Sept. 18, 1934. H. L. PITMAN 1,974,313

PRINTING INSTRUMENTALITIES FOR TYPEWRITING MACHINES

Filed March 19, 1931 3 Sheets-Sheet 1

Fig. 1.

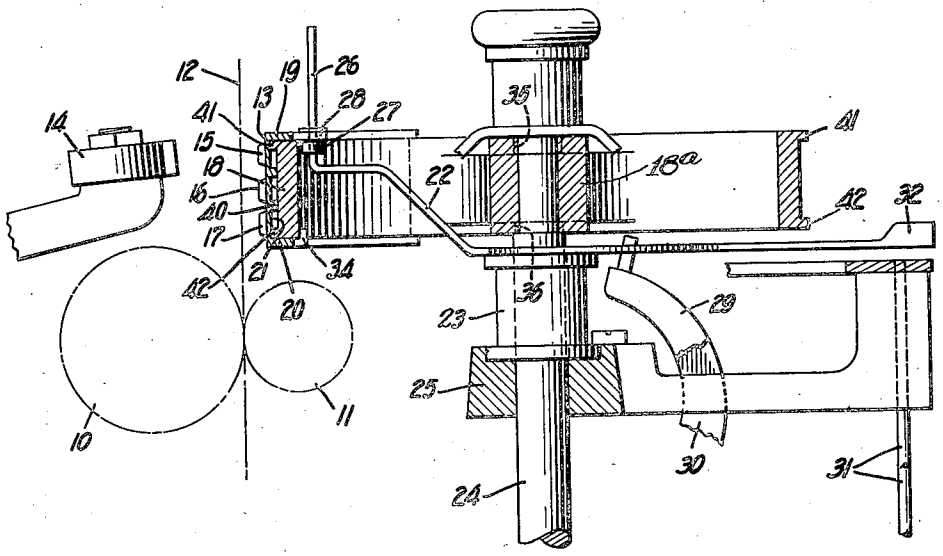
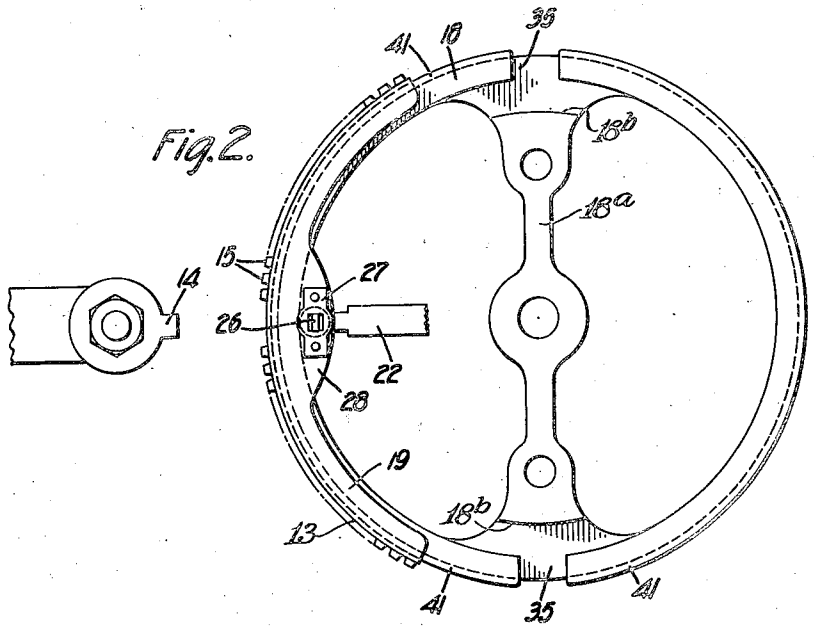


Fig. 2.



INVENTOR
Henry L. Pitman.
BY John Waldheim
ATTORNEY

Sept. 18, 1934. H. L. PITMAN 1,974,313

PRINTING INSTRUMENTALITIES FOR TYPEWRITING MACHINES

Filed March 19, 1931 3 Sheets-Sheet 2

Fig. 3.

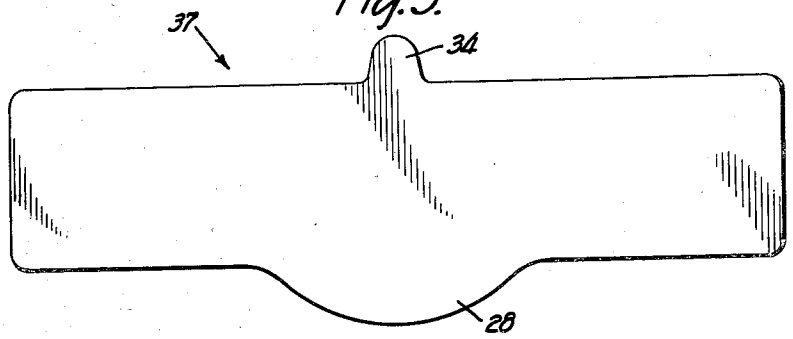


Fig. 4.

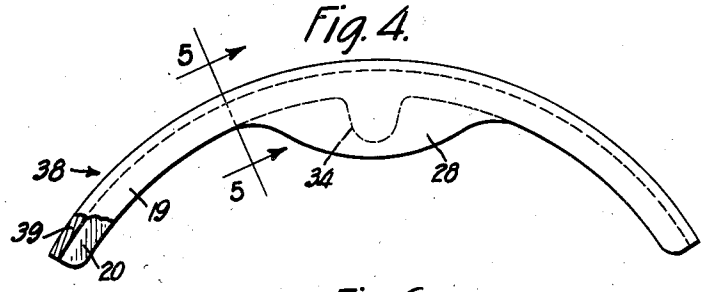
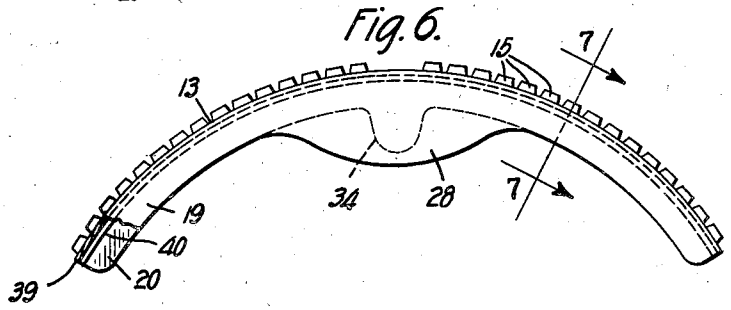


Fig. 6.



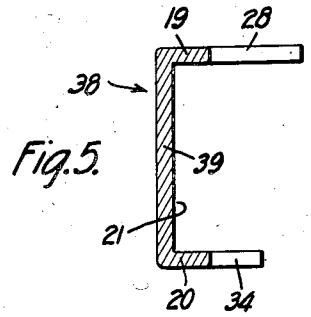


Fig. 5.

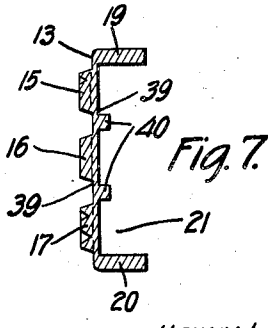


Fig. 7.

INVENTOR
Henry L. Pitman.

BY John Waldheim
ATTORNEY

Sept. 18, 1934. H. L. PITMAN 1,974,313

PRINTING INSTRUMENTALITIES FOR TYPEWRITING MACHINES

Filed March 19, 1931 3 Sheets-Sheet 3

Fig. 8.

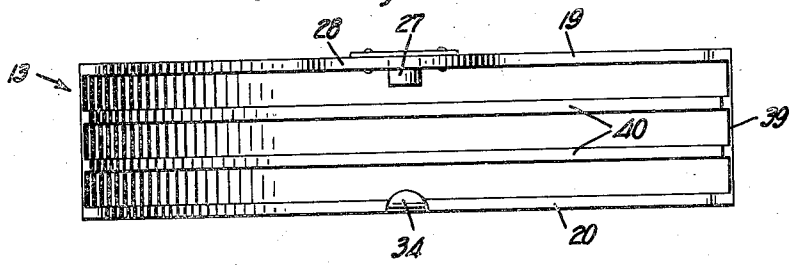


Fig. 9.

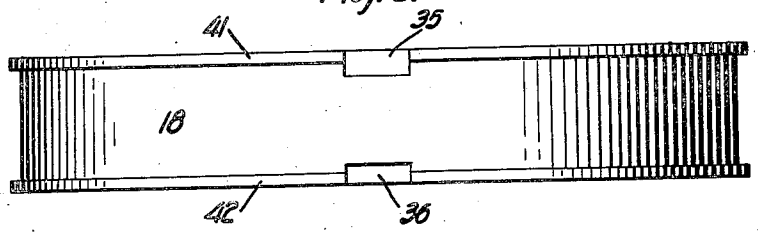


Fig. 10.

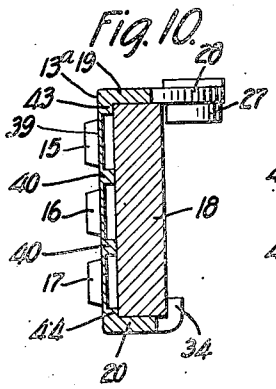


Fig. 11.

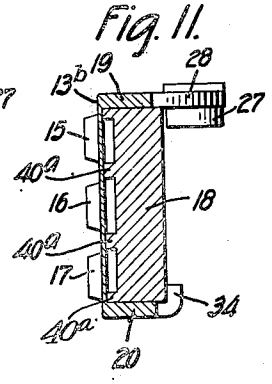
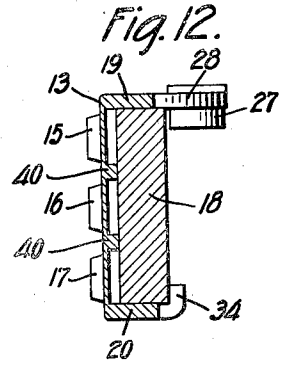


Fig. 12.



INVENTOR
Henry L. Pitman.
BY John Waldheim
ATTORNEY

Patented Sept. 18, 1934 1,974,313

UNITED STATES PATENT OFFICE

1,974,313

PRINTING INSTRUMENTALITIES FOR TYPEWRITING MACHINES

Henry L. Pitman, Westfield, N. J., assignor, by mesne assignments, to Ralph C. Coxhead Corporation, New York, N. Y., a corporation of Delaware

Application March 19, 1931, Serial No. 523,919

9 Claims. (Cl. 197—49)

This invention relates to improvements in typewriting machines and more particularly to printing instrumentalities therefor.

The invention is herein illustrated in connection with a machine known as the Varityper which is provided with a type carrier or shuttle ordinarily composed of hard rubber and mounted on a ring-like support or anvil about which it is operable; the type carrier being provided with a metal web extending from the middle thereof through a slot in the support for guidance and for attachment to an actuating lever.

An object of the present invention is to provide a type carrier which is simpler in construction and by which the slot heretofore necessary in the anvil is avoided, thus reducing the cost of manufacture of the machine and also producing an anvil stronger in construction than that used heretofore.

Another object of the invention is to provide a type carrier composed completely of metal so as to render it more durable and produce sharper printing of the types; the metal being light in weight and also durable, such as duralumin, to decrease the inertia of the type carrier, thus decreasing the resistance offered to the type keys and accordingly increasing the speed of operation of the machine.

Still another object of the invention is to reduce to a minimum the contact between the inner face of the type carrier shuttle and the outer face, of its support, by providing longitudinal ribs, to reduce frictional resistance of the shuttle and thus further aid in making the touch of the keys lighter.

The method of making the type shuttle herein illustrated is disclosed in my application No. 523,920, filed March 19, 1931 and includes means by which the metal is forced from the body of a blank into a die to form types on the outer face of the shuttle, at the same time forming the ribs on the inner face of the shuttle.

Other features and advantages will hereinafter appear.

In the drawings which form part of the specification,

Fig. 1 is a sectional, side view of a portion of the machine showing the novel shuttle applied thereto;

Fig. 2 is a top plan view of Fig. 1, some of the parts being removed;

Fig. 3 is a view of the flat blank from which the shuttle is formed;

Fig. 4 is a top plan view showing the blank of Fig. 3 bent to the curvature of the anvil and the flanges formed thereon;

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 4;

Fig. 6 shows the shuttle after the types have been formed thereon;

Fig. 7 is a vertical cross-section taken on the line 7—7 through the types i, I and 8;

Fig. 8 is an elevation of the type shuttle showing the inner or concaved side thereof;

Fig. 9 is a side elevation of the anvil;

Fig. 10 is a vertical section illustrating another form of shuttle and anvil;

Fig. 11 is a similar view showing a further form of shuttle and anvil; and

Fig. 12 shows another arrangement of shuttle and anvil.

Similar reference characters represent similar parts throughout the specification.

The machine includes feed rollers 10 and 11, on a carriage (not shown) by which a work sheet 12 is fed upwardly between a type carrier 13, at the front of the work-sheet, and a hammer 14 to co-operate therewith, the hammer being operated, in the usual manner, upon the actuation of type keys, not shown, to press the work-sheet against any one of the types 15, 16 or 17 of the type carrier.

The type carrier or shuttle 13 is mounted on a ring-like support or anvil 18 to which the blow of the hammer 14 is transmitted, said anvil having a cross-piece 18a spanning the ring portion thereof. Flanges 19 and 20 are formed at the upper and lower edges of the shuttle, thus providing a channel 21 into which the anvil 18 fits.

The shuttle 13 is provided with two groups of types at opposite sides of the hammer 14 (Fig. 2). It is operable by a lever 22 from a central position to either side of the machine to carry the desired types to the printing point opposite the hammer. The shuttle actuating lever is pivotally supported by a sleeve 23 to swing about a vertical shaft 24 suitably supported in the machine frame 25, said shaft having the anvil 18 secured thereto by means of the cross-piece 18a. The lever 22 has a vertical finger 26 engaging in a bushing 27 secured to an extension 28 on the upper flange 19. Said lever 22 is operable by any one of two vertically disposed arms 29 and 30 of frames (not shown) actuated by the usual key levers. The finger 26 is sufficiently long to engage the type shuttle in any one of the case shift positions to which it may be moved vertically by the usual means, not shown, co-operating with the rod 24 which supports the anvil 18 at its upper end. It

will be understood that the lower flange 20 prevents accidental detachment of the shuttle from the anvil 18 which may otherwise be occasioned during a lowering operation of the shuttle, the shuttle having a tendency to stick to the finger 26. The lower flange also prevents overthrow of the shuttle with reference to the anvil during case shifting operations, thus avoiding misalignment of the typing. Indexing pins 31 are also operable by the key-levers to project them into the path of an arm 32 of the lever 22, to accurately arrest the type shuttle at the printing point.

To retain the shuttle 13 on the anvil 18, against the action of the centrifugal force thereof, the bushing 27 extends down behind the inner face of said anvil, and the lower flange 20 is provided with an extension 34 which engages behind said anvil also.

To permit the monuting of the shuttle 13 on the anvil 18 the upper and lower edges of the latter are provided with slots 35 and 36 through which the sleeve 27 and the lip 34 pass to the inner face of the anvil 18 which is relatively fixed and mounted on the shaft 24, as above described, for case shifting movements. The slots 35 and 36 are at the ends of the cross-piece 18^a (Figs. 1 and 2) and accordingly there is provided a slot 18^b at each end of said cross-piece to reduce the thickness thereof so as to have it not greater than the axial breadth of the ring at said slots 35 and 36. The slots 18^b not only facilitate the mounting of the shuttle on the anvil but also permit the shuttle to be moved around on the ring portion of the anvil to the front or back.

The shuttle is formed of a single piece of lightweight sheet metal such as duralumin which compares favorably with aluminum in weight and with steel in strength. Blanks 37 (Fig. 3) are first formed with extensions 28 and 34. The blank is then treated to curve it and to form the flanges 19 and 20, thus producing the partially formed shuttle 38 (Figs. 4 and 5). The partially formed shuttle is then treated in a manner described in my above mentioned application, by placing its outer face against a matrix and then forcing the metal from the body part 39, by rolling on the back face thereof, to form the three tiers of types 15, 16 and 17 on the outer face as in Figs. 6 and 7, at the same time forming ribs 40 on the inner face of the shuttle, the ribs being located in transverse planes extending between the tiers of types; said ribs serving to reinforce the shuttle and to produce a minimum of friction between the shuttle and its support since by means of said ribs the total area of surface of the shuttle which engages the anvil is considerably less than in shuttles used heretofore in which the whole concaved surface thereof engages the anvil. The contact surface of the support anvil 18 may be flush as in Fig. 12 or it may be provided at its upper and lower edges with ribs 41 and 42, as in Fig. 1, to brace the shuttle in its upper and lower corners.

In another form of the invention the shuttle 13^a may be provided with additional ribs 43 and 44 as in Fig. 10 and the face of the support 18 may be flush similar to the one in Fig. 12.

In still another form of the invention the shuttle 13^b may be formed without ribs and all of the ribs 40^a may be formed on the anvil 18 as in Fig. 11.

It will be understood that the anvil is adapted to support another shuttle, having a different style of type, and that the anvil may be set circumferentially, in the usual manner, to render either shuttle effective.

It should be understood that the arcuate type carrier is provided with a major groove on its concaved side in which the anvil is located to guide the carrier, and a plurality of minor grooves are formed in the body part of the carrier, thus forming a plurality of ribs to contact with the cylindrical support or anvil. It will further be understood that the metal in the type carrier is displaced to form the grooves in its concaved face and that the types are formed on the convexed face from the displaced metal.

From the above it will be understood that a very simple shuttle is provided, and that with a shuttle of this construction an anvil of simpler and stronger construction may be used, since the slot heretofore necessary is eliminated.

While certain preferred embodiments of the invention have been shown and described, it will be understood that changes in the form, arrangements proportions, sizes and details thereof may be made without departing from the scope of the invention as defined in the appended claims.

I claim:—

1. In a typewriting machine, the combination of a type carrier, an anvil to support said carrier for lengthwise movement of the latter, two flanges on said carrier, one at the upper edge and one at the lower edge, a lip on one of said flanges to assist in holding the carrier on the anvil, an extension on the other flange, and operating means to engage said extension.

2. In a typewriting machine, the combination of a cylindrical anvil, an arcuate type carrier supported thereon, types on the convexed side of said carrier, said carrier having a major groove in its concaved side in which the anvil is located to guide the carrier, said carrier having also a plurality of minor grooves, and a plurality of ribs formed by the minor grooves to contact with the cylindrical face of the anvil.

3. In a typewriting machine, the combination of a segmental type carrier, a stationary guide therefor, two flanges on said carrier to embrace said guide, one of said flanges extending over said guide, the other extending under said guide, projections, one on each of said flanges, to prevent accidental detachment of said carrier from said guide, and means to actuate said carrier relatively to said guide.

4. In a typewriting machine, the combination of a segmental type carrier, a stationary support therefor, flanges on said carrier to form a groove in which said support is located, an extension on one of said flanges to hold the carrier on said guide, an extension on the other flange, and means engaging the last mentioned extension to actuate said carrier about said support.

5. In a typewriting machine, the combination of an arcuate type carrier, a ring-like support therefor about which the type carrier is actuable, flanges, one at the upper edge and one at the lower edge of said type carrier, one of said flanges having a projection to engage the inner face of the support to retain the shuttle on said support, said support having a slot in its edge to permit passage of the projection in assembling the carrier on said support, and means to actuate said shuttle.

6. In a typewriting machine, the combination of an arcuate type carrier, a ring-like support therefor about which the type carrier is actuable, flanges, one at the upper edge and one at the lower edge of said type carrier, each flange hav-

ing a projection to engage the inner face of the support to retain said carrier on said support, said support having slots on opposite edges through which said projections may pass while assembling the carrier on said support, and means to engage one of said projections to actuate said carrier about said support.

7. A ring-like support for a type shuttle of a typewriting machine, said support being solid and having slots extending therein in opposite faces thereof to facilitate assembling of the shuttle on said support.

8. A support for a type shuttle of a typewriting machine, said support including a ring shaped guide for the shuttle, a cross-bar spanning the ring by which said support may be mounted in the machine, said ring having slots in its opposite flat faces to facilitate mounting of the shuttle thereon, and the thickness of the cross-bar where it joins said ring being not greater than the axial breadth of the ring at said slots so as to permit the shuttle to be moved freely about said ring and past the cross-bar to the other side of the support.

9. In a typewriting machine, the combination of a segmental type shuttle, a solid ring-like support therefor, a cross-piece spanning the ring-like support, means to support said shuttle for movement about said support and on the outer face thereof, a projection on said shuttle to engage the inner face of the anvil to assist in holding the shuttle on said support, a radially extending slot in one of two parallel faces of said support through which the projection may pass while mounting the shuttle on said support, the cross-piece being shaped to clear the projection so as to permit the shuttle to be moved freely about the circumference of said support.

HENRY L. PITMAN.