

(No Model.)

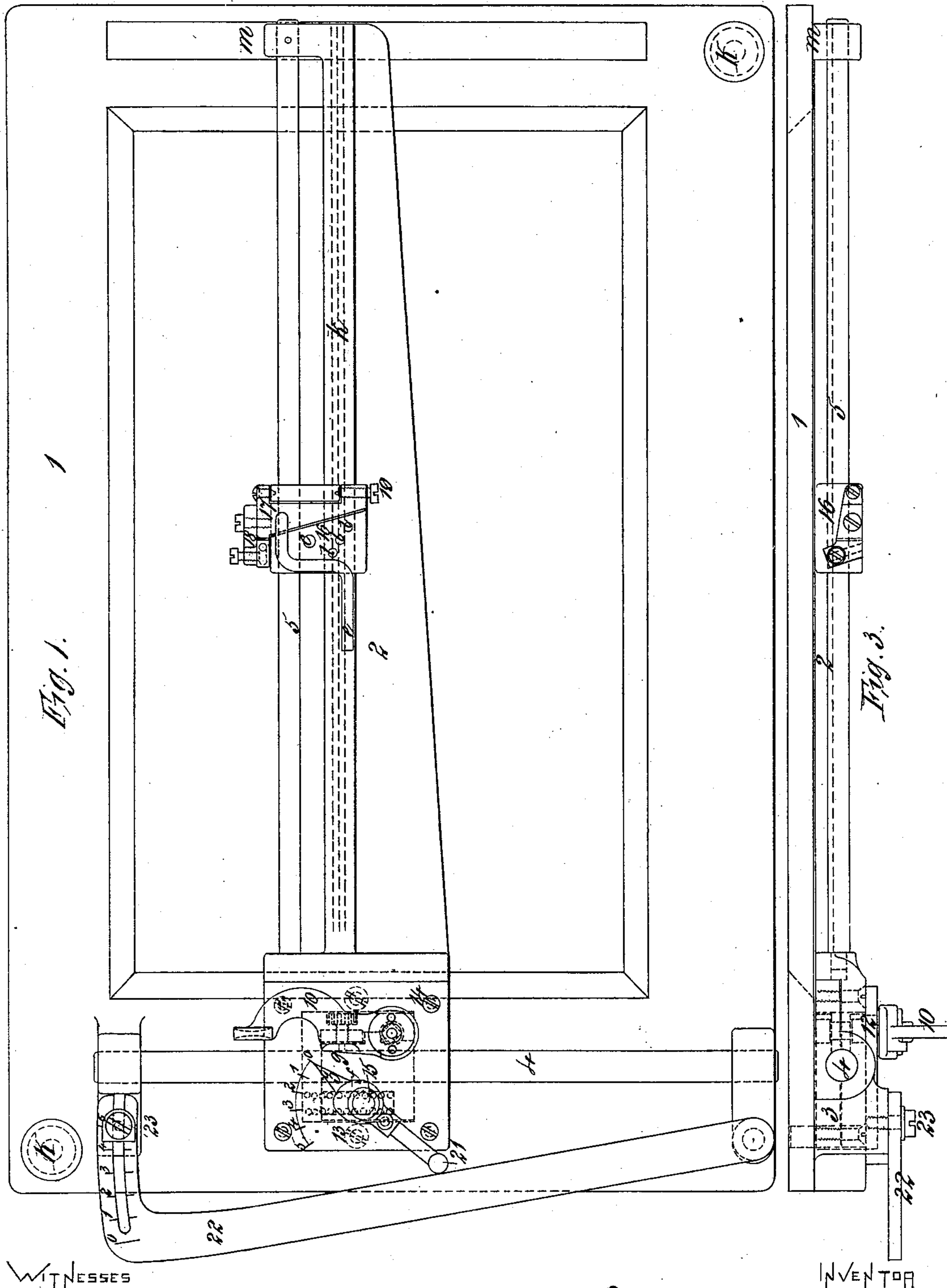
2 Sheets—Sheet 1.

C. HUBER.

APPARATUS FOR HATCHING, RULING, AND DRAWING ON STONE, &c.

No. 247,060.

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WITNESSES
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APPARATUS FOR HATCHING, RULING, AND DRAWING ON STONE, &c.

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To all whom it may concern:

Be it known that I, CASPAR HUBER, a citizen of the Republic of Switzerland, residing at Zurich, in the canton of Zurich, Switzerland, have invented new and useful Improvements in Apparatus for Hatching, Ruling, and Drawing on Stone and other Materials, of which the following is a specification.

This invention has for its object improvements in apparatus for hatching, ruling, or drawing straight, curved, or undulatory lines on stone, steel, copper, wood, or other material, and has reference, first, to means for effecting the feed or intermittent sidewise motion of the marking-instrument in such apparatus; secondly, to means whereby the amount of the feed may be automatically increased or diminished gradually, so that lines may be drawn at gradually increasing or diminishing distances apart; thirdly, to means for effecting the ruling or drawing of undulatory lines; fourthly, to the construction and operation of the slide and holder that carries the marking-instrument. A sliding piece having a long rigid arm is carried at one end on a fixed rod, and is furnished with clamping devices, which embrace the said rod and are free to seize and relax their hold by being moved in recesses and being urged in one direction by a spring. With these clamping-pieces is combined a spindle provided with an eccentric, whereby the clamping-pieces may by turning the spindle be caused to gripe the rod when required. The eccentric-spindle carries a finger which abuts against the sliding arm, and a hand-lever which can be turned through a distance determined by an adjustable stop. The effect of turning the hand-lever and eccentric-spindle in one direction is to lock the clamping-pieces against the rod, so that they form an abutment or fulcrum that enables the finger on the spindle, as the lever moves farther, to push the sliding arm (which carries the marking-instrument holder) forward through a distance depending on the range of motion of the hand-lever. Thus it will be understood that the hand-lever, spindle, and finger form together the mechanism for effecting the feed or intermittent sidewise motion of the marking-instrument. The adjustable stop is

made in the form of an eccentric or cam, and is attached to an index-lever pivoted on a stud. This lever can be secured opposite any point on a scale. The angular motion of the index-lever varies the position of the eccentric-stop with relation to the hand-lever hereinbefore described, and consequently varies the amount of feed imparted to the sliding arm by the motion of the said hand-lever. In the sliding arm are undulating lines or grooves, into either of which a screw or screws on the marking-instrument holder can be entered, so that the said holder, in traveling along the said arm, may be obliged to follow an undulating course. The holder that carries the pen, pencil, diamond, or other marking-instrument is secured to a bracket which is hinged to a slide working along the sliding arm. The lever or handle by which the said slide is moved backward and forward to draw the lines also serves to raise the marking-instrument from the material to be drawn or engraved upon at the end of each course. The index-lever can be left free and be controlled by contact of its unmarked end with an inclined adjustable bar, by which, as the index-lever is carried forward by the intermittent motion of the sliding arm, it is gradually pushed over to automatically alter the distance apart of the lines to be produced.

Referring to the accompanying two sheets of drawings, Figure 1 is a plan of the improved apparatus for hatching, ruling, or drawing straight, curved, or undulatory lines. Fig. 2 is an end elevation of the same. Fig. 3 is a side elevation. Fig. 4 is a side elevation of the slide that carries the marking-instrument as it appears while the line is being drawn. Fig. 5 is a similar view, showing the slide as it appears while being pushed back to the starting position after a line has been drawn. Fig. 6 is a plan of part of the sliding arm, with the hand-lever, index-lever, and cover-plate removed. Fig. 7 is an end elevation of the cover-plate, index-lever, and cam or eccentric. Fig. 8 is a sectional plan of part of the sliding arm, taken in the center line of the rod 4, Fig. 6. Fig. 9 is a vertical longitudinal section in line A B, Fig. 6. Fig. 10 is a vertical longitudinal section in line C D, Fig. 6. Fig. 11 is a verti-

cal cross-section in line E F, Fig. 6. Fig. 12 is a vertical cross-section in line G H, Fig. 6. Fig. 13 is a vertical sectional elevation of the slide which carries the marking-instrument. Fig. 14 shows two elevations of the handle for moving the slide and marking-instrument backward and forward. Fig. 15 shows, on a larger scale, the three undulating lines, each differing from the other, so as to induce corresponding undulations in the lines produced by the marker when the corresponding screw is engaged.

Similar figures and letters of reference indicate like parts in all the figures.

1 is a frame which serves as the base for the other parts of the apparatus. It is faced or covered on its lower side with caoutchouc cloth to form a yielding cushion between it and the surface of the material on which it may be laid. 2 is a sliding arm, forming a guide for the slide 16, which carries the marking-instrument. The rod 5 is supported in bearings at each end in the slide 2, and acts as an additional guide to the slide 16. The fixed rod 4 is secured in bearings upon the frame 1, and is designed, among other purposes, to form a guide and support for one end of the sliding arm 2, which slides at its other end on the plane surface *m*. The mechanism which effects the feed, and which is shown in greater detail in Figs. 6, 7, 8, 9, 10, 11, and 12, is situated at the left-hand end of the sliding arm 2.

3 is a packing or filling piece, secured to the sliding arm 2 by two screws, 13 13, Figs. 1, 6, and 8.

6 is a clamping-piece embracing the rod 4, Figs. 8, 9, and 10, and fitting loosely in a recess in the sliding arm 2.

7 is a second clamping piece or key, fitting in a groove, and secured from moving endwise in the said clamping-piece by the point of the set-screw 8, which takes into a hole bored for its reception in the piece 7.

11 is a helical spring, fitting in a recess in the clamping-piece 6 and abutting against the sliding arm 2.

9, Figs. 8, 10, and 12, is a spindle carried by the clamping-piece 6, and provided with an eccentric or cam-like portion and a square surmounted by a screw at its upper part. Below the squared part is fixed a finger, *a*, Fig. 6, lying in a recess or slot in the cover-plate, Fig. 10, and on the squared part is secured a hand-lever, 10, Figs. 1 and 3. This hand-lever can be turned from the position in which it is shown toward the left hand until it comes in contact with the cam or eccentric-stop *f* attached to the lever 21, which is provided with the index-finger *z* and the screw 15, by which it can be secured in any position with regard to the scale numbered 0 to 5. The marking-instrument *i* is fitted in a socket or holder, 18, which is secured to a bracket, 17, carried between centers on the slide 16. Either of the screws *l* can be set down until its point engages with one of the three different undulatory grooves *k*, and thereby form a guide to oblige the slide to

carry the marking-instrument along an undulatory path. The slide 16 is moved backward and forward by the handle 20, Figs. 4, 5, and 14, which is pivoted to the stud *b*. The hole *c* receives the stud *b*. The toe *d* of the lever 20 stands under a part of the arm *e*, which is provided with the weight *h*, and serves to raise, through the interposition of the arm *e*, the marking-instrument from the material to be engraved at the end of a line. The marking-instrument must be raised previous to and during its return motion and be lowered with its point on the exact position for commencing the next line. K K are handles for lifting the whole.

The operation of the apparatus is as follows: It is laid upon the surface or material to be drawn or engraved upon. The stud *b* of the handle 20 is placed in the hole *c* and the marking-instrument, carried in the holder 18, adjusted to the position for the first line, commencing at the left-hand side. The slide is drawn from left to right by the handle 20, held in the position shown in Fig. 4, and on the completion of the line is pushed back by the handle, after the said handle has been lowered into the position shown in Fig. 5, to the starting-point. Simultaneously with the return of the slide the hand-lever 10 is pushed over by the left hand of the operator until it comes against the stop *f*. The angular motion of the hand-lever rotates the spindle to which it is attached and brings its eccentric or cam-like portion to bear against the clamping-piece 7, thereby causing the two pieces 6 and 7 to tightly embrace the rod 4, so that they form an abutment or fulcrum, that enables the finger *a* on the spindle (as the lever is moved farther) to push against the cover-plate 12 and to move the sliding arm forward through a distance dependent on the range of motion of the hand-lever. On the return of the arm to its original position the spring 11 pushes the clamping-piece again to the end of the recess, thereby actuating the feed mechanism and carrying the sliding arm sidewise through a space equal to the pitch or distance from center to center of adjoining lines. The bar 22 is pivoted at one end and secured at the other end by the set-screw 23. Its angular position with regard to the rod 4, and consequently with regard to the path of the sliding arm, may be varied, a slot being provided through which the set-screw passes for the purpose.

When it is desired to rule undulating lines one of the screws *l* is turned so as to enter one of the grooves *k* and receive therefrom an undulating or rocking motion, which, though slight, is sufficient to impart the required vibrations to the point of the marker *i*.

It will be understood that the grooves *k* are undulatory in the vertical direction, and rock the marker by causing it and its connections to turn slightly on the rod 5 as an axis.

When the machine is to be used for ruling lines at gradually-increasing distances, the range of motion of the hand-lever 10 is auto-

5 matically increased at each operation of the feed mechanism by the index-lever 21 receiving an angular movement resulting from its being carried forward while its end is in contact with the inclined bar 22. The movement of the index-lever 21 partially rotates the cam or eccentric *f* and varies the limit of the travel of the hand-lever.

10 It will be evident that the details of construction of this mechanism are susceptible of modification without departure from the essential characteristics of the invention.

15 The apparatus may be constructed to trace convergent lines by joining the sliding arm 2 to the feed mechanism by a pivot or hinge-joint and by providing a suitable support for its other end.

What I claim is—

20 1. In a drawing apparatus, the combination, with a spindle, *g a*, and spring 11 for effecting the feed or intermittent sidewise motion of the marking-instrument, of a clamping device, 6 7 8, adapted to serve substantially as set forth.

25 2. In a drawing-machine, the combination, with the sliding arm 2 (serving as a guide for the marking-instrument) and a rod or device, 5, along which that arm is adjustable, of clamp-

ing-pieces 6 7 8, a spindle, 9, with an eccentric or cam, *f*, a finger or projection, *a*, and a spring, 11, as and for the purposes specified. 30

3. In an apparatus for hatching, ruling, and drawing on stone or other material, the combination, with the feed mechanism, of an eccentric or curved stop, a lever, and an inclined adjustable bar, the whole arranged so that the amount of feed or intermittent sidewise motion of the marking-instrument can be determined by means of the said eccentric or curved stop controlled by said lever and inclined adjustable bar, substantially as described. 35 40

4. In an apparatus for hatching, ruling, and drawing on stone or other material, the combination, with the slide that carries the marking-instrument, traveling upon an axis about which it is capable of oscillation, of a guide constructed with vertically-undulating grooves arranged so as to cause the marking-instrument to travel in a sinuous course, substantially as set forth. 45

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Witnesses:

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