C. A. G. PFANNE.

DEVICE FOR GRAINING LITHOGRAPHIC STONES.

APPLICATION FILED JUNE 30, 1910.

990,384. Patented Apr. 25, 1911.

4 SHEETS—SHEET 1.

Fig. 1.

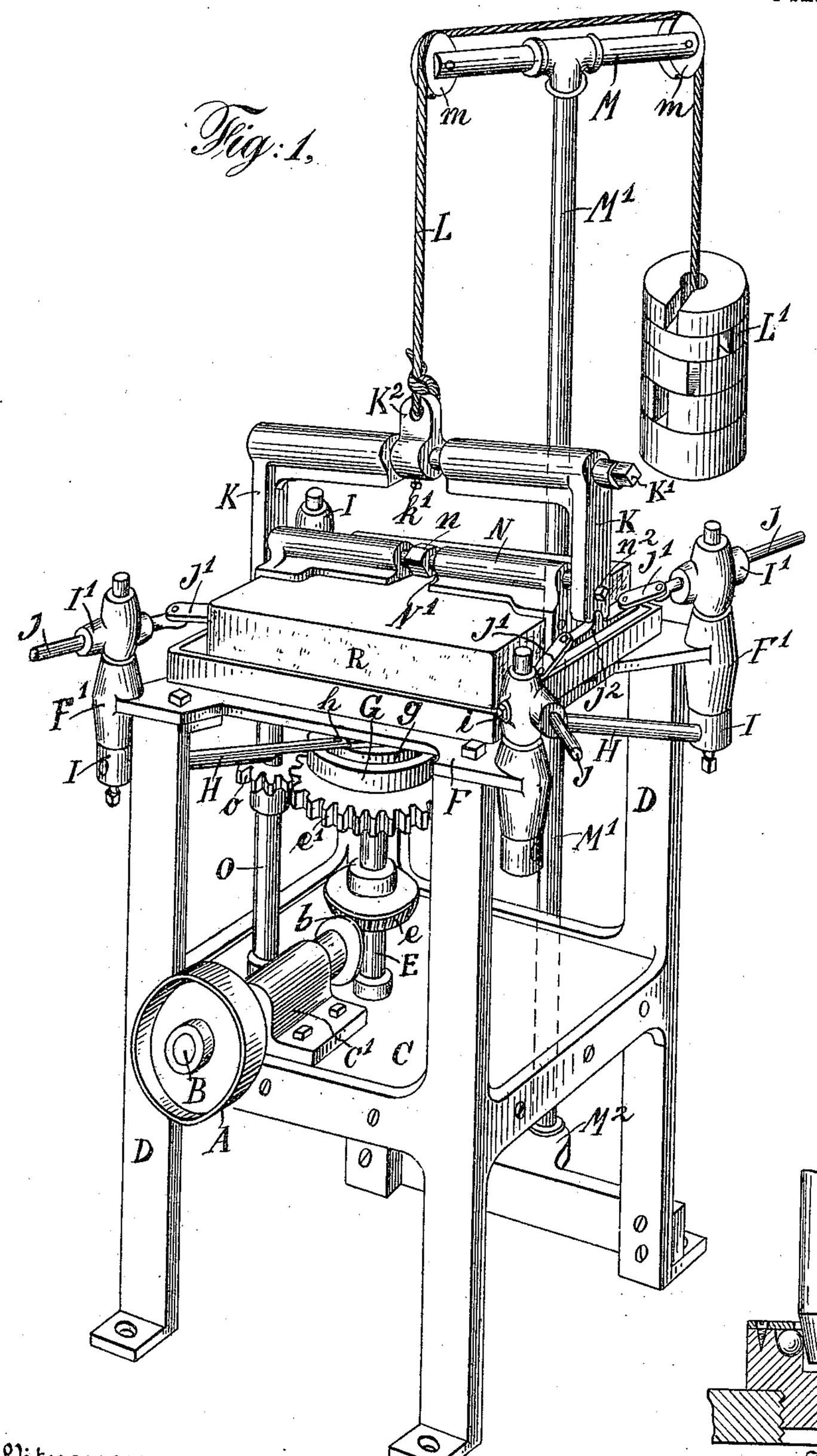
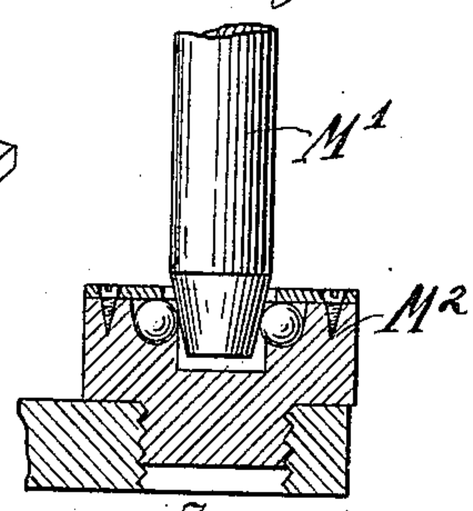


Fig. 7.



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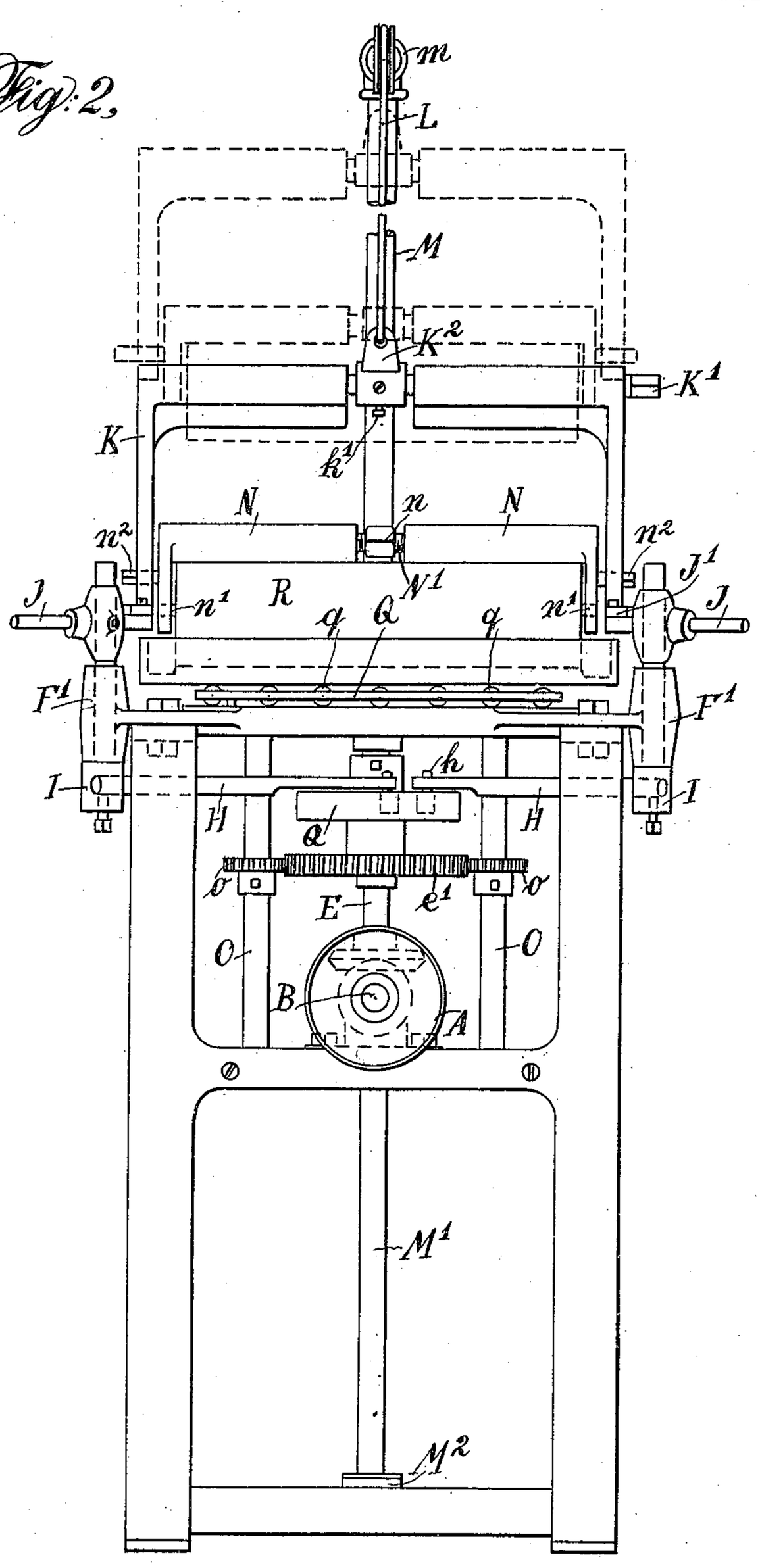
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

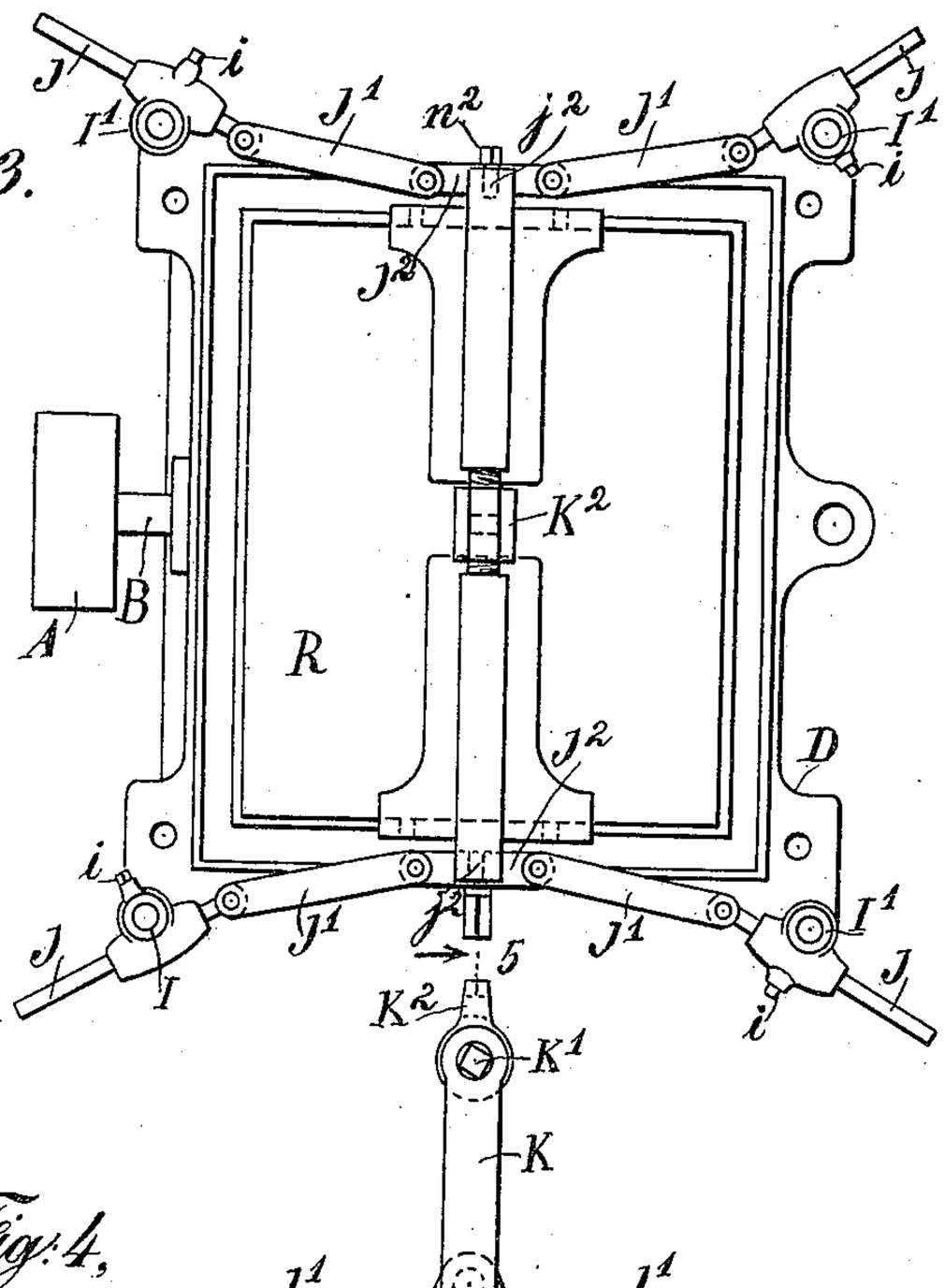
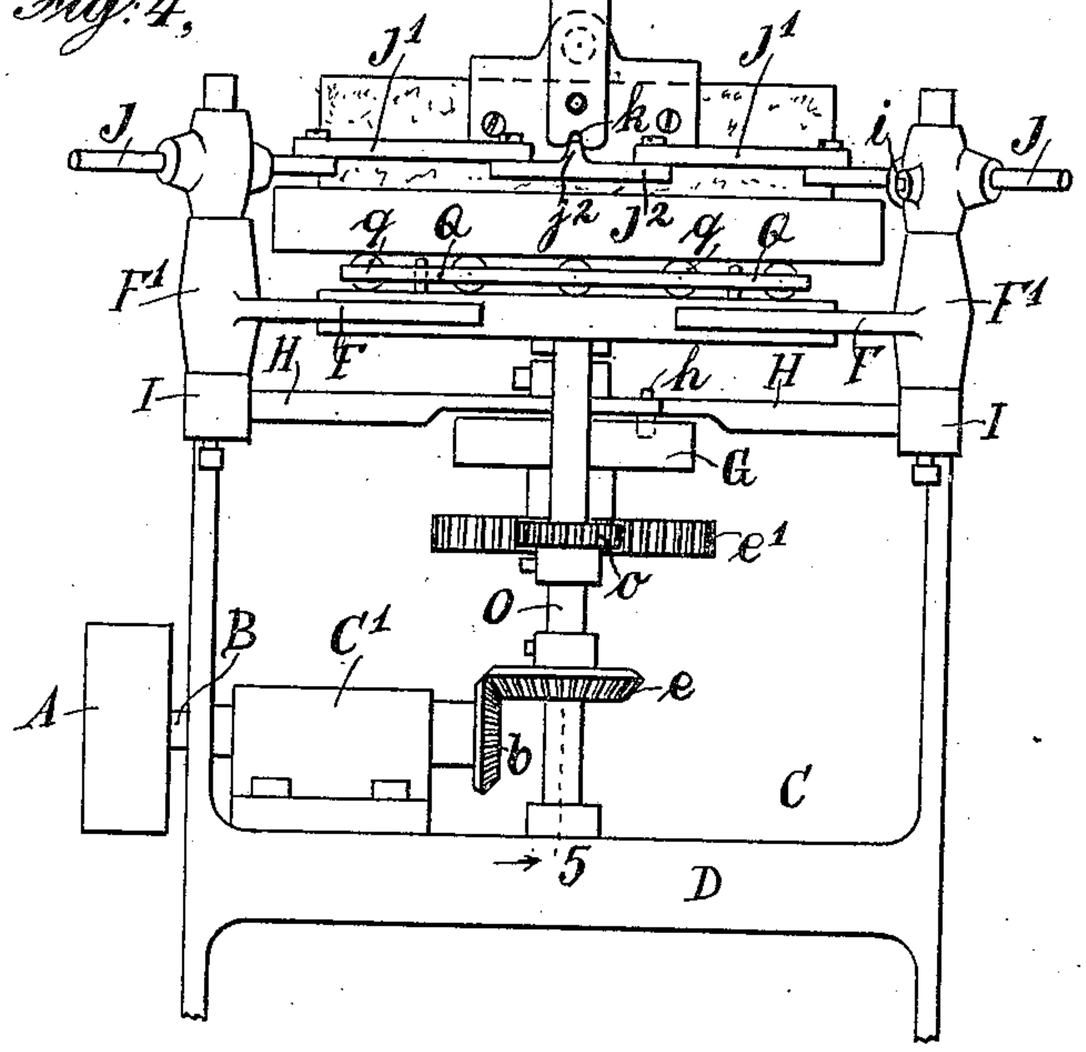


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 6.

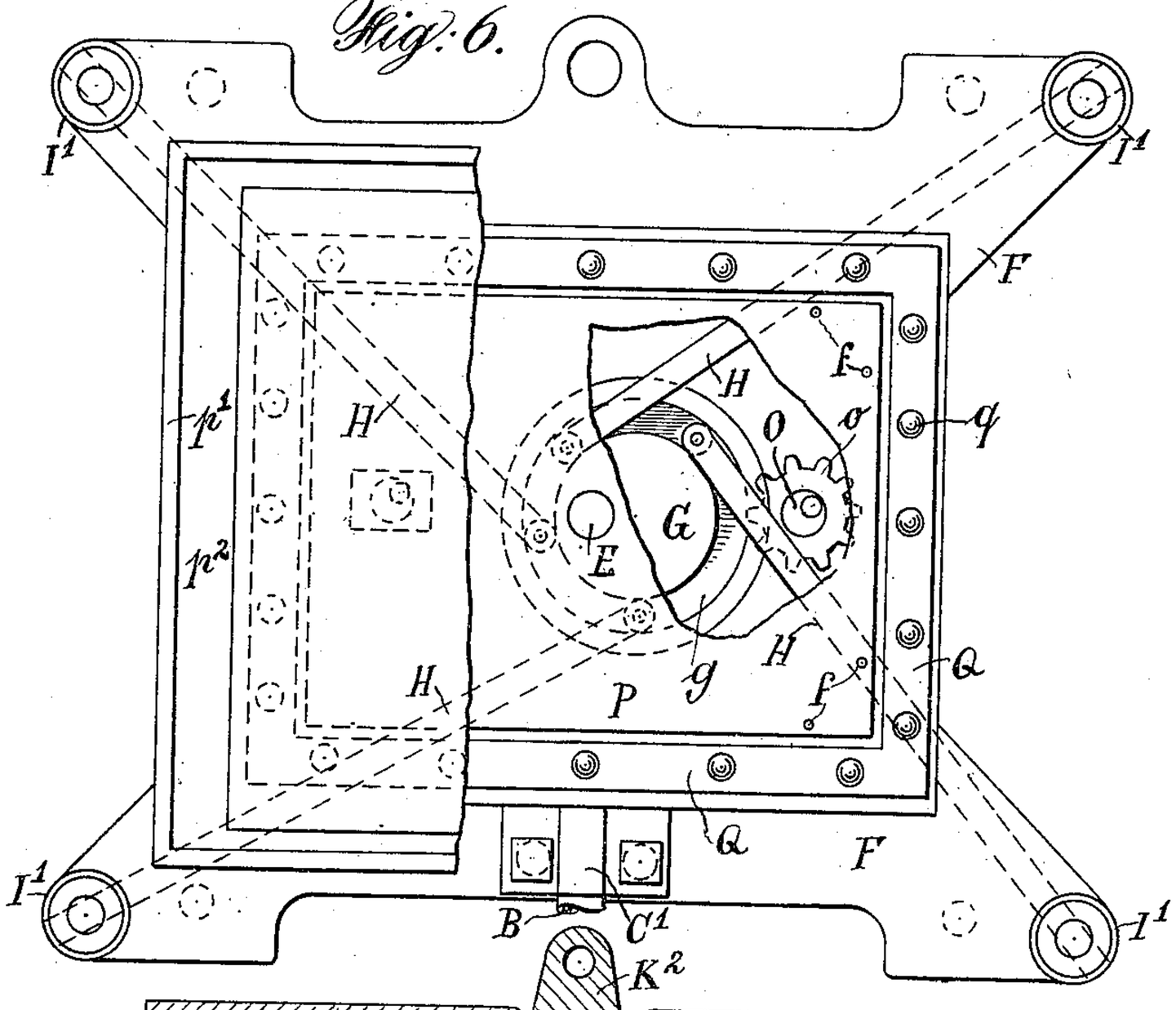
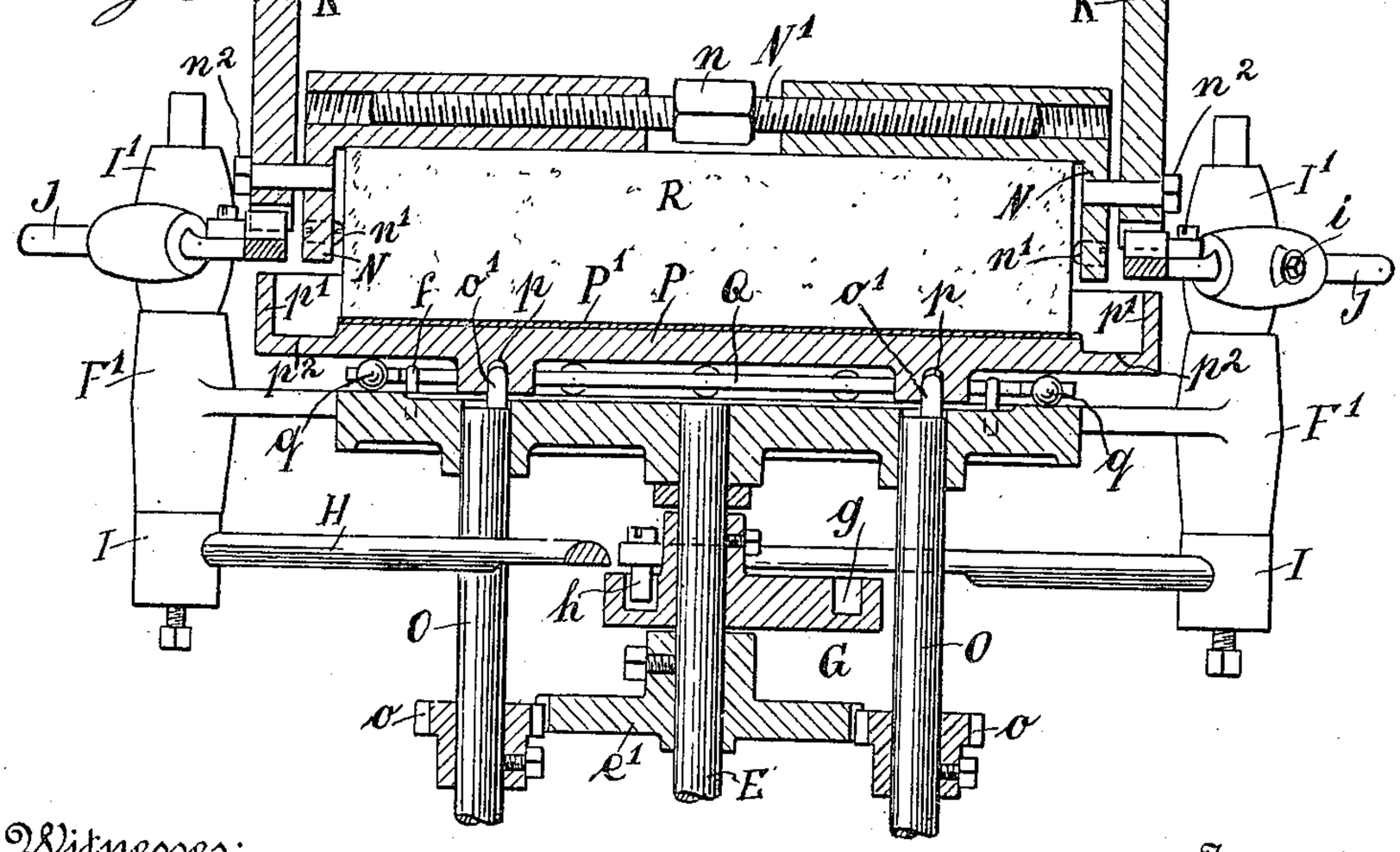


Fig. 5



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UNITED STATES PATENT OFFICE.

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DEVICE FOR GRAINING LITHOGRAPHIC STONES.

990,384. Specification of Letters Patent. Patented Apr. 25, 1911.

Application filed June 30, 1910. Serial No. 569,646.

To all whom it may concern:

Be it known that I, CARL A. G. PFANNE, a citizen of the United States of America, and a resident of Hoboken, county of Hudson, State of New Jersey, have invented certain new and useful Improvements in Devices for Graining Lithographic Stones, of which the following is a specification.

This invention has reference to improvements in devices for graining lithographic stones by means of which the graining surface required by the artist is produced as well as if the stone were grained by the most skilled handwork. In addition thereto the stones are grained in a fraction of the time required for hand graining and naturally more uniform results are obtained.

The invention is illustrated in the accompanying drawings in which:

Figure 1 represents in perspective view a device for graining lithographic stones embodying in desirable form the present improvements. Fig. 2 shows same in front elevation. Fig. 3 is a plan view of the device shown in Figs. 1 and 2 partly broken away. Fig. 4 is a like view in side elevation. Fig. 5 is a sectional view on line 5—5 of Fig. 4. Fig. 6 is a top plan view of the device shown in Figs. 1 and 2 with parts broken away and Fig. 7 illustrates in sectional view a detail.

Similar characters of reference denote like parts in all the figures.

In the drawings A designates a pulley or wheel, shown as affixed to a shaft, as B. The wheel A may be turned by any desired means of power. The shaft B is shown as working in a sleeve, C^1, cast on or secured to a plate, as C. This plate C may be made integral with or secured in any desired manner to the frame D.

The shaft B is shown as provided with a gear wheel *b* which meshes with another gear wheel as *e* on a shaft, as E. This shaft E is shown as mounted between the plate C and another plate F. The last mentioned plate may also be made integral with or secured in any desired manner to the frame D.

As shown, the shaft E is provided with a cam, as G, having a groove *g* therein. Into this groove *g* rollers, as *h* are shown as fitted. These rollers *h* are shown as attached to rods H, and the rods H are shown as fastened to pieces, as I. These pieces I are shown as passing through bearings, as F^1, on extensions of the plate F.

To the pieces I cross sleeves, as I^1, are shown as secured, and in these cross sleeves I^1 rods as J are shown as inserted. Two of the cross sleeves I^1 are shown as provided with screws *i* and the other two of the cross sleeves are shown as not provided with screws *i*. The screws are intended to fasten the cross sleeves I^1 which are so provided with such screws to the rods J which are inserted in them. Failure to provide any means for fastening the other two cross sleeves to the rods J inserted in them leave these rods J, not so fastened, free to ride in their cross sleeves I^1.

To the rods J links, as J^1, are shown as attached. These links J^1 are shown as also attached to center links, as J^2, and projections j^2 are shown as provided on the upper sides of these center links J^2. The projections j^2 are intended to fit in suitable openings *k* provided in the lower ends of brackets, as K. The brackets K are shown as held together by a right and left hand screw as K^1, and this screw K^1 is shown as provided at one end with a head so that it may be easily turned to adjust the brackets K relatively to each other.

K^2 designates a loose fitting sleeve surrounding a portion of the screw K^1. This sleeve K^2 may be held in position on the screw K^1 by means of a screw as k^1.

L designates a rope shown as fastened at one end to the sleeve K^2. This rope is shown as passing over grooved rollers *m* and as having adjustable weights as L^1 attached to the other end thereof. The rollers *m* are shown as mounted in a cross bar, M, supported upon a shaft, as M^1, and this shaft M^1 is shown as extending through an opening in the plate F and as resting in a ball bearing fixture M^2 in the base of the machine, as shown in detail in Fig. 7.

N designates brackets shown as held together by a right and left hand screw as N^1, which screw is shown as provided at about its center with a head *n* to enable the screw to be readily turned. The brackets N are also shown as having pins as n^1 by which the stone may be securely bolted in the brackets N. The brackets K and N are shown as fastened together by bolts, n^2, and these bolts n^2 act as hinges on which the stone may be turned.

The shaft E is shown as provided with a gear wheel e^1 which meshes with other gear wheels *o* on the shafts O. These shafts O are shown as mounted between the plates C

and F and as having projections o^1 on their upper ends. These projections o^1 are intended to fit into openings p in the under side of a plate, as P. The projections o^1 are so arranged that as they travel around in the openings p the plate P will receive an eccentric motion. The plate P is shown as provided with a rim p^1 and as having a grooved space p^2 inside the rim p^1. A plate P^1 of hardened material, such, for instance, as glass or steel, may cover the surface of the plate P inside the grooved space p^2. The plate P is shown as resting on a frame Q provided with ballbearings as q. Guide pins, as f, may be provided to retain the frame Q in position.

I will now describe the mode of operation of the machine.

A lithographic stone as R is placed on the surface of the plate P inside the grooved portion p^2 thereof. The brackets N are securely fastened to the sides of the stone R by the adjustment of the screw N^1, and the brackets K are adjusted to proper position by turning the screw K^1. The brackets N and K are then fastened together by the bolts n^2. The surface of the stone R which is to be grained, will of course, rest on the surface of the plate P. The surface of the plate P having had placed thereon a sufficient quantity of graining material, such for instance as sand and water, the wheel or pulley A is caused to revolve, thereby causing the revolution of the shaft B, and from the shaft B motion is transmitted to the shaft E by means of the gearings which mesh with each other. The revolution of the shaft E also causes the revolution of the shafts O, through the instrumentality of the gearings e^1 and o. The revolution of the shaft E gives motion to the cam G, and the rollers h which work in the grooves g of the cam G in turn cause the movement of the rods H. These rods H in turn move the pieces I and with them the cross sleeves I^1. The two cross sleeves I^1 to which the corresponding bars J are fastened by the screws i move such bars J and these bars transmit movement to the links J^1, and through the links J^1 to the center links J^2. The projections j^2 on the center links J^2 projecting into suitable openings in the brackets K move the brackets K and these brackets K in turn move the brackets N which are secured to the stone R. The motion of the cam G thereby gives the stone R a reciprocating movement. The pieces I which are not fastened in their corresponding sleeves I^1 meanwhile play in their sleeves. While this reciprocating movement is being given to the stone R the shafts O are carrying around their projections o^1, thereby giving an eccentric movement to the plate P on the surface of which the stone R rests. In this way the grains of sand to which the surface of stone R is exposed are caused to so move that any design which may have been upon this surface of the stone R when it was placed on the plate P will be speedily removed. The counter-balancing weights L enable the weight with which the stone R is held against the plate P to be so adjusted as to meet the requirements of the operator. When the operator desires to raise the stone to see how the work is progressing he may, with slight effort and, if desired, by adding weights to the pile L^1 raise the stone R up from the plate P, and when the stone R has been raised to a sufficient height he may then turn it around on the bolts n^2 to expose the surface of the stone R to examination. It will of course be understood that the brackets K will be so shaped that they will not interfere with the turning of the stone R on the bolts n^2. If on examination the operator finds that the design on the stone R has not been satisfactorily removed he simply lowers the stone back onto the surface of the plate P and permits the machine to complete the effacement of the design. When the design has been satisfactorily removed the graining material to which the stone has been exposed may be removed and in place thereof other graining material may be placed on the plate P and the operation of the machine continued until the surface of the stone has been given that grained surface which is required by the artist. When the work of graining the stone is completed the stone may be raised and turned around by means of the cross bar M and lowered to a carriage. When the stone has been loosened from the brackets in which it was held the machine is ready for the next stone.

I claim as my invention:

1. A device for graining lithographic stones, comprising a plate on the top surface of which the lithographic stone is placed, means for imparting an eccentric motion to said plate, stone clamping and supporting devices, means for imparting reciprocating motion to said devices, and a device for counter-balancing partly the weight of the stone during graining.

2. In a device for graining lithographic stones, a ballbearing supported plate having recesses in its bottom surface portion and a smooth top surface on which the stone is placed, rotatable shafts below having projections which extend into the recesses of the plate so arranged that eccentric motion is imparted to the plate, means for clamping and supporting the stone, and means for imparting reciprocating motion to the stone clamping devices.

3. In a device for graining lithographic stones, a plate having recesses in its bottom surface portion and a smooth top surface on

which the stone is placed, a ballbearing device upon which the plate rests, means for holding said device in position, and rotatable shafts below having projections which extend into the recesses of the plate so arranged that eccentric motion is imparted thereto.

4. In a device for graining lithographic stones, a shaft, a cam operated by said shaft, rods moved by said cam, pieces to which said rods are fastened, sleeves secured to said pieces, bars passing through said sleeves, links attached to said bars, and means for transmitting the motion of said links to the stone, substantially as specified.

5. In a device for graining lithographic stones, a ballbearing supported plate having recesses in its bottom surface portion, rotatable shafts below having projections which extend into the recesses of the plate to impart eccentric motion thereto, means for clamping and supporting the stone, and a cam operated device for imparting reciprocating motion to the stone clamping device and stone.

6. In a device for graining lithographic stones, a ballbearing supported plate having recesses in its bottom surface portion, rotatable shafts below having projections which extend into the recesses of the plate to impart eccentric motion thereto, means for clamping and supporting the stone, a shaft with cam, rods moved thereby, pieces connected to said rods, sleeves on said pieces, bars passing through the sleeves, links attached to the bars, and means for transmitting the motion of said links to the stone.

7. In a device for graining lithographic stones, adjustable brackets, brackets in connection with the first, links, means for detachably connecting the links and brackets, links connected to said first mentioned links, bars attached to the links, heads into which the bars are inserted, pieces secured to said heads, rods attached to said pieces, a cam, means whereby said rods are attached to said cam, and means for moving said cam.

8. In a device for graining lithographic stones, the combination of a shaft, a cam on said shaft, rods operated by said cam, pieces to which said rods are fastened, sleeves secured to said pieces, bars passing through said sleeves, links connected to said bars, other links connected to the first mentioned links, projections on said links secondly mentioned, brackets extending within reach of said projections, openings in said brackets into which said projections may fit, means for adjusting said brackets and a counter-weight attached to said brackets.

9. In a device for graining lithographic stones, the combination of a shaft, a cam operated by said shaft, rods operated by said cam, pieces to which said rods are fastened, sleeves secured to said pieces, bars held in said sleeves, links connected to said bars, other links connected to said first mentioned links, projections on said secondly mentioned links, brackets within reach of said projections having openings in said brackets into which said projections may fit, means for adjusting said brackets, a counter-weight attached to said brackets, other brackets, means for adjusting said last mentioned brackets and means for connecting said last mentioned brackets with the first mentioned brackets.

10. In a device for graining lithographic stones, the combination of a shaft, a cam operated by said shaft, rods operated by said cam, pieces adjusted to said rods, heads secured to said pieces, bars held in said pieces, links attached to said bars, other links attached to said first mentioned links, projections on said secondly mentioned links, brackets within reach of said projections, openings in said brackets into which said projections may fit, means for adjusting said brackets, other brackets attached to the first mentioned brackets, means for adjusting said secondly mentioned brackets, a counter-weight attached to said first mentioned brackets, shafts having projections thereon, a plate having openings on its under side into which said last mentioned projections may fit, said projections being so arranged that when the shafts last mentioned are revolved said plate will be given an eccentric motion, a movable frame on which said plate rests, and means for holding said plate in position.

Signed at Jersey City, N. J., this 28th day of June, 1910.

CARL A. G. PFANNE.

Witnesses:
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Corinne Myers.