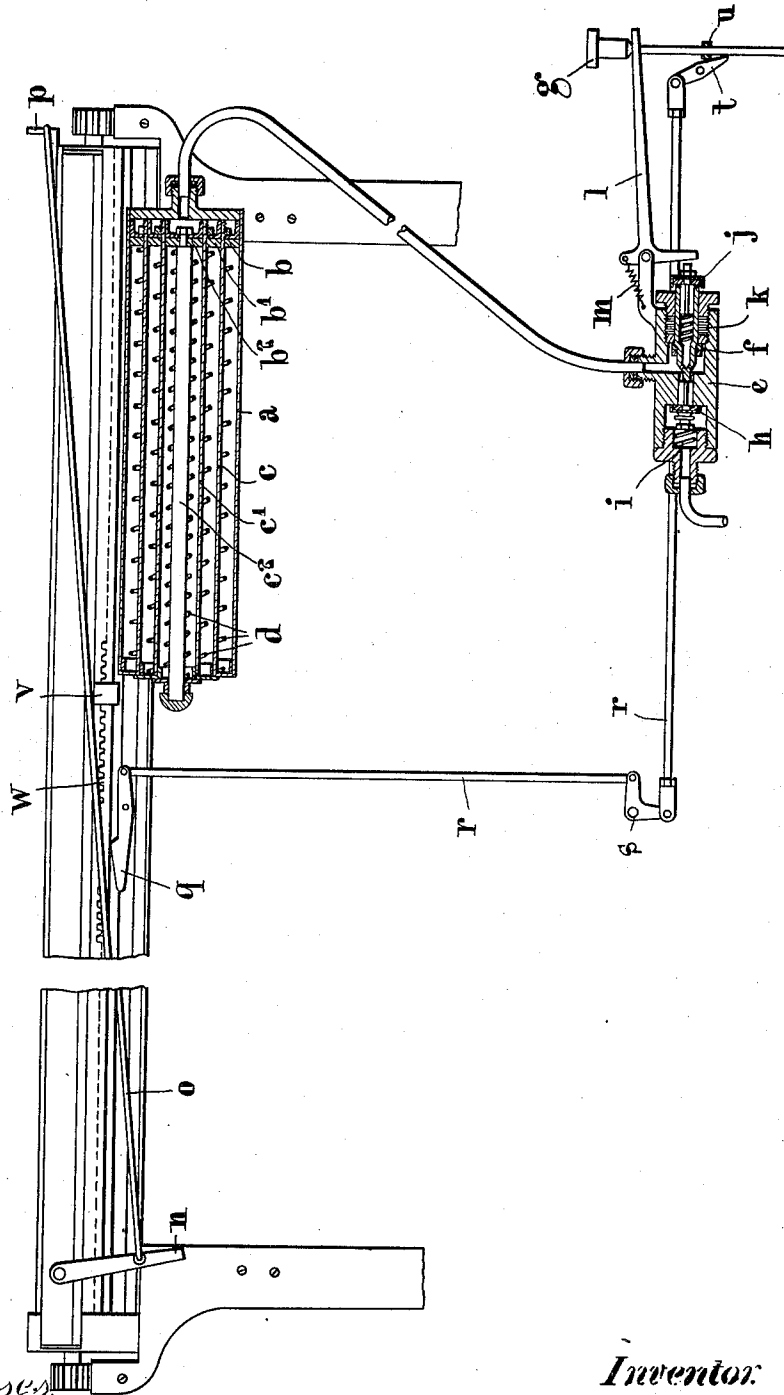


A. W. HARRIS.
 TYPE WRITING AND CALCULATING MACHINE.
 APPLICATION FILED FEB. 20, 1912.

1,029,500.

Patented June 11, 1912.



Witnesses
 C E Parsons
 & L. Tolson

Inventor
 Arthur William Harris
 By: Spear Middleton Bondeson & Spear
 Attorney.

UNITED STATES PATENT OFFICE.

ARTHUR WILLIAM HARRIS, OF LONDON, ENGLAND, ASSIGNOR TO THE HARRIS CALCULATING MACHINE COMPANY LIMITED, OF LONDON, ENGLAND.

TYPE-WRITING AND CALCULATING MACHINE.

1,029,500.

Specification of Letters Patent.

Patented June 11, 1912.

Application filed February 20, 1912. Serial No. 678,897.

To all whom it may concern:

Be it known that I, ARTHUR WILLIAM HARRIS, a subject of the King of Great Britain and Ireland, and residing at Bush Lane House, Bush Lane, Cannon street, London, E. C., England, have invented certain new and useful Improvements Relating to Type-Writing and Calculating Machines, of which the following is a specification.

This invention relates to typewriting machines having arranged therewith pneumatically operated calculating machines as described, for example, in my former specification of Letters Patent No. 995135 and has for its object to provide improved pneumatic mechanism for returning the typewriter carriage to its initial position at the will of the operator.

Reference is to be had to the accompanying drawing which represents a diagrammatical elevation of the invention with parts shown in section.

In one convenient manner of carrying the invention into effect as shown in the accompanying diagram, a comparatively short cylinder *a* is mounted in any convenient position adjacent to the typewriter carriage, and within the said cylinder are arranged concentric telescopic pistons *b*, *b'*, *b''* and rods *c*, *c'*, *c''*, the central one (*c''*) of which is adapted to operate upon the carriage through a lever *n*. The pistons are held in their innermost position by springs *d*.

Any convenient valve mechanism may be employed. Preferably the valve comprises a body part *e* containing a sliding plug *f*, which when actuated in one direction by a finger key *g* presses a valve *h* off its seating and permits air to be admitted from any convenient pump or reservoir to the cylinder aforesaid. When the finger key is released the valve *h* and plug *f* are returned by the spring *i* and a valve *j* is opened at the outer end of the plug by a spring *k* permitting air to escape to atmosphere from the cylinder along the interior of the plug. Motion is transmitted to the plug from the finger key by a bell crank lever *l* which is actuated in one direction by a spring *m*.

The stroke of each piston is relatively short, but the total movement of all the pistons is sufficient to return the carriage from one limit of its movement to the other. In the arrangement shown the abutment on the typewriter carriage is in the form of a lever

n pivoted on the sliding carriage which supports the usual roller and connected by a link *o* with a lever *p* by which an ordinary ratchet device is operated for producing the usual partial rotation or angular movement of the roller whereby the paper is advanced to a new position after a line has been completed. The first action of the central piston is to move the lever *n* sufficiently to actuate the ratchet device. At this position the lever is arrested and further movement of the piston is transmitted through the lever to the carriage.

For putting the piston out of action when the carriage reaches its initial position a trip piece *q* suitably situated near the carriage is connected by rods *r* and bell crank lever *s* with the catch *t* by which the finger key aforesaid is held down after depression, such holding down being effected by the engagement of the catch with a collar *u* on the stem of the key. As the carriage reaches its initial position, a projection *v* thereon operates the trip piece and liberates the catch and finger key and permits the valve *h* to close under the action of the spring and air to be released from the cylinder through the valve *j*. The catch and trip aforesaid are held in or returned to their operative position after displacement therefrom by any suitably arranged spring (not shown). In the position of the mechanism illustrated by the diagram the carriage is supposed to be moving toward the cylinder.

To prevent undue impact of the carriage against its stop when returned by mechanism as above described, the piston may be arranged to be put out of action before the carriage completes its return movement, the completion of such movement being effected under momentum. For this purpose the projection *v* may be arranged to liberate the valve before the carriage reaches the end of its movement. The projection is preferably adjustably mounted on a rack bar *w* secured to the carriage. Another method of reducing the impact of the carriage against the stop at its initial position, consists in so proportioning the springs controlling the concentric pistons above referred to that the pressure applied to the carriage by the pistons progressively diminishes as the carriage approaches the stop. It must be observed that this condition is inherent in the

arrangement of pistons shown in the drawing, but by suitably proportioning the springs the progressive reduction of pressure can be increased.

5 The invention is not limited to any particular cylinder or valve mechanism, or means for producing or controlling the movement of the carriage, as these details may be varied to suit different requirements.

10 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is:—

In typewriting and calculating machines,
15 the combination with a typewriter carriage,

a pneumatic cylinder, valve and finger key, of a collar and valve lever in conjunction with the key, a catch adapted to engage the collar when the key is depressed, a trip piece adjacent the carriage, a projection on the 20 carriage for actuating said piece, and rods and bell crank lever connecting the catch and trip piece, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

ARTHUR WILLIAM HARRIS.

Witnesses:

JOHN MORGAN,
GWYNNE MORGAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
