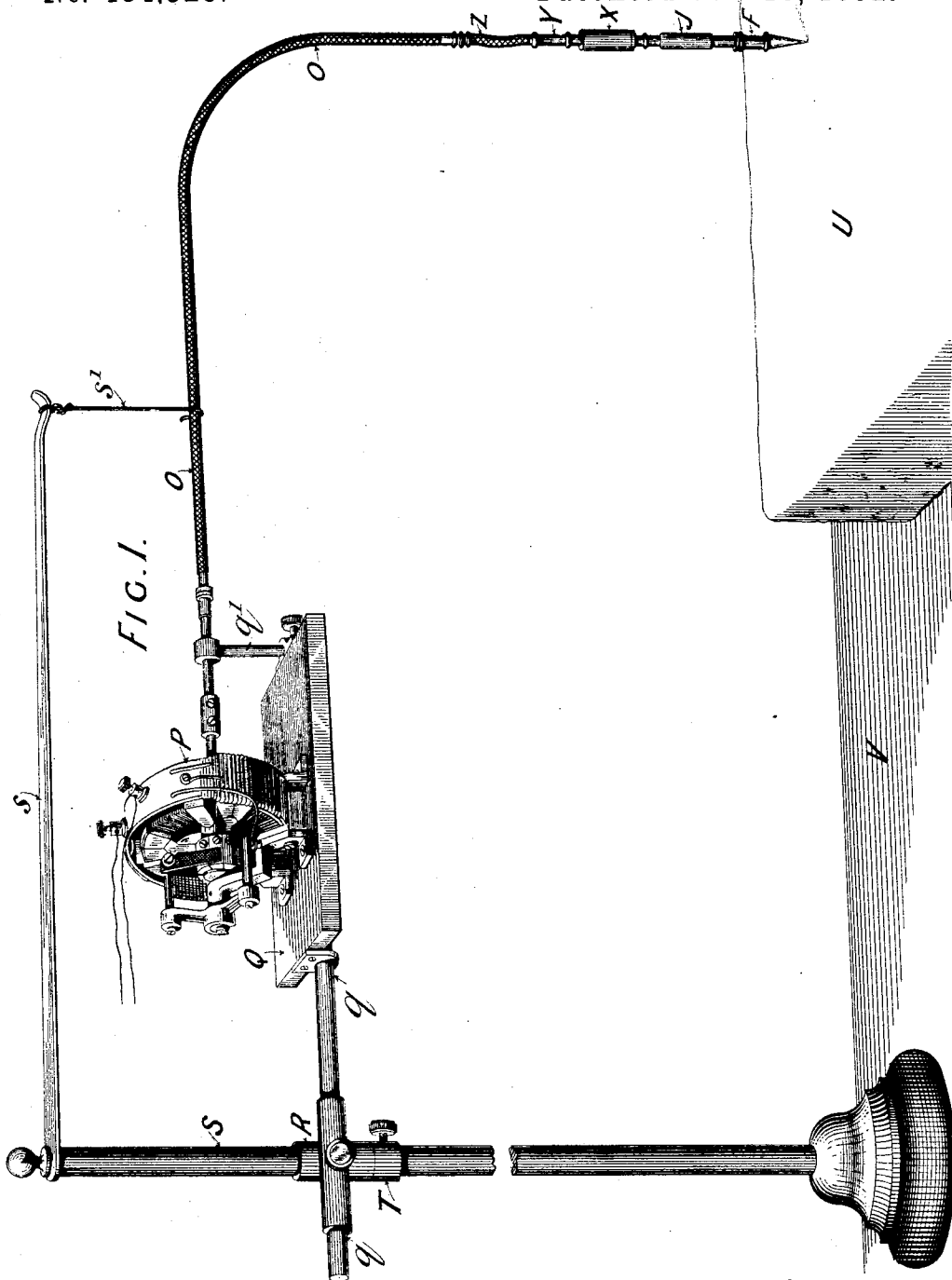


2 Sheets—Sheet 1.

No. 484,523.

Patented Oct. 18, 1892.



Wm<sup>m</sup> Andrew.

J. E. Bodincaud

John Phillips  
by Fairfax & Wetter  
Attorneys

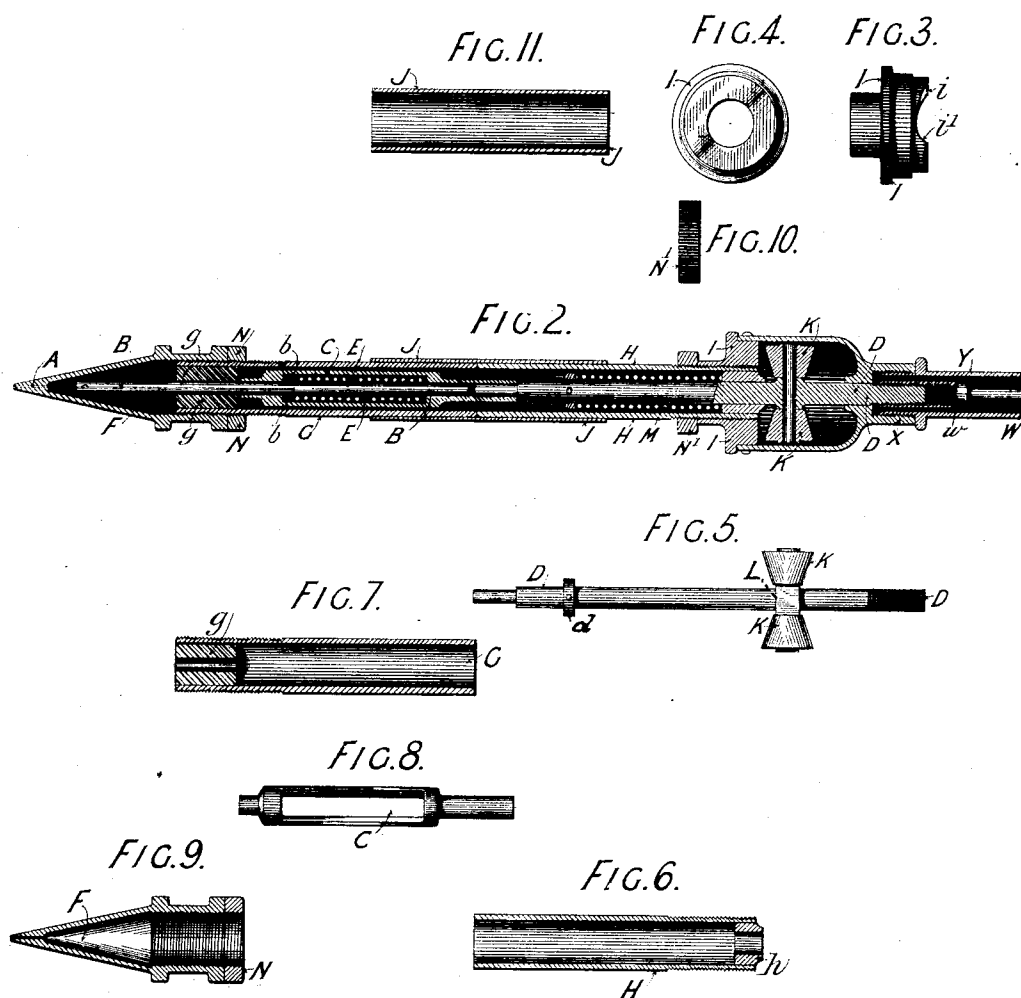
(No Model.)

2 Sheets—Sheet 2.

J. PHILLIPS.  
DRAWING AND STIPLING PEN.

No. 484,523.

Patented Oct. 18, 1892.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN PHILLIPS, OF LONDON, ENGLAND.

## DRAWING AND STIPPLING PEN.

SPECIFICATION forming part of Letters Patent No. 484,523, dated October 18, 1892.

Application filed March 1, 1892. Serial No. 423,431. (No model.) Patented in France February 27, 1892, No. 219,719.

*To all whom it may concern:*

Be it known that I, JOHN PHILLIPS, a subject of the Queen of Great Britain, residing at London, England, have invented a certain new and useful Improvement in Drawing and Stippling Pens, (which has been patented to me in France by Letters Patent No. 219,719, dated February 27, 1892,) of which the following is a full, clear, and exact specification.

This invention relates to pens used by lithographic and other artists for drawing and stippling; and it has for its object to facilitate the production of grained drawings. For this purpose I employ a stylus or needle, to which two distinct motions are imparted by suitable mechanism—namely, a rotary motion on its axis and a reciprocating or up-and-down motion along the same. The said stylus or needle is inclosed in a suitable holder, which is guided over the surface of the paper or stone by hand and which also contains an ink-receptacle.

In the following description reference will be made to the accompanying drawings, in which—

Figure 1 is a general view showing the position of a pen when in use, together with a flexible driving-shaft, an electromotor, and an adjustable stand. Fig. 2 is a longitudinal section of a pen on a larger scale. Figs. 3 to 11 represent details of construction.

A is the needle secured at its upper end in a needle-bar B, which is guided in a sleeve C, attached to a central spindle D. The ends of the sleeve C fit exactly upon the needle-bar, but the middle part is wider and provided with a pair of slots in order to introduce a compensating or buffer spring E, which rests with its lower end upon a pin *b*, driven diametrically into the needle-bar, while the upper end of the spring abuts against the interior of the sleeve C. Consequently the up-and-down motion of the spindle D and sleeve C is first transmitted to the spring E and through the latter upon the pin *b* and upon the needle-bar B; but the rotary motion of the sleeve is imparted to the needle-bar directly through the pin *b*, which comes into contact with the side or face of the slot.

The needle-bar B, sleeve C, and the lowest part of the spindle D are inclosed in a casing

made of three principal parts—namely, the ink-receptacle F, (shown separately in Fig. 9,) the middle tube G, Fig. 7, and the upper tube H. This tube (shown separately by Fig. 6) is fitted with a bush *h*, serving as an upper or intermediate guide for the spindle D. The tubes G and H are connected by a tightly-fitting external sleeve J, Fig. 11, which may be fixed to one of them. The upper tube is screwed into a head-piece or top plate I, (shown separately by Figs. 3 and 4,) which forms an annular path for a pair of rollers K, mounted on a cross-head L, which is fixed to the spindle D. The upper face of the top plate I, forming the roller-path, is not level, but provided with two gradually-inclined planes *i i'* and with sudden depressions placed diametrically opposite each other. Consequently if the rollers are supported by the roller-path or kept in contact with it by a spring they rise and fall twice during each revolution of the spindle D in traveling over the said path.

For keeping the rollers in contact with their path or the annular cam-face of the top plate I, I employ a helical spring M, placed in the upper tube H, so that the upper end of the spring presses against the top of the tube H, while the lower end rests on a collar *d*, fixed to the spindle D by a pin.

The upper part of the ink-receptacle F is connected with the lower end of the tube G by a screw-joint secured by a nut N, so that the receptacle can be quickly detached and again screwed on when required, while the lower part is gradually reduced to a narrow point, like a pencil. The lower end of the ink-receptacle F has a narrow axial orifice, which is cylindrical, so as to fit closely upon the needle, as shown in detail by Fig. 9. In the lowest position of the needle the latter projects slightly below the point of the receptacle F. At every up motion the point of the needle recedes into the receptacle until it has arrived slightly above the cylindrical orifice, so that the ink will just moisten the point of the needle. During its subsequent down motion the needle will therefore push a very minute quantity of ink down through the orifice and carry it upon the surface of the stone or paper which is to receive the drawing, and as

the pen receives in addition to its down motion also a rotary motion the dot produced by it will be round and uniform. When the supply of ink is exhausted, the ink-receptacle is screwed off, filled with ink, and again screwed onto the tube G.

To prevent the needle from making holes into the paper or stone, I employ the compensating spring E, mentioned above, which allows the needle and needle-bar to recede when the pressure exceeds the desired limit. As the ink in the receptacle F will adhere to the needle-bar B more or less, I close the lower end of the tube G by a leather ring g, which fits exactly upon the needle-bar, and thereby prevents the latter from carrying the ink up into the tube G. The maximum stroke of the needle is determined by the vertical height of the cams on the top plate I or by the depressions of the roller path. If it is desired to shorten the stroke, the casing F G H is lengthened by screwing the upper tube more or less out of the top piece I, and then fixing it in position by the nut N. For this purpose the upper end of the tube H is connected with the top piece I by a screw-thread, while the lower end forms, with the tube G, a butt-joint. If the casing is lengthened, as described, the needle will reach the paper or stone before the friction-rollers have come into contact with the lowest parts of the cam-faces, and any further down motion of the said rollers will only serve to compress the compensating spring. The cross-head L is fixed upon the central or driving spindle, so as to impart to the latter its up-and-down motion, while receiving from the central spindle its rotary motion.

Rotary motion is imparted to the central spindle D from the top in any convenient manner, preferably by means of a flexible shaft O and an electromotor P, as indicated by the drawings.

The construction of the motor and of the flexible shaft and the means of coupling the same with the mechanism of the pen may be similar to those used in the case of dental drills, and are not claimed as part of my invention.

As shown by Fig. 2, the rollers K are protected by a casing X, which serves as a guide for the upper end of the driving-spindle D and which is coupled with a short tubular casing Y by a screw-joint. The casing Y in its turn is coupled to the lower end of a short flexible pipe Z, (shown by Fig. 1,) connected at its upper end to the stationary part or protecting-tube of the flexible shaft. The core of the said shaft is a helically-coiled wire connected at the upper end with the armature-shaft of the electromotor and at the lower end with a spindle W, Fig. 2, which is coupled to the upper end of the driving-spindle D by a screw-joint w.

The motor P is mounted on a bed-plate Q, which carries a bearing q' for the armature-shaft and is fixed upon a cylindrical bar q.

The latter is supported by a vertical post S by means of a double sleeve R and an adjustable collar T. The horizontal part of the sleeve R receives the sliding bar q, which can be secured in the desired position by means of a set-screw, while the vertical part of R fits on the cylindrical post S and is supported at the desired height by the adjustable collar T, provided with a set-screw.

s is a spring-arm fixed to the top of the post S and serving to support the flexible shaft O by means of a string or wire s'.

U represents a lithographic stone, and V the table which supports the said stone as well as the post S.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A drawing or stippling pen comprising in its construction a needle and needle-bar, a holder and ink-receptacle adapted to guide the said needle-bar and to supply the needle with ink, and mechanism for imparting to the needle-bar a rotary motion around its axis as well as a to-and-fro motion along the same, substantially as described.

2. In a drawing or stippling pen having a reciprocating needle and needle-bar guided in a holder, the combination of the needle-bar and holder with a simultaneously revolving and reciprocating driving-spindle adapted to transmit its rotary motion upon the needle-bar, and a buffer-spring interposed between the needle-bar and the driving-spindle adapted to transmit the axial motion of the driving-spindle upon the needle-bar until the pressure on the point of the needle exceeds a given limit, substantially as described.

3. In a drawing or stippling pen having a reciprocating needle and needle-bar guided in a holder, the combination of an annular cam-face or roller-path formed on the holder with a continuously-revolving driving-spindle, a cross-head fixed on the said driving-spindle and carrying a pair of friction-rollers adapted to run on the said cam-face, a spring adapted to keep the friction-rollers in contact, and mechanism for transmitting the motion of the driving-spindle to the needle-bar, substantially as described.

4. In a drawing or stippling pen having a reciprocating needle and needle-bar guided in a tubular holder, the combination of an extensible holder provided with an annular cam-face with a revolving driving-spindle adapted to set in motion the needle-bar, a cross-head fixed on the driving-spindle and carrying a pair of friction-rollers adapted to run on the said cam-face, and a spring adapted to press the said rollers against the cam-face, substantially as described.

5. In a drawing or stippling pen having a reciprocating needle and needle-bar, an extensible holder comprising in its construction a pencil-shaped lower part serving as a needle-guide and ink-receptacle, a tubular middle part serving as a lower guide and packing for the needle-bar and connected with the

lower part by a screw-joint, and a tubular upper part serving as a guide for the driving-spindle, substantially as described.

6. In a drawing or stippling pen having a reciprocating needle and needle-bar guided in a holder, the combination of the needle-bar with automatic mechanism for imparting to the same an axially-reciprocating motion from the top of the holder and a compensating-spring placed between the said mechanism and the needle-bar, so as to serve as a buffer between the same, substantially as described.

7. In a drawing or stippling pen having a reciprocating needle and needle-bar guided by a holder, the combination of the needle-bar with a driving-spindle receiving a rotary and a reciprocating motion, a coupling-sleeve, and a compensating or buffer spring interposed between the needle-bar and the driving-spindle, the said parts being arranged and connected with each other in such a manner as to transmit the rotary motion of the driving-

spindle to the needle-bar through the coupling-sleeve, and the reciprocating motion through the spring, substantially as described.

8. The combination of a drawing or stippling pen with a flexible shaft adapted to transmit rotary motion to the mechanism of the said pen, an electromotor adapted to drive the said flexible shaft, a stand provided with a cylindrical column or post, and a bed-plate or arm supporting the said motor and shaft, the said arm being adapted to pivot or turn on the said column or post and to be secured thereto at various heights, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JNO. PHILLIPS.

Witnesses:

CHAS. ROCHE,  
HARRY PETER VENN.