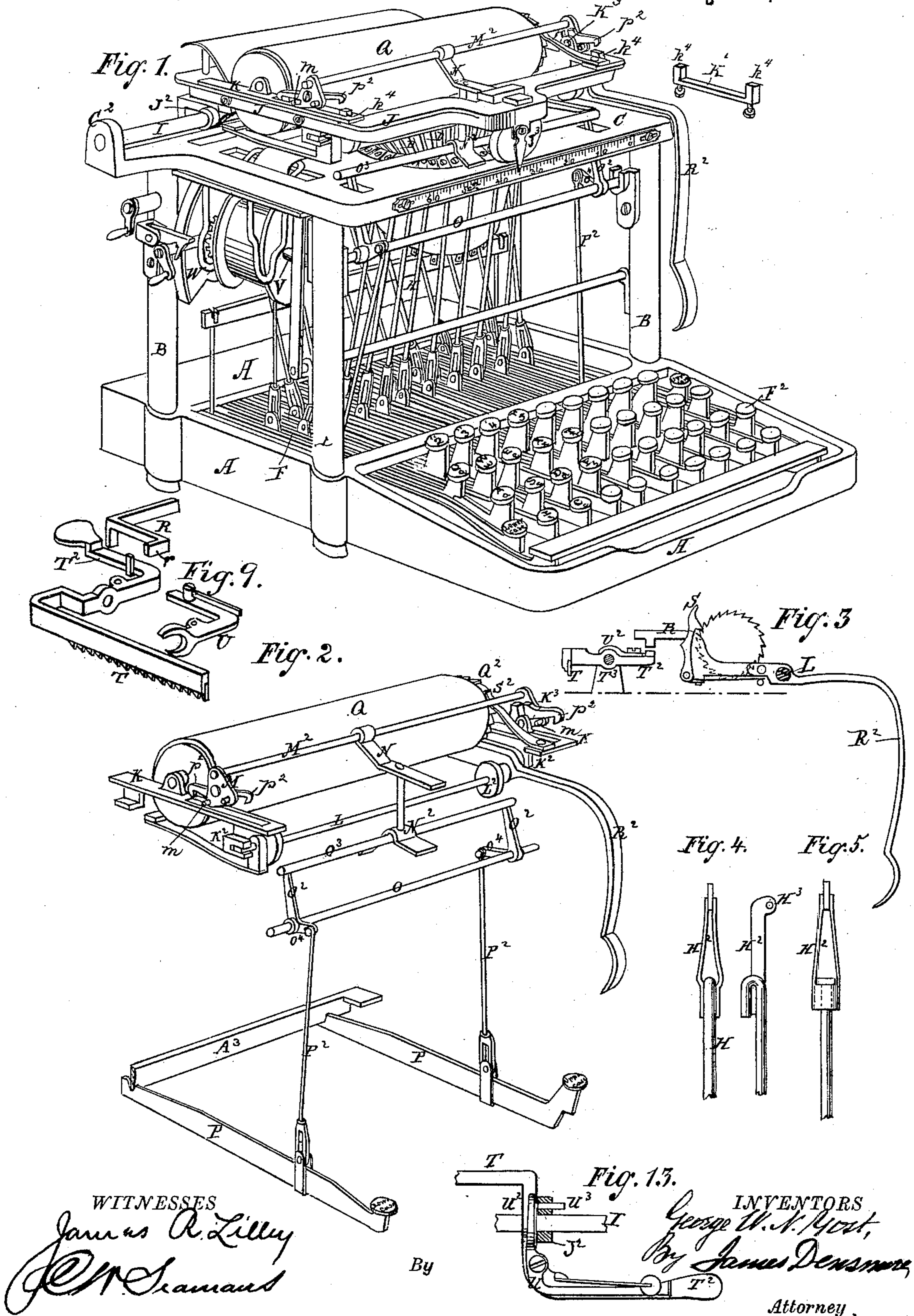


G. W. N. YOST.  
TYPE WRITING MACHINE.

No. 408,061.

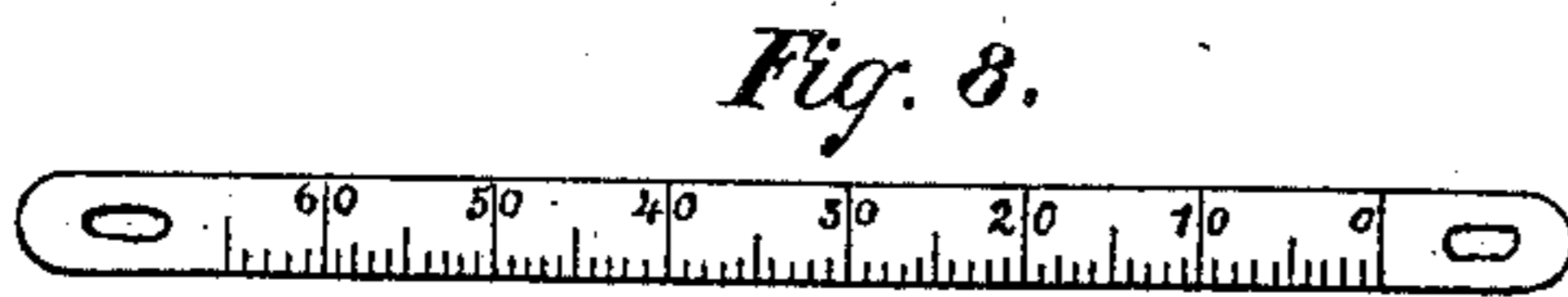
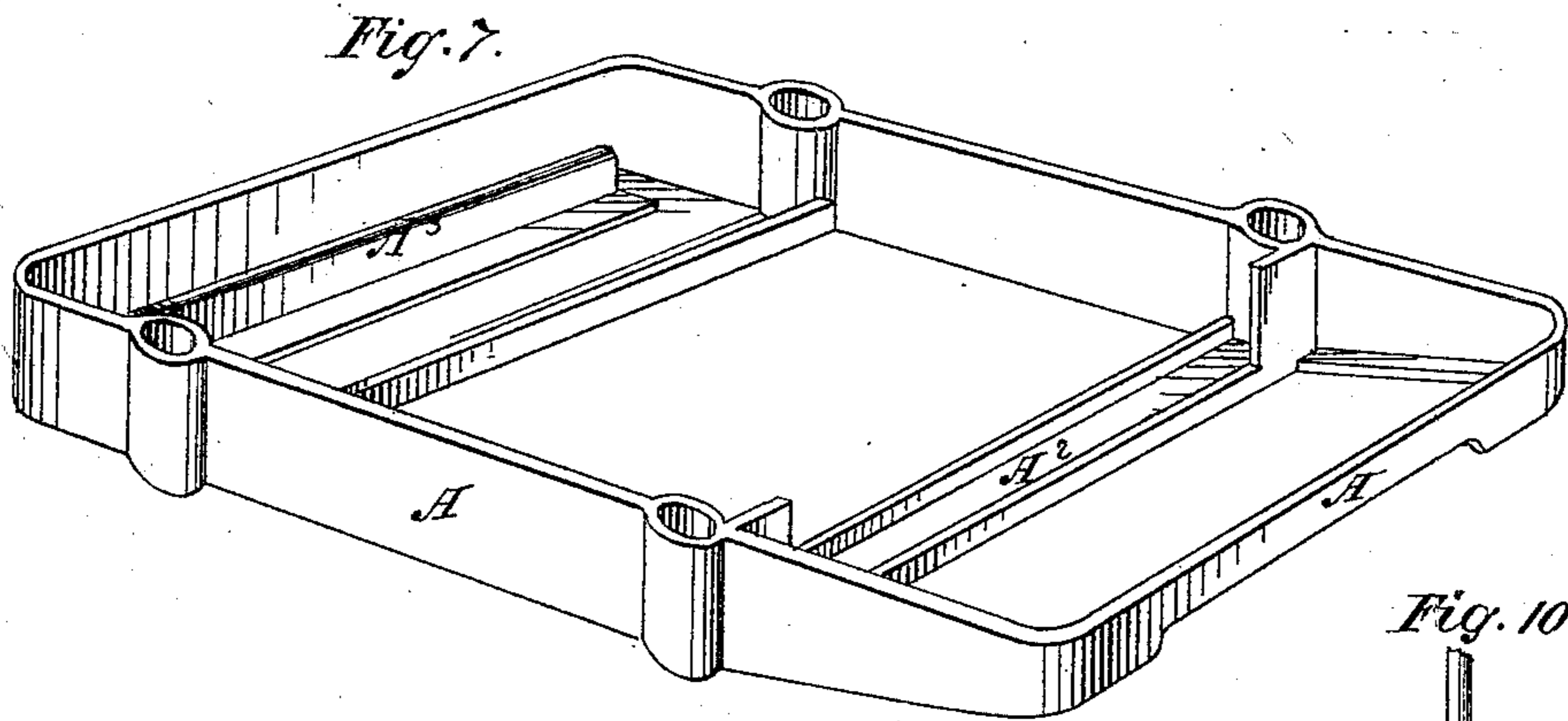
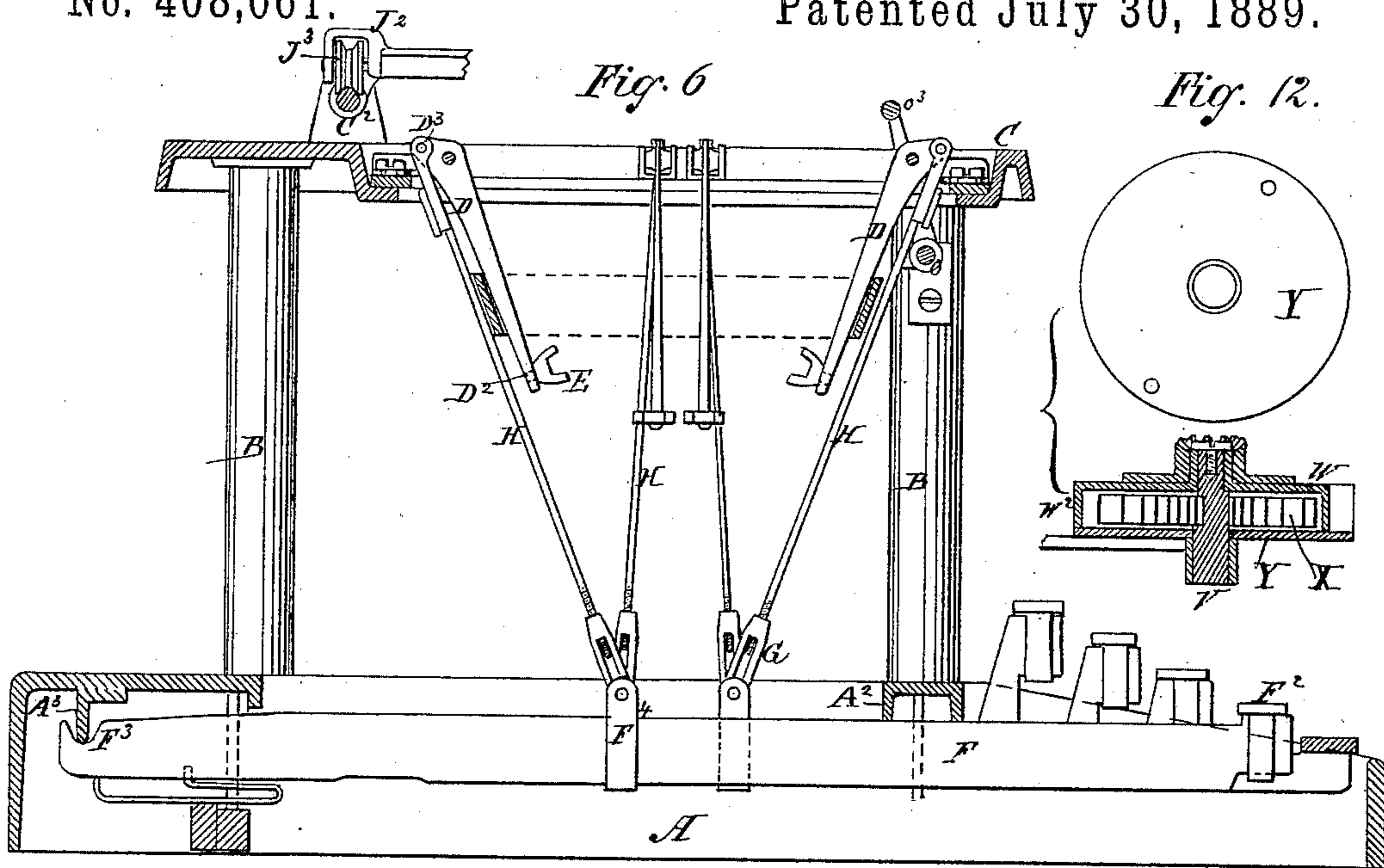
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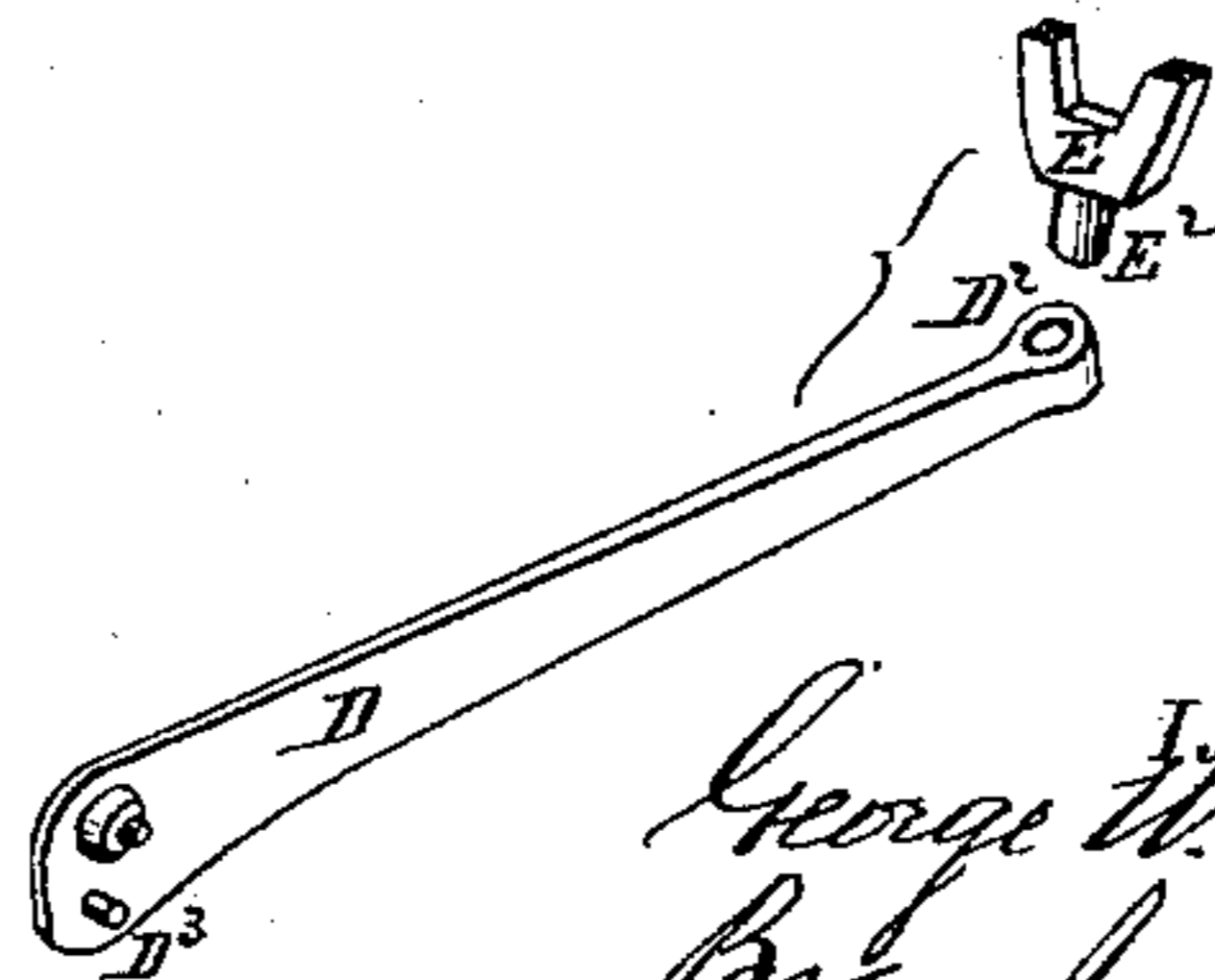
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*Fig. 10*



*Fig. 11.*



WITNESSES  
*James R. Lilly*  
*W. M. Siamant*

By

INVENTOR  
*George W. N. Yost.*  
By *James Densmore.*  
Attorney

# UNITED STATES PATENT OFFICE.

GEORGE W. N. YOST, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN WRITING MACHINE COMPANY, OF NEW YORK.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 408,061, dated July 30, 1889.

Application filed June 23, 1879. (Model.) Patented in England January 7, 1878, No. 89.

*To all whom it may concern:*

Be it known that I, GEORGE W. N. YOST, of the city, county, and State of New York, have invented Improvements in Type-Writing Machines, (for which I obtained English Patent No. 89 of 1878,) of which the following is a specification.

The nature of the invention is in the combination of a cast hollow base-frame which has an integral key-lever pivot-rib with the connecting-posts and cap-frame of a type-writing machine; in the combination of a swivel with the key-lever, connecting-rod, and type-bar; in the combination of a connecting-rod which has a bifurcated hinge end with the key-lever swivel and type-bar; in the combination of a bifurcated connecting-rod which has a bearing in each fork with a journal on each side of the outer end of a type-bar, which is a lever of the first order; in the combination of a handle with and attached to the carriage and line-space apparatus; in the combination of two extra key-levers and connecting-rods with the platen transverse reciprocating apparatus; in the combination of a trip-ratchet which has an elongated curved finger which surrounds the ratchet-bar hinge-hub concentrically with the ratchet-bar trip-pin, and in the combination of a shield with and against the coiled spring and spring-wheel.

The invention is illustrated by the accompanying drawings and following description thereof.

In the drawings, Figure 1 represents a view of a type-writing machine which embodies the invention; Fig. 2, a view of the platen transverse reciprocating frame and alternate key-levers; Fig. 3, a view of the carriage-handle; Figs. 4 and 5, views of the bifurcated connecting-rod; Fig. 6, a view of the key-levers, connecting-rods, and type-bars; Fig. 7, a view of the under side of the base-frame; Fig. 8, a view of the reversed scale. Fig. 9 is a perspective view of the end of the ratchet-bar arm upon which the ratchet-lever operates to trip and elevate the ratchet-bar; Fig. 10, a view of the swivel and connecting-rod; Fig. 11, a view of the type-bar and type-body; Fig. 12, a view of the spring-wheel, and Fig.

13 a plan view of the trip-ratchet and trip-pin.

In the drawings, also, A represents a cast hollow base-frame of a type-writing machine; A<sup>2</sup>, a bar which has a groove in its under side across the top of the base-frame A between the middle and fore end; A<sup>3</sup>, a flange or rib which has a round under edge integrally a part of the base-frame A and across near the hind end; B, a frame-post extended up from each side of the base-frame A between the middle and each end; C, a cap-frame on the frame-posts B; C<sup>2</sup>, a lug extended up from each side of the cap-frame C between the middle and hind end; D, a series of type-bars, which are levers of the first order, pivoted in adjustable hangers set around a large circular aperture through the middle of the cap-frame C; D<sup>2</sup>, a round hole or socket in the inner end of each type-bar D; D<sup>3</sup>, a journal on each side of the outer end of each type-bar D; E, a U-shaped bifurcated or twofold type-body adapted to hold two types in the inner end of each type-bar D; E<sup>2</sup>, a round shank on the lower end of each type-body E, adapted to fit in the type-bar socket D<sup>2</sup>; F, a series of levers within the base-frame A; F<sup>2</sup>, a key on the fore end of each lever F; F<sup>3</sup>, a bearing in the hind end of each key-lever F, adapted to work on the base-frame pivot-rib A<sup>3</sup>; F<sup>4</sup>, a connection-holder attached to each key-lever F between the key F<sup>2</sup> and pivot F<sup>3</sup>; G, a swivel pivoted to the connection-holder F<sup>4</sup> of each key-lever F; G<sup>2</sup>, a hole or socket which has an interior screw vertically in the upper end of each swivel G; H, a connecting-rod which has an exterior screw on the lower end in each swivel G; H<sup>2</sup>, a bifurcation or two-pronged spring-fork on the upper end of each connecting-rod H; H<sup>3</sup>, a bearing in the upper end of each connecting-rod fork H<sup>2</sup> and adapted to work on the contiguous corresponding type-bar journal D<sup>3</sup>; I, a rail in the lugs C<sup>2</sup> across over the cap-frame C; J, a carriage on the cap-frame C over the type-bars D; J<sup>2</sup>, a lug extended down from each end of the hind bar of the carriage J over and adapted to slide along on the rail I; J<sup>3</sup>, a traveling wheel on the front bar of the carriage J, adapted to run on the front edge of the cap-frame C; K, a

bar or plate on and adapted to reciprocate forward and rearward along each end bar of the carriage J; K<sup>2</sup>, a lug extended down from the front end of each reciprocating plate K; K<sup>3</sup>, a lug extended up from the front end of each reciprocating plate K; L, a round rod attached to the under lugs K<sup>2</sup> of the reciprocating plates K across under the carriage J parallel with the carriage-rail I; L<sup>2</sup>, a band-pulley loose on each end of the combined connecting-bar and axle-rod L; M, a triangular plate pivoted to the upper lug K<sup>3</sup> of each reciprocating plate K; M<sup>2</sup>, a vibratory bar attached to the triangular plates M of the reciprocating plates K across over the carriage J parallel with the carriage-rail I; N, a bar or arm attached to the vibratory connecting-bar M<sup>2</sup> and extended forward and adapted to work in a slot in the front bar of the carriage J; N<sup>2</sup>, a saddle extended down from the reciprocating arm N; O, a rocking bar across under the cap-frame C parallel with the carriage-rail I in bearings attached to the front frame-posts B; O<sup>2</sup>, an arm extended up from each end of the rocking bar O in a slot through the cap-frame C; O<sup>3</sup>, a bar extended to the upper end of each rocking bar vertical arm O<sup>2</sup> across over the cap-frame C, under and adapted to work in the saddle N<sup>2</sup>; O<sup>4</sup>, an arm extended horizontally from each end of the rocking bar O, one forward and the other rearward; P, a key-lever on each side of and similar to each of the series or key-board of key-levers F; P<sup>2</sup>, a connecting-rod similar to each of the type-bar-connecting rods H, attached to each side key-lever P and to the corresponding contiguous horizontal rocking-bar arm O<sup>4</sup>; Q, a round platen parallel with the carriage-rail I across over the middle of the circle or disk of type-bars D in bearings attached to the reciprocating plates K; Q<sup>2</sup>, a ratchet-wheel on the end of the platen Q; R, an arm or lever hinged on the axle-rod L and extended rearward under the axle of the platen Q between the platen ratchet-wheel Q<sup>2</sup> and the end bar of the carriage J; R<sup>2</sup>, a handle hinged on the axle-rod L, attached to or integrally a part of the hinged lever R, and extended forward and down in front of the cap-frame C; S, a driving-ratchet pivoted to the hinged lever R and extended up behind and adapted to work in the platen ratchet-wheel Q<sup>2</sup>; S<sup>2</sup>, a holding-ratchet attached to the fore end of the contiguous reciprocating plate K and adapted to work in the platen ratchet-wheel Q<sup>2</sup>; T, a ratchet-bar parallel with, behind, and hinged on the carriage-rail I; T<sup>2</sup>, an arm or handle attached to or integrally a part of the ratchet-bar T and extended forward and out under the hind end of the hinged lever R; T<sup>3</sup>, a circular enlargement or hub of the ratchet-bar and arm T T<sup>2</sup>, by which they are hinged to the carriage-rail I; U, a trip-ratchet pivoted to the ratchet-bar arm T<sup>2</sup>; U<sup>2</sup>, a curved finger on the hind end of the trip-ratchet and elongated and adapted to work around the ratchet-bar hinge-hub T<sup>3</sup>; U<sup>3</sup>, a trip-pin par-

allel with the carriage-rail I, loose in a hole through the carriage-lug J<sup>2</sup>, and adapted to work against the trip-ratchet finger U<sup>2</sup>.

The operation of the lever R<sup>2</sup> and the ratchet-bar T is as follows: When the front part of lever R<sup>2</sup> is raised, it rotates the platen by means of the pawl S, and the end of the arm R strikes the trip-ratchet U, thereby depressing the arm T<sup>2</sup> and lifting the ratchet-bar T clear of the pawls. The carriage is then moved to the right until the trip-pin U<sup>3</sup> strikes a fixed part of the machine, and is moved to the left, Fig. 3, which moves the trip-ratchet U from under the arm R of the lever R<sup>2</sup>. This allows the ratchet-bar T to drop into engagement with the pawls while the arm R is still depressed.

V is an axle attached to a hanger extended down from the hind part of the cap-frame C over and parallel with the key-levers F; W, a plate or wheel, circular or scroll form, loose on the axle V; W<sup>2</sup>, a flange or rim parallel with the axle V and concentric with and attached to the periphery of the wheel W; X, a spring in scroll-coils attached to the axle V and wheel-rim W<sup>2</sup>; Y, a circular plate or shield loose on the axle V next to and against the coiled spring X on the side opposite to the wheel-plate W and attached to the wheel-rim W<sup>2</sup>; Z, a scale on which are vertical parallel marks corresponding in number and distance apart with the teeth of the ratchet-bar T, attached to the front edge of the cap-frame C; and Z<sup>2</sup>, an adjusting-slot in each end of the scale Z.

The cast hollow shell-like base-frame A is a convenient light cheap case for the key-levers F, solid and firm, and the pivot-rib A<sup>3</sup>, integral with the base-frame, is a uniform firm journal for the key-lever bearings, which will always keep its relative place.

The series of key-levers F is wider than the disk of type-bars D, which makes the connection between certain key-levers and type-bars more or less laterally oblique. In some machines the key-board is much wider than the disk, and this lateral obliqueness in certain places consequently much greater, and this tends to pull certain type-bars out of place, and thereby destroy the alignment of the types; but the bifurcated connecting-rod H, screwed into the pivoted swivel G, with the fork-bearings over the journals of the type-bar D, adjusts the connection to the least lateral strain and friction, and thereby remedies the defect.

The bifurcated or twofold type-body E allows two types to be in the same body and plane and transverse line, yet sufficiently apart for each to work clearly and separately from the other, whereby one series of type-bodies gives two series of types, of which one can be capital and the other small types. The round type-body shank E<sup>2</sup> in the round type-bar socket D<sup>2</sup> allows each type-body and its types to be adjusted, and both types at once, as adjusting one adjusts the other—one to

work in one line and the other in another and parallel line—and the platen Q, adapted to reciprocate forward or rearward, can be moved to one line for the capital types and to the other for small types, whereby both series can work in the same line on the platen and paper.

The handle R<sup>2</sup>, by which to seize and draw the carriage J back to place after a line is written, is simple and convenient. At the same time when first seized it turns slightly on the axle-rod L and depresses the hind end of the ratchet-lever R, which depresses the ratchet-bar arm T<sup>2</sup> and lifts the ratchet-bar T clear from the letter-space ratchets, and permits the carriage to be moved to the right or to the left. The lever R has also a rearwardly-extending arm r to arrest its further downward motion by coming in contact with the carriage-frame. The same motion of the handle R<sup>2</sup> also pulls down the driving-ratchet S and turns the platen Q and paper a line-space distance; but, inasmuch as it is not essential in my machine that the handle shall be used for lifting the ratchet-bar clear from the letter-space ratchet, as other means may be adopted and used for that purpose—as, for instance, extending the ratchet-bar arm T<sup>2</sup> to the right and forming a thumb-piece thereon, as shown—I desire to be understood as not limiting myself to the use of the handle R<sup>2</sup> and its accompanying mechanism, or any accompanying mechanism, to the performance of all the functions before mentioned. It is clear that by omitting the connection or combination of the handle with the ratchet-bar arm T<sup>2</sup> by cutting off the hind end of the ratchet-lever R, or otherwise, the handle R<sup>2</sup> and its accompanying mechanism would be confined to the functions of moving the carriage to the right and left and rotating the platen by means of the driving-ratchet S, as before described. I do not wish either to be understood as confining myself to the rearwardly-extending arm R to arrest the downward motion of the lever by coming in contact with the carriage-frame. This may be entirely dispensed with, or other equivalent mechanism be substituted for the same purpose.

The depression of either alternate key-lever P will pull down a connecting-rod P<sup>2</sup> and rocking arm O<sup>4</sup>, and thereby work the rocking bars O O<sup>3</sup> and the reciprocating apparatus N<sup>2</sup> N K L M<sup>2</sup>, and move the platen Q and paper to the capital-type or small-type line.

To guide the reciprocating plates K, they have a longitudinal slot, through which passes a flat bar K<sup>4</sup>, secured to the top of the carriage J. To prevent the retrograde movement of the plates K and the platen thereon until released by the operator from capital letters to small letters, or vice versa, the plate K carries mounted upon the pivot of the lug k<sup>3</sup> two pawls p<sup>2</sup> of such length as to successively, but not simultaneously, engage with vertically-projecting lugs k<sup>4</sup> on the ends of the flat bar

K<sup>4</sup>. To release said pawls from engagement when the triangular plate M is rocked, said plate (at each end of the rod M<sup>2</sup>) carries two laterally-extending pins m to successively lift the pawls from engagement with the lugs k<sup>4</sup>.

The extension of the trip-ratchet finger U<sup>2</sup> around the ratchet-bar hinge-hub T<sup>3</sup> presents a solid surface to the trip-pin U<sup>3</sup> at whatever position of the carriage, and prevents the trip-pin from catching and breaking on the end of the trip-finger, as is liable when the finger is not thus extended.

The coiled spring, when unprotected except by fastenings at the ends, is liable to bulge out laterally, and if it touches a substance which does not move with it friction and sluggish movement are caused; but the wheel-plate W protects and holds in place the coiled spring X on one side, while the shield Y, attached to the wheel-rim W<sup>2</sup>, does the same for the other side.

The drawings, besides many things old and common, show some things which are the invention of another. The combination of key-levers which have keys on one end, pivots at the other, and connecting-rods between the pivots and keys, which pivots are rearward and connecting-rods forward of the vertical plane of the pivots of the letter-space ratchets, with the letter-space vibratory frame set between the key-lever pivots and connecting-rods; the combination of a cam-wheel with the driving-spring and carriage; the combination of a worm-wheel and spur-wheel with the spring-wheel; the combination of a guide with the inking-ribbon and ribbon-spool guide; the combination of a connecting vibratory frame and reciprocating regulating-frames with the ribbon-spools; the combination of a V-grooved traveling wheel and V-shaped rail with the carriage; the combination of bearing-wheels with the carriage and platen transverse reciprocating frame; the combination of alternate locks with the carriage and platen transverse reciprocating frame; the combination of alternate stops and latches with the carriage and platen transverse reciprocating frame; the combination of a vibratory connecting-frame and alternate lifts with the alternate stops and latches of the carriage and platen transverse reciprocating frame; the combination of an adjustable head with the band-shield; the combination of a head with the band-shield which has an adjusting-slot; the combination of a band-shield which has a holding-arm with the band-shield head and band-pulley, and the combination of a band-shield which has a bifurcated loose end with the carrying-band and reversed scale, form no part of this invention, but are the subject of an application for a patent to be filed simultaneously herewith by William K. Jenne.

But the devices which do constitute this invention, and what I claim, therefore, are as follows:

1. The combination of a single-tenon swivel with a flat-strap connection-holder F<sup>4</sup>, key-

lever embraced by said strap, connecting-rod, and type-bar of a type-writing machine, substantially as and for the purpose set forth.

2. The combination of the type-bar of a type-writing machine, its journal D<sup>3</sup>, secured thereto, with a connecting-rod H, and its spring-fork H<sup>2</sup>, having bearings to receive and clasp said journal, substantially as and for the purpose described.

10 3. The combination, with the carriage and line-spacing apparatus of a type-writing machine, of a lever or handle extending in front of said machine and down toward the keyboard, substantially as and for the purposes described.

15 4. The combination of two extra key-levers and connecting-rods with the platen transverse reciprocating apparatus of a type-writ-

ing machine and a series of key-levers for operating the type-bars located between said extra key-levers, substantially as and for the purpose described.

5. The combination of a trip-ratchet which has an elongated curved finger which surrounds the ratchet-bar hinge-hub with the ratchet-bar trip-pin of a type-writing machine, substantially as and for the purpose described.

6. The combination of the main spring of a type-writing machine, its shaft, and a shield loose on said shaft to prevent undue friction against said spring, as described.

GEORGE W. N. YOST.

Witnesses:

G. F. WELLMAN,

E. DENNING LUXTON.