

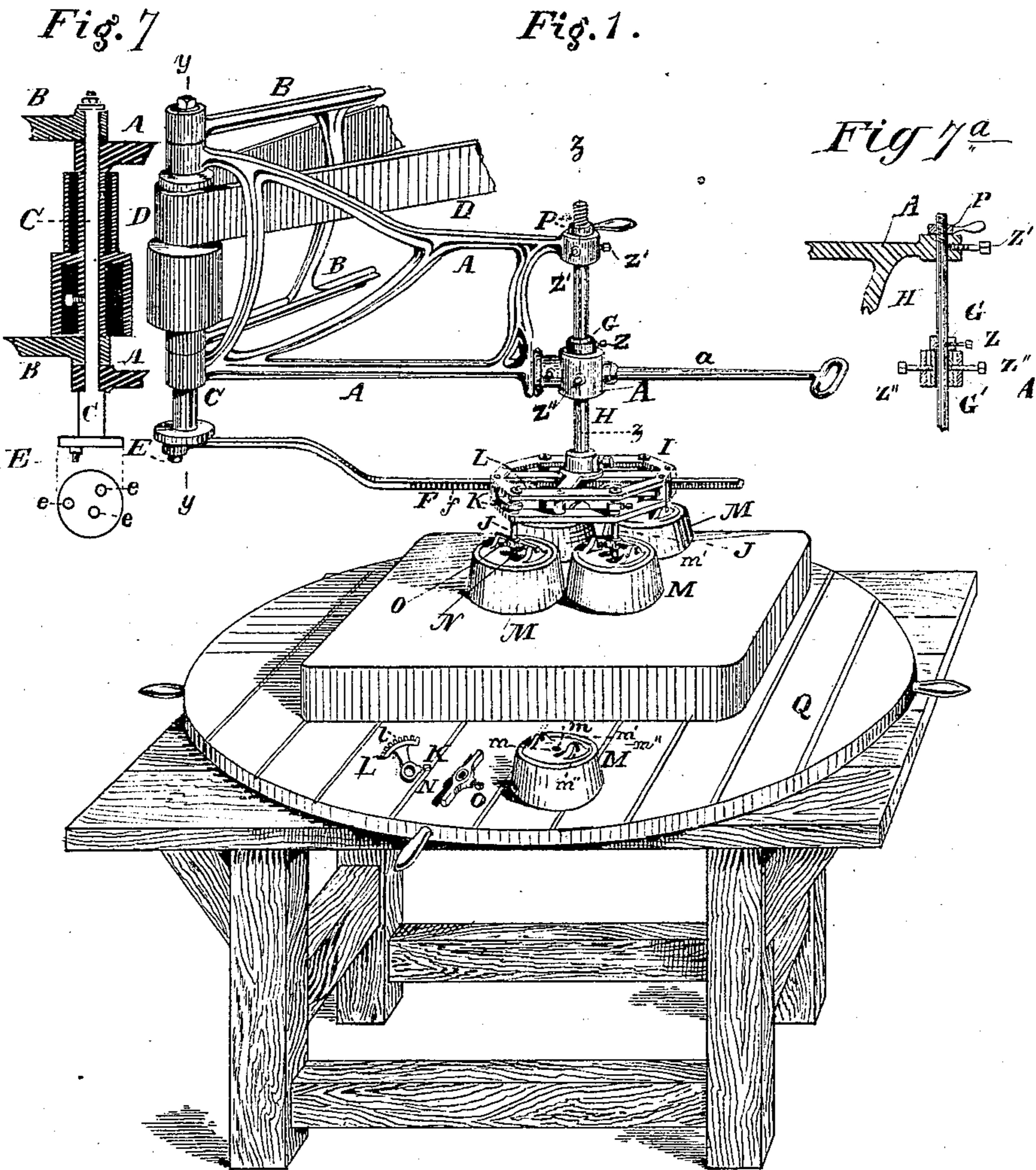
(No Model.)

3 Sheets—Sheet 1.

C. N. MORRIS.
GRAINING DEVICE.

No. 253,086.

Patented Jan. 31, 1882.



Witness.
L. M. Hopkins
Harry E. Knight

Inventor.
Charles N. Morris
Ray Knight Bros.
Atty's

(No Model.)

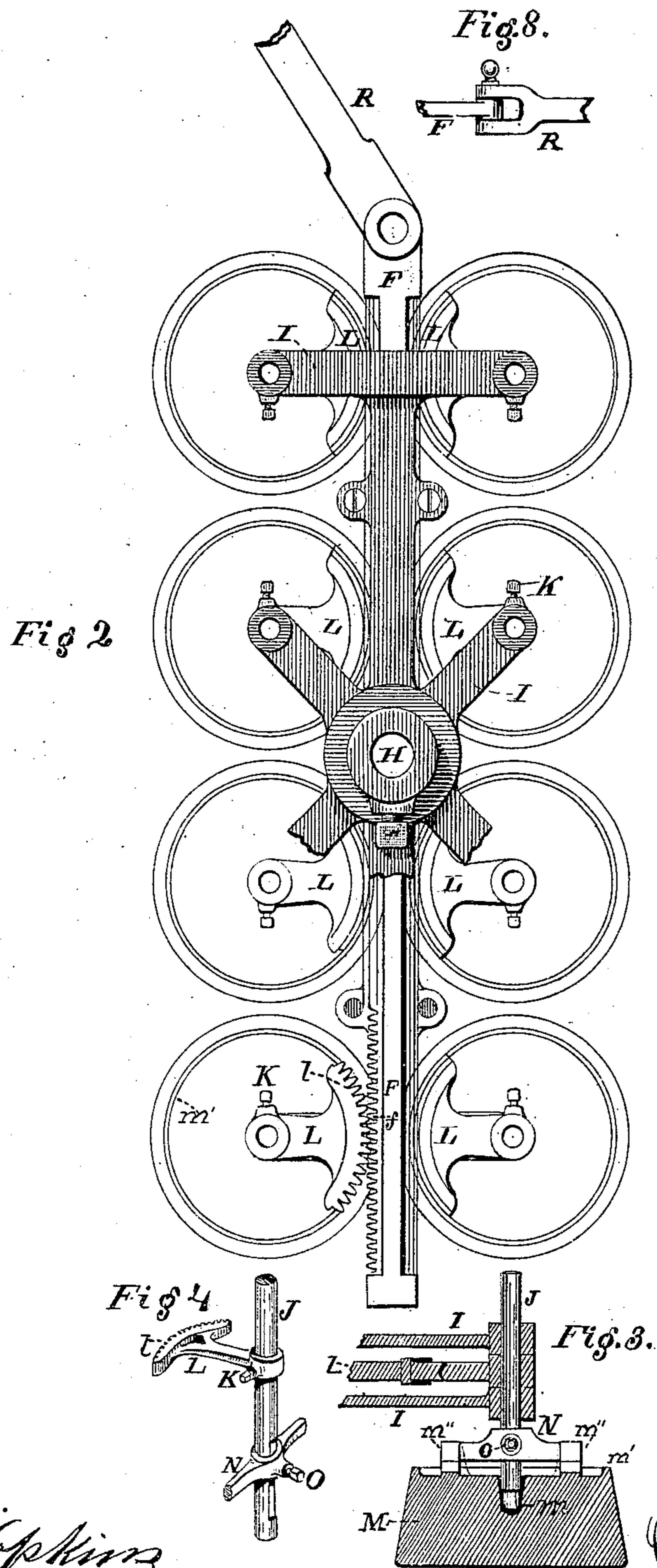
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By *L. Knight Bros.* Attys.

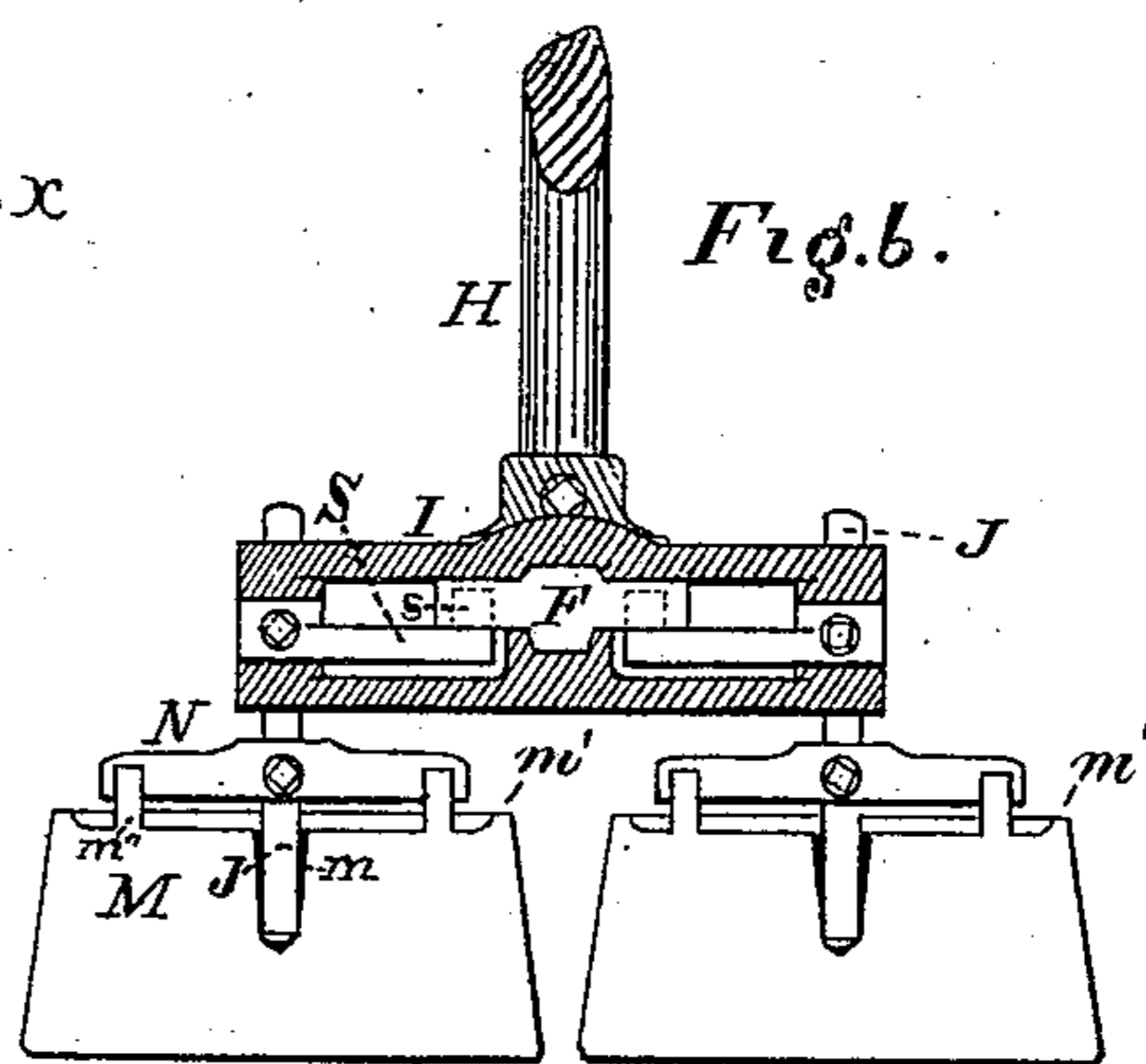
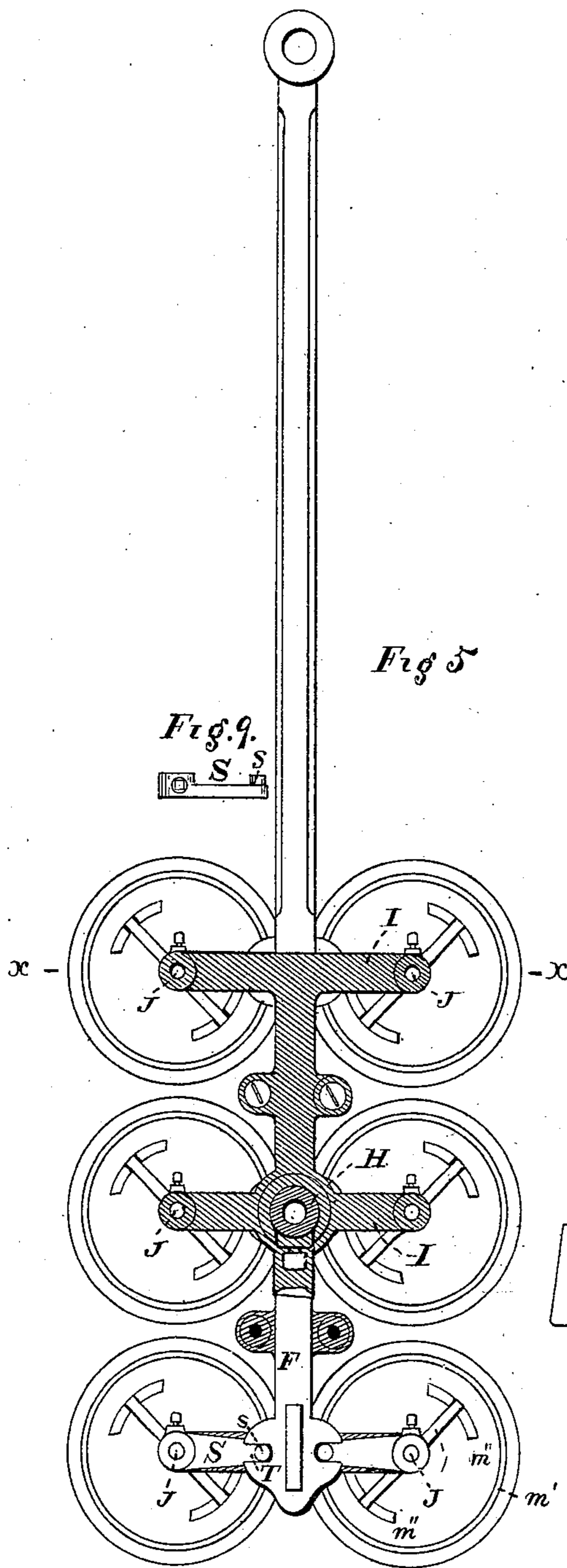
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UNITED STATES PATENT OFFICE.

CHARLES N. MORRIS, OF CINCINNATI, OHIO.

GRAINING DEVICE.

SPECIFICATION forming part of Letters Patent No. 253,086, dated January 31, 1882.

Application filed September 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES N. MORRIS, of Cincinnati, Hamilton county, Ohio, have invented a new and useful device for graining lithographic stones and zincographic and like plates, and for imparting a ground surface to window-glass, &c., of which the following is a specification.

In common with my invention patented January 18, 1881, No. 236,824, my present invention relates to mechanism for producing the proper "grain" or plain granular or dulled surface upon a lithographic stone, or upon a zinc or other plate or slab to adapt it to receive a crayon or pen drawing for printing purposes, and also for producing a ground or dulled surface upon window or other glass by the action, in conjunction with any suitable abradant, of one or any desired number of masses automatically moved and resting by their weight upon the surface to be grained. In my patented device aforesaid the graining masses (grainers proper) were cones or cylinders (journaled about their axes, which were horizontal) which rested by their peripheries upon the work over which they rolled in cyclonic paths. In my present improvement the grainers are preferably likewise of conical or cylindrical form; but their axes, instead of being horizontal, are vertical. Instead of resting by their peripheries, my improved grainers rest by their bases, upon the work; and their motion, instead of being a rolling one, as in my former device, is an oscillatory rubbing one in the plane of the surface to be ground, their action in that respect being closely analogous to that of the customary hand-worked grainers. By these means the abradant is more evenly distributed over the work, the grainer operating to spread and level accumulated masses of sand, instead of rolling over and pressing them into the face of the plate, as my former device was liable to do.

In the accompanying drawings, Figure 1 is a perspective view of a form of my device adapted for the simultaneous use of four grainers. Fig. 2 is a top view of a group of eight grainers with portions of bearing-frame and oscillating rack. Fig. 3 is an axial section through one of the grainers. Fig. 4 is a perspective view, showing a portion of one of the grainer-shafts with its attachments. Fig. 5 is a top

view of a group of six grainers with portion of bearing-frame and a modified form of oscillating rack. Fig. 6 is a transverse section of the same on line xx in Fig. 5. Fig. 7 is a section on line yy in Fig. 1. Fig. 7^a is a vertical section on the line zz , Fig. 1. Fig. 8 is a top view of the joint that connects the pitman with the rack-bar. Fig. 9 is a side view of the upper oscillating arm shown in Fig. 5.

A may represent the outer, and B a portion of the inner, member or leaf of a folding crane, which, except as hereinafter explained, is such as represented in my aforesaid patent. The said outer leaf has a rigidly-projecting handle, a , as in said patent.

The pintle C, by means of which the members A and B are hinged together, is, as in my said patent, driven by a band, D, from the counter-shaft, but differs from said patent in carrying at its lower extremity a wrist-pin, E, which is engaged in one end of a reciprocating rack, F. The wrist E being screwed in one or other of the sockets e at a less or greater distance from the center, any desired stroke of rack is secured.

The outer end of the outer leaf, A, instead of carrying a rotary shaft, as in my former patent, receives and holds (to its proper vertical height while permitting oscillation upon its axis by means of set-screw Z and collar G) the stem or shank H of frame I, within which are journaled a series of vertical shafts, J. The collar G rests upon a sleeve, G', supported by set-screws Z' Z'. (See Fig. 7^a.)

Fastened to each shaft J by set-screw K is a segment-rack, L, whose cogs l gear in the corresponding cogs f of bar F. This segment-rack or a suitable collar supports said shaft at proper height in its bearing. The lower end of each shaft J engages in a tapering cavity, m , in top of a grainer, M, of zinc, iron, glass, stone, or any other suitable material or composition, and preferably of the represented truncated conical shape, and with a raised margin, m' , to catch any drippings of oil from shaft J.

A cross-bar, N, secured by set-screw O to shaft J, and engaging in notched lugs m'' , that project upward from the grainer, communicates to the grainer the oscillatory motion of the shaft.

The upper portion of shank H, being screw-

threaded, takes a nut, P, whose rotation in one direction operates to elevate the portions H I J K F N O clear of the grainers, so as to permit of their removal or replacement, and
 5 whose rotation in the contrary direction operates to engage the shafts J and the bars N with their proper grainers, the stem being held steady by set-screws Z' Z'.

The slab or plate to be grained may be supported on any firm level table; but in practice I prefer to support it upon a turn-table, Q, so as to enable the shifting of the work at discretion of the operator.

I reserve the right to vary the above in non-essential particulars. For example, the rack-bar, instead of being coupled direct to the wrist-pin, may be connected therewith by an intermediate link or pitman, such as R, Figs. 2 and 8. When thus arranged the set-screws Z'' (see
 20 Figs. 1 and 7^a) are closed so tightly upon the stem H as to constitute the latter a rigid projection from the outer member of the holding-frame. An arm, S, projecting from the grain-er-shaft, having a pin, s, which engages in a
 25 notch, T, on the rack-bar, (see Figs. 5, 6, and 9,) may dispense with the necessity of segment-rack L and the cogs on the rack-bar.

It will be seen that the arrangement is such as to avoid imposing any of the weight of the
 30 driving and guiding mechanism upon the grainers, which therefore rest simply by their own proper weight upon the plate.

It is of course understood that water and fine sand or other suitable abrasives are employed in association with the grainers, and also that one or more grainers may be omitted for jobs which do not require the full complement. For example, for very small jobs a single grainer is used in the form shown in
 40 Fig. 1, the other members of the group being for the time being removed.

I claim as new and of my invention—

1. An apparatus for imparting a dulled level surface to lithographic slabs, &c., consisting of one or more flat-bottomed grainers, vertical
 45 shafts adapted to oscillate the grainers, driving-bar engaging with the said vertical shafts, a supporting-frame for the shafts, and pintle C, having wrist-pin E, and rotated by suitable mechanism, as set forth. 50

2. In a graining apparatus, one or more separable grainers capable of resting by their flat bottoms upon the work, and having central perforations, *m*, and notched lugs *m''*, in combination with oscillating driver J N, upheld in
 55 folding crane A B, and driven by an oscillating connection with reciprocating bar F upon eccentric E in said crane, substantially as set forth.

3. A power-driven grainer separable from
 60 the driving mechanism, capable of resting by its proper weight by one flat end upon and of being oscillated in the plane of the work, and having in its crown the central perforation, *m*, raised margin *m'*, and notched lugs *m''*, sub-
 65 stantially as set forth.

4. The combination of one or more grainers having vertical projections, the folding bearing-crane A B, rotating pintle C, prolonged
 70 downward, wrist-pin E, reciprocating bar, supporting-frame, and vertical shafts J, each shaft having an arm at top and a cross-bar at bottom, the said arm being engaged by the reciprocating bar, and the cross-bar engaging with the projections on the grainers, as and for the
 75 purpose set forth.

In testimony of which invention I hereunto set my hand.

CHAS. N. MORRIS.

Attest:

GEO. H. KNIGHT,
 SAM'L. S. CARPENTER.