(No Model.) 2 Sheets—Sheet 1.

J. B. HEMSTEGER.

AUTOMATIC FEED FOR PERFORATING MACHINES.

No. 497,178. Patented May 9, 1893.

Fig. 1.

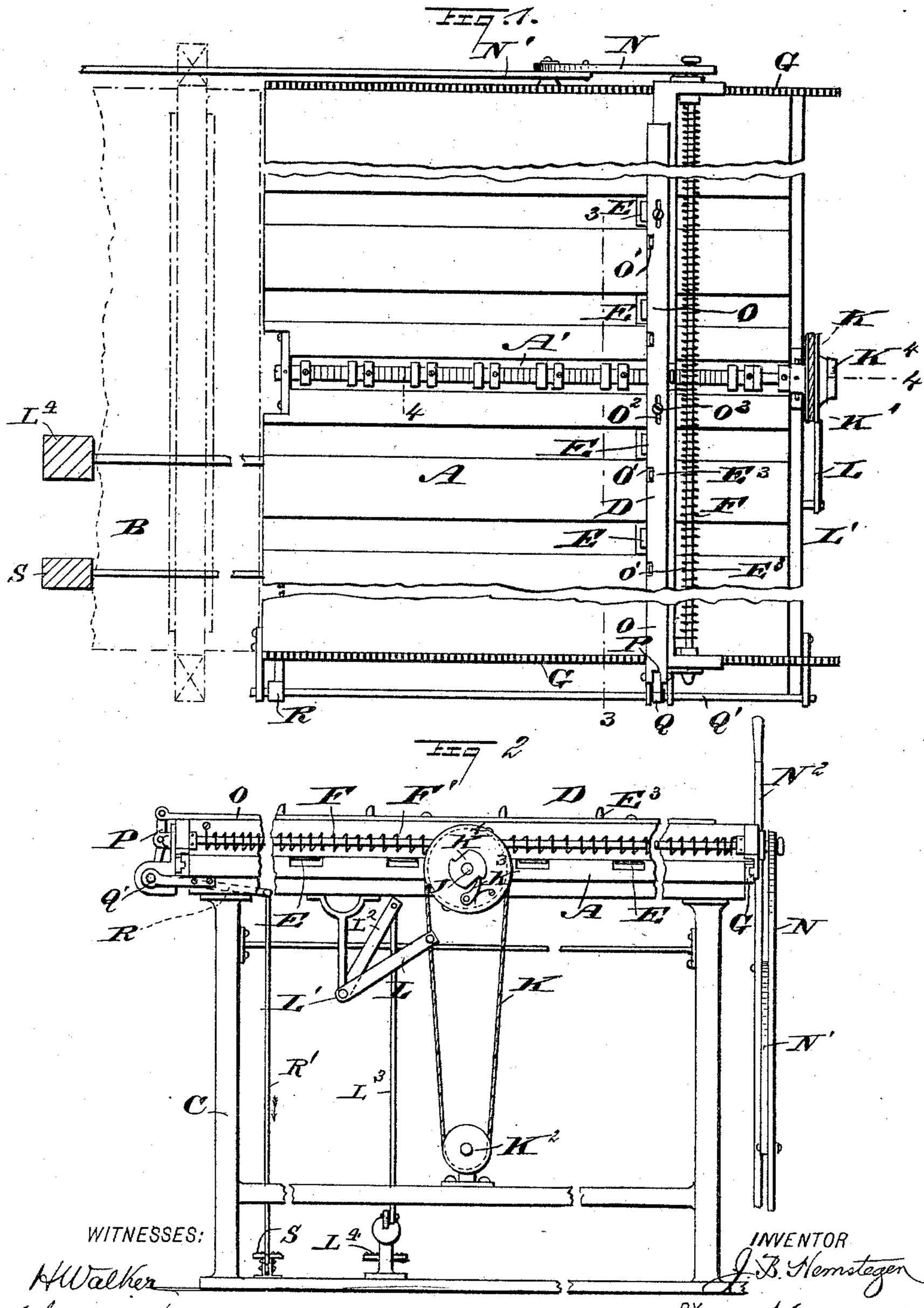

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

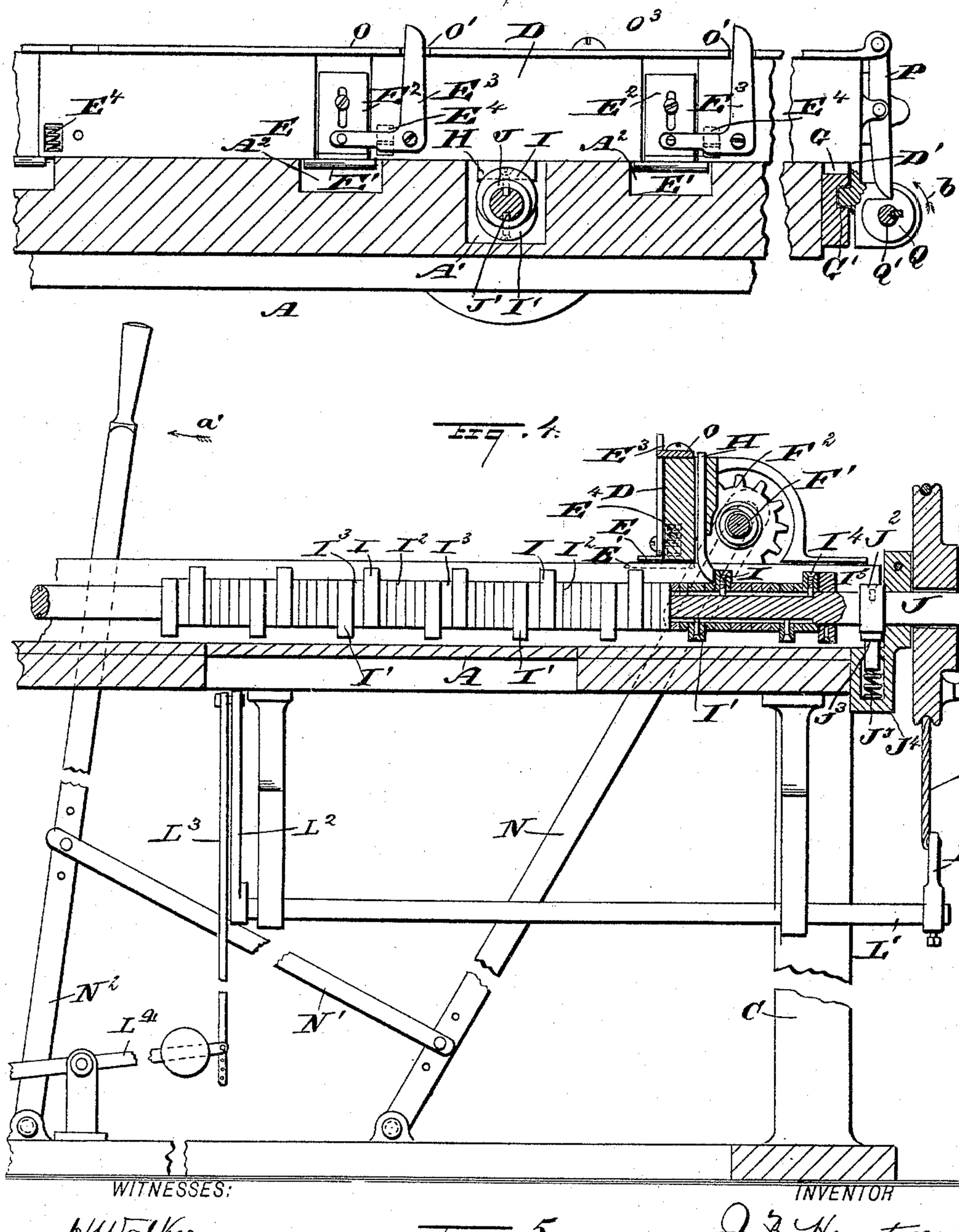

Fig. 4.

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Fig. 5

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UNITED STATES PATENT OFFICE.

JACOB BONIFACE HEMSTEGER, OF PIQUA, OHIO.

AUTOMATIC FEED FOR PERFORATING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 497,178, dated May 9, 1893.

Application filed July 7, 1892. Serial No. 439,199. (No model.)

To all whom it may concern:

Be it known that I, JACOB BONIFACE HEMSTEGER, of Piqua, in the county of Miami and State of Ohio, have invented a new and Improved Automatic Feed for Perforating-Machines, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved feed mechanism for perforating machines, which is simple and durable in construction, very effective in operation, and arranged to make the rows of perforations in the paper any desired distance apart.

The invention consists of a gripper engaging one end of the paper, and mounted to slide a predetermined distance, the gripper being actuated periodically from the needle bar of the perforating machine.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter described and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is an end elevation of the same. Fig. 3 is an enlarged transverse section of the improvement on the line 3—3 of Fig. 1. Fig. 4 is an enlarged sectional side elevation of the same on the line 4—4 of Fig. 1; and Fig. 5 is a face view of the locking device for the cam shaft.

The improved automatic feed table A, is fitted at one end to the perforating machine B, of any improved construction and indicated in dotted lines in Fig. 1. The table A is mounted on top of the perforating machine stand or frame C, and on the top of the table is mounted to slide from and toward the needle bar of the perforating machine B, a transversely-extending gripper bar D, carrying sets of grippers E, engaging one end of the paper. The movement from the needle bar of the perforating machine B is accomplished periodically by the action of the perforating machine, the motive power for moving the bar D, being, however, a coil spring F, coiled on a transversely extending shaft F′, mounted to turn in suitable bearings in the ends of the gripper bar D. One end of the spring F is fastened to the gripper bar, and the other end to the shaft F′ so that the spring in uncoiling moves the gripper bar D away from the needle bar of the perforating machine B.

On the ends of the shaft F′ are secured gear wheels F^2 in mesh with racks G secured on the sides of the table A, as plainly shown in Fig. 1, the said gear wheels rolling off on the racks by the action of the spring F to move the gripper bar D from the needle bar of the perforating machine B. When the gripper bar D is on the outer end of the table and moves forward toward the needle bar of the perforating machine B, then the gear wheels F^2 revolve and thus rotate the shaft F′, which thereby winds up the spring F so that the latter can again actuate the gripper bar D on the return movement of the latter from the needle bar of the perforating machine B. The racks G also form metallic guide-ways G′ for the metallic ends D′ of the gripper bar, to guide the latter in its forward and outward movement on the table A.

On the gripper bar D in the middle of the same is arranged a bolt H mounted to slide in a suitable guideway formed on the said gripper bar. The lower end of this bolt H extends into a longitudinal recess A′ formed in the top of the table A, the lower end of the said bolt being adapted to abut alternately on cams I and I′ arranged in sets in the said slot and secured on the longitudinally extending shaft J, mounted to turn in suitable bearings held on the table A. The sets of cams I, I′, are separated from each other by washers I^2 which can be increased or diminished in number to increase or diminish the distance between the sets of cams according to the distance desired between the rows of perforations. The two cams I, and I′ are also separated from each other in each set by a washer or washers I^3 to increase or diminish the distance between the two cams of each set. The cams I and I′ are arranged in such a manner that they are alternately engaged by the projecting lower end of the bolt H, the said cams being secured to the shaft J by set screws I^4 passing through the cams into grooves J′ formed longitudinally in the shaft J. When one of the cams I is in an uppermost position, the next adjacent cam I′ is in a lowermost position. A half revolution is

intermittently given to the shaft J so that the sets of cams I are brought alternately to the top with the sets of cams I′ to engage the bolt H.

In order to lock the shaft J in position after the half revolution is completed, a collar J^2 is provided flattened at opposite sides and secured on the shaft J, near the outer end thereof, see Figs. 4 and 5. This collar J^2 is alternately engaged on its flat sides by a plate J^3 fitted to slide vertically in a suitable casing J^4 formed on one of the bearings for the shaft J. A spring J^5 presses the said plate J^3 upward in contact with the collar J^2 so that the plate, by pressing on the flattened surface of the collar J^2 holds the shaft J in position, at the same time permitting a revolving of the shaft J when power is applied, as hereinafter more fully described. On this outer end of the shaft J is mounted to rotate loosely, a pulley K, over which passes a rope or belt K′ also passing over a pulley K^2 journaled in the lower part of the frame C; see Fig. 2.

On the face of the pulley K is pivoted a spring-pressed pawl K^3 engaging a two-toothed ratchet wheel K^4 secured on the shaft J next to the pulley K. One of the downwardly extending parts of the rope or belt K′ is connected with an arm L secured on the transversely-extending shaft L′ mounted to turn in suitable bearings in the framework C. On this shaft L′ is secured an arm L^2, extending approximately at an angle of five degrees to the arm L, and pivotally connected by a link L^3 with the back end of the treadle L^4 of the perforating machine B, so that the treadle L^4, at each stroke, imparts alternately an upward and downward motion to the link L^3, which motion is transmitted by the arm L^2, and shaft L′, to the arm L, which thus pulls on the rope K′ downward on one stroke of the machine B and upward on the return stroke of the said perforating machine. By doing so, the rope K′ turns the pulley K forward and backward so that its pawl K^3 alternately engages the two teeth of the ratchet wheel K^4, thus turning the shaft J always in the same direction. The shaft J thus receives at each full stroke of the machine B, a half revolution so that the next adjacent cam I or I′ is brought to the top to be engaged by the bolt H, the previously engaged cam moving away from the bolt to permit the gripper bar D to slide outward until the bolt H engages the next cam moved to the top as before described.

In order to move the gripper bar D toward the needle bar of the perforating machine B, I prefer a lever N pivoted on the base of the framework C and connected with one end of the gripper bar, the said lever being pivotally connected by a lever N′ with a second lever N^2 also fulcrumed on the base of the framework C and under the control of the operator. Thus, when the lever N^2 is moved in the direction of the arrow *a′* a like swinging motion is given to the lever N, which acting on the gripper bar D, slides the latter forward on top of the table toward the needle bar of the perforating machine B.

Each of the grippers E for the gripper bar D is provided with a fixed jaw E′ secured to the under side of the bar D and extending in a groove A^2 formed longitudinally in the top of the table A. Above this fixed jaw E′ is arranged a movable jaw E^2 mounted to slide vertically in suitable guideways arranged in the front face of the gripper bar D. A bell crank lever E^3 is pivotally connected with this movable jaw E^2 and is pressed on by a spring E^4 held in the bar D and engaging a lug projecting from one of the arms of the bell crank lever E^3, see Figs. 3 and 4. The upwardly extending arm of each bell crank lever E^3 engages a notch O′ in a plate O mounted to slide transversely on top of the gripper bar D, said plate being adapted to be held in place on top of the bar D by means of set screws O^3 screwing in the latter and passing through elongated slots O^2 in the plate. One outer end of this plate O is pivotally connected with a lever P fulcrumed on one end of the gripper bar D, the lower end of the said lever being adapted to be acted on by a cam Q held on a longitudinally-extending shaft Q′ by means of a key loosely engaging a longitudinal groove in the said shaft Q′. The cam Q is held between two lugs projecting from the end of the gripper bar D, so that the cam moves with the gripper bar in its forward and backward motions toward and from the needle bar of the perforating machine B. On one end of the shaft Q′ is secured an arm R pivotally connected by a perpendicular link R′ with a treadle S under the control of the operator so that when the operator presses the treadle S, a turning motion is given to the shaft Q′ and to the cam Q held thereon, in the direction of the arrow *b*, see Fig. 3, whereby a swinging motion is imparted to the lever P which thus moves the plate O transversely. This movement of the plate O imparts simultaneously, a swinging motion to the bell crank lever E^3, which thus raises the movable jaws E^2 to release the grip on the paper and to permit of removing the perforated sheet and inserting a new sheet in the gripper jaws. When the operator releases the pressure on the treadle S, the several springs E^4 force the bell crank levers E^3 back to their former positions so that the movable jaws E^2 close and clamp the paper between the movable jaws and the fixed jaws E′. The return movement of the bell crank levers E^3 caused by the action of the springs E^4 also causes a return movement of the plate O and lever P, which latter again engages the back of the cam Q, as shown in Fig. 3.

The operation is as follows:—The eccentric cams I and I′ are spaced apart on the shaft J according to the distance desired between successive rows of perforations. In starting the machine, the gripper bar D is near the end of the table next to the needle bar of the perfo-

rating machine B, and the paper is clamped in the jaws as above described, the operator first opening the movable jaws by pressing the treadle S. When the paper has been inserted, the operator releases the treadle S, so that the movable jaws close by the action of the springs E^4, as stated. Now, when the perforating machine B is at work, and the needle bar thereof rises, then the shaft J is given a half turn so as to bring the first cam, against which the bolt H abuts, into a lowermost position, at the same time bringing the next following cam into an uppermost position. As soon as the first cam turns down it disengages the gravity bolt H so that the gripper bar D is unlocked and the spring F causes an outward sliding of the said gripper bar until the gravity bolt H engages the next upturned cam, thus stopping the outward motion of the gripper bar D. The needle bar of the perforating machine now descends, making the perforation, and on the upward stroke of the needle bar the shaft J is again given a half turn and the above described operation is repeated; that is, the gripper bar D is first unlocked by the cam turning downward, and then moves outward until this motion is interrupted by the gravity bolt H engaging the next up-turned cam. By each outward movement of the gripper bar D, the paper is carried along a distance corresponding to the distance between two successive cams, so that the rows of perforations are made in the paper equal distances apart corresponding to the distance between the several cams I, I'. When the gravity bolt H finally leaves the last cam on the outer end of the shaft J, then the said pawl abuts against a collar I^5 secured on the said shaft and which limits further outward motion of the gripper bar D. When the paper has been fed through the perforating machine, as described, the operator presses on the treadle S to simultaneously actuate the movable gripping jaws E^2 so that the perforated paper can be removed. The operator then moves the lever N^2 in the direction of the arrow a', so as to cause the bar D to slide toward the needle bar of perforating machine B, thereby winding up the spring F, as above explained. This lever N^2 is supplied with foot pedals in front and at back of machine, so that the gage may be brought forward either by the hand or foot of the operator at the front of the machine, or by the foot of an assistant who may be stationed at the back of feed board. The bolt H is slightly bent forward at its lower end, as shown in Fig. 4, so that the said bolt on the return movement of the gripper bar D readily slides over those cams standing in an uppermost position. The shaft J can be readily moved from its bearings on the table A, so as to arrange the cams I and I' differently in case a change in the width between the successive rows of the perforations is desired. When the cams have been reset on the shaft J, the latter is again placed in position on the feed table A.

In order to conveniently set the several cams on the shaft J, a sheet of paper is used marked off with the intended places for the rows of perforations, the cams being set on the shaft according to those marks. The final stop I^5 consists of a plain round collar with set screw. This collar I^5 may be slipped onto the shaft J, at any point desirable for final perforation. The gravity bolt H, cannot clear this collar, and hence the gripper bar D, cannot move outward beyond this collar, no matter how often the shaft J, may turn. This collar, with set screw, may also be used as a permanent gage set, when it is desirable to use the machine with stationary gage. By means of the set screw, the stop collar may be fixed at any point on the shaft J, forming a quickly adjustable gage set.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination with the feed table provided with longitudinal guide ways of a transverse gripper sliding on said ways and provided with a propelling or motor mechanism to slide it from the inner to the outer edge of the table, and a releasing mechanism engaging the gripper and periodically releasing it to permit it to be slid outward a predetermined distance by the action of its motor or propeller, substantially as set forth.

2. An automatic feed for perforating machines, comprising a feed table, a gripper bar mounted to slide thereon and carrying gripping jaws for gripping the paper, and cams mounted to turn and adapted to alternately release the said gripper bar and permit it to be moved a certain predetermined distance, substantially as described.

3. An automatic feed for perforating machines, comprising a feed table, a gripper bar mounted to slide thereon and carrying gripping jaws for gripping the paper, cams mounted to turn and adapted to alternately release the said gripping bar, and means, substantially as described, for imparting an outward sliding motion to the said gripper bar, to move it a predetermined distance toward the outer edge of the table whenever released by said cams as set forth.

4. An automatic feed for perforating machines, comprising a shaft having an intermittent motion, cams secured on the said shaft and placed suitable distances apart, the said cams being arranged alternately on top and bottom, a locking mechanism preventing accidental rotation of said shaft a gripper bar carrying gripping jaws and mounted to slide, and a bolt held on the said bar and adapted to alternately engage the said cams when the latter are in an uppermost position, substantially as described.

5. An automatic feed for perforating machines, comprising a shaft having an intermittent motion, cams secured on the said shaft and placed suitable distances apart, the said cams being arranged alternately on top and

bottom, a gripper bar carrying gripping jaws and mounted to slide, a bolt held on the said bar and adapted to alternately engage the said cams when the latter are in an uppermost position, and means, substantially as described, for imparting an intermittent half revolution to the said shaft, substantially as described.

6. An automatic feed for perforating machines, comprising a shaft having an intermittent motion, cams secured on the said shaft and placed suitable distances apart, the said cams being arranged alternately on top and bottom, a gripper bar carrying gripping jaws and mounted to slide, a bolt held on the said bar and adapted to alternately engage the said cams when the latter are in an uppermost position, and a spring for imparting a sliding motion to the said gripper bar, substantially as described.

7. In an automatic feed for perforating machines, the combination with a feed table provided with stationary racks, of a gripper bar fitted to slide on the said feed table and provided with gripping jaws, a shaft journaled on the said gripper bar and carrying gear wheels engaging the said racks, and a spring coiled on the said shaft and secured at one end to the said gripper bar and at its other end to the said shaft, so that when the gripper bar is moved in one direction, the said spring is wound up to impart a return motion to the said gripper bar, substantially as described.

8. In an automatic feed for perforating machines, the combination with a feed table provided with stationary racks, of a gripper bar fitted to slide on the said feed table and provided with gripping jaws, a shaft journaled on the said gripper bar and carrying gear wheels engaging the said racks, a spring coiled on the said shaft and secured at one end to the said gripper bar and at its other end to the said shaft, so that when the gripper bar is moved in one direction, the said spring is wound up to impart a return motion to the said gripper bar, and means, substantially as described, for imparting movement to the said gripper bar to wind up the said spring, as set forth.

9. In an automatic feed for perforating machines, the combination with a feed table provided with stationary racks, of a gripper bar fitted to slide on the said feed table and provided with gripping jaws, a shaft journaled on the said gripper bar and carrying gear wheels engaging the said racks, a spring coiled on the said shaft and secured at one end to the said gripper bar and at its other end to the said shaft, so that when the gripper bar is moved in one direction, the said spring is wound up to impart a return motion to the said gripper bar, a gravity bolt held in the said gripper bar, and a shaft having an intermittent rotary motion and carrying cams arranged alternately on top and bottom and adapted to be engaged when in an uppermost position by the said gravity bolt, as set forth.

10. In an automatic feed for perforating machines, the combination with a feed table provided with stationary racks, of a gripper bar fitted to slide on the said feed table and provided with gripping jaws, a shaft journaled on the said gripping bar and carrying gear wheels engaging the said racks, a spring coiled on the said shaft and secured at one end to the said gripper bar and at its other end to the said shaft, so that when the gripper bar is moved in one direction, the said spring is wound up to impart a return motion to the said gripper bar, a gravity bolt held in the said gripper bar, a shaft having an intermittent rotary motion and carrying cams arranged alternately on top and bottom and adapted to be engaged when in an uppermost position by the said gravity bolt, and means, substantially as described, for locking the said shaft in place, as set forth.

11. In an automatic feed for perforating machines, the combination with a gripper bar mounted to slide and provided with fixed and movable gripping jaws, of spring-pressed levers connected with the said movable jaws, a plate engaging the said levers to impart, simultaneously, a sliding motion to the said levers, and means, substantially as described, for actuating the said plate, as set forth.

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Witnesses:
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CARRIE LEBENSBERGER.