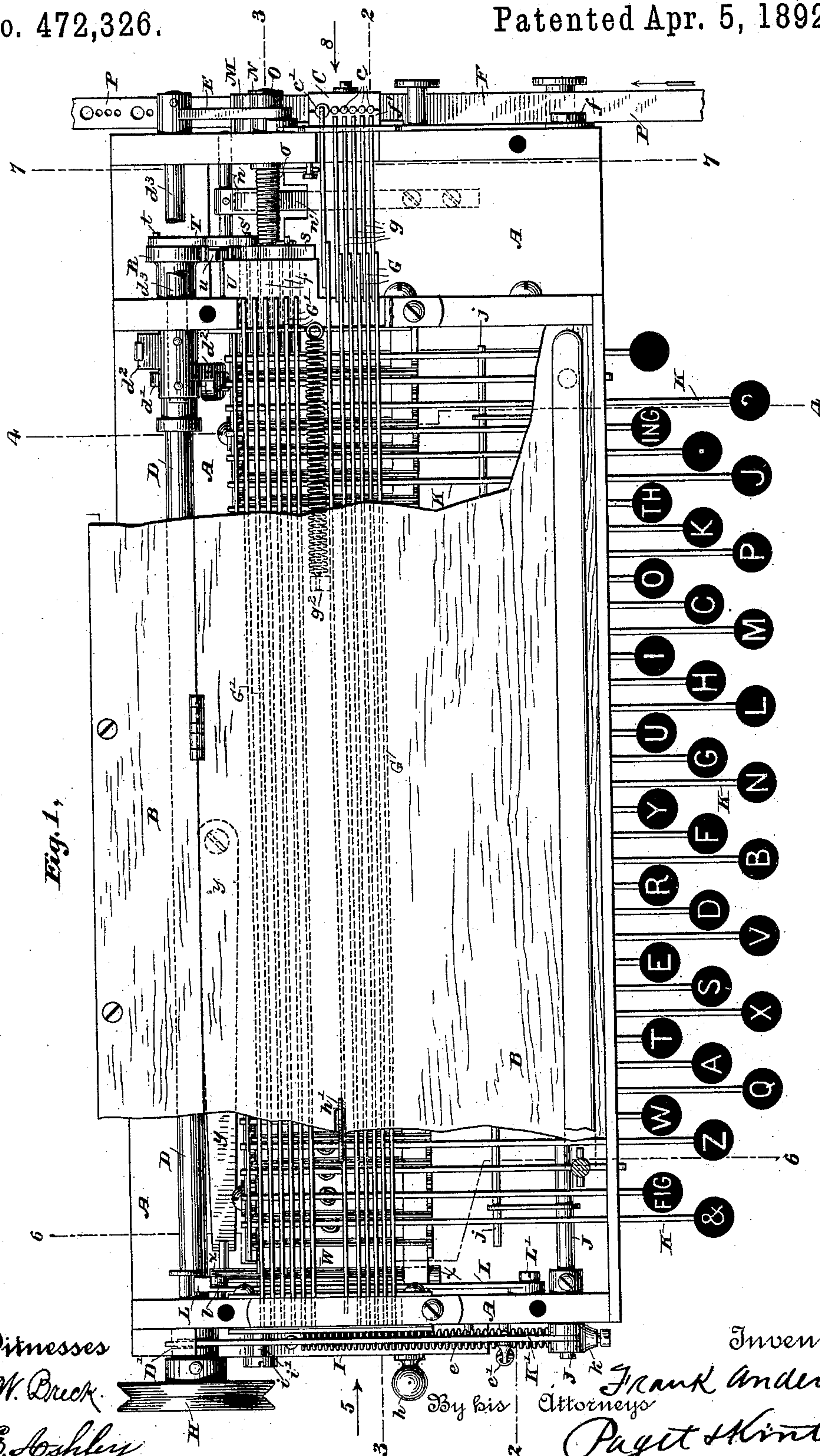


3 Sheets—Sheet 1.

A. L. ANDERSON, Administratrix, and G. H. & H. ANDERSON, Administrators.

No. 472,326.

Patented Apr. 5, 1892.



Witnesses
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(No Model.)

3 Sheets—Sheet 2.

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AUTOMATIC TELEGRAPH.

No. 472,326

Patented Apr. 5, 1892.

Fig. 2.

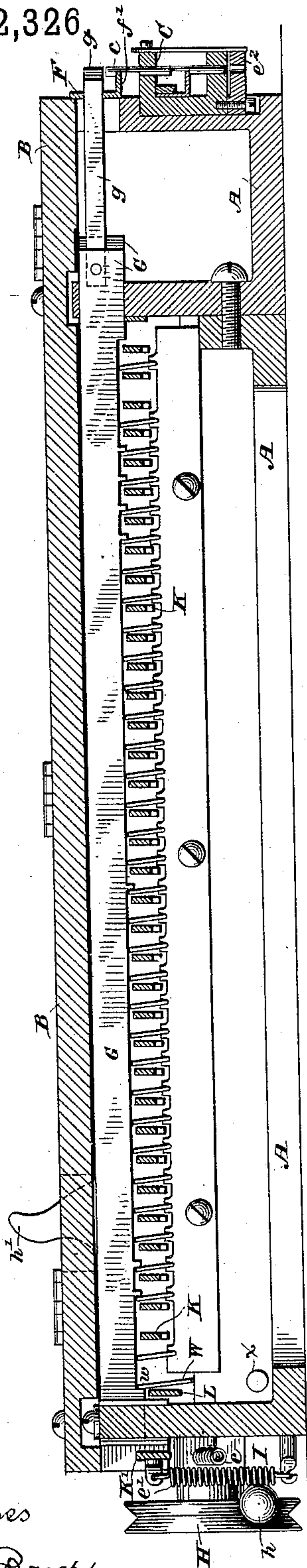


Fig. 3.

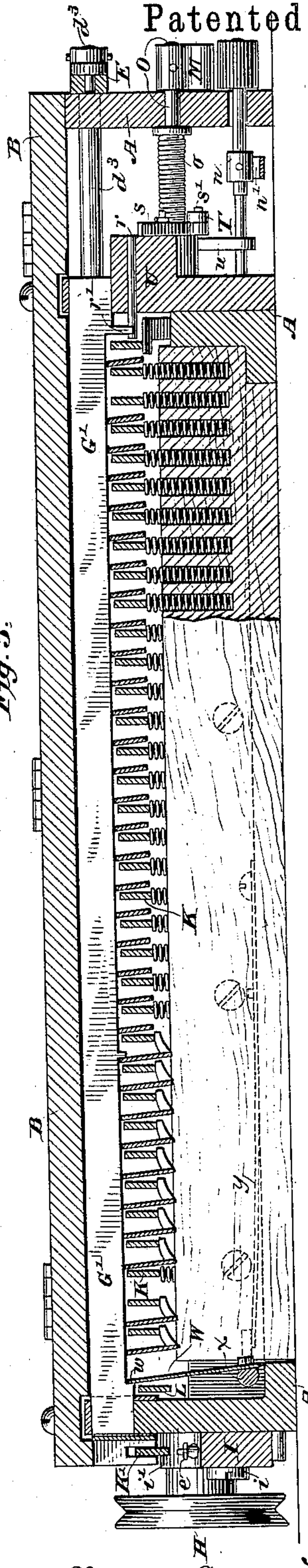
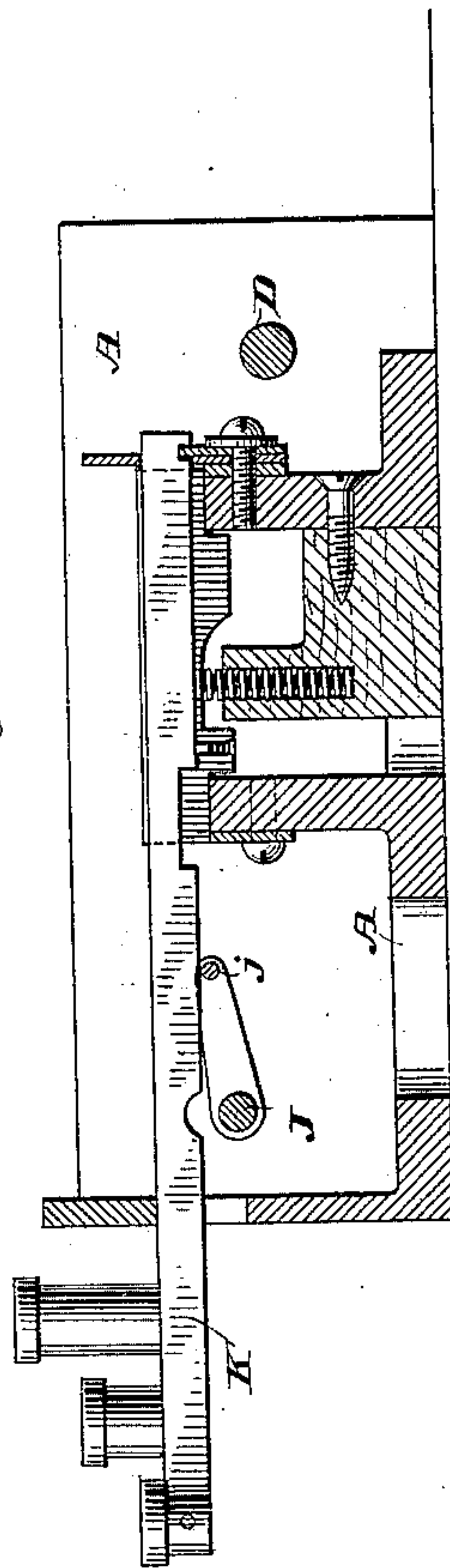


Fig. 4.



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3 Sheets—Sheet 3.

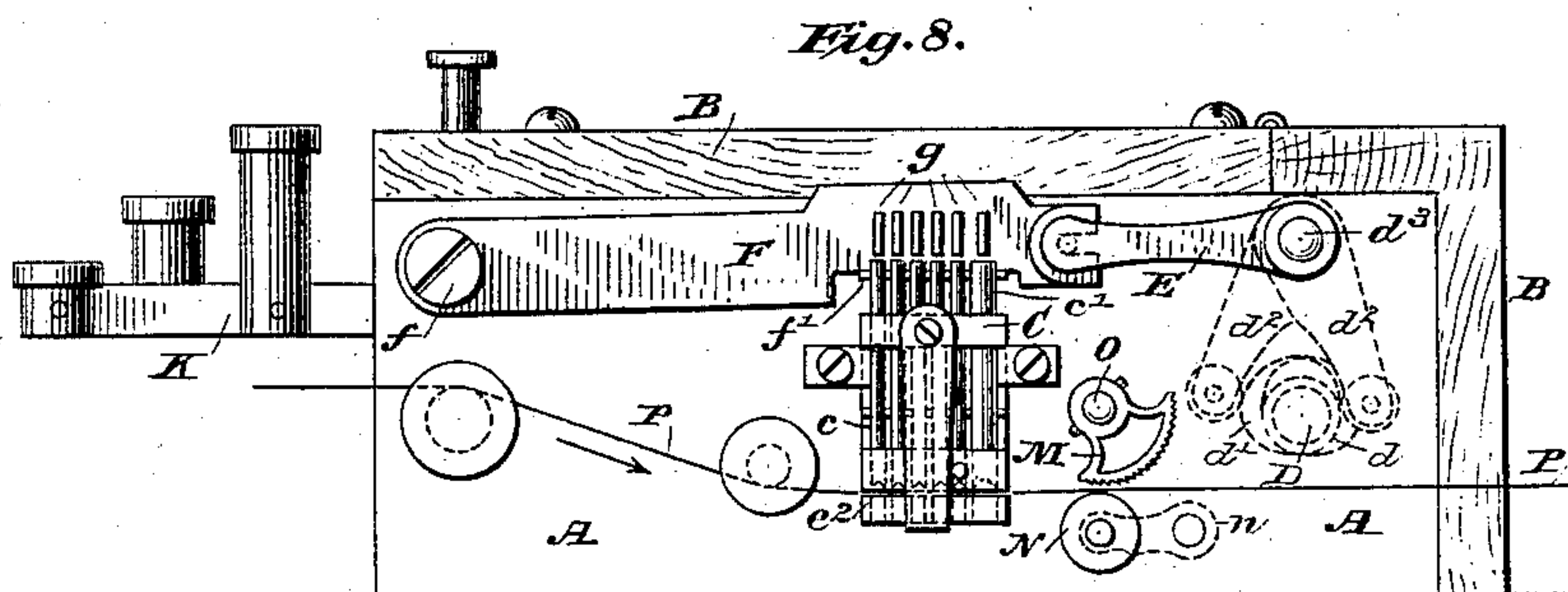
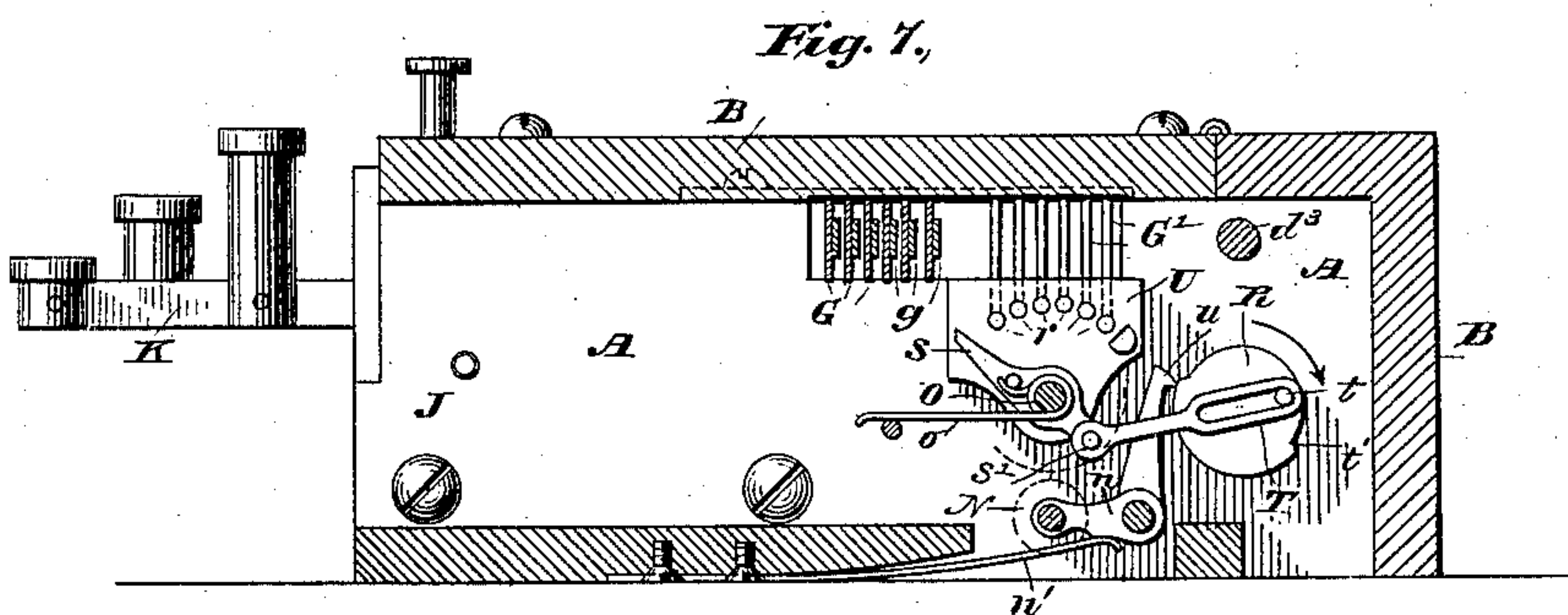
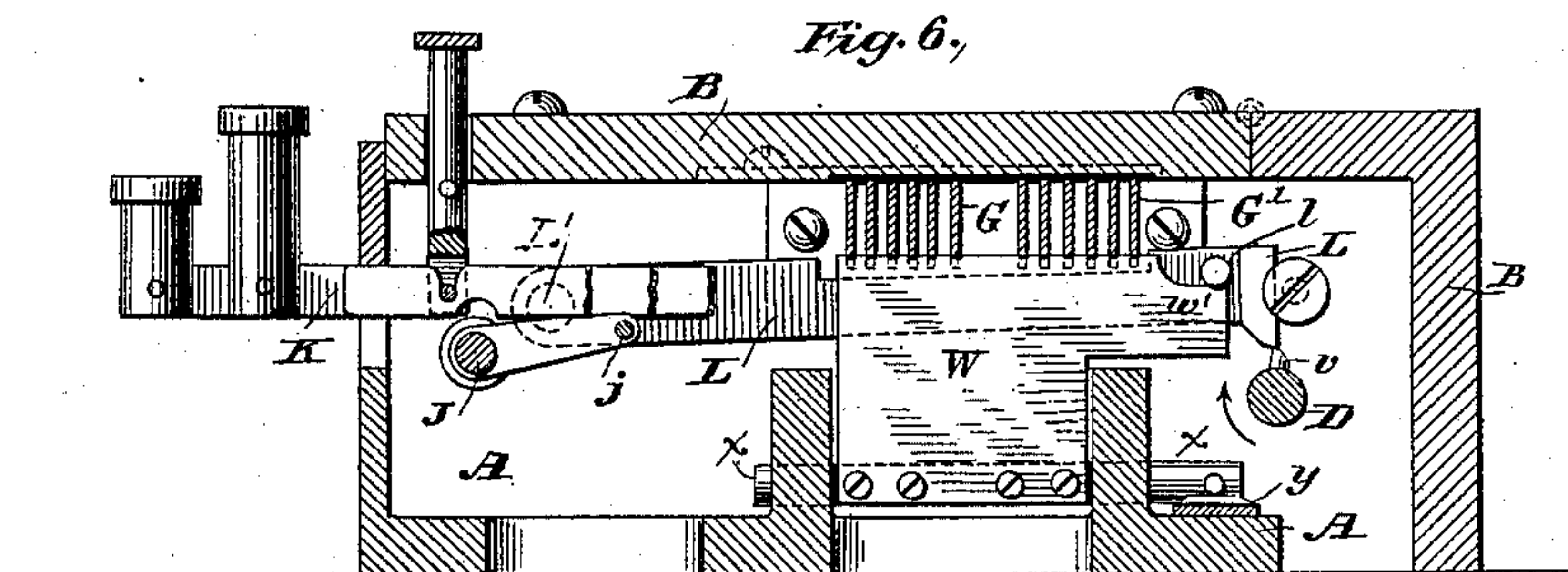
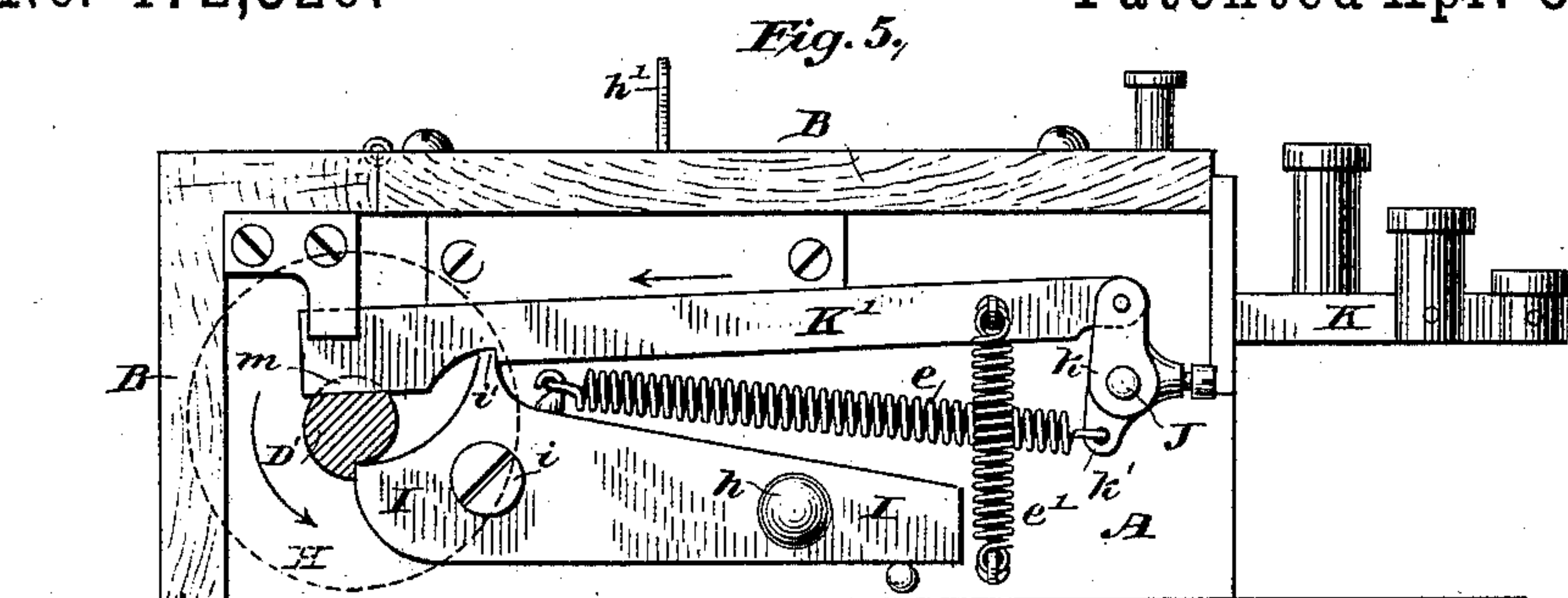
F. ANDERSON, Dec'd.

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AUTOMATIC TELEGRAPH.

No. 472,326.

Patented Apr. 5, 1892.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC TELEGRAPH.

SPECIFICATION forming part of Letters Patent No. 472,326, dated April 5, 1892.

Application filed March 8, 1890. Serial No. 343,181. (No model.)

To all whom it may concern:

Be it known that I, FRANK ANDERSON, a citizen of the United States, residing at Peekskill, in the county of Westchester and State of New York, have made a new and useful Invention in Perforating-Machines, of which the following is a specification.

My invention relates particularly to improvements in perforating-machines for use with automatic or rapid telegraphy, and is directed to improvements upon Patent No. 418,484, granted to me on the 31st day of December, 1889; and its object is to adapt mechanism of the type therein disclosed to be driven by a constant source of power other than that of the hand or hands of the operator and to so arrange the apparatus thus devised that the process of perforating may be practiced with a minimum expenditure of energy for the operator. I accomplish this object by the mechanism hereinafter described, but particularly pointed out in the claims which follow this specification.

I am aware that prior to my invention it was old in the art to operate telegraphic perforators by an extraneous source of power through the agency of belt-pulleys and analogous apparatus; and I make no claim therefore, broadly, to the application of the principle of extraneously-applied power.

My invention will be fully understood by referring to the accompanying drawings, in which—

Figure 1 is a plan view of the entire apparatus and showing part of the top or cover broken away in order to better illustrate the interior construction. Fig. 2 is a longitudinal section taken on the broken sectional line 2 2, Fig. 1, as seen looking from the front of the machine toward the rear. Fig. 3 is a similar section taken on the broken sectional line 3 3, Fig. 1, viewed in the same direction. Fig. 4 is a transverse section taken on the broken sectional line 4 4, Fig. 1, as seen looking in the direction of the arrow 8 at the right hand of Fig. 1. Fig. 5 is an end elevational view of Fig. 1, as seen looking in the direction of arrow 5 on the left of said figure, the pulley being shown in dotted lines, so as not to conceal the connections behind. Fig. 6 is a trans-

verse sectional view taken through Fig. 1 in the direction of the broken sectional line 6 6, as seen looking in the direction of the arrow 8 at the right-hand end of said figure. Fig. 7 is a similar view taken on the line 7 7, Fig. 1, as seen looking at Fig. 1 in the same direction. Fig. 8 is an end view of the machine, looking in the direction of arrow 8, Fig. 1.

In all the figures of the drawings like letters represent like parts wherever used.

A A is the base or frame of the machine, B being the cover thereof.

D is a rotary shaft extending the entire length of the machine and journaled in the ends thereof, carrying a pulley H, which is adapted to carry a loose-running belt, so that when the shaft is checked in its rotation the belt will simply slide in the grooved face of said pulley, but little power being required to run the apparatus. It is obvious that any equivalent frictional driving apparatus might be substituted for the pulley and sliding belt.

The key-levers K K K, &c., and the selecting-bars G G, together with their operating-levers and the punches and punch-head, are substantially the same in arrangement as the same parts disclosed in my prior patent, and need not be further described here.

G' G' G' represent a second set of selecting-bars operated by the key-levers K and in the same manner as are the selecting-bars G, the function of said bars G' being to control the paper-feed, as will be more particularly hereinafter described.

At one end of the shaft D is a pair of cams $d d'$, fixedly secured thereto, said cams being located on diametrically-opposite sides of the shaft D and adapted to act, respectively, upon the two arms $d^2 d^2$, having frictional rollers in their free ends and secured at their other ends to a rock-shaft d^3 , to which in turn is fixed a lever E, having its free end pivotally secured to the free end of an oscillating lever F, pivoted to the frame of the machine at f . To the ends of the selecting-bars G are pivoted a series of short bars $g g g$, extending through slots in the lever F, or, if otherwise held in position, simply under the lever, and adapted when thrust forward through the agency of the key-levers and selecting-bars

to assume positions directly over the punches *c c c*, located in the punch-frame C, as clearly shown in Figs. 1 and 2. The normal position of these bars *g* is that shown in Fig. 1, all of said bars lying out of the path of the punches except the upper one, which is always normally in the path of the large punch *c'* unless removed therefrom by the agency of the finger-hook *h'* when pressed to the left, so as to counteract the action of the spring *g²*, which normally tends to force the selecting-bar *G* into the position shown.

When it is desired to discontinue all the perforations in the fillet or to feed off a blank portion thereof, the selecting-bar *G* is held to the left by the action of the finger upon the hook *h'* and the spacing-key is depressed.

The lever *F* is provided with a ledge *f'*, which is adapted to lift the punches on coming in contact with the shoulders on their inner sides, as clearly shown in Fig. 2. At the left-hand end of the shaft *D* is a ratchet *D'* and a detent or pawl *I*, pivoted at *i*, said detent having a lug or projection *i'* on its upper side and a lifting-handle *h* near the right-hand end and held in the locking position shown in Fig. 5 by a spring *e*, connected to the short arm *k'* of the lever, fixedly secured to the shaft *J*, extending from end to end of the machine, the other arm *k* having pivotally attached to it the pawl *K'*, which takes against the lug *i'*, before referred to, said pawl being held in its downward position by the spring *e'* and resting normally on a flattened surface *m* of the ratchet *D'*.

To the shaft *J* is secured by a pair of arms a rod *j*, lying in the path of all of the operating-keys *K*, as clearly shown in Figs. 1, 4, and 6, the function of said shaft being to force the pawl *K'* in the direction of the arrow, as shown in Fig. 5, and cause the pawl *I* to release the ratchet *D'*. The operation of this portion of the apparatus is such that, no matter whether a key be simply touched or held down permanently, the shaft *D* cannot make more than one rotation for each touch or manipulation of any one key.

I will now describe the fillet-feeding apparatus, which is operated only during that portion of the rotation of the shaft *D* when the punches are in their upper position, as shown in Fig. 8. As soon, however, as the shaft *D* begins to rotate after a key has been depressed the fillet *P*, after passing over the necessary guide-rollers, passes through the punch-head and between the feeding-segment *M* and tension-roller *N*, the latter being pivotally secured to the frame at *n*. The feeding-segment *M*, of the usual roughened type, is fixedly secured to the pivoted shaft *O*.

Inasmuch as the individual letters or characters of a message are made up of different combinations of perforations, as disclosed in my prior patent, above referred to, it becomes necessary to give the fillet a varying feed, which bears a fixed ratio to the spaces occupied by said characters in the fillet. I accom-

plish this varying feed by the mechanism shown in Figs. 1, 3, 6, 7, and 8. When the punches are acting, the feeding-segment *M* and tension-roller *N* are out of frictional contact with the fillet and in the position shown in Fig. 7. On the same shaft *O* with the feeding-segment *M* is a two-armed lever *s s'*, pivotally attached to a slotted link *T*, which in turn is connected with the pin *t*, carried by a cam *R* on the main shaft *D*. The cam *R* has a raised portion *t'* extending around one-half its circumference, adapted to hold the tension-roller *N* in its outward position through the agency of an arm *u*, said parts acting against the stress of a spring *n'*, which normally tends to force the tension-roller *N* into contact with the segment *M* when the arm *u* leaves the raised portion *t'* of the cam *R*.

o is a spiral spring frictionally secured to the frame of the machine and to the shaft *O* and the two-armed lever *s s'*, its function being to take up the lost motion between the pin *t* and slotted link *T*.

r r r is a series of push-pins having notches on their inner ends adapted to receive the lugs *r'* of the selecting-bars *G'*, said push-pins having horizontal motion through the part *U* and adapted to be placed into the path of the free end *s* of the two-armed lever *s s'*, the function of said push-pins being to limit the radial motion of the feeding-segment *M* in accordance with the length of the characters made by the individual combinations of punches.

In order that the entire feeding apparatus may be absolutely positive in its operation, whether for a delicate touch of any one of the keys or for a prolonged operation thereof or for any change in the speed of rotation of the shaft *D*, I provide a locking-plate *W*, pivoted at *x x* (see Figs. 3 and 6) and located beneath the selecting-bars *G G'*, the function of said plate being to return all of said selecting-bars to their normal position under the tension of a spring *y*, as clearly shown in Figs. 3 and 6, the plate acting against ledges *w* on the under side of the selecting-bars. In the rear of the pivoted plate *W* is a light lever *L*, pivoted at *L'* and its free end resting on a pin *v* in the shaft *D*. Near the free end of this lever *L* is a pin *l*, which projects over the extension *w'* of the pivoted plate *W* when the lever *L* is held in its upward position by the pin *v*. As soon, however, as any key has been depressed the shaft *D* is released and the plate *W* forced forward, the lever *L* drops off of the pin *v*, and the pin *l* falls behind the projection *w'* of the plate *W*, locking it in its forward position against the stress of spring *y* until said shaft *D* has made a complete rotation and the end of lever *L* again rests upon the pin *v*, thereby securing the action of the selecting-bars for both the punches and the feeding mechanism during one complete revolution of the shaft *D*.

The operation of the apparatus is as follows: Suppose the belt to be sliding or run-

ning loosely upon the pulley H and that any one of the keys be either lightly touched or permanently held in its depressed position. Said key, acting on the levers for the selecting-bars G in the manner described in my prior patent, causes the desired selecting-bars to thrust the pivoted bars *g g*, attached thereto, into the path of such of the punches *c c* as make up the desired character. In the same manner the desired selecting-bar G' is caused to thrust a push-pin *r* into the path of the two-armed lever *s s'*, thereby limiting its forward motion in proportion to the space it is desired to feed the fillet on the return motion of said lever. The same act of depressing the key causes the shaft J to be rocked through the agency of the rod *j* and arms connecting said rod to said shafting. As the shaft J rocks, the pawl K' is thrust forward in the direction of the arrow. (See Fig. 5.) Said pawl, acting on lug *i'* of the detent I, causes the latter to release the ratchet D' and permit the shaft D to make one revolution, and one revolution only, in the direction of the arrow, as shown. The cams *d d'* are so located on the shaft D (see Fig. 8) that during the first half of the revolution of said shaft the lever E causes the tilting lever F to make a complete vibration, thereby causing such of the punches *c c* as lie in the paths of the selected bars *g g* to descend and to again be drawn into their normal position. During this time the feeding mechanism, consisting of the vibrating segment M and tension-roller N, has been held out of frictional contact with the fillet, as clearly shown in Fig. 7, and the two-armed lever *s s'* is drawn to the extreme backward position by the spring *o*, secured to the shaft O and frame A, thereby taking up the lost motion due to the link T and pin *t*. As the shaft D continues to rotate in the direction of the arrow, as shown in Fig. 7, when the arm *u* leaves the projection *t'* the tension-roller N under the influence of the spring *n'* is forced against the fillet and feeding-segment M, and this feeding-segment has been limited in its backward motion by that particular push-pin *r* which was thrust into its path, as already described, and the lost motion due to the pin *t* and slot T is taken up by the spring *o*, so that when the pin *t* again comes into contact with the right hand of the link T it vibrates the feeding-segment a distance which has been limited by the push-pin *r* and the fillet is fed forward the required distance.

When it is desired to feed blank paper through the punch-head, the hook *h'* is pressed to the left and the spacing-key is actuated a number of times, said spacing-key not being operatively connected with any one of the selecting-bars which control the punches, but actuates the push-pin *r* through the agency of the desired selecting-bar adapted to give to the fillet the greatest length of feed for any one complete rotation of the shaft.

It will of course be understood that there may be departures from the construction of

the apparatus herein disclosed and which will still come within the scope of my invention.

While the apparatus which I have herein disclosed is designed particularly for use in the perforation of transmitting-fillets for automatic or rapid telegraphy, it is, of course, obvious that the application of the principle herein involved of variable feed may have a variety of uses in analogous instruments—as, for instance, type-writers, printing-telegraphs, or any of those devices in the arts wherein extraneous power is used and it is desired to impart variable feed to fabrics or paper—and I desire it to be understood that the scope of my claims shall be of such nature as to include apparatus of this general nature.

I am aware of a prior patent granted to T. M. Foote and myself on the 8th day of June, 1880, No. 228,585, wherein perforating is effected by a machine in which key-levers control selecting-bars for punches and feed mechanism, with clutch connections between said parts and a source of extraneous power which is utilized at the will of the operator for the purpose specified. My present invention is directed to improvements upon the aforesaid apparatus in that with the present apparatus the rotary driving-shaft is held under the direct and constant influence of the extraneous source of power by a rigid pulley, over which the driving-belt slides continuously when the machine is not in actual operation, and this shaft is set in motion the instant a key is depressed, while in the patented device the keys actuate clutch mechanism and a loose continuously-driven pulley is clutched to the shaft at the will of the operator, there being much lost motion between the clutch, the pulley, and the shaft, and an objectionable feature, also, is that such a device is very noisy in operation. I make no claim here, therefore, to anything shown or described in said patent, my invention being directed to improvements thereon.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. A perforating-machine having perforating devices, key-levers, and fillet-feeding mechanism, in combination with a rotary driving-shaft carrying a driving-pulley rigidly secured to it and having a loose driving-belt, which normally slides over the pulley, and mechanical connections between the key-levers and it, whereby the shaft is allowed to rotate one revolution only for each depression of a key and the fillet is perforated and fed forward, substantially as described.

2. In a perforator, a pulley fixedly secured to a rotary shaft and having a loose sliding driving-belt continuously driven by a source of extraneous power, in combination with perforating mechanism, fillet-feeding devices, and key-levers having mechanical connections between them and the rotary shaft, and addi-

tional mechanical connections between the perforating and fillet-feeding devices, whereby the extraneous power is utilized to impel the mechanism as the key-levers are depressed, substantially as described.

3. In a perforator, a series of selecting-bars, a series of punches, one for each selecting-bar, a series of key-levers, a second set of selecting-bars, paper-feeding devices controlled by the second set of selecting-bars, a rotary shaft carrying a pulley fixedly or rigidly secured to it and carrying a loose sliding belt continuously driven by an extraneous source of power, and mechanical connections between the shaft and the two sets of selecting-bars and key-levers, whereby the extraneous power is utilized to perforate and feed the fillet and the key-levers are made to control its application, substantially as described.

4. In a perforator, a rotary propelling-shaft carrying a pulley fixedly or rigidly secured to it under stress of a sliding belt impelled by a source of extraneous power, which constantly tends to set said shaft in motion, with detent or holding mechanism for controlling its rotation, in combination with key-levers, perforating and fillet-feeding mechanism, and mechanical connections between the shaft, the key-levers, and the perforating and fillet-feeding mechanism, whereby the fillet is perforated and fed through the agency of the extraneous power applied to the shaft and the application of such power is regulated by the manipulation of the key-levers only, substantially as described.

5. In a perforator, a rotary shaft carrying a fixed pulley, on which slides a loose belt driven by an extraneous source of power, said shaft having detent or holding devices for regulating its rotation, and cam mechanism, in combination with fillet perforating and feeding mechanism, and key-levers having mechanical connections with the aforesaid parts, whereby the fillet is perforated and fed forward through the agency of the extraneous power and the application thereof regulated solely by the operation of the key-levers, substantially as described.

6. In a perforator, a series of key-levers, a series of punches, and a series of selecting-bars, one for each punch, said selecting-bars having pivoted extensions adapted to slide through a pivoted lever into the path of the punches, and mechanical connections between the pivoted lever and a power-impelled shaft, whereby the fillet is perforated by extraneous power and the punches are selected by the keys, substantially as described.

7. In a perforator, a series of key-levers having mechanical connections with a series of selecting-bars, a series of punches, a series of short bars pivotally secured to the ends of the selecting-bars and located in the path of the punches, mechanical connections between the ends of the selecting-bars and a rotary shaft for giving to said selecting-bars a vertical motion as the shaft rotates, and ad-

ditional mechanical connections in the nature of locking and releasing devices between the key-levers and the rotary shaft, whereby the paper or fillet is caused to be perforated by extraneous power and the application thereof is regulated solely by the manipulation of the keys, substantially as described.

8. In a perforator, a series of key-levers, a series of punches, a series of selecting-bars having pivoted extensions, a pivoted lever through which the pivoted extensions are adapted to slide into the path of the punches, and a rotary shaft bearing cams having mechanical connections with the free end of the pivoted lever, and mechanical connections in the nature of locking and releasing devices between the key-levers and the rotary shaft, substantially as described.

9. In a perforator, a series of key-levers mechanically connected to a series of selecting-bars, a series of punches, one for each selecting-bar, a series of pivotal extensions for said selecting-bars, each adapted to slide into the path of one punch, and a pivoted lever through which said extensions slide, said lever having mechanical connection with all of the punches as it rises, in combination with a rotary shaft having cams and connections with the pivoted lever, and additional mechanical connections in the nature of locking and releasing devices, whereby the punches are selected by the keys and propelled in both directions by a source of extraneous power, substantially as described.

10. In a perforator or analogous mechanism, a power-impelled shaft carrying a cam, a vibrating paper-feeding segment, a tension-roller adapted to bear against the fillet between it and the aforesaid segment, and mechanical connections between the segment, the tension-roller, and the cam for causing them to release or retain the fillet in accordance with the demands of the operator, substantially as described.

11. In a perforator or analogous device wherein paper or equivalent material is to be fed forward at varying rates, the combination of the following elements: a power-impelled shaft, a vibrating feeding-segment or impelling device, a tension-roller, mechanical connections between the segment, the tension-roller, and shaft for causing them to grip and propel or release at will the material to be fed, a series of key-levers, mechanical connections between said key-levers and the rotary shaft in the nature of locking and releasing devices, and connections between said key-levers, the segment, and the tension-roller for causing the material to be periodically fed and in such lengths as the operator may wish, substantially as described.

12. In a perforator or analogous device, a power-impelled shaft, a feeding or propelling segment, a two-armed lever carried by a shaft which carries, also, the feeding-segment, a tension-roller, cam mechanism on the first-named shaft, mechanical connections in the nature of locking and releasing devices between said

key-levers and the power-impelled shaft, a series of key-levers, a series of selecting-bars, a series of push-pins controlled by said selecting-bars, and mechanical connections between the cam mechanism and the two-armed lever, whereby the paper or fillet is gripped and fed or released at will through the agency of power and the regulation of such feed effected by the key-levers.

13. A feeding device for paper, fabric, or analogous material, consisting of a series of limiting push-pins, a vibrating feeding-segment, a tension-roller, selecting-bars, key-levers, a rotary shaft, a cam or cams, and connections, as described, whereby variable feed is imparted to said paper or fabric, substantially as described.

14. A perforating-machine having the perforating and feeding devices actuated by cams placed upon a power-impelled shaft, the means for imparting intermittent motion to said shaft, consisting of an affixed driving-pulley, over which slides a continuously-running belt tending to rotate said pulley, a ratchet or detent also affixed to the shaft, and a pawl engaging with said detent to prevent the rotation of the shaft except when it is tripped through its mechanical connection with the keys, substantially as described.

15. In a perforator, a rotary cam-shaft carrying a fixed pulley, over which slides a continuously-running belt driven by extraneous power tending to rotate it, and a detent or stop device which limits the rotation to one revolution, substantially as described.

16. In a perforator, a series of key-levers, a series of punches, a series of selecting-bars, one for each punch, said selecting-bars having at one end pivoted extensions capable of vibration independently of said bars, said extensions adapted to slide through a pivoted lever into the path of said punches, said pivoted lever being mechanically connected with cams on a power-impelled shaft, mechanical connections in the nature of locking and re-

leasing devices between the key-levers and the power-impelled shaft, whereby while the keys select the punches the punching is performed by extraneous power, substantially as described.

17. In a perforator, a series of key-levers mechanically connected to a series of selecting-bars, a series of punches, one for each selecting-bar, a series of pivoted extensions for said selecting-bars, each adapted to slide into the path of one punch, and a pivoted lever through which said extensions slide, said lever having mechanical connection with all of the punches as it rises, in combination with a rotary shaft having cams and connections with the said pivoted lever, whereby the punches are selected by the keys and propelled in both directions by an extraneous source of power, substantially as described.

18. In a perforator, in combination with perforating-punches, a power-impelled shaft carrying a cam, a vibrating paper-feeding segment, a pressure-roller adapted to bear against said segment and clasp the fillet between, and mechanical connections between the segment, the pressure-roller, and the cam for causing them to release or retain the fillet in accordance with the demands of the operator, substantially as described.

19. In a perforator, in combination with perforating-punches, a variable paper-feeding device consisting of a vibrating segment which is adapted to move through a varying number of degrees, and a pressure or contact roller adapted to automatically press against said segment while the latter is moving in one direction and to cease contact during the return of the segment, thereby causing the paper between the roller and segment to be clasped and fed while the segment moves in one direction only, substantially as described.

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Witnesses:

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WM. F. Z. DESANT.