

(No Model.)

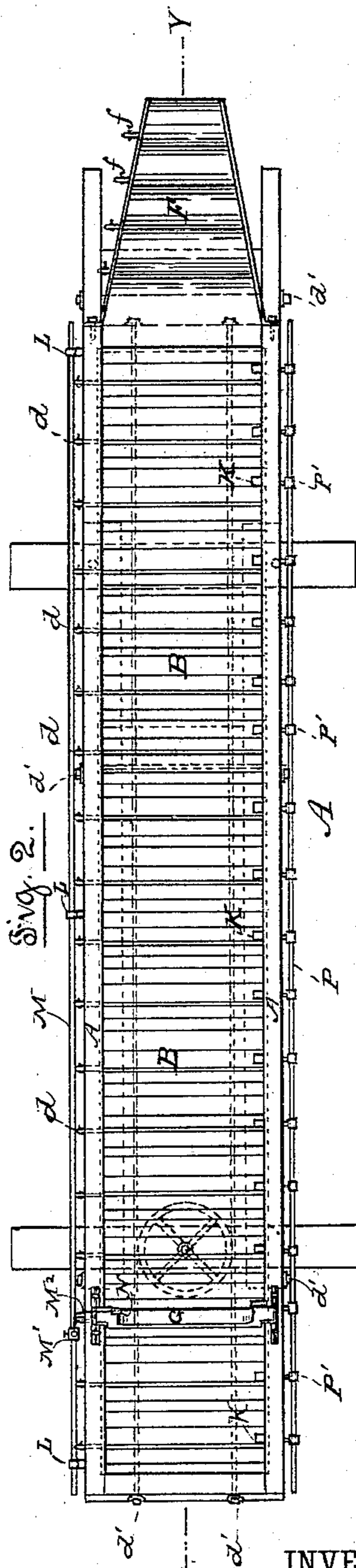
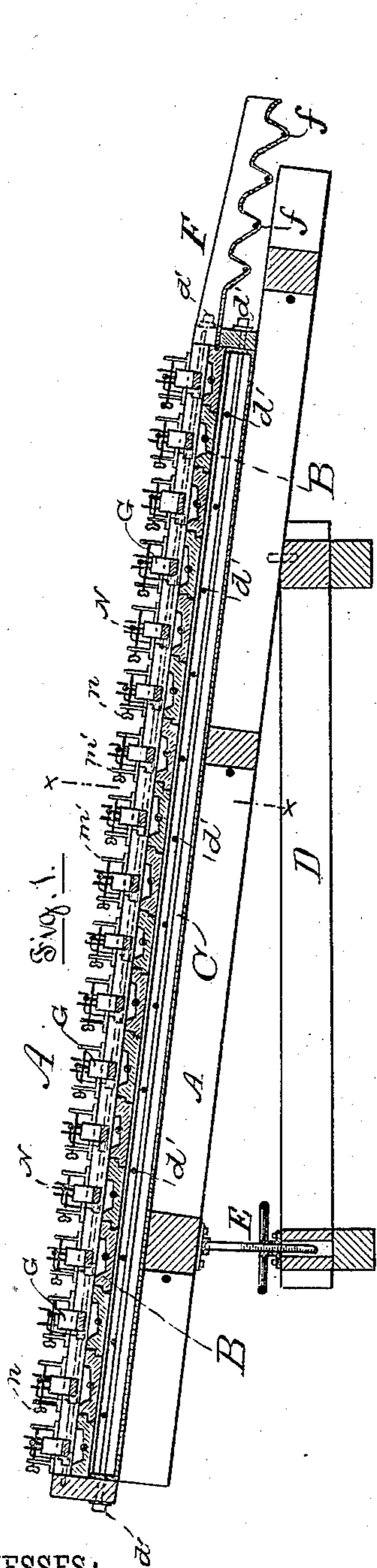
2 Sheets—Sheet 1.

S. BEAR.

AMALGAMATING TABLE.

No. 307,081.

Patented Oct. 28, 1884.



WITNESSES:

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

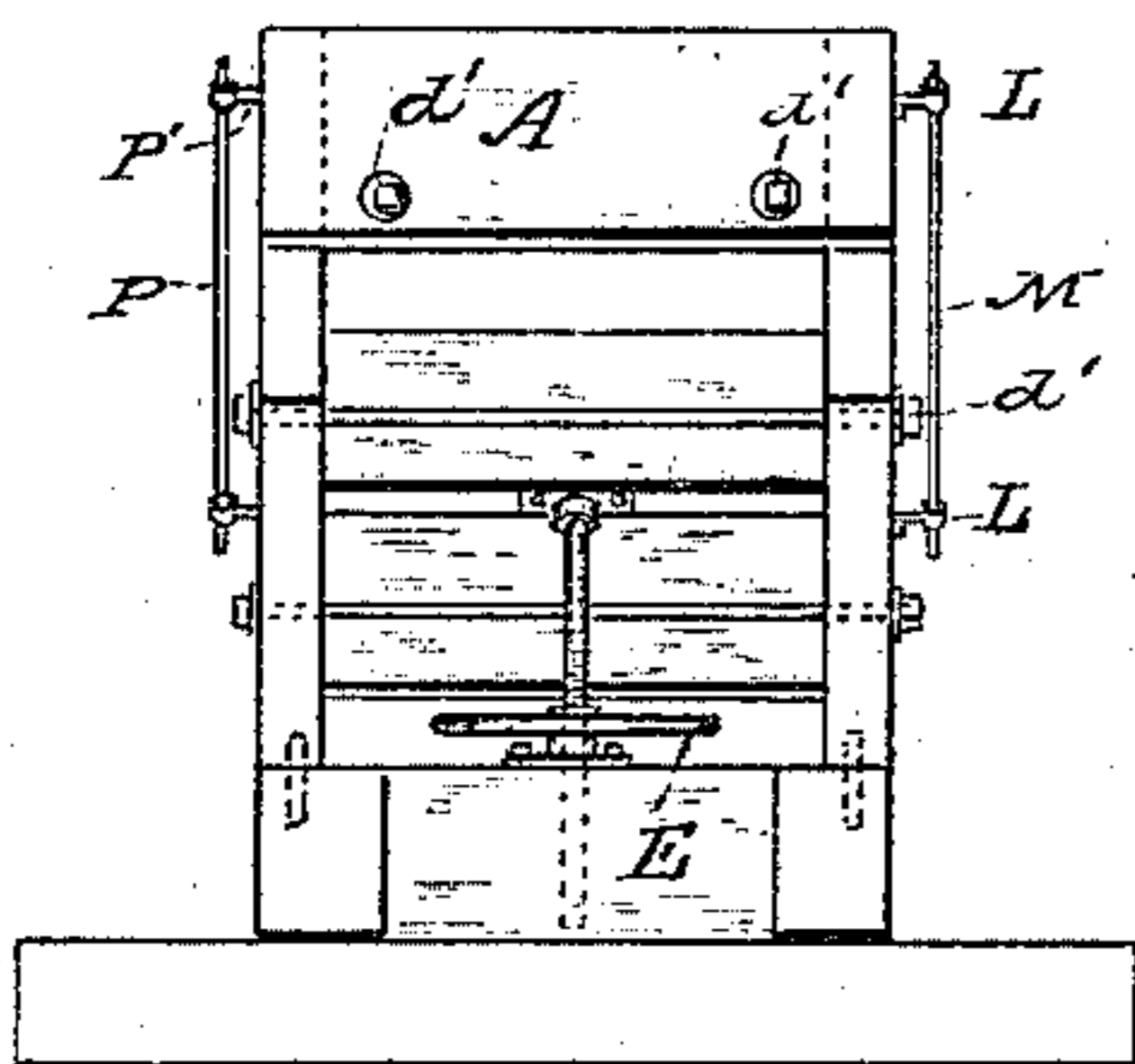


Fig. 4.

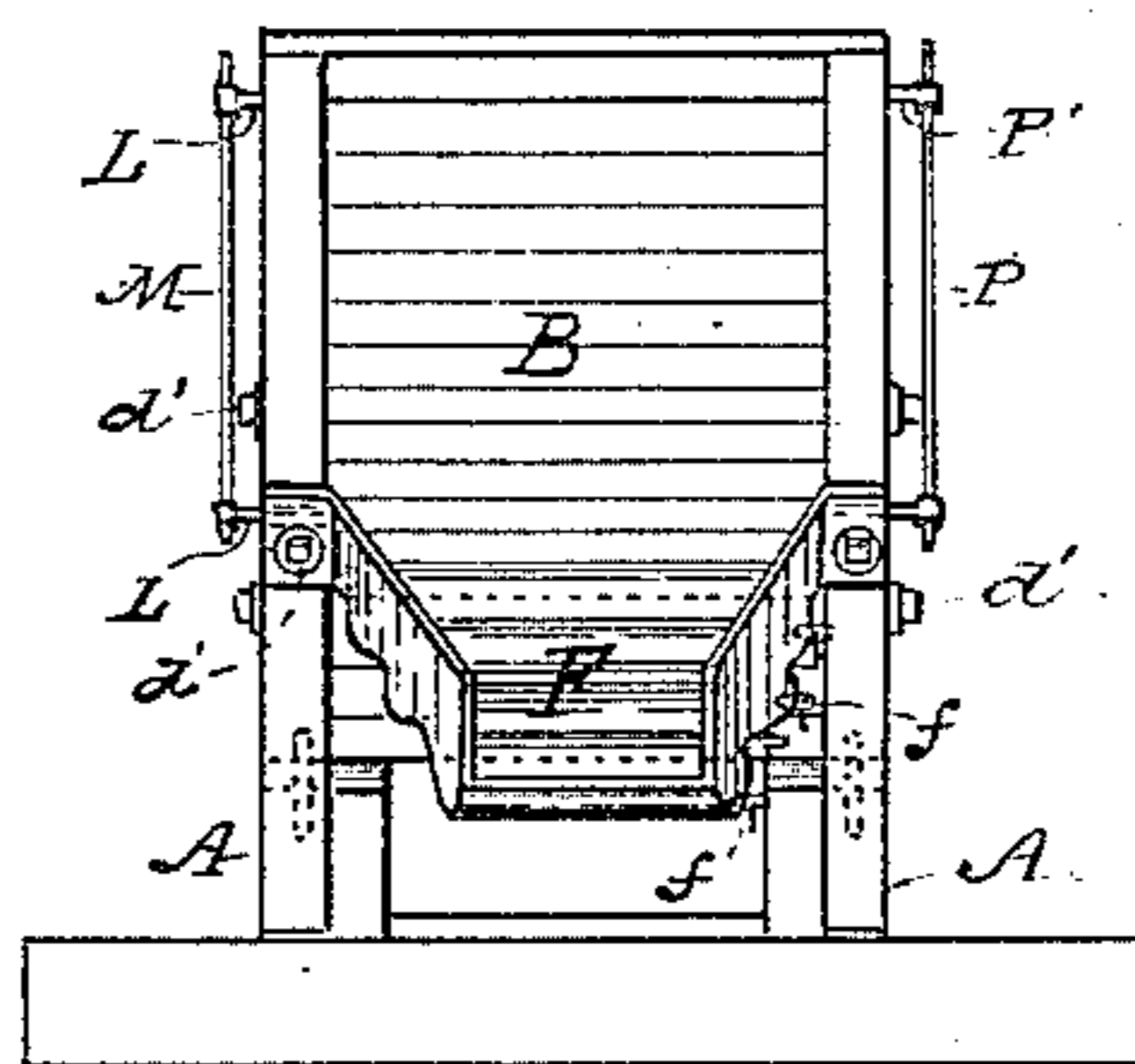


Fig. 5.

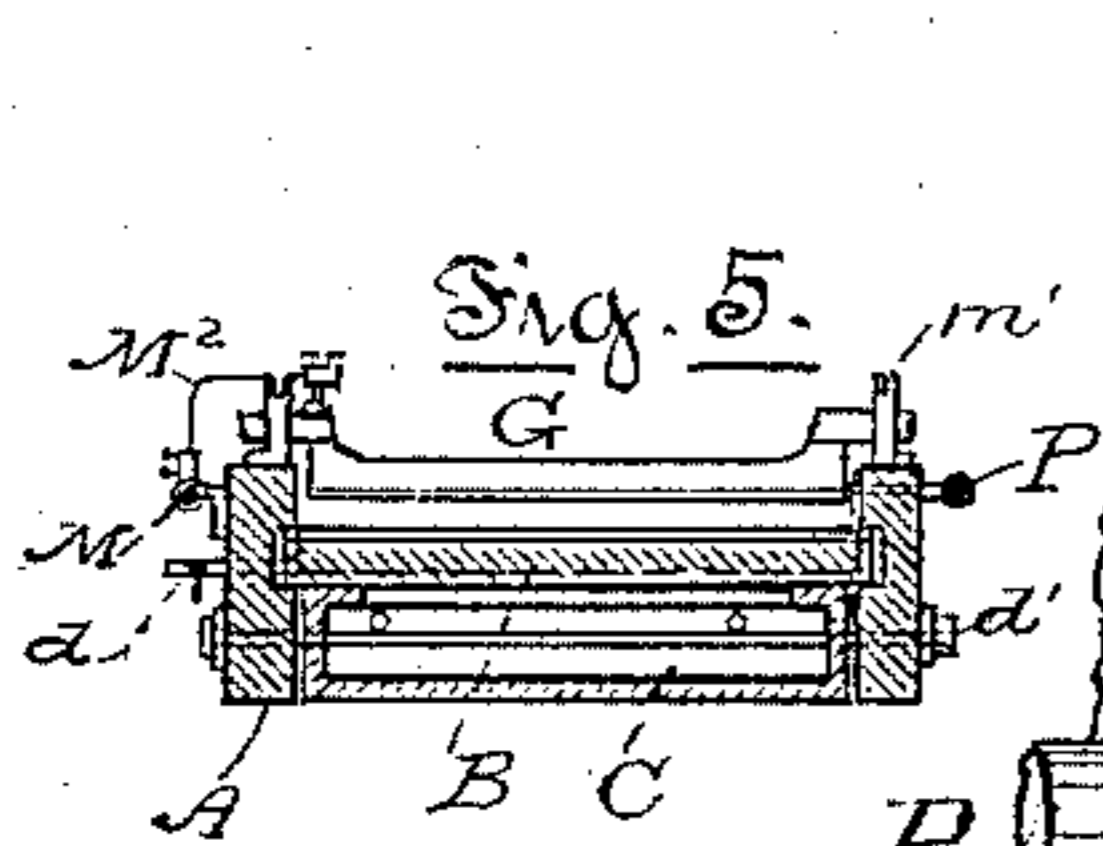


Fig. 6.

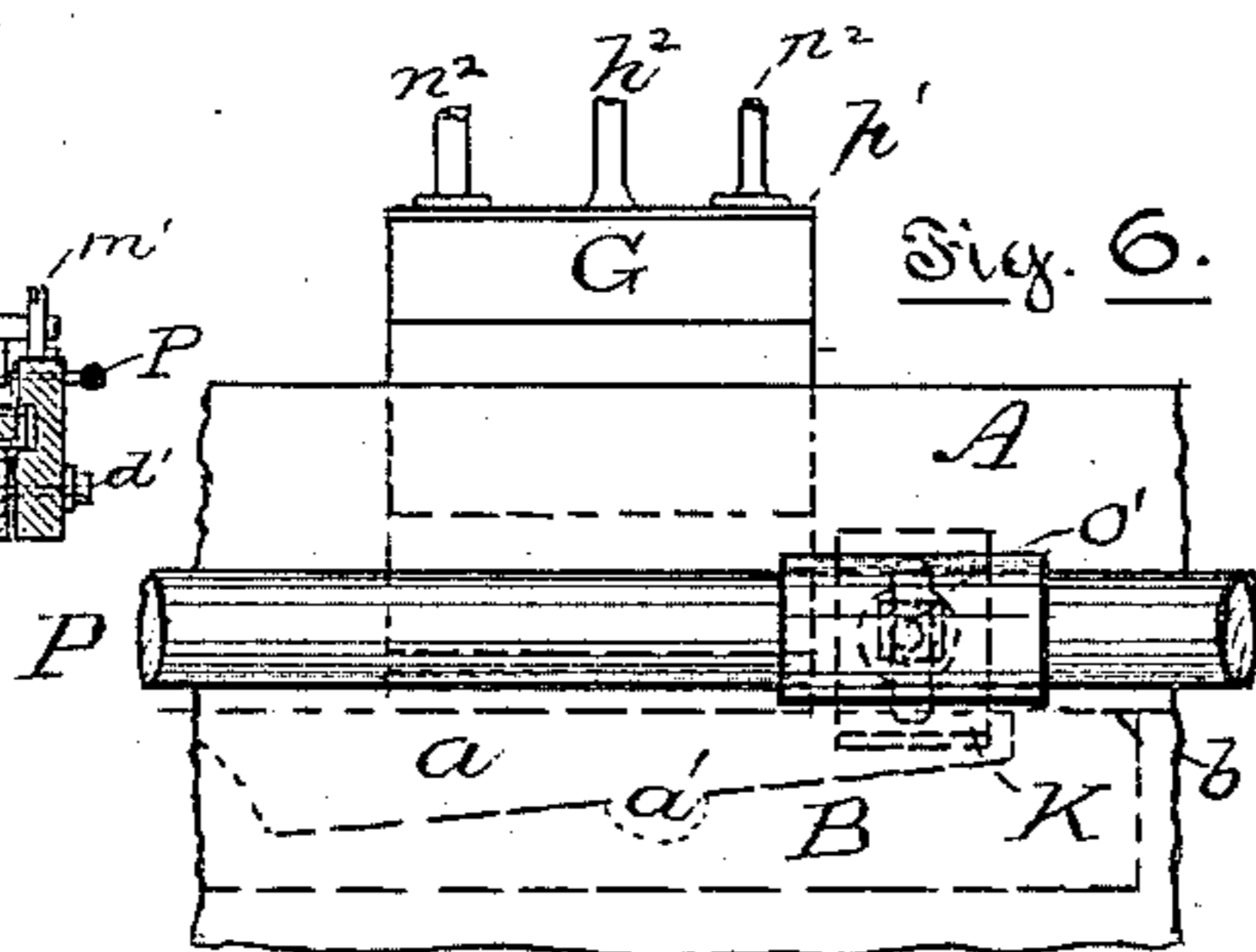


Fig. 7.

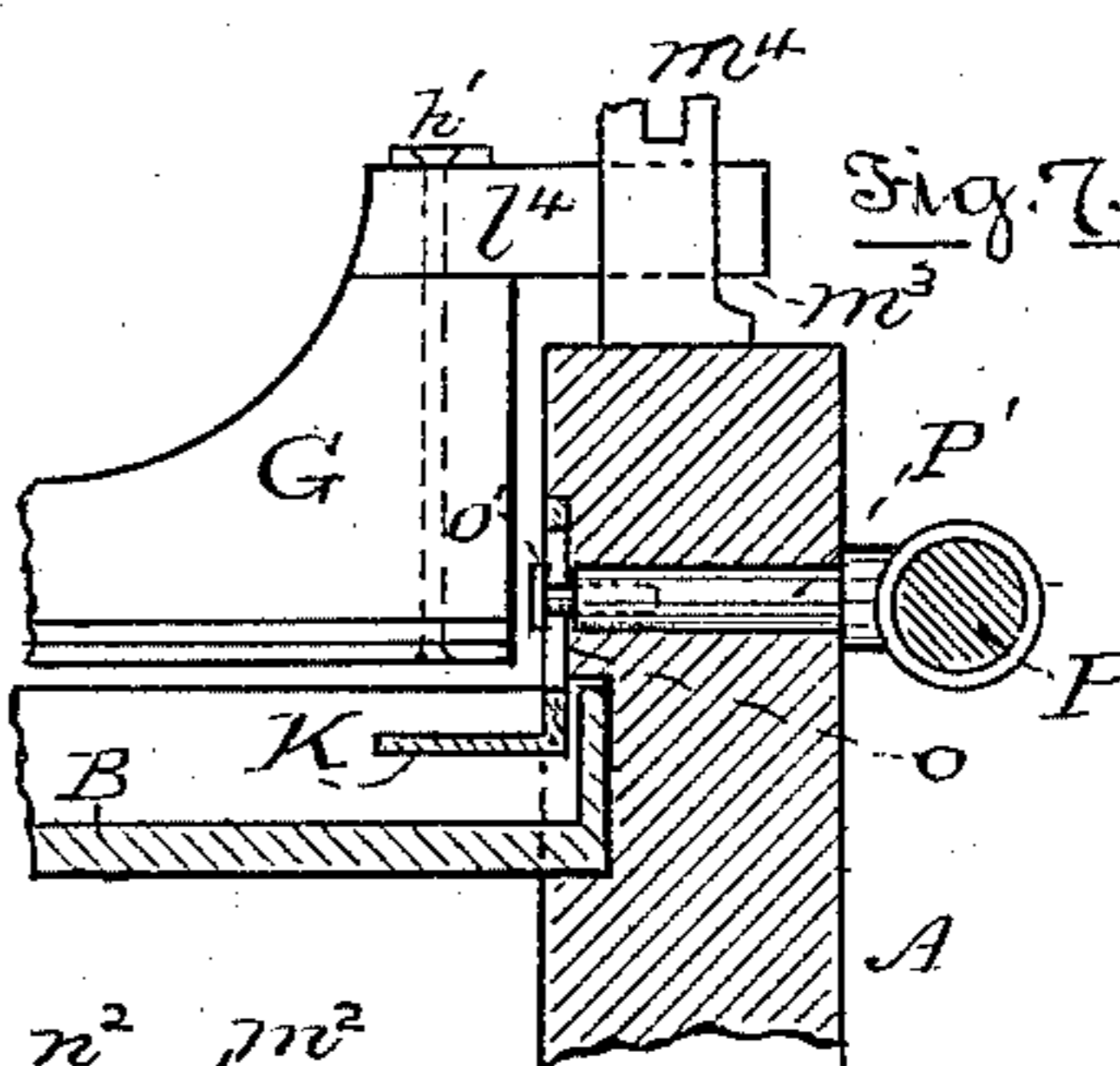


Fig. 8.

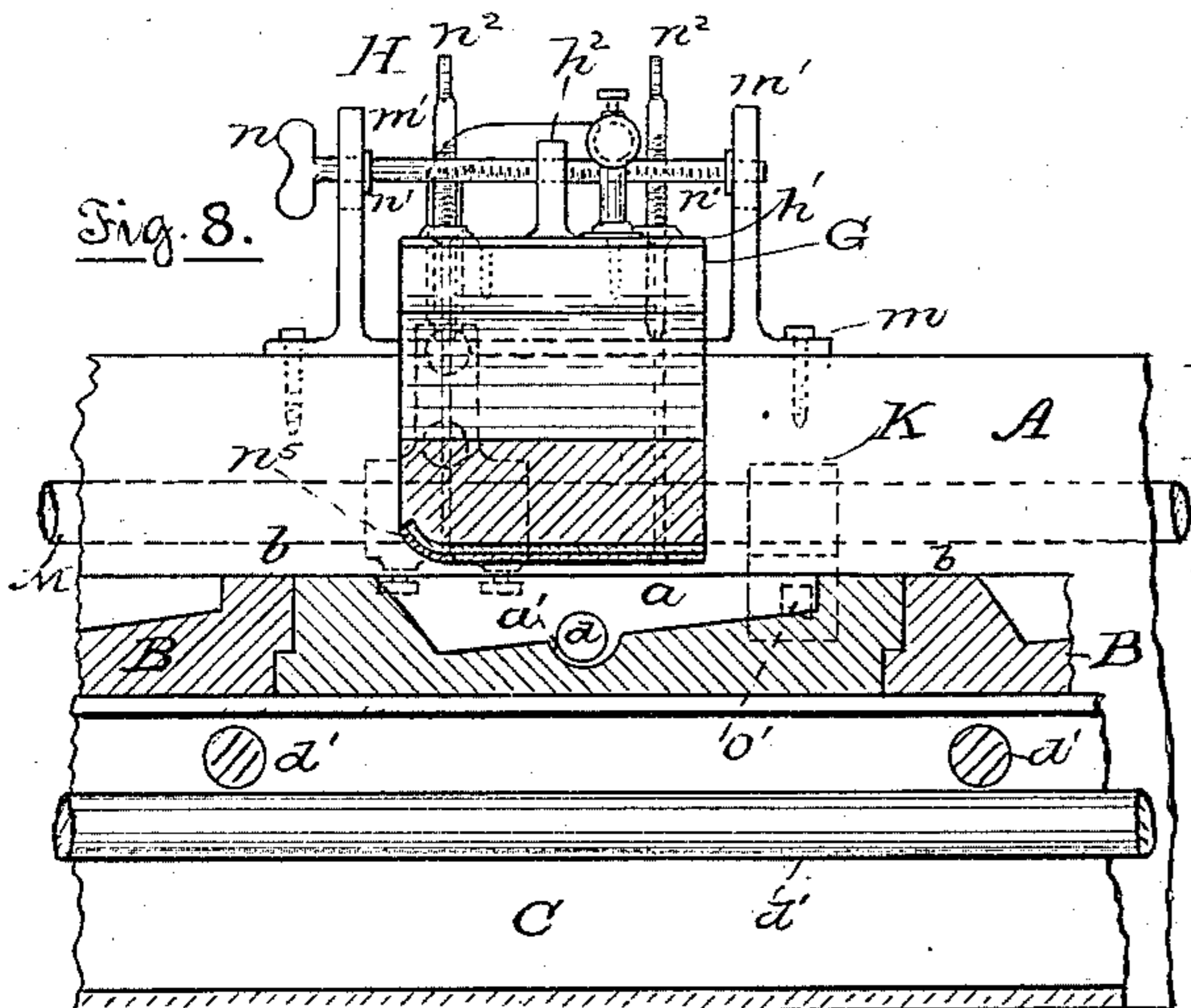


Fig. 9.

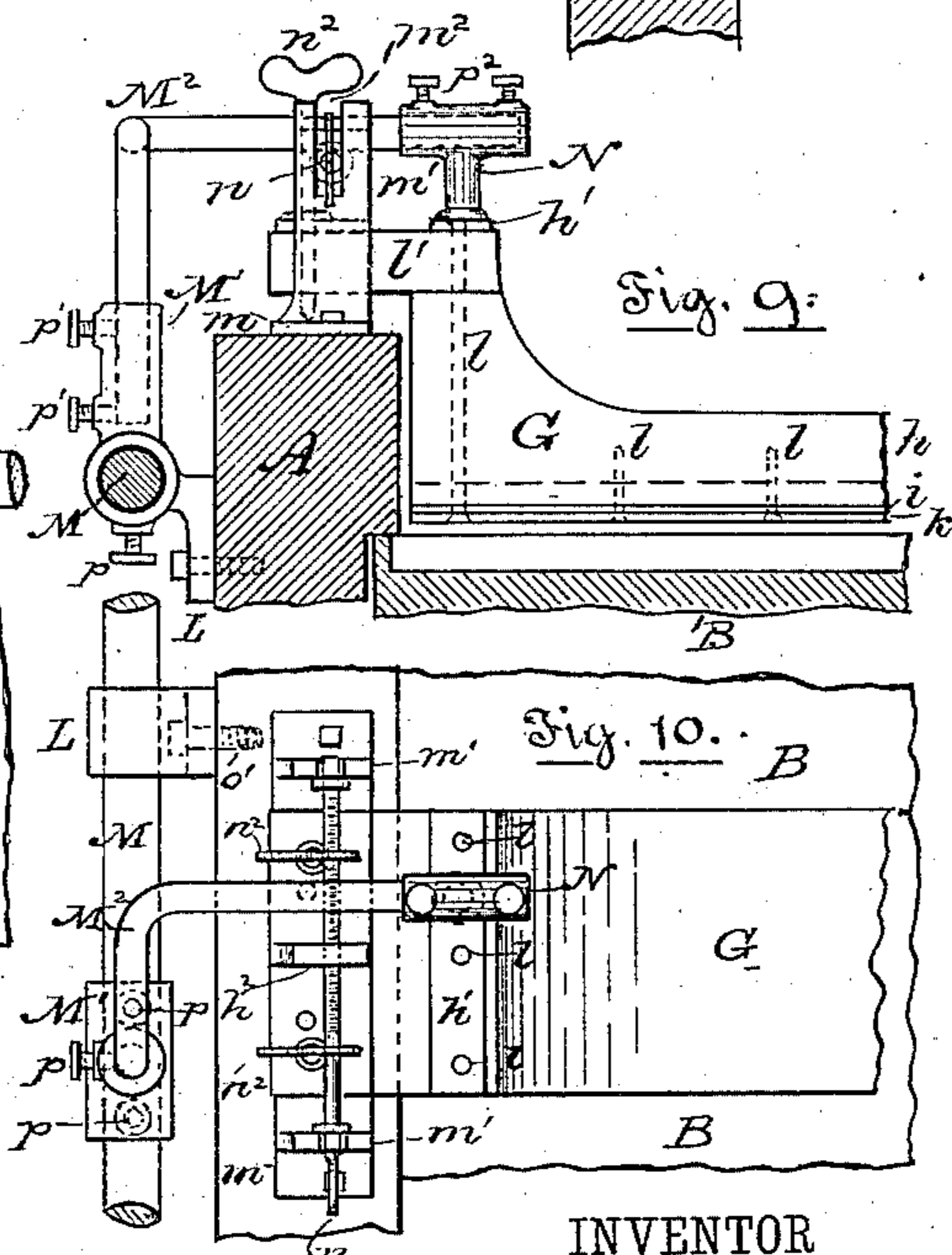
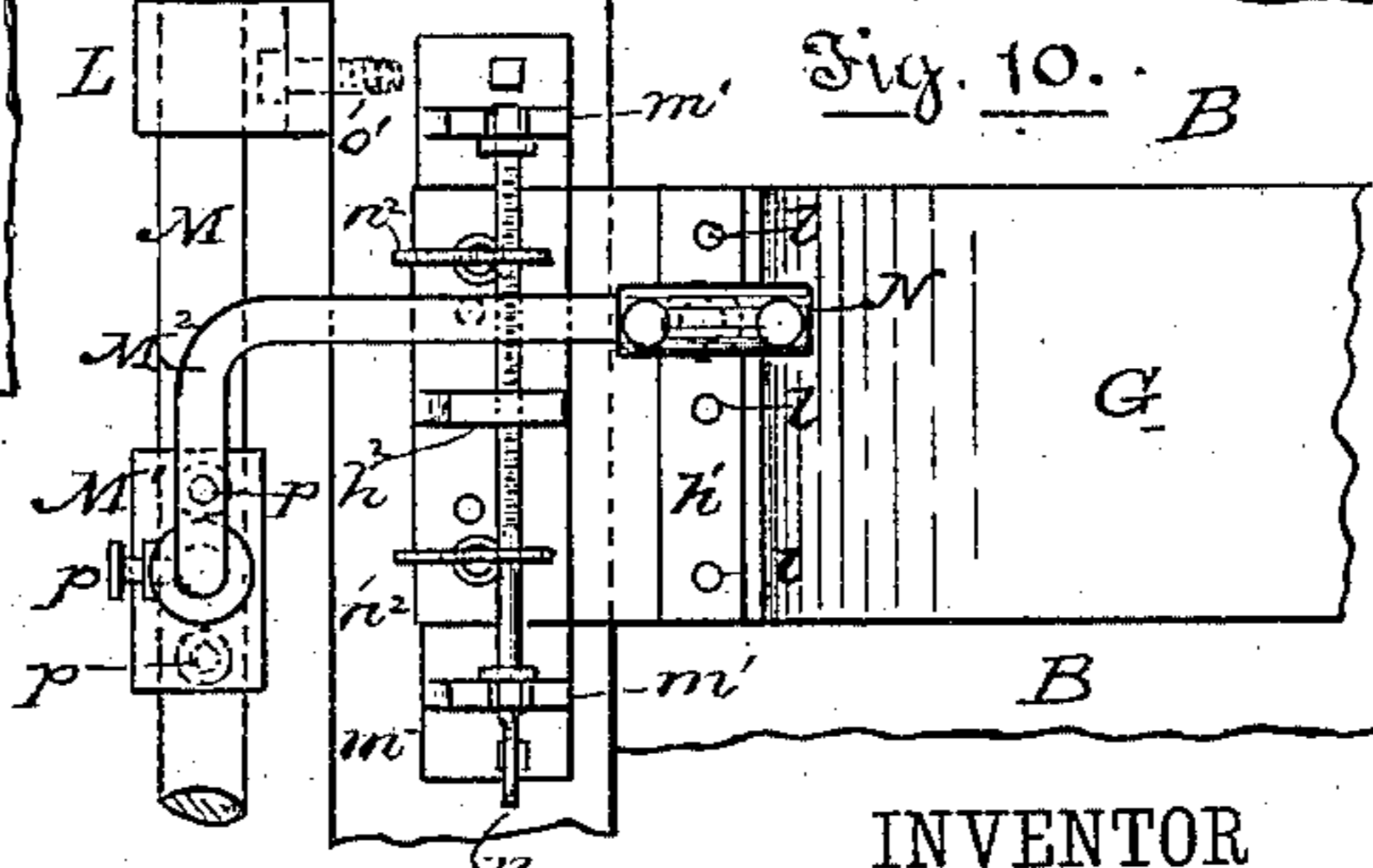


Fig. 10.



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UNITED STATES PATENT OFFICE.

SAMUEL BEAR, OF BROOKLYN, NEW YORK, ASSIGNOR OF THREE-FOURTHS
TO LEO SCHLESINGER, SIDNEY H. CARR, AND JACOB BLUMAUER, ALL
OF NEW YORK, N. Y.

AMALGAMATING-TABLE.

SPECIFICATION forming part of Letters Patent No. 307,081, dated October 28, 1884.

Application filed January 19, 1884. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL BEAR, a citizen of the United States of North America, and a resident of Brooklyn, county of Kings, State of New York, have invented a new and useful Improvement in Amalgamating-Tables, of which the following is a specification.

The object of this invention is to provide an improved apparatus wherewith the combined action of electricity, mercury, and water may be made to serve for the extraction of gold and silver from their ores.

The invention consists of an amalgamating-table provided with a soapstone bottom, beneath which is a steam or hot-water chamber, and it embraces novel devices for adjusting the improved plates that are respectively connected with the positive and negative electric poles, a series of improved connected settling-troughs, and other improved devices for assuring the efficient working of the apparatus.

Reference is to be had to the accompanying drawings, forming part of the specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a longitudinal sectional elevation of my improved apparatus. Fig. 2 is a plan of the same with parts removed. Fig. 3 is a rear end elevation of the same. Fig. 4 is a front end elevation of the same. Fig. 5 is a cross-section on line *x x*, Fig. 1. Fig. 6 is an enlarged partly sectional side elevation showing an anode and a cathode in position. Fig. 7 is an enlarged partly sectional end elevation of the same. Fig. 8 is an enlarged partly sectional side elevation of a portion of the apparatus, showing the adjusting mechanism of an anode. Fig. 9 is an enlarged partly sectional end elevation of the same. Fig. 10 is an enlarged plan of the same.

In the drawings, A represents the amalgamating-table, with a bottom composed of slabs B B of soapstone or steatite closely fitted or jointed together, and provided with superficial transverse cavities *a*, for containing mercury, alternating throughout the length of the table with elevated planes *b*.

Centrally in each cavity *a* is formed a deeper depression or cup, *a'*, into which is inserted,

through a side of the table, a faucet, *d*, for drawing off the mercury and amalgam when desired.

Beneath the soapstone slabs B B is a chamber, C, preferably made of iron, designed for receiving and holding hot water or steam, applied through suitable pipes, for heating the said slabs B B, and through them the mercury resting thereupon for the purposes of preventing the "flouring" of the latter and facilitating the passage of the electric current through it, and the heat imparted by the warmed slabs B B to the mixture of ore and water flowing over them furthers chemical decomposition whenever reagents are introduced into said mixture. The soapstone bottom B B is, for the purposes for which it is designed, preferable to a bottom of any other material, because it is impervious to water, is non-corrosive, is a poor conductor of electricity, and is but slightly affected by changes of temperature, whereas wood, metal, and every other material available for bottoms of amalgamating-tables is deficient in one or more of the above-mentioned advantages. The table is strengthened by longitudinal and transverse bolts *d' d'*, or by other suitable devices, and is supported on a bed-frame, D, in such a manner that by a screw, E, its rear end can be elevated or depressed at will for the purpose of securing a suitable inclination of the table for the easy flow of the water and ore over it, and for varying the inclination of said table, as may be required, to adapt it to work on heavy or light ores, as the case may be.

At the lower end of the table A, and designed to be connected therewith, are arranged a series of V-shaped troughs, F F, planned for an overflow from one to the other in sequence, and decreasing in width from the table A forward for the purpose of causing, by lateral contraction, a proportionately increased rapidity of the flow of the escaping water and ore. These troughs F F are preferably constructed of iron enameled on its upper face, so that they may easily be cleaned and may be unaffected by any corrosive elements or reagents that may be introduced into the water or ore in working the latter. These troughs

F F are designed to be shaped so as to create eddies in the water and ore flowing over and through them from the table A, whereby any particles of gold, silver, or mercury escaping from the table above may be made to subside in contact with the mercury, that when the apparatus is in operation will be contained in the bottom of each trough and each trough F has inserted into it a faucet, *f*, for drawing off the contents thereof. When operating this table, suitable charges of mercury are placed in the cavities *a* thereof, as hereinbefore set forth, the surface of the mercury being designed to come to within about an inch of the top of the plane *b*, next succeeding the table, being at an inclination of about an inch to the foot. Over each cavity *a* a plate, *G*, is adjustably suspended so that its lower edge enters the water used in the operation and reaches to within about half an inch of the mercury in each cavity *a*, and each plate *G* serves as a positive electric pole or anode, and consists of a block, *h*, of wood, having secured on its upper edge a copper plate, *h'*, provided with an upward-projecting nut, *h''*, and having secured on its lower edge a sheet of hard vulcanized rubber, *i*, and over that a sheet, *k*, of copper, fastened in place by copper bolts *l*, several of which bolts extend upward through a lug, *l'*, of said plate and through the copper plate *h'* thereon, to serve for the passage of the positive electric current to the sheet *k*. The upper sides of the copper sheets or plates *k* are so covered, it will be seen, that no ore or water can come in contact with them, and so that the current of electricity can flow only on their lower surfaces. The devices *H*, for adjusting these plates *G*, are secured on one side of the table-frame, as shown in Fig. 8, each adjusting device *H* consisting of a bed-plate, *m*, from which rise two standards, *m'*, provided with vertical slots *m''*. A horizontal screw, *n*, provided with collars *n'* *n'*, passing through the screw-threaded nut *h''*, has its ends resting in these slots *m''*, so that by turning said screw *n* the connected plate *G* may be laterally adjusted, the opposite lug, *l'*, of plate *G* at the same time being entered in a vertical slot, *m'''*, of a standard, *m'*, that is fixed on the opposite side of the table-frame. Vertical adjustment of a plate, *G*, is effected by means of upright screws *n''* *n''*, that pass down through the lug *l'*, and have their points in contact with the plate *m*, the slots *m''* permitting this vertical adjustment. The lower edge of each plate *G* that is toward the upper or higher end of the table is curved, as shown at *n''*, to permit the free flow of the water and ore beneath it. The angle-plates *K* serve as negative poles or cathodes of the battery or other source of electricity connected with the device, and each plate *K* consists of a copper plate bent at right angles and having in its vertical leg a slot, *o*, through which is passed into a branch rod, *P'*, a brass or copper screw-bolt, *o'*, that holds said plate in position, as shown in Figs. 6

and 7, so that by turning said bolt *o'* the said plate *K* may be loosened in position and be elevated or depressed in the mercury that is in the cavities *a*, and by withdrawing said bolt *o'* the plate *K* may be easily removed from its place to be cleaned, to have the amalgam that may have adhered to it scraped off. Brackets *L*, fixed on a side of the table A, support the copper rod *M*, which extends along a side of the table and is designed to be connected with the positive pole of the battery or other source of electricity used when operating this device. In posts *M'*, that are held on the rod *M* by binding-screws *p*, the lower ends of the branch rods *M''* are held by screws *p'*, the other ends of said rods *M''* being held by screws *p''* in posts *N*, that are set on the plates *h'*, so that the positive electric current shall pass into the plates *G*, as set forth. The negative electric current is conveyed from the battery or other source of electricity through a copper rod, *P*, that is held on the opposite side of the table in the eyes of the branch rods *P'*, which enter through the side of the table and are connected with the plates *K* by the bolts *o'*, as set forth, so that the negative electric current may pass into said plates *K*.

It will be seen that the negative plates or poles *K* are connected with the mercury in the table-cavities, and the positive poles or plates are introduced into the water immediately above the mercury and sufficiently close thereto to cause an energetic action, the electric current passing through the water to the mercury, and thereby creating a continuous agitation of the auriferous material and sand at the surface of the mercury and preventing it from "sickening" in the presence of arsenic, sulphur, oil, or any other substances which are deleterious to the action of mercury in amalgamating with gold or silver—that is to say, the surface of the mercury immediately beneath and about the copper plates is by the electric current kept thoroughly bright and capable of amalgamating readily with gold and silver in spite of the presence of foreign substances.

I am aware that steam has been applied to the bottom of amalgamating-pans for facilitating the amalgamating operation, and I am aware, also, that in apparatus for extracting gold and silver from their ores by the combined action of mercury, electricity, and water the anodes have been made vertically adjustable; hence I do not broadly claim these devices.

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

1. An amalgamating-table constructed, substantially as herein shown and described, with soapstone bottom, beneath which is a hot-water or steam chamber whose top is formed by the soapstone bottom of said table, as set forth.

2. The combination, with table A, provided with soapstone bottom B B and hot-water or steam chamber C, of the series of settling-

troughs F, narrowing laterally from said table forward, as set forth.

3. In an apparatus for extracting gold and silver from their ores by the combined action of mercury, electricity, and water, the combination, with vertically-adjustable cathodes, of horizontally-adjustable anodes, substantially as set forth.

4. In an apparatus for extracting gold and silver from their ores by the combined action of electricity, mercury, and water, an anode, constructed substantially as herein shown and described, consisting of wooden blocks, vulcanized rubber, copper plates, and copper bolts, all arranged and operating as set forth.

5. In an apparatus for extracting gold and

silver from their ores by the combined action of electricity, mercury, and water, the combination, with the anode G, of the adjusting mechanism H, constructed, substantially as herein shown and described, with a horizontal screw for laterally adjusting, and vertical screws for vertically adjusting, said anode, as set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 9th day of January, 1884.

SAMUEL BEAR.

Witnesses:

JACOB J. STORER,
A. P. MORIARTY.