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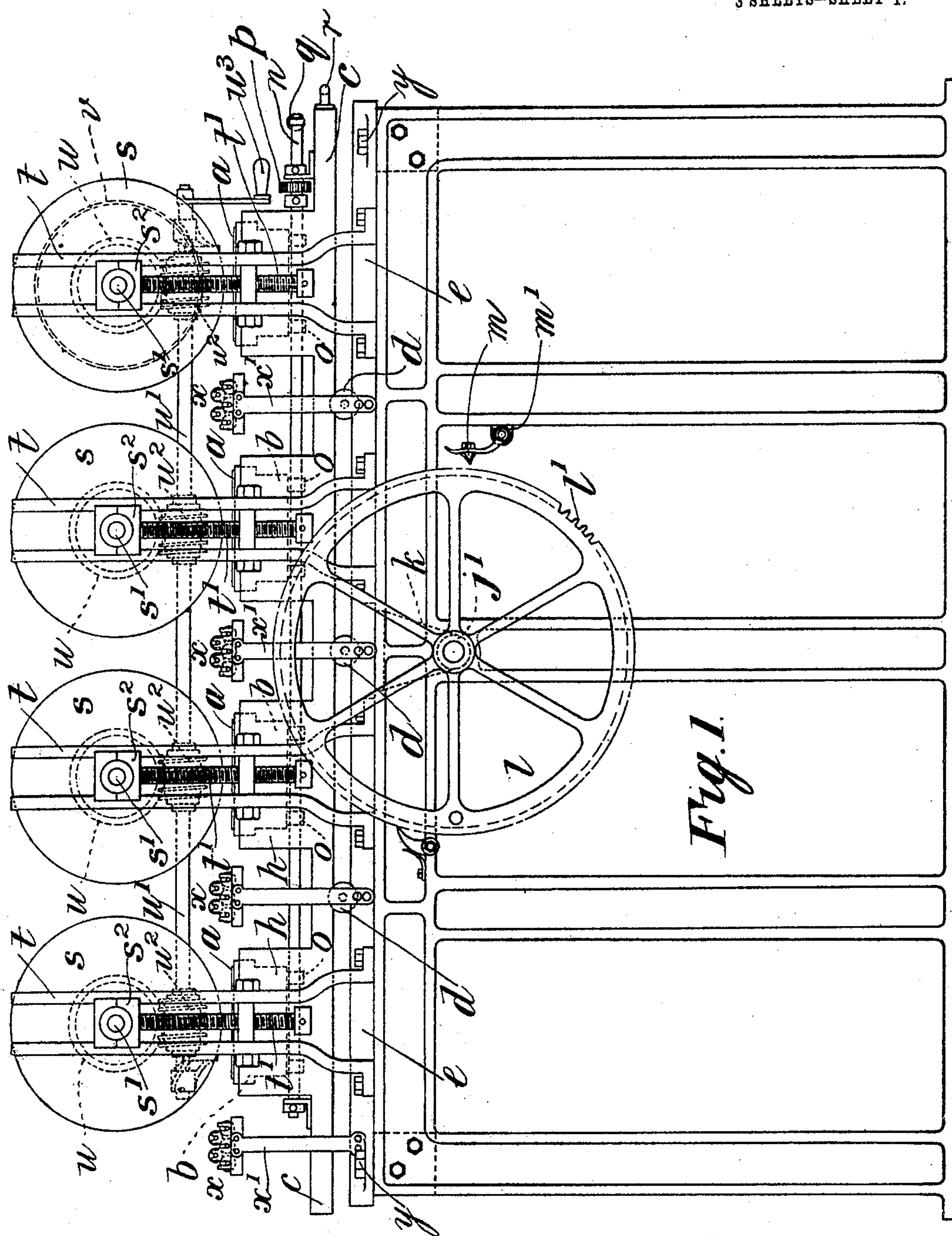
PATENTED AUG. 29, 1905.

C. A. & W. A. KER.

MACHINE FOR USE IN THE ENGRAVING OR ETCHING OF METALLIC SURFACES.

APPLICATION FILED APR 4, 1905.

3 SHEETS—SHEET 1.



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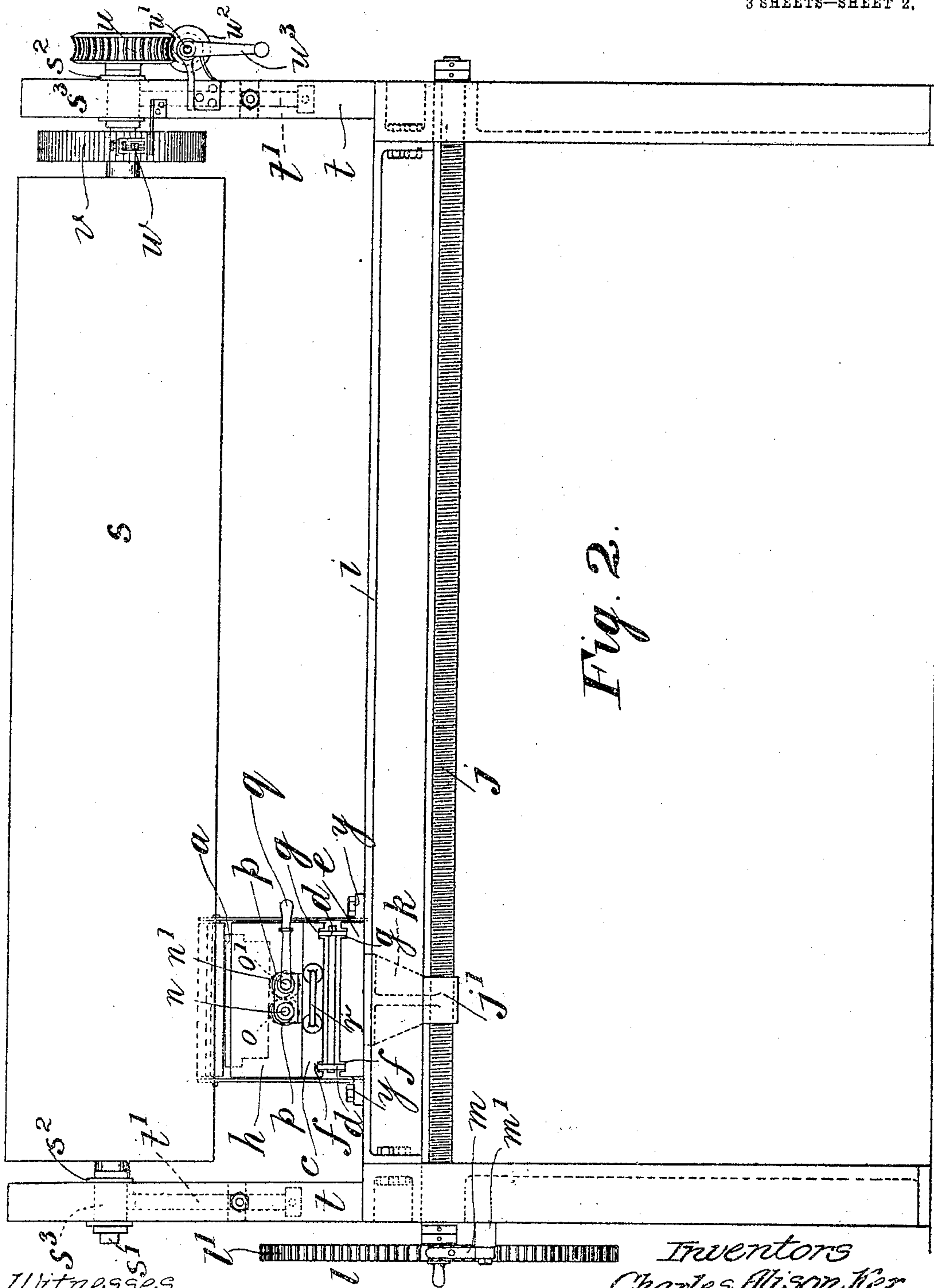
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3 SHEETS—SHEET 2.



Witnesses

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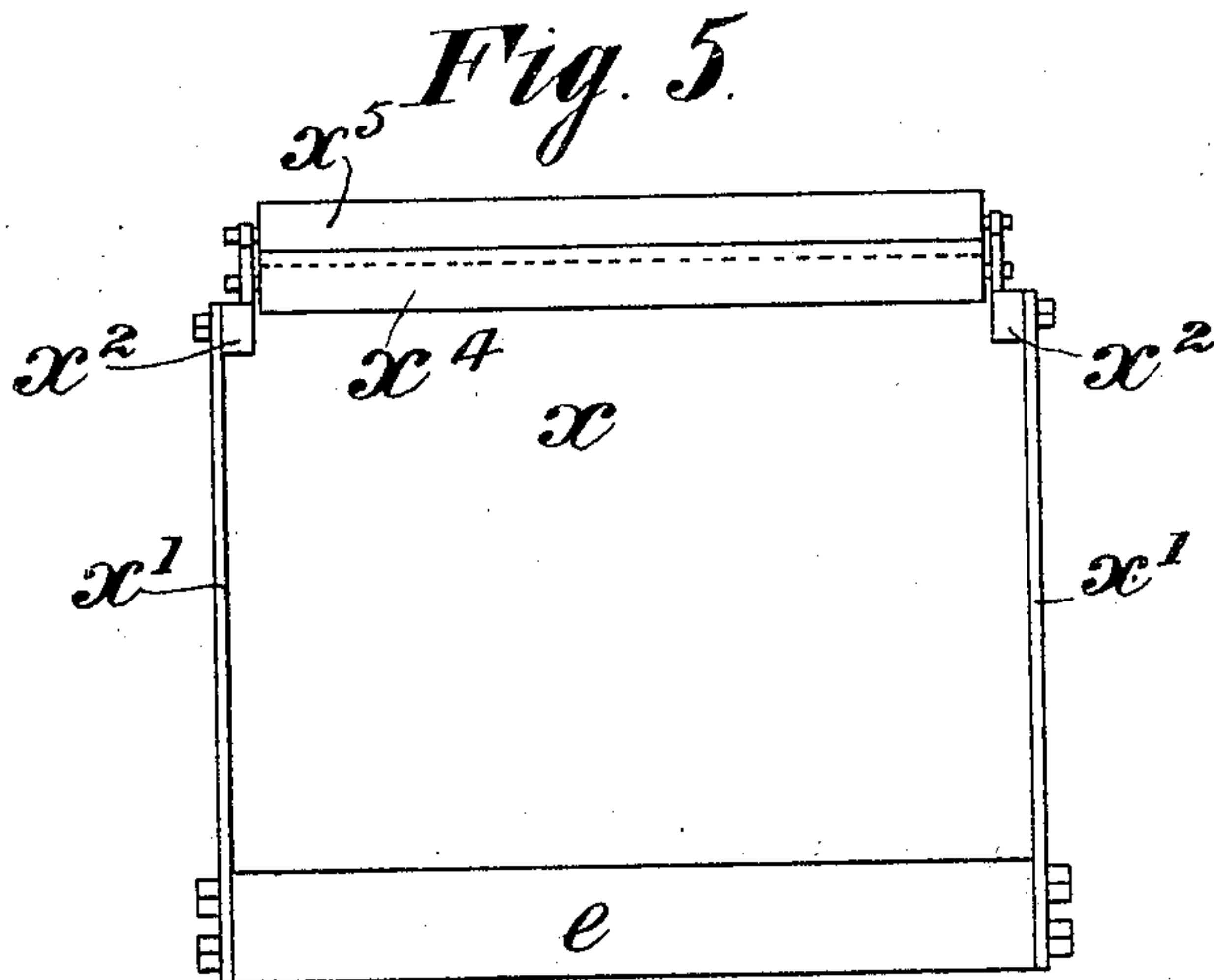
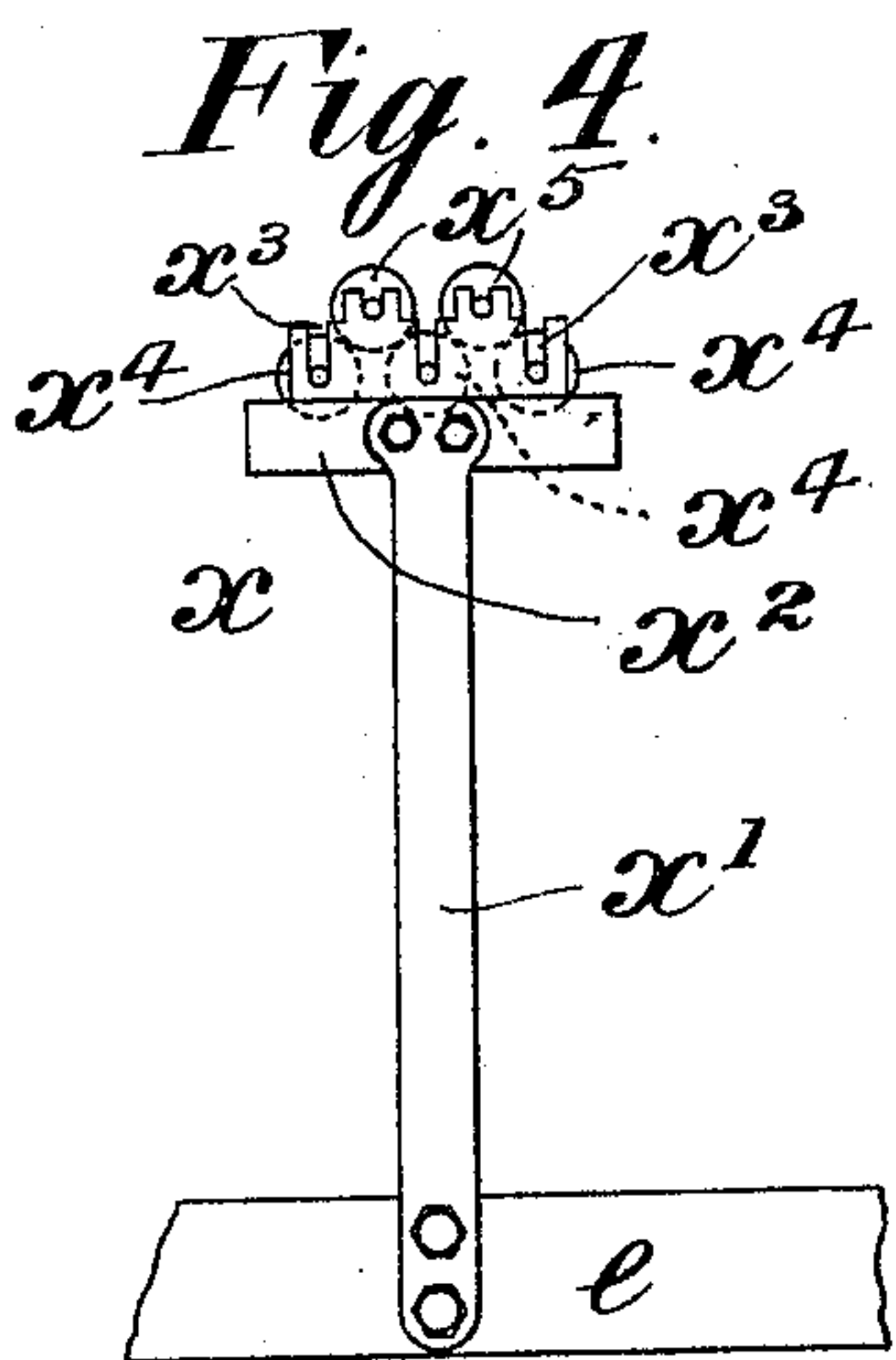
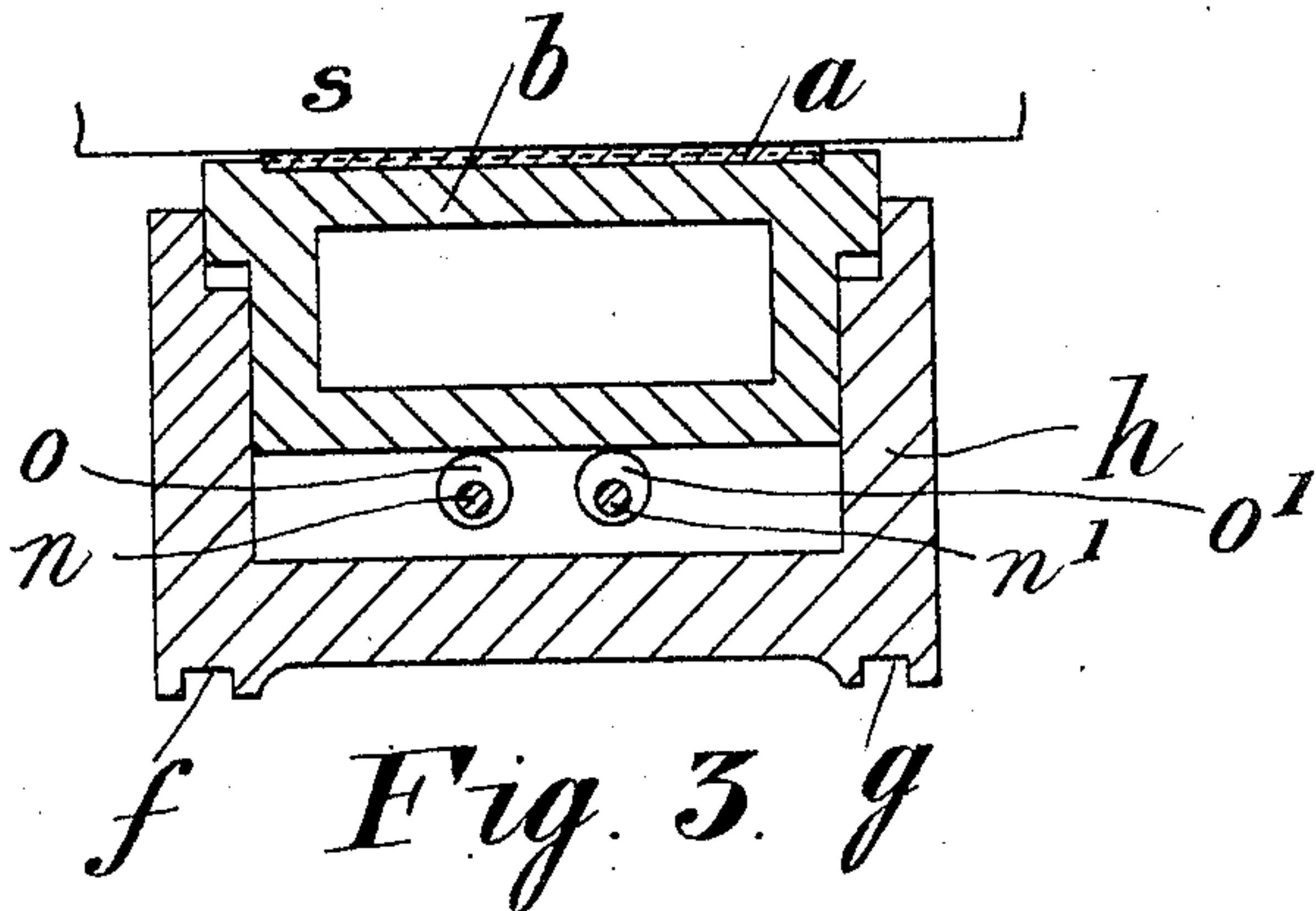
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES ALISON KER AND WILLIAM ALISON KER, OF GLASGOW, SCOTLAND, ASSIGNORS OF ONE-THIRD TO JAMES ANDREW DONALD, OF GLASGOW, SCOTLAND.

MACHINE FOR USE IN THE ENGRAVING OR ETCHING OF METALLIC SURFACES.

No. 798,421.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed April 4, 1905. Serial No. 253,857.

To all whom it may concern:

Be it known that we, CHARLES ALISON KER and WILLIAM ALISON KER, subjects of the King of Great Britain, residing at 45 Rottenrow, Glasgow, Scotland, have invented a certain new and useful Machine for Use in the Engraving or Etching of Metallic Surfaces, of which the following is a specification.

This invention relates to the engraving or etching of metallic surfaces, and is specially adapted to the engraving or etching of copper rolls for calico and other printing.

We first engrave a design or pattern on a suitable printing-plate, and we then ink this plate with a greasy and acid-resisting ink and transfer impressions from the plate to the metallic surface which is to be engraved or etched. After the metallic surface has been duly printed the design or pattern is engraved or etched in the usual manner. The raised or relief parts of the engraved printing-plate form clear or uninked parts on the metallic surface while the other parts are inked, and when the surface is etched the acid of course only bites into the exposed parts of the metallic surface, thereby reproducing the design.

Our invention particularly relates to a machine for manipulating the printing-plate and causing it to make impressions on the metallic surface to be engraved. The machine is a multiple machine and is capable of printing a number of metallic surfaces, such as copper rolls, at a time.

In order that our invention may be clearly understood, we have hereunto appended explanatory sheets of drawings, whereon—

Figure 1 is a side elevation of one construction of the machine suitable for printing a number of copper rolls simultaneously. Fig. 2 is an end elevation of the machine. Fig. 3 is an enlarged section of one of the boxes. Fig. 4 is an end and Fig. 5 a side view of the inking-roller arrangement.

We prefer to make the printing-plates *a* of zinc, and we mount them in beds *b* in boxes *h* on a movable table *c*, which rests on wheels *d*, carried by the table *e* of the machine. The wheels work in grooves *f g*, made in the under side of the table *c* and the upper side of the table *e*, which latter is capable of being moved transversely on the bars *i* by means of a screwed spindle *j*, which passes through a nut *j'* on a bracket *k*, depending from the

table *e*. The screwed spindle at its ends is carried in bearings in the framing, and it is revolved by means of a hand-wheel *l*, provided with exterior teeth *l'*.

m is an index-finger, which is bolted to a bracket *m'*, secured to the frame.

Passing through the boxes are two shafts *n n'*, provided within the boxes with cams *o o'*, which act upon the under side of the beds *b*. The two shafts are geared together by gearing *p*, and when the shaft *n'* is turned by means of the crank-handle *q* the cams are caused to raise up the beds, which fit with a sliding fit in their boxes.

The table *c*, with the boxes thereon, can be adjusted longitudinally by pulling or pushing it by means of the handle *r*.

The copper rolls *s* to be printed on are fitted on shafts *s'*, whose journals *s³* fit in bearing-blocks *s²*, which are adapted to slide in the uprights *t*. Screws *t'* are provided in connection with the blocks for the purpose of vertically adjusting the position of the rolls. On the end of each shaft *s'* is a worm-wheel *u*. A shaft *u'* has worms *u²* on it, which engage with the wheels *u*, and this shaft can be rotated by a crank *u³*. An index-pointer *w* is secured to one of the uprights and is used in conjunction with an index-wheel *v*, which is secured on one of the shafts *s'* and is suitably graduated on its circumference.

For the purpose of inking the zinc plates a number of inking devices *x*, corresponding in number to the number of the boxes, are secured to the table *c*. One of the inking devices is shown at Figs. 4 and 5, and it will be seen that it consists of two uprights *x' x'*, one fixed at each side of the table, and these uprights are provided with cross-heads *x²*, into the open slots *x³* of which the inking-rollers *x⁴* are laid. There are three rollers *x⁴* of the usual construction and two supply-rollers *x⁵*. These supply-rollers can be inked at intervals by rolling up on a slab and then laid on the rollers *x⁴*. As the rollers *x⁴* revolve they take ink up from the rollers *x⁵*.

With this machine the engraved zinc plates are fitted in the beds *b*, and then the wheel *l* is turned so as to traverse the table *c* and bring it to the desired position under the rolls. When the table is adjusted, it can be secured by means of the clamping-bolts *y*, engaging in suitable holes (not shown) in the

bars *z*. The handle *r* is now pushed so as to cause the table *c* to travel on the wheels *d* and pass the zinc plates under the inking-rollers, which are at such a height as to be
 5 capable of bearing on the plates when they pass under them. The inking-rollers act on the plates and ink them ready for printing on the rolls. The handle *q* is now turned so as to raise up by the cams the beds *b* and press
 10 the zinc plates into contact with the surfaces of the copper rolls, thereby inking them. The rolls can be slowly turned, so as to transfer the pattern from the printing-plates to the rolls by turning the shaft. When the rolls
 15 have been printed at one part, the table *c* is again moved by the wheel *l* for a second printing, when the same procedure as before is repeated, and so on until the rolls are fully printed with the design or pattern and re-
 20 peats thereof. When this has been done, the rolls can be removed and etched in the usual manner and their places be taken by new rolls.

By having an index-pointer *m* and teeth on the wheel *l* the exact angle through which
 25 the wheel should be turned for each transverse adjustment of the printing-plates can be nicely determined, and likewise the exact angle through which the rolls should be turned for each repeat printing can be determined
 30 by means of the index-wheel *v* and pointer.

Having now fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In combination, a framing, a traveling
 35 table, a second movable table, a box on the second table, a movable bed in the box for receiving a printing-plate, means for inking the printing-plate, means for causing said first table to travel and means for raising the bed,
 40 substantially as described.

2. In combination, a framing, a traveling table, a second movable table, a box on the second table, a movable bed in the box for receiving a printing-plate, means for inking the
 45 printing-plate, means for causing said first table to travel, and means for raising the beds, substantially as described.

3. In combination, a framing, a traveling table, a second movable table, a box on the
 50 second table, a movable bed in the box for receiving a printing-plate, means for inking the printing-plate, means for causing said first ta-

ble to travel and shafts with cams thereon for raising the bed, substantially as described.

4. In combination, a framing, a traveling 55 table, a second movable table, a number of boxes on the second table, movable beds for printing-plates in the boxes, means for inking the printing-plates, means for causing said first table to travel, two parallel shafts geared 60 together and passing through the boxes, cams on the shafts, and means for turning the shafts, substantially as described.

5. In combination, a framing, a traveling table, a second movable table, a box on the 65 second table, a movable bed in the box for receiving a printing-plate, means for inking the printing-plate, a transverse screwed spindle working through a nut on a bracket depend- 70 ing from the first table, a wheel on the screwed spindle, and means for raising the bed, substantially as described.

6. In combination, a framing, a table that can be moved transversely of the machine, a second table movably supported on wheels on 75 the first table, a series of boxes on the second table, beds fitted in the boxes so that they can be raised and lowered, means for raising and lowering the beds, inking devices, uprights for carrying copper rolls, and means for trav- 80 ersing the first table and of rotating the rolls, substantially as described.

7. In combination, a framing, a table capable of sliding on the framing and having a depending bracket with nut therein, a screwed 85 spindle, means for turning the spindle, a second table movably supported on wheels on the first table, a series of boxes on the second table, beds fitted in the boxes so that they can be raised and lowered, means for raising and 90 lowering the beds, inking devices, uprights for carrying copper rolls, means for adjusting the height of the copper rolls, means for rotating the rolls and means for accurately determining the degree of rotation of the rolls, 95 substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES ALISON KER.
 WILLIAM ALISON KER.

Witnesses:

WILLIAM FLEMING,
 WILLIAM GALL.