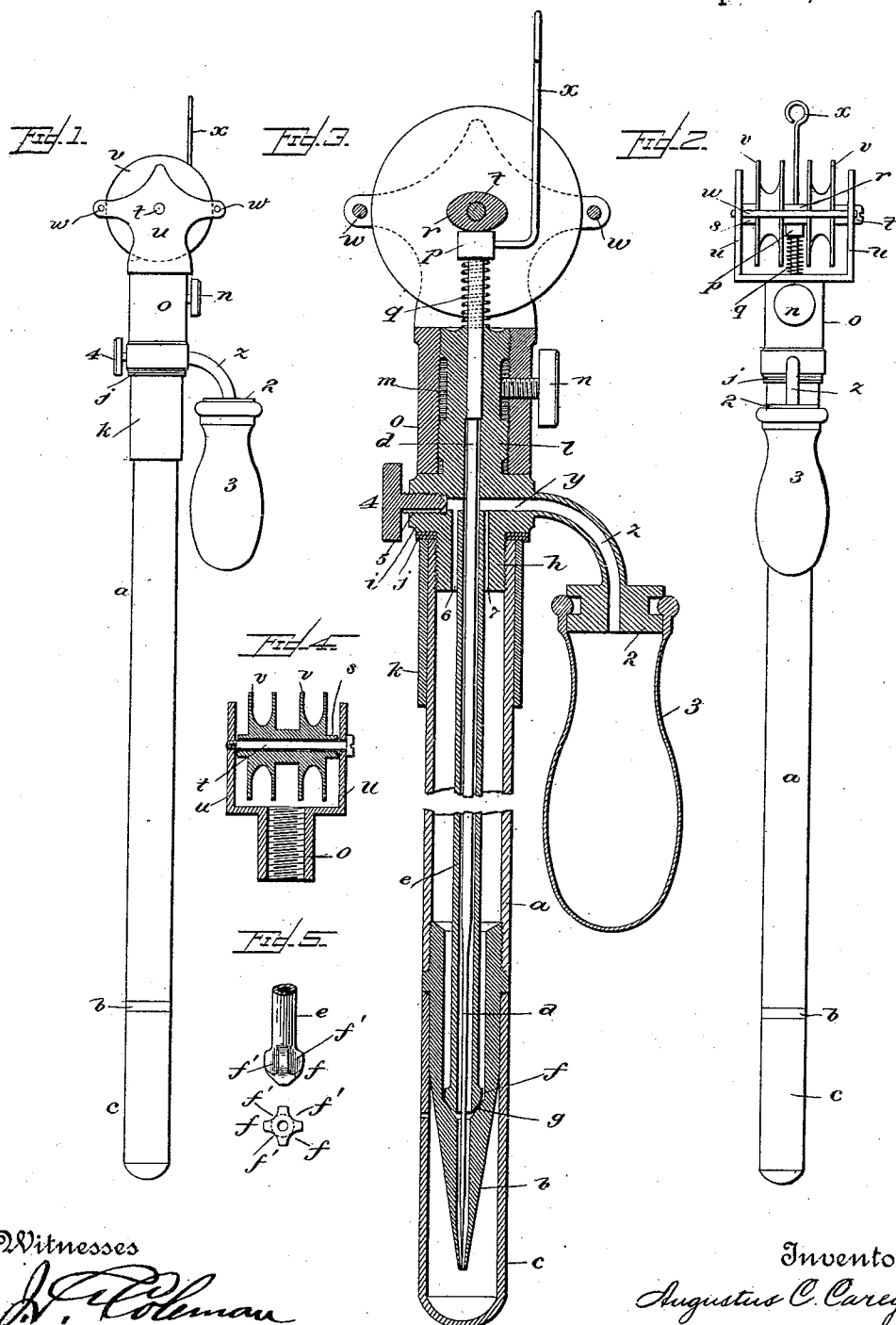


(No Model.)

A. C. CAREY.
MANIFOLDING PEN.

No. 473,207.

Patented Apr. 19, 1892.



Witnesses

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AUGUSTUS C. CAREY, OF LAKE PLEASANT, MASSACHUSETTS.

MANIFOLDING-PEN.

SPECIFICATION forming part of Letters Patent No. 473,207, dated April 19, 1892.

Application filed September 21, 1891. Serial No. 406,351. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS C. CAREY, a citizen of the United States, residing at Lake Pleasant, in the county of Franklin and State of Massachusetts, have invented a certain new and useful Improvement in Manifold-Pens, of which the following is a full, clear, and exact description.

The object of this invention is to provide an efficient pen for producing a number of written copies simultaneously by driving the ink through a series of superposed sheets of paper or writing material. Manifolding in this way has been published by me heretofore, and hence the present invention relates only to the writing or manifolding instrument.

I will describe the principle of my invention first and the best mode in which I have contemplated applying that principle, and then will particularly point out and distinctly claim the part or improvement which I claim as my invention.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation, and Fig. 2 a plan view, on one scale. Fig. 3 is a longitudinal section on a larger scale, with the fountain and stylus broken out midway, so as to bring the figure within the sight. Fig. 4 is a cross-section of the driving-head, and Fig. 5 shows in elevation and plan the end of the tube which surrounds the stylus.

The fountain or barrel *a* is provided with a point or nib *b*, the two being united by a screw-thread or other joint.

c is an ordinary cap for the point.

d is the stylus.

e is a tube within the fountain or barrel which surrounds the stylus. The point of this tube is made with an enlargement *f*, which co-operates with the bore *g* of the point or nib *b* to center the stylus with relation to said point or nib. This enlargement *f* is grooved longitudinally, as clearly shown in Fig. 5 at *f'*, to permit the outflow of writing-fluid. The tube *e* is made with or fixed to a head *h*, having a screw-thread by which the barrel *a* is secured to it, and also having a shoulder *i*, between which and the barrel

washers *j* are interposed to make a tight joint. The barrel, if made of usual frangible material, such as gutta-percha, may have its upper end reinforced by a band of metal *k*, thus making its joint with the head *h* more secure. The head *h* is provided with a screw-threaded neck *l*, which is constructed with a circumferential groove *m*, in which fits a binding-screw *n*, and this screw is tapped into the screw-threaded shank *o* of the driving-head. The stylus *e* extends through the head *h*, and the upper end of this stylus is made as or with a tappet *p*, between which and the neck *l* a retracting spring *q* is arranged. This tappet is engaged by a cam *r*, having one or more cam-surfaces, to give to the stylus a rapid longitudinal motion. The cam *r* is arranged upon a sleeve or hollow shaft *s*, and this shaft is mounted and revolves upon a screw-bolt *t*, which is supported upon the cheeks *u* of the driving-head. Upon the shaft *s* are the pulleys *v* to receive bands for driving the cam.

It will be understood that the pen is designed to be power-driven, and any suitable motor may be employed; but whatever the source of power I prefer to use two driving-bands, because thereby the pen is more evenly balanced and rendered easier of manipulation and guidance than where a single band is used; but I do not mean to exclude a single driving-band for the pen, as quite obviously it may be used. The cheeks *u* may be tied together by rods *w*.

The stylus is provided with an arm *x* for use in moving it independently of the spring and cam to clear out dirt or sediment from the point. The head *h* is pierced transversely by a canal *y*, which intersects the stylus' way therein. One end of this canal is continued as a tube *z*, which ends in an enlargement 2, to which is secured an ordinary air-bulb 3. The other end of the canal *y* is screw-threaded to receive a screw 4, the point of which is adapted to close the canal. The screw 4 is made with a longitudinal groove 5, which opens communication between the external air and the canal *y*. A canal 6 leads from the canal *y* into the fountain or barrel *a*, and a canal 7 serves to connect the bulb's canal with the said fountain or barrel. Because

the screw 4 controls the air-passages I call it herein the "air-screw." The rods *w* also subserve the purpose of preventing the driving-bands from jumping or slipping off the pulleys.

The operation is as follows: To supply the fountain or barrel with writing-fluid, the air-screw 4 is turned to close the canals, the point *b* is removed, and the pen turned upside down, the bulb is compressed, the fluid poured in, the point replaced, the pen reversed, and the bulb released. In this way a little air will be drawn in at the point, and no ink will flow until the air-screw is turned to let in air above, and hence the common fault of a drop or drops of ink accumulating at the point is avoided. If from any cause the ink should fail to flow, a slight pressure on the bulb will start it. If the canals should be clogged, the bulb may be used to force air back and forth through them and so effectually clear them. The binding-screw *n* is loosened and the neck *l* rotated in the shank *o* one way or the other, in order to increase or decrease the length of projection of the stylus beyond the nib to provide for penetrating a greater or less number of sheets—that is, to say, for making many or few copies at one writing. By the centering of the enlargement *f* in the point, the stylus is not only kept centered with relation to the point, but the said stylus is kept surrounded with ink.

By the construction of pen herein described the work of manifolded writings by flowing the ink through a number of superposed sheets of paper may be very quickly and efficiently done. It will be understood that the original and all copies are made at one and the same operation.

I have thus described what I believe to be the best mode of applying the principle of my invention; but I wish to be understood as not limiting myself to the exact details of construction, excepting as such may form the subject of specific claims. Moreover, por-

tions of my invention may be applied to stylographic pens and other fountain-pens.

What I claim is—

1. A pen comprising a reciprocating stylus extending throughout the pen and projecting from both ends thereof, and means to impart the reciprocating movements to such stylus, a surrounding tube terminating in an enlargement, a fountain surrounding the tube and stylus, and a point or nib in which the enlargement is located to center the stylus in the point, substantially as described.

2. A pen comprising a stylus, a surrounding tube, an ink-fountain, an air-valve communicating with such fountain, and an air-forcing apparatus, also connected therewith, substantially as described.

3. A pen comprising a stylus, a tube surrounding it and terminating in an enlargement, a head on such tube terminating in a screw-threaded shank having a circumferential groove, a driving-head having a screw-threaded shank, into which the screw-threaded neck is fitted, and a binding-screw fitted to said circumferential groove to permit the adjustment of the neck in the shank to cause the stylus to project more or less beyond the point, and a fountain having a point in which the enlargement is placed to center the stylus with relation to the point, substantially as described.

4. A driving-head having a cam, a hollow cam-shaft, a driving medium, and a screw-bolt passed through the hollow cam-shaft and constituting the axis for said shaft and secured in the driving-head, combined with a pen-barrel, a stylus, and intermediate connections, substantially as described.

In testimony whereof I have hereunto set my hand this 16th day of September, A. D. 1891.

AUGUSTUS C. CAREY.

Witnesses:

FRANCIS M. THOMPSON,
FRANCIS NIMS THOMPSON.