(No Model.) 3 Sheets—Sheet 1.

A. H. CAMPBELL.

MILLING MACHINE.

No. 253,974. Patented Feb. 21, 1882.

Fig. 1.

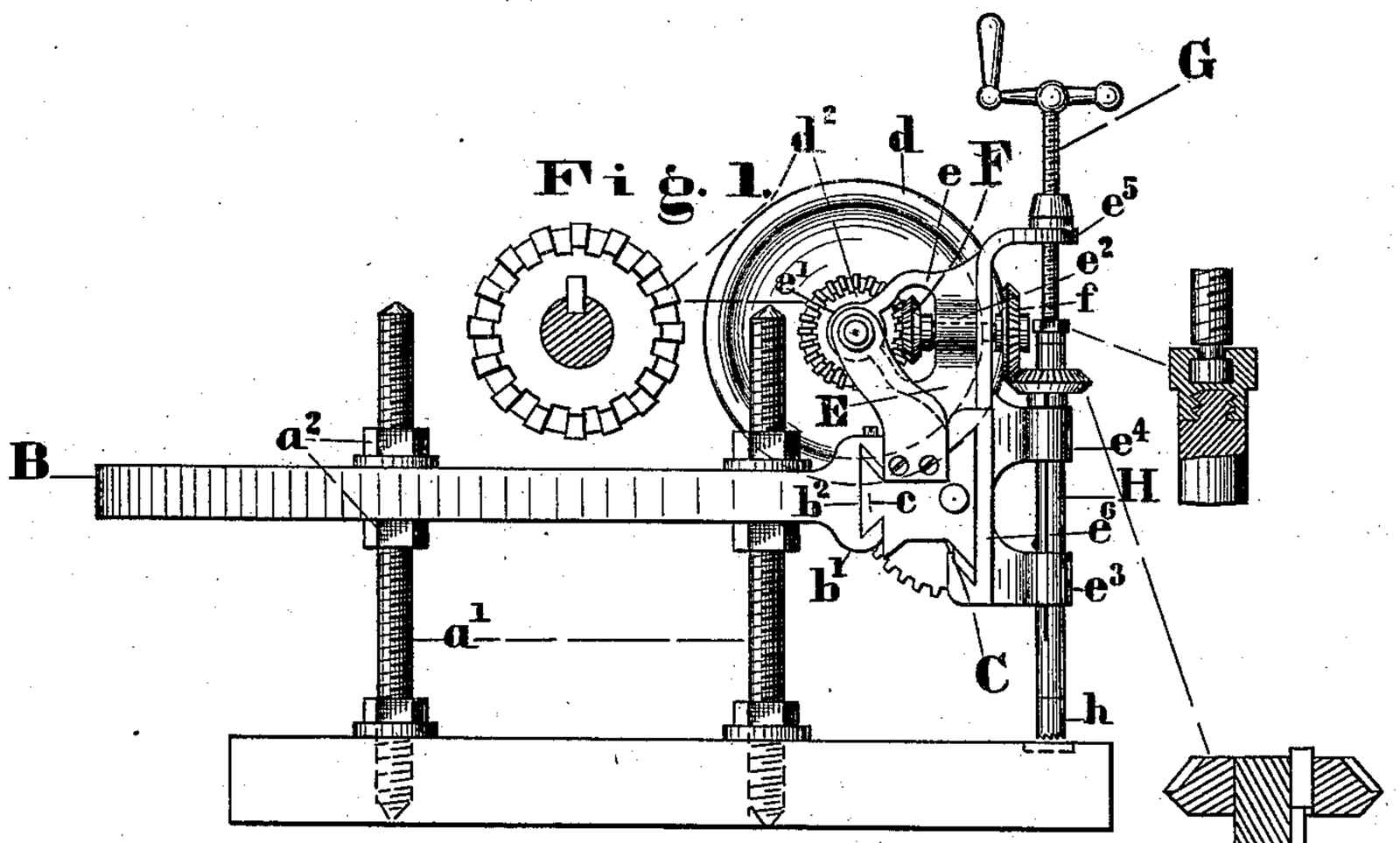

Fig. 2.

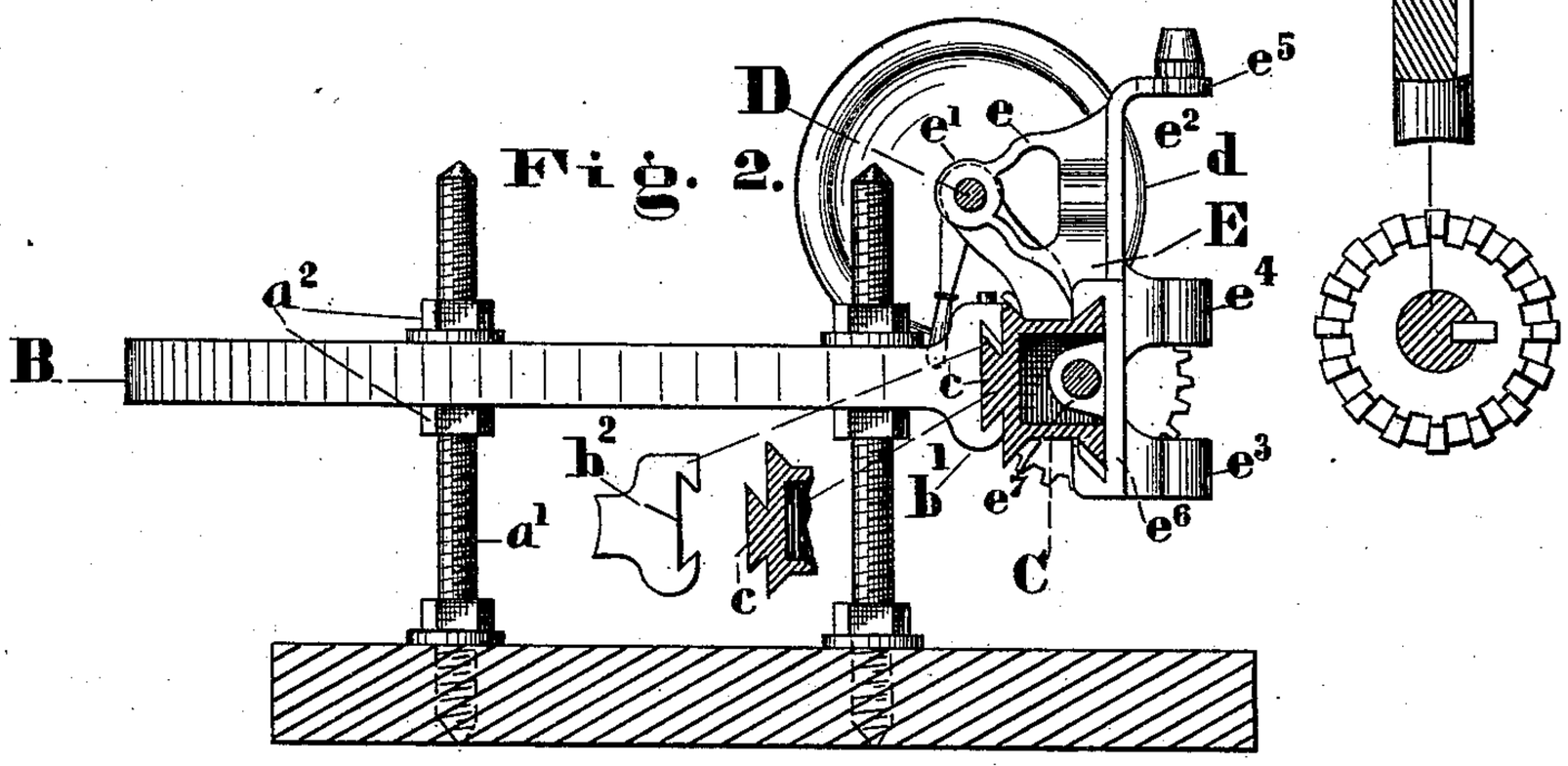

Fig. 3.

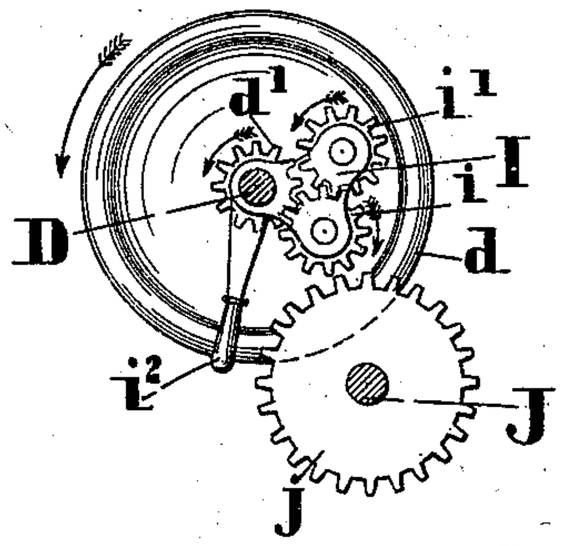

Fig. 4.

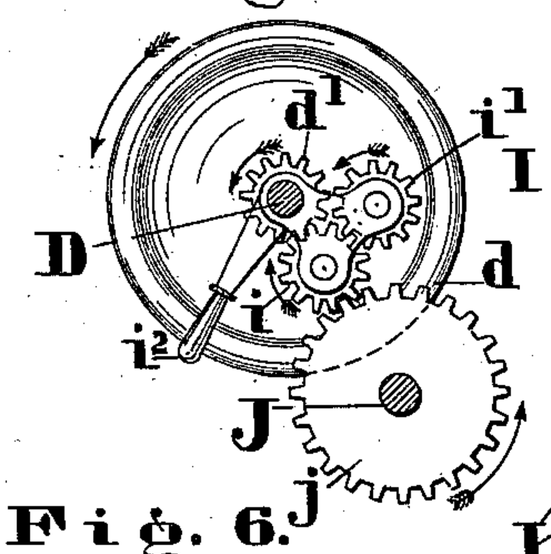

Fig. 5.

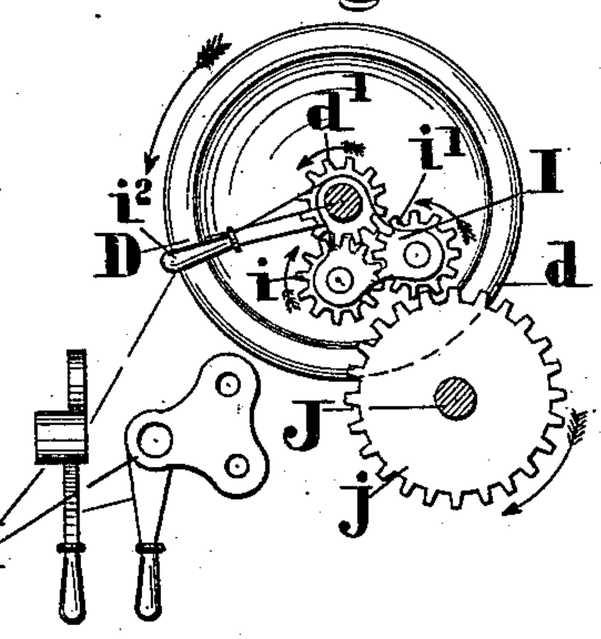

Fig. 6.

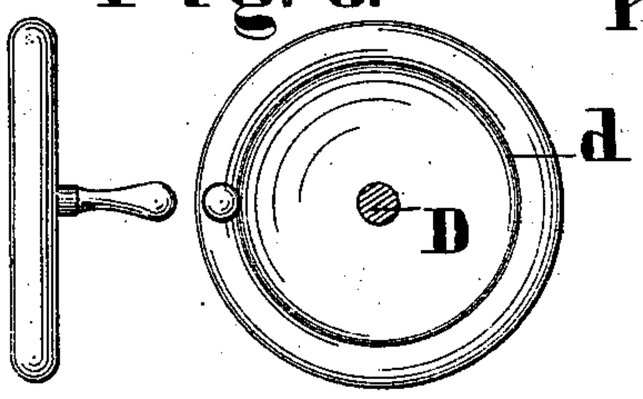

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Fig. 7.

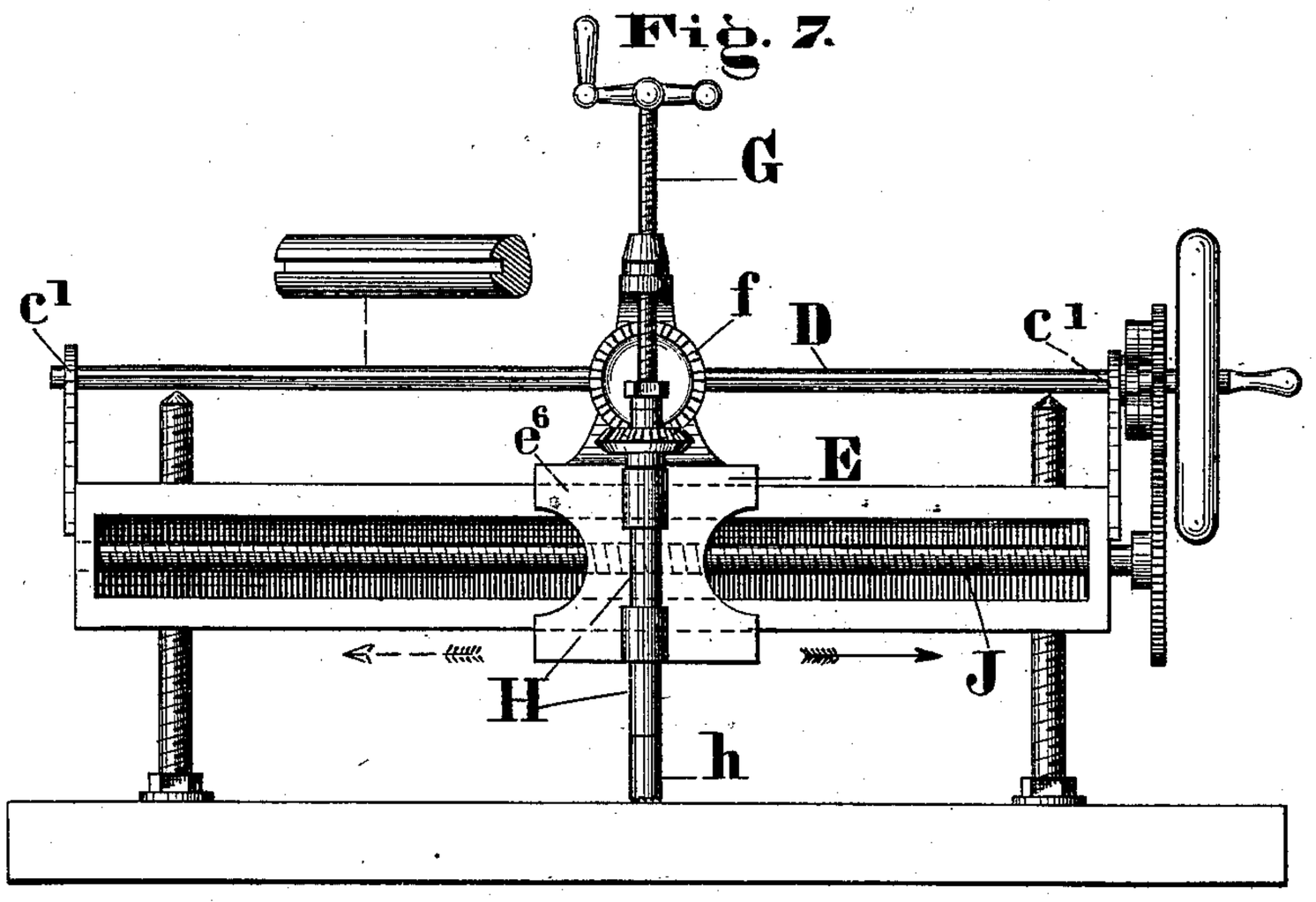

Fig. 8.

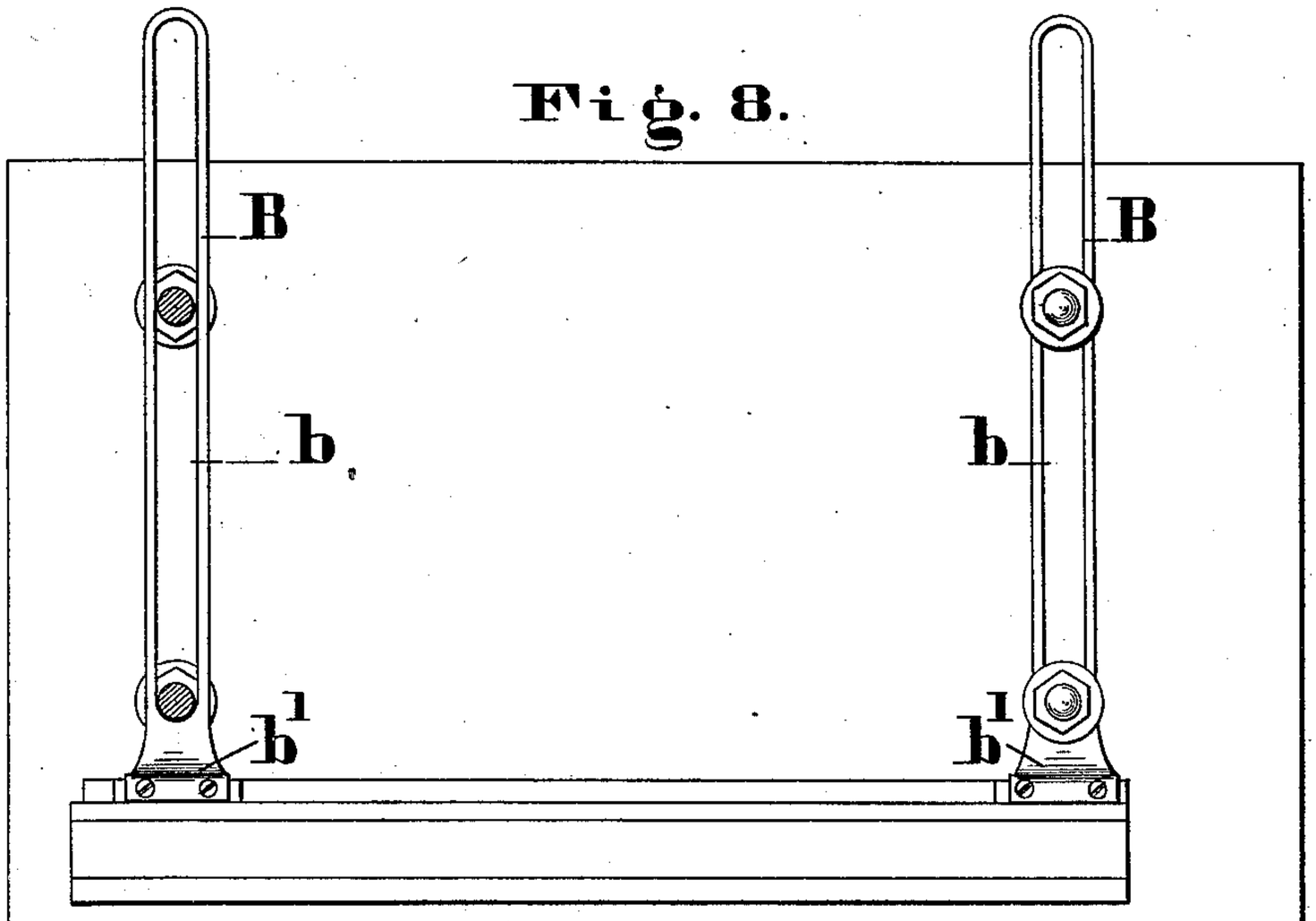

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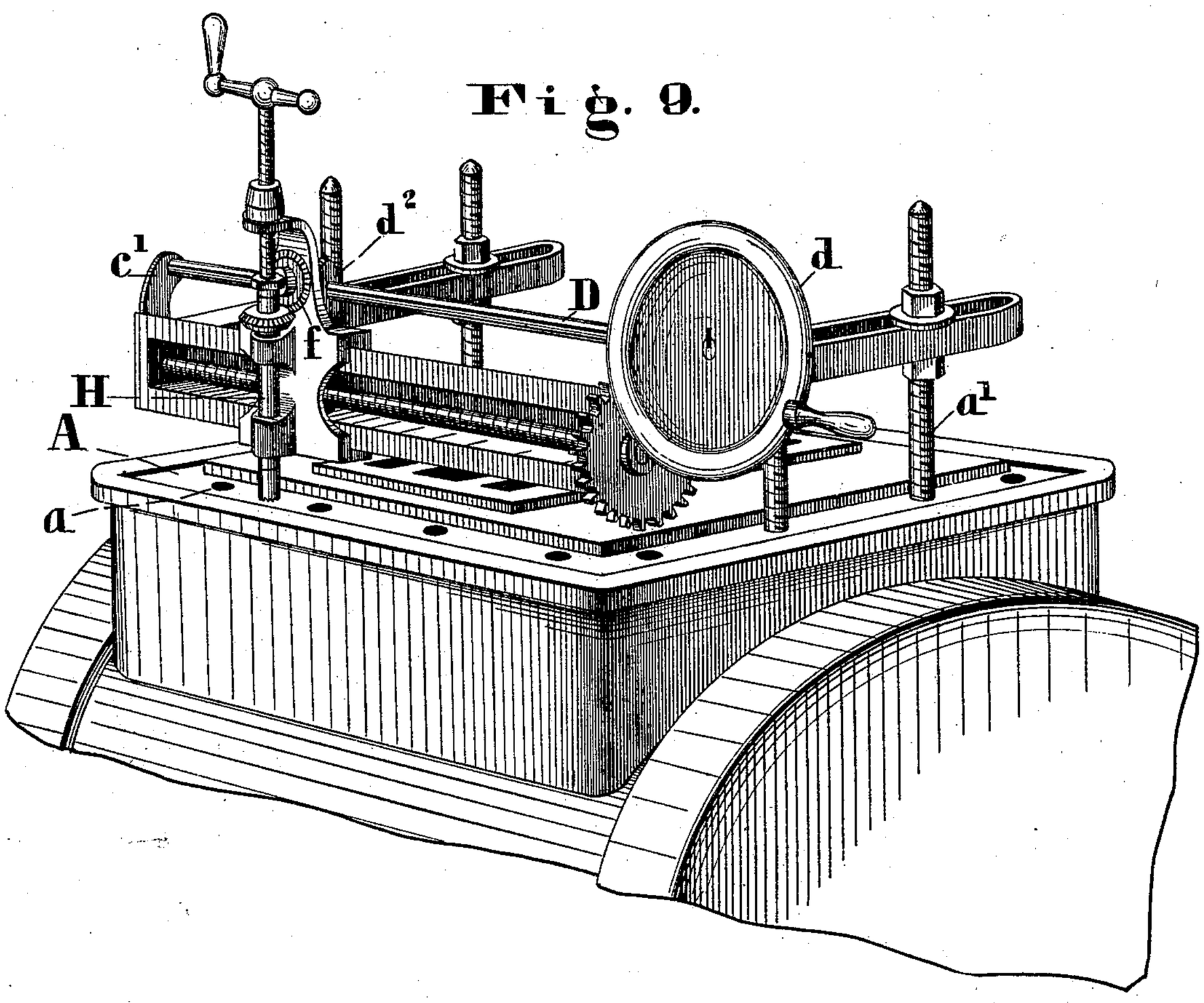
Fig. 9.



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UNITED STATES PATENT OFFICE.

ALEXANDER H. CAMPBELL, OF HARTFORD, CONNECTICUT.

MILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 253,974, dated February 21, 1882.

Application filed October 8, 1881. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER H. CAMPBELL, of Hartford, county of Hartford, and State of Connecticut, have invented new and useful Improvements in Milling-Machines; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention is specially designed for the purpose of repairing corroded steam-chest seats; and it has for its novelty certain specific combinations, hereinafter fully described, by means of which it is adapted to perform properly and advantageously its special work.

In the drawings, Figure 1 represents an end elevation of the improved machine; Fig. 2, a similar view with certain parts in section; Figs. 3, 4, and 5, various views of the gearing by means of which revolution is given to the feed-screw for moving in a longitudinal direction the frame carrying the milling-tool; Fig. 6, views of the hand-wheel by means of which the main shaft is revolved; Fig. 7, a front elevation of the improved machine; Fig. 8, a plan view, illustrating the capacity of the frame-work for lateral adjustability; and Fig. 9, a perspective view, illustrating the practical application of the machine.

To enable others skilled in the art to make my improved machine and properly use the same, I will proceed to describe fully its construction and the manner of its operation.

A, Fig. 9, represents the steam-chest seat, having the usual openings, *a*, for holding the screws which secure the chest in place.

a' a', Figs. 1, 2, and 9, represent screw-standards, four in number, which are adapted, by means of the threads and nuts at their lower ends, to be strongly secured to the chest-seat plate, as shown.

a^2 a^2 represent nuts by means of which the slotted arms B of the frame-work hereinafter described are secured at any desired height above the chest-seat plate, as shown. These arms B B, before referred to, are provided with the long slots *b b*, Fig. 8, adapted to permit the lateral adjustment of the screw-standards *a'* when such adjustment is necessary.

b' represents an enlargement of the arm *b*, which is provided with a dovetailed recess, b^2, as shown.

C represents the main beam of the frame-work, having a projection, *c*, corresponding to the recess b^2 of the arms *b*, as shown. By means of this construction the main beam is strongly secured to the supporting-arms without interfering with the capacity of the latter for adjustment in a longitudinal direction.

c' c', Figs. 7 and 9, represent arms or standards rising from the beam C, which are provided with proper bearings for supporting the main shaft D, as shown.

d represents a hand-wheel by means of which the main shaft is revolved, and *d'* a pinion by means of which movement is communicated from the main shaft to the gearing which actuates the feed-screw for moving the frame of the milling-tool in a longitudinal direction.

d^2, Fig. 9, represents a bevel-gear keyed to the main shaft in such manner as to move freely thereon in a longitudinal direction while revolving rigidly with it.

E represents the frame-work carrying the milling-tool, which is provided upon one side with the lateral extension *e*, having a bearing, *e'*, for the gear d^2, Fig. 9, upon the main shaft, and a bearing, e^2, Fig. 1, for the shaft of the bevel-gears F *f*, and upon the other side with lateral extensions e^3 e^4 e^5 for supporting the shaft of the milling-tool and the vertical screw for feeding the same.

e^6, Figs. 1, 2, and 7, represents a main vertical portion, having a dovetailed recess, by means of which it is strongly secured to a corresponding projection upon the main beam in such manner as to move freely thereon in a longitudinal direction.

e^7, Fig. 2, represents a threaded ear or sleeve, by means of which the frame E is united to the feed-screw, hereinafter referred to.

F, Fig. 1, represents a bevel-gear engaging with the bevel-gear d^2 upon the main shaft D, the shaft of which is supported in the bearing e^2, as shown.

f represents also a bevel-gear on the other end of this shaft, which engages with a corresponding gear upon the shaft of the milling-tool, as shown in Fig. 1.

G, Fig. 1, represents a feed-screw, supported

by the threaded extension e^5 of the frame E, which is provided at its upper end with the usual handle for revolving the same and at its lower end with a recess adapted to receive a corresponding projecting portion upon the upper end of the shaft H, as shown. By means of this construction the shaft is properly supported without interfering with its freedom of revolution. This shaft H is further held without interference with its freedom of revolution or with its movement in a vertical direction by the extensions e^3 e^4 of the frame E, as shown.

h, Figs. 1 and 7, represents any suitable milling-tool, which is properly secured to the lower end of the shaft.

The mechanism before described is adapted to give the milling-tool its necessary revolution and also movement in a vertical direction.

The mechanism for giving the milling-tool movement in a longitudinal direction will now be described.

I, Fig. 5, represents a sleeve loose upon the main shaft, which is provided with arms having bearings for the pinions *i* *i'*, and with a handle, i^2, as shown.

J represents a longitudinal screw-shaft, held in proper bearings in the frame D, which is provided at one end with the gear-wheel *j*, as shown. This gear-wheel *j* engages with the pinion *d'* upon the main shaft, and also with the pinion *i'*, as shown. The relation of the pinions *i* *i'* to the gear-wheel *j* is such that either one of them may be thrown into gear with it, or both may be disengaged from it by the proper movement of the lever.

The operation is substantially as follows: The machine may be properly secured to the steam-chest plate, the proper adjustment having been made, by means of the threaded standards *a'* *a'*. The milling-tool then, when located at the proper point, may be given revolution by revolving the main shaft, its vertical position being determined by the position of the vertical feed-screw in the manner well understood. When the handle i^2 is in the position shown in Fig. 3 the milling-tool will have no movement in a longitudinal direction, because both of the pinions *i* and *i'* are disengaged from the pinion *j* of the feed-screw. When the handle i^2 is in the position shown in Fig. 4, the frame E, carrying the milling-tool shaft, will be moved in the direction of the full arrow, Fig. 7, because the movement of the main shaft will be communicated through the pinion to the shaft of the feed-screw. When the handle i^2 is in the position shown in Fig. 5 the frame E will be moved in the direction of the dotted arrow, Fig. 7, because the movement of the main shaft will be communicated through the pinions to the shaft of the feed-screw.

Some of the advantages of the described construction are as follows: The steam-chest seat, when corroded by the action of the heat upon the tallow, may be readily repaired without the expenditure of the time and labor required when the groove is cut with a chisel. The mechanism is simple in its construction, and yet very effective in action. Its capacity for adjustment adapts it for ready attachment to any steam-chest seat.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with the main beam C, the slotted arms B B and the independent threaded standards *a'* *a'*, the construction being such that adjustment to chests of different sizes may be made either in a vertical, lateral, or longitudinal direction, according to the necessities of the case.

2. In combination with the beam C, having the projection *c*, the slotted arms B B, having a recess corresponding to said projection, as described.

3. In combination with the beam C and the mechanism, substantially as described, for securing the beam to any desired base, the tool-carrier E and the feed-shaft J, for actuating the same.

4. The milling-machine described, having the standards *a'* *a'*, the slotted arms B B, the main beam C, the main shaft D, with gearing d^2, the tool-carrier E, with gearing, and the feed-shaft J, as described.

This specification signed and witnessed this 29th day of August, 1881.

A. H. CAMPBELL.

Witnesses:
E. E. MARVIN,
W. L. FAY.