-clamp device upon its periphery for gripping the edge of the sheet to be perforated. Fig. 5 is a view in side elevation, partly in dotted lines, of the machine, showing the preferred construction of the automatic gage device. Fig. 6 is a section taken on the line 6 of Fig. 5, viewed in the direction of the arrow and enlarged. Figs. 7 and 8 are enlarged, but omitting the wheel P and lever O, perspective views of details employed in the construction of gage shown in Fig. 5. Fig. 9 is a view in side elevation, partly in dotted lines, of the machine, showing a modified construction of the automatic gage device. Figs. 10 and 11 are enlarged perspective views of details employed in the construction of gage shown in Fig. 9. Fig. 12 is a section taken on the line 12 of Fig. 9, viewed in the direction of the arrow and enlarged. Fig. 13 is a plan section taken on the line 13 of Fig. 9, and Fig. 14 is a view in rear elevation of the machine.

A is the frame of the machine, surmounted by the table B and supporting the usual die r and stripper r', Fig. 1, and a cross-head and a punch-bar C, which may be of any well-known construction, though preferably of that set forth in Letters Patent of the United States No. 387,543, granted me on the 7th day of August, 1888, for an improved perforator.

As the cross-head and punch-bar form, as to their construction, no part of my present invention, they are not herein fully shown or described in detail.

D, Fig. 1, is a rock-shaft journaled at its

opposite ends in the sides of the frame A and having rigidly connected with it a rod D′, which is parallel with the shaft, the connection being produced by means of arms x at the opposite extremities of the rod, and which may comprise the bent ends of the latter. The parts D, D′, and x constitute in form a narrow skeleton frame. Near one end of the shaft D is a hook t, extending laterally from it and connected by a spring t' with a rigid part of the frame of the machine.

D^2 is a lever fulcrumed near one end to a lower portion of the frame A, and extending thence into a position where its opposite end is readily accessible to a foot of the operator. The lever D^2 forms a pedal, and it is connected between its extremities by a rod t^2 or other suitable medium with an arm x near the rod D′. Thus pressure on the pedal D^2 pulls the rod D′ downward against the resistance of the spring t', the resilience of which returns it when the pressure on the pedal is removed.

E is a rotary horizontal shaft journaled in the opposite sides of the frame toward the upper rear portion thereof and carrying, to rotate with it, a wheel or series or set of wheels E′, comprising, say, three uniform members, as shown in Fig. 14, each having, as shown in Figs. 1 and 4, a recess w formed in its periphery to receive a nipper E^2, which may be pivotally secured between its extremities to the wheel and have, by means of a spiral spring w' countersunk into the periphery near the rear end of the nipper, a tendency to grip at its opposite end, as shown in Fig. 4, or which may be controlled by the form of spring w', and pivotally connected with the wheel, as shown in Fig. 1. Each nipper is provided near its forward extremity with a pin w^2, entering a coincident hole w^3 in the recess w and affording a stop, as hereinafter described.

Each wheel E′ is provided on one side, around the shaft E, with a cam E^3, loosely secured to the shaft and having an arm E^4 rigidly secured to it and bifurcated toward its extremity, which embraces the rod D′. From the pivot of each nipper E^2 a finger E^5 extends into engagement with the highest point of the cam E^3 when the latter is in its normal or initial position. When the rod D′ is depressed in the manner described, the cam E^3 of the wheel E′ or the cams of the several wheels, if more than one feed-wheel be provided, are turned backward, thereby permitting the springs w' to actuate the nippers to grip the edge of a sheet brought to them upon the table B below the stripper r', and the action of the springs w' on the nippers, which thus turns them on their pivots, likewise turns the fingers E^5, bringing their free extremities against lower parts of the cams E^3. When the pressure is removed from the pedal, the resilience of the spring t' in returning the cams (through the intermediate mechanism connecting them with the spring) to their normal positions causes them to strike against the fingers E^5 and thereby turn the wheels E′, and through the latter the shaft E, slightly forward, or, in other words, start the rotation of the shaft for a purpose hereinafter described.

F, Fig. 5, is a wheel of larger diameter than any of the wheels E′, and rigidly supported, beyond a side of the frame A, on the end of the shaft E, which projects through it. The wheel F has a circular enlargement F′ around its center on one side provided with a circular T-shaped recess q, expanded at any desired point, as shown at q', to admit to it the nuts on the dogs G, hereinafter described, and in the periphery of the wheel F is a concavity p.

H, Figs. 5 and 6, is a flat spring cylindrical toward its extremities, at one of which it is secured to a stationary collar y on the end of the shaft E, and extending thence horizontally part way across the face of the wheel F.

The dogs G are preferably of the flaring shape shown, perforated at v and provided each with a recess o in its flaring extremity and with a transverse pin o', extending through it near the base of the recess to one side of the center of the latter, and one end of the pin is beveled, as shown at x'. The dogs are adjusted upon the wheel F at intervals (predetermined in the manner and for the purpose hereinafter described) by means of bolts n, Fig. 10, in the perforations v, the heads n' of which are inserted at the enlargement q' into the recess q, and slid thence to desired positions in the recess and clamped in place by means of nuts n^2, all as clearly shown in Fig. 12. The pins o' extend at their rear unbeveled ends, when the dogs are adjusted as described, against the periphery of the circular part F′ of the wheel F.

I is the drive-wheel on a rotary shaft K, journaled in the opposite sides of the frame A, near the base and toward the rear side of the latter. The hub m of the wheel contains in its opening a longitudinal concave recess m', and the shaft K, where the hub m encircles it, has a corresponding recess m^2, whereby when the two recesses coincide a cylindrical opening is formed between the hub and the shaft. The recess m^2 contains a bolt m^3, originally cylindrical, but turned off in the recess between its extremities, which are confined in collars on opposite ends of the hub, to cause its exposed portion to form a continuation of the circumference of the shaft, and at the inner end of the bolt is a laterally-projecting finger m^4, engaged by a spring m^5, Fig. 2, the strain of which tends to turn the bolt in its seat in the recess m^2 and thus present a shoulder to the inner side of the hub m. The projection of the shoulder, however, can only be produced when the recesses m' and m^2 are coincident. The clutch device thus formed is not of my invention, but is old in connections, like the one, generally speaking, in which I employ it. The shaft K is encircled by an eccentric L, of ordinary

construction in perforators, and which oscillates with the rotation of the shaft (which is intermittent, as hereinafter described) to actuate the punch-bar, being connected with the cross-head for the purpose by means of the rod L′. On the shaft K, nearly opposite the recess m^2, is a rigid cam m^6.

M is a bent lever of peculiar construction, having a hook-shaped end M′, bent laterally toward its extremity, as shown in Fig. 13, and provided on its inner rear side with a shoulder l, the lever terminating at its opposite extremity in a plate N, having, as shown in Fig. 8, an opening k and a lateral projection or ear k', shaped to correspond with the form of recess o in the flaring extremity of each dog G. The lever M is fulcrumed near its center, as shown at x^2, upon a side of the frame A, whereby the hook embraces the hub m, toward opposite ends of the latter, and the line of the plate N, on which the opening k therein is provided, extends to about the center of the free cylindrical end of the spring H, (which may be provided with an offset toward its extremity, as shown in Fig. 6,) the opening k itself beslightly to one side of the normal line of the spring.

O is a bent lever pivoted to the lever M above the fulcrum of the latter and having its fulcrum in the form of a set-screw i in a stationary nut i' on the frame of the machine, and the upper end of the lever O carries a friction-wheel P, an arc of the circumference of which corresponds with that of the concavity p in the wheel F. A spring h, with its free end against a block h' on the hook of the lever M, serves to produce a normal tendency in the lever to throw its hook end backward, and consequently the lower end forward. The shaft which supports the friction-wheel on the lever O also carries a belt-wheel Q, connected by an endless belt Q′ with a similar belt-wheel Q^2, rigidly secured to the shaft K at the inner side of the drive-wheel I.

The machine operates as follows, the parts being, as shown in Figs. 5 and 9, in their initial or normal relative positions—that is to say, with the concavity p in the wheel F adjacent to and embracing the friction-wheel P, with the finger m^4 of the clutch for the shaft K and hub m against the shoulder l in the hook M, with the cam m^6 beyond the end of the hook M′, with the nippers on the wheels E′ (or nipper on the wheel, if only one be provided, as may be the case) in position with reference to the upper surface of the table B to admit between them and the adjacent surfaces of the wheels the edge of a sheet of paper introduced to them, and with the spring H extending to one (the inner) side of the hole k against the face of the head N on the upper end of the lever M: First, a sheet of paper is marked off at intervals to indicate the lines at which the punches are to perforate, the intervals being equal or unequal, as desired. The sheet is then moved by hand to bring the first line indicated thereon underneath the line of punches and the edge into the nippers E^2, when a dog G is adjusted in the recess q of the wheel F to bring a pin o' with its beveled end underneath and into contact with the spring H. Turning forward (by hand) of the wheel F, the dog being rigidly secured upon it, causes the beveled end of the finger o' to force the spring H laterally toward the hole k until its extremity is brought coincident with the latter, when, the resistance being removed from the face of the head N, the spring h at the hook end of the lever M forces the head toward the spring, the end of which enters the hole k, while the ear k' on the head enters the recess o on the dog, thereby in the manner hereinafter described bringing the parts into relative positions which would, were the wheel I being rotated, cause the punches to be actuated. The head N on the lever M is then forced back to permit the spring H again by its resilience, when thus released from the hole k, to resume its normal position of pressing at its extremity against the face of the head to the side of the hole k, when the wheel F is further turned to cause the nippers on the wheels E′, in their rotary movement produced by thus turning the wheel F, to draw the sheet sufficiently far to bring the next line indicated upon it underneath the punches, when a second dog is adjusted as stated of the first. These operations are continued, one for each line indicated, until a dog has been adjusted on the wheel so that it will trip or displace the spring H for each line, and, as will presently be seen, when a sheet is subsequently passed through the machine while in operation the punches will perforate it in lines at intervals corresponding with those indicated on the first or adjusting sheet. To start the machine adjusted as described the wheels Q and Q^2 are geared together by the endless belt Q′, and the wheel I is geared to the driving-power. Pressure is exerted upon the pedal D^2, and, through its connection, as described, with the cams E^3 on the shaft E, turns back the cams, thereby permitting the nippers E^2 to grip the edge of a sheet introduced to them as the initial step of the proceeding. On releasing the pedal the resilience of the spring t' returns the cams E^3 to the positions from which they were turned, and causes them in resuming their original positions to impinge against the adjacent ends of the fingers E^5, extending obliquely toward them from near the peripheries of the wheels E′, and start the latter, and with them the shaft E, whereby, also, the wheel F is turned sufficiently far to remove the concavity p in its periphery beyond the friction-wheel P, which, while in the concavity, affords a stop to the rotation of the wheel F or "gage." The rotation of the friction-wheel P (which is continuous, being produced by that of the shaft carrying the wheel

Q) against the periphery of the gage-wheel F as soon as the concavity p is turned from the friction-wheel causes the wheel F to revolve, thereby turning the shaft E and the feed-wheels E′, which draw the sheet to be perforated around with them from the table B. Rotation of the gage-wheel and feed-wheels continues until the pin o' on the first dog G strikes the spring H, when the latter is forced to one side to release its pressure against the head N and permit the spring h to press the ear k' on the head into the recess o in the dog, whereby the end of the spring H passes into the hole k. The forward movement of the upper portion of the lever M obviously moves the lever O above its fulcrum i in a backward direction, thus separating the friction-wheel from the gage-wheel, which then remains stationary with the feed-wheels or feed E′, whereby the feeding of the sheet is stopped until the punches have been caused to operate as follows: While the upper end of the lever M was forced back and held by the spring H the hook end thereof was forced forward, thereby bringing the shoulder l on the inner side of the hook M′ into the path of the clutch-finger m^4 of the clutch for the shaft K. The striking of the finger m^4 against the shoulder caused the bolt m^3 to be turned into the recess m^2 in the shaft K, flush with the circumference of the latter, and consequently moved it out of the recess m' in the hub m, permitting the wheel I, thus unclutched from its shaft, to continue to rotate without rotating the latter. When the dog G tripped the spring H, thereby allowing the head N to be forced forward, as described, by the action of the spring h and the hook end M′ to be forced backward, the shoulder l was removed from the path of the finger m^4, allowing the spring m^5, Fig. 2, to act as soon as, in the continued rotation of the wheel I, the recess m' in its hub should be brought coincident with the bolt m^3, when the bolt would be turned to present a shoulder to the recess m', and thus clutch together the shaft K and wheel I, causing the rotation of the latter to rotate with it the former and actuate the eccentric L, which operates the cross-head to reciprocate the punches by first lowering them to punch and subsequently raising them. With the shaft K turned to the position wherein it is actuating the eccentric L to raise the cross-head, the rigid cam m^6 on the shaft on the side of the hub substantially opposite that beyond which the finger l extends from the shaft K (the cam m^6 being near the outer end of the hub, while the finger extends across the inner end thereof) engages with an anti-friction roller m^7 on the inner edge of the hook end M′ of the lever M, thus in its path, and turns the lever on its fulcrum x^2 to move the hook end forward and the head N backward. This permits the spring H, thus released from the hole k, to resume by its lateral resilience its normal position of impinging at its extremity against the face of the head N, where it continues to hold the lever against the force of the spring h in the position to which the cam m^6 turned it after the cam, in the briefly-continued rotation of the collar carrying it on the shaft, leaves the end of the hook M′. The backward movement of the lever M above its fulcrum brings the friction-wheel P again into contact with the periphery of the gage-wheel F, and its forward movement below the fulcrum brings the shoulder l in the path of the finger m^4, thereby in the last-named instance disengaging the clutch, which connects the shaft K with the hub m at the end of the rise of the cross-head and punch-bar, and thus stopping the rotation of the shaft K, and consequently the reciprocation of the punching device, and in the first-named instance causing the gage-wheel F to resume its rotation and actuate the feed until stopped by the engagement of the pin o' on the next succeeding dog G with the spring H to force the extremity of the latter into coincidence with the hole k. With the parts thus described in the relative positions last named the punching operation again takes place at the line brought under the punches with the stoppage of the feed, after which the cam m^6 again operates in the manner described. Each time, therefore, a dog G operates to force the spring H away from its normal position (after, of course, the initial operation of working the pedal shall have been performed) first the feed and gage wheel are stopped, then the punches are actuated, and finally the cam m^6 acts to return the parts to their relative positions in which the feeding, gaging, and punching operations are resumed. It will thus be seen that the working of the machine is thoroughly automatic and absolutely accurate and rapid. When the wheel F has made a complete revolution, thereby having caused as many lines of perforations to be produced as there are dogs G, the concavity p comes coincident with the friction-wheel P, which thus enters it and stops the rotation of the gage-wheel, the cam m^6 having, according to the initial adjustment of the parts, just passed the end of the hook M′, and, with the complete revolution of the gage-wheel, the feed-wheels will likewise have completed their revolution, in approaching which, however, and with the sheet (which, with the particular arrangement of the feed shown, should be shorter than the circumference of the feed-wheels) hanging from the nippers where, or near where, they reach their lowest point, the fingers E^5 engage toward their extremities with the bulging portions of the cams E^3, whereby they are turned on their pivots and thus raise the gripping ends of the nippers, releasing the sheet and permitting it to fall to the floor or into a suitable receptacle provided to receive it. Of course, as it will be understood, a number of sheets may be perforated simultaneously, as in other perforators.

While the construction thus described is

preferred as having proved itself in practice to be the most effective, I may (thereby indicating one modification of which the mechanism permits by way of suggesting one change in the construction which would not be a departure from the spirit of my invention) use instead of the spring H and form of dog G and head N shown in Figs. 5 to 8, inclusive, the corresponding mechanism shown in Figs. 9 to 12, inclusive, and of which the following is a description: Each dog G, instead of extending at its flaring recessed extremity beyond the periphery of the circular part F′ on the wheel F, extends only to such periphery, and is unprovided with a pin *o′*, but instead has a cam-face *g* on one surface extending transversely across it and preferably at the base of the recess *o*. The head N is then unprovided with a hole *k*, but has a pivotal block *f* on its inner face having an ear *k′*, projecting forward at a right angle from its upper inner corner, and a roller *f′*, extending from its face, a spring f^2 being confined against one edge of the block *f* to hold the roller *f′* normally in contact with the surface of the circular enlargement F′, and as a cam-face *g* on a dog G passes underneath it in the rotation of the gage-wheel F it forces the block *f* on its pivot against the spring f^2, the resilience of which returns the roller *f′* to the surface of the enlargement F′ when the roller has cleared the cam on the dog. In the meantime, however, the spring *h* has forced the upper end of the lever M forward and extends the ear *k′* into the recess *o*, thereby locking the wheel F against further rotation, substantially as accomplished by means of the mechanism hitherto described for the purpose. Thus and otherwise may the mechanism be changed, but without thereby departing from the spirit of my invention, provided the machine have an automatic feed for the sheet or sheets and an automatic gage for the perforator or an automatic discharge for the feed.

If it be desired to operate the machine by hand, the mechanism involving the shaft K, clutch and cam devices thereon, wheels I, Q^2, and Q, pedal D^2, hook M, lever O, and friction-wheel P could be omitted and a crank applied to the shaft E, which should then be provided with a suitable clutch device, (as like that described for the shaft K,) not only for the wheel E′, but also for the feed wheel or wheels, when the forcing back of the head N could be effected, say, by a suitable arm extending from the shaft E. Such changes as that suggested will readily be understood by those skilled in the art to which my improvement relates without requiring illustration thereof.

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

1. In a perforating-machine, the combination, with the punches and means for actuating them, of a rotary feed-wheel provided with means for controlling the sheet to be perforated, and a dog on a rotary support rotating with the feed-wheel, the said dog being adapted to engage, in the rotation of its support, with the punch-actuating mechanism to produce operation of the punches, substantially as described.

2. In a perforating-machine, the combination, with the punches and means for actuating them, of a rotary feed-wheel provided with means for controlling the sheet to be perforated, and a rotary wheel rotating with the feed-wheel and having dogs secured upon it at predetermined intervals and adapted to engage successively in the rotation of the wheel supporting them with the punch-actuating mechanism to produce operation of the punches, substantially as described.

3. In a perforating-machine, the combination, with the punches and means for operating them, of a rotary feed-wheel E′, provided with means for controlling the sheet to be perforated, and a rotary wheel F, connected and rotatory with the feed-wheel, a dog G on the wheel F, a pivotal head N, and means, substantially as described, for producing and releasing alternately engagement of the head with the dog, substantially as set forth.

4. In a perforating-machine, the combination, with the punches and means for operating them, of a rotary feed-wheel E′, provided with means for controlling the sheet to be perforated, and a rotary wheel F, connected with and rotating with the feed-wheel and provided with a recess *p* in its periphery, a dog G on the wheel F, a pivotal head N, a lever O, carrying a friction-wheel P and pivotally connected with the head between the latter and the pivot thereof and fulcrumed between its pivot and the friction-wheel, and means, substantially as described, for producing and releasing alternately engagement of the head with the dog, whereby also the friction-wheel is alternately removed from and forced into contact with the periphery of the wheel F, substantially as set forth.

5. In a perforating-machine, the combination, with the punches and means for operating them, of a wheel E′ on a rotary shaft E and provided with a nipper E^2 on its periphery, and a pivotal finger E^5, connected with the nipper and extending over a side of the wheel, and a cam E^3, loose on the shaft, normally engaging the finger and provided with a rigid arm E^4, and a dog on a rotary support on the shaft E, the said dog being adapted to engage in the rotation of its support with the punch-actuating mechanism to produce operation of the punches, substantially as described.

6. In a perforating-machine, the combination, with the punches and means for operating them, of a rotary feed-wheel E′, provided with means for controlling the sheet to be perforated, a rotary wheel F, one or more dogs G on the wheel, a pivotal head N, connected with and controlling the punch-actuating mechanism, and a spring H, extending across

the path of the said dog or dogs normally against the head N and actuated by each said dog to produce engagement therewith of the head, and alternately, by the punch-actuating mechanism, to release such engagement, substantially as and for the purpose set forth.

7. In a perforating-machine, the combination, with the punches and means for operating them, of a rotary feed-wheel E′, provided with means for controlling the sheet to be perforated, a rotary wheel F, provided with a peripheral recess *p*, one or more dogs G on the wheel, a pivotal head N, connected with and controlling the punch-actuating mechanism, and a spring H, extending across the path of the said dog or dogs normally against the head N and actuated by each said dog to produce engagement therewith of the head, and alternately, by the punch-actuating mechanism, to release such engagement, and a friction-wheel P, rotated from the driving-power of the machine and pivotally connected with the head N above the pivotal support of the latter and suitably fulcrumed, whereby the engagement of the head with a dog removes the friction-wheel away from the wheel F, and the disengagement of the head forces the rotating friction-wheel against the wheel F and actuates the latter, substantially as described.

8. In a perforating-machine, the combination, with the punches and frame A, of a rotary shaft E, carrying a feed-wheel E′, provided with means for controlling the sheet to be perforated, a wheel F on the shaft E, provided with a peripheral recess *p* and a recess *q*, and one or more dogs G, adjustably secured in the recess *q*, a driving-shaft K, connected with the punches, a drive-wheel I, provided with a suitable automatic clutch device, a cam m^6 on the shaft K, a lever M, having a hook M′ at one end embracing the hub of the wheel I and provided with a shoulder *l* to engage the clutch device and having a head N at its opposite end, the lever being fulcrumed to the frame between the hook and head, a lever O, pivotally supported on the lever M below the head N and carrying a friction-wheel P on a rotary shaft, a fulcrum *i* for the lever O, and a spring *h*, pressing against the lever M, the whole being constructed and arranged to operate substantially as described.

FREDRICK P. ROSBACK.

In presence of—
J. W. DYRENFORTH,
M. J. BOWERS.