

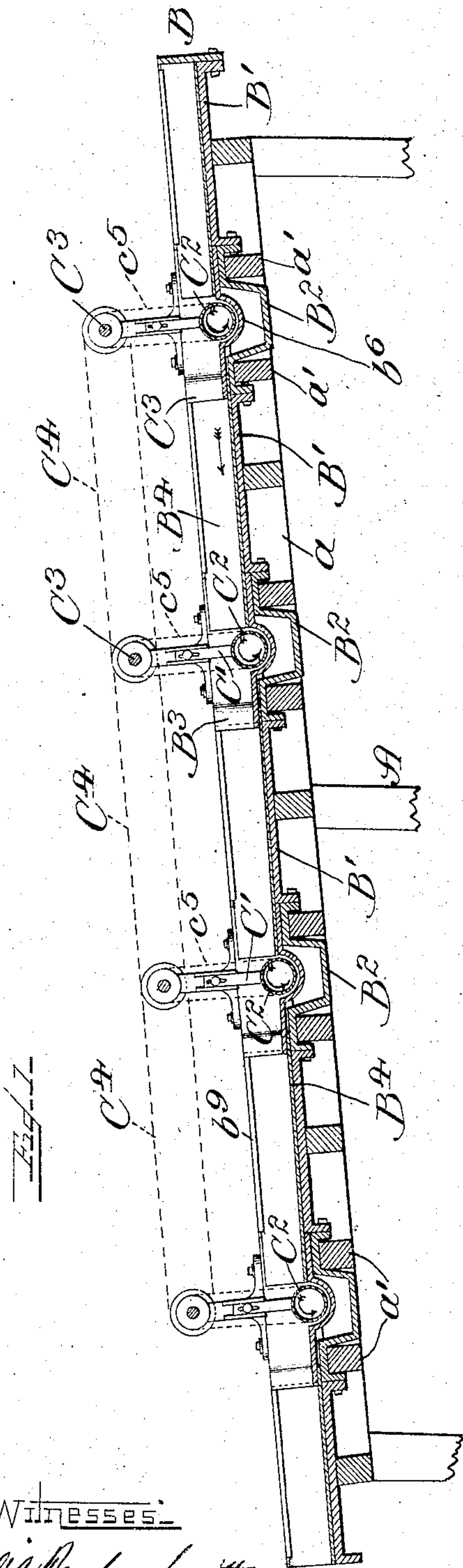
No. 790,000.

PATENTED MAY 16, 1905.

J. J. PEACOCK.  
AMALGAMATOR.

APPLICATION FILED MAR. 28, 1904.

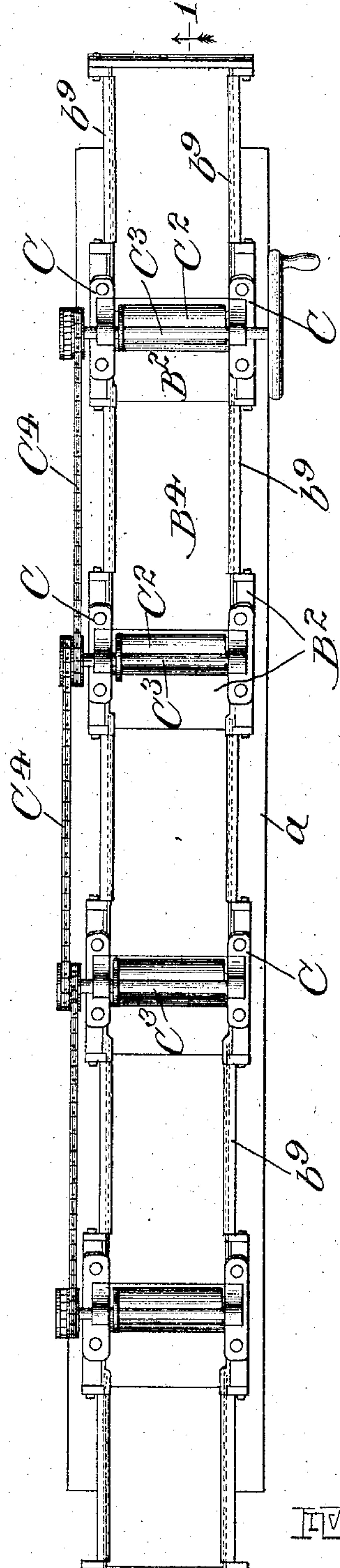
2 SHEETS—SHEET 1.



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Fig. 2.



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ATTYS.

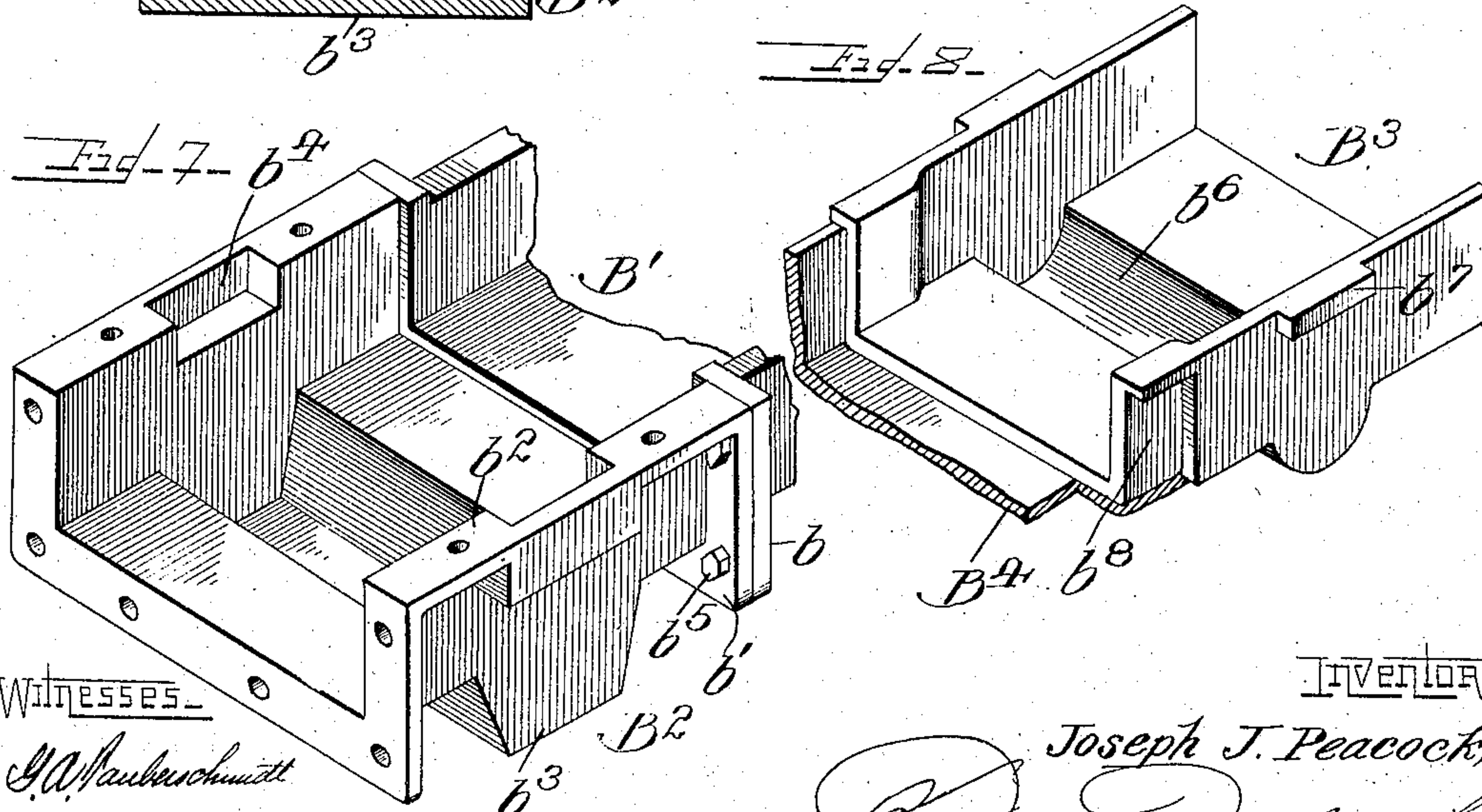
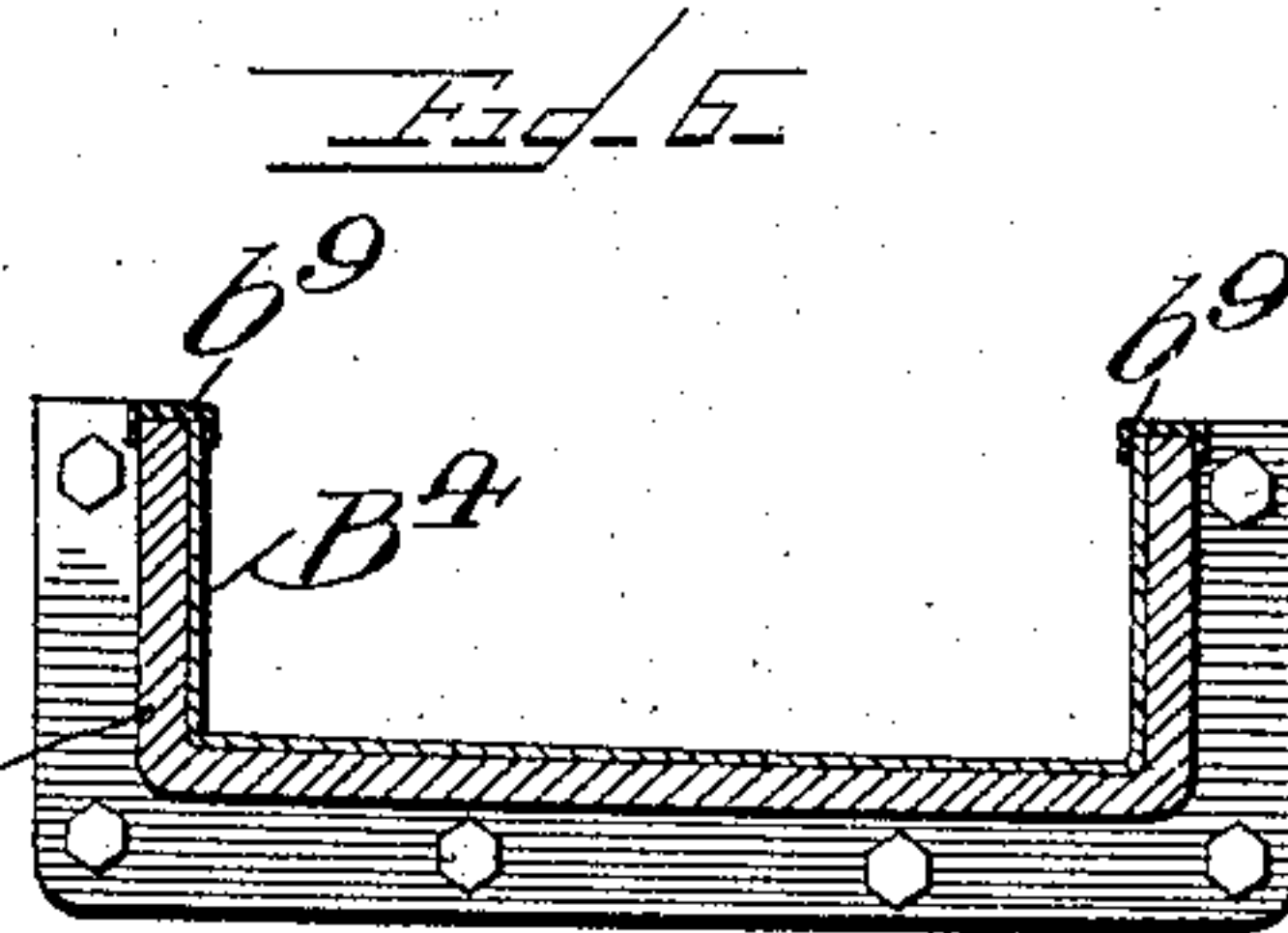
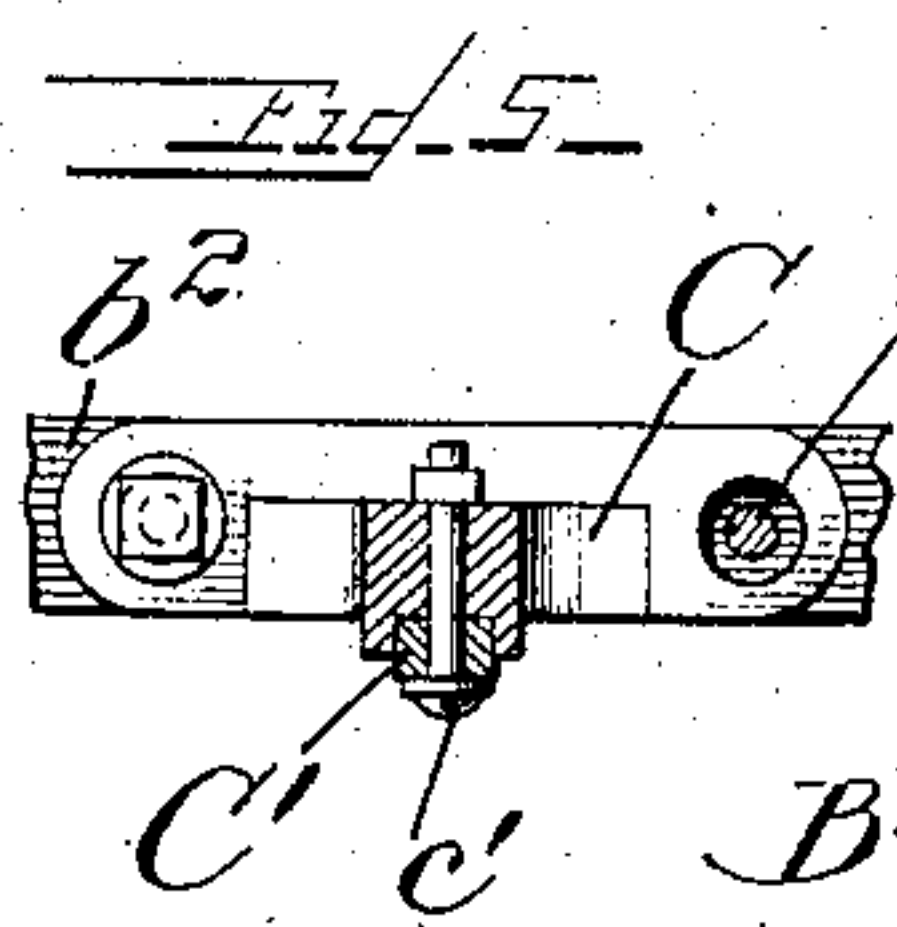
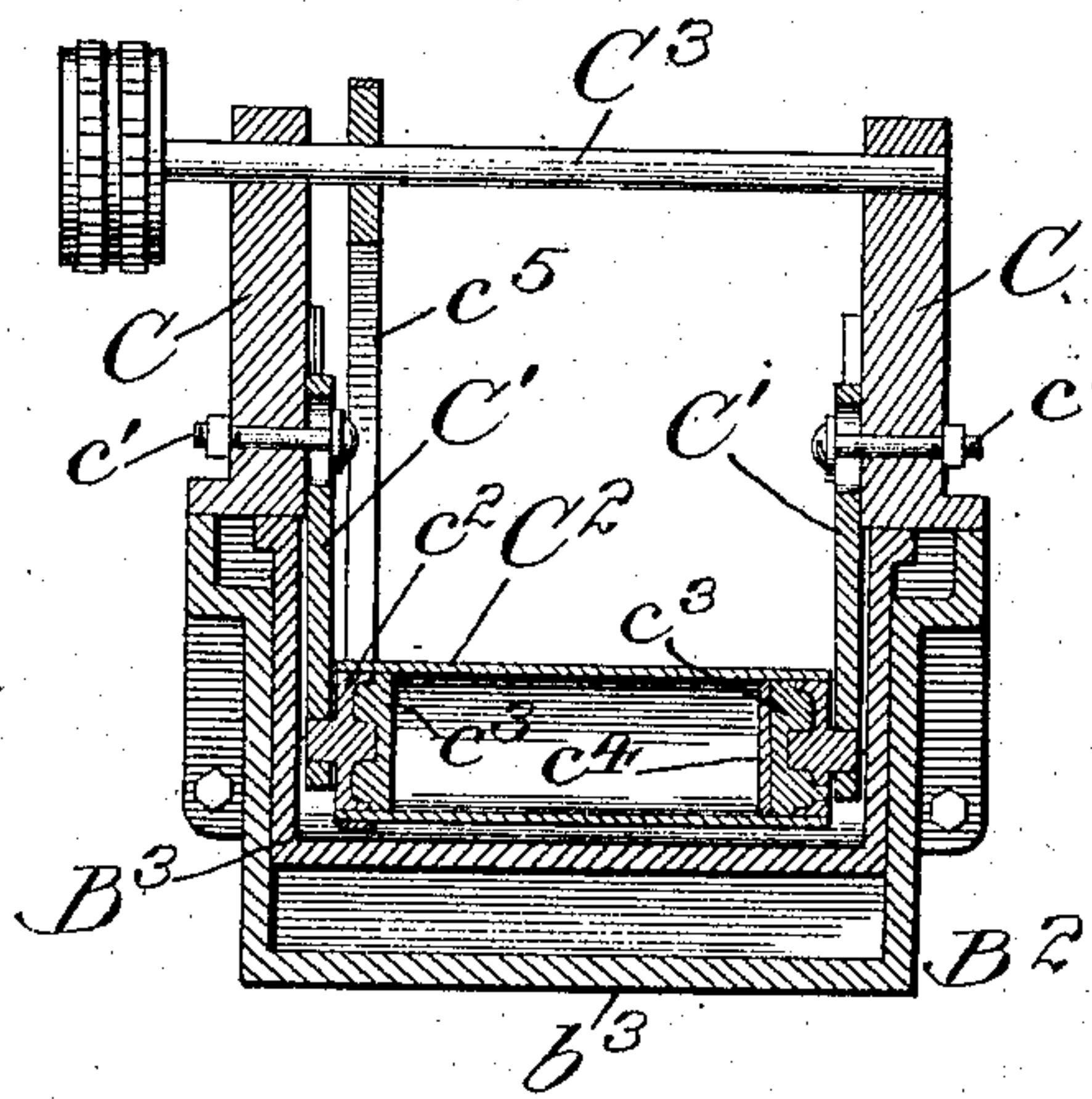
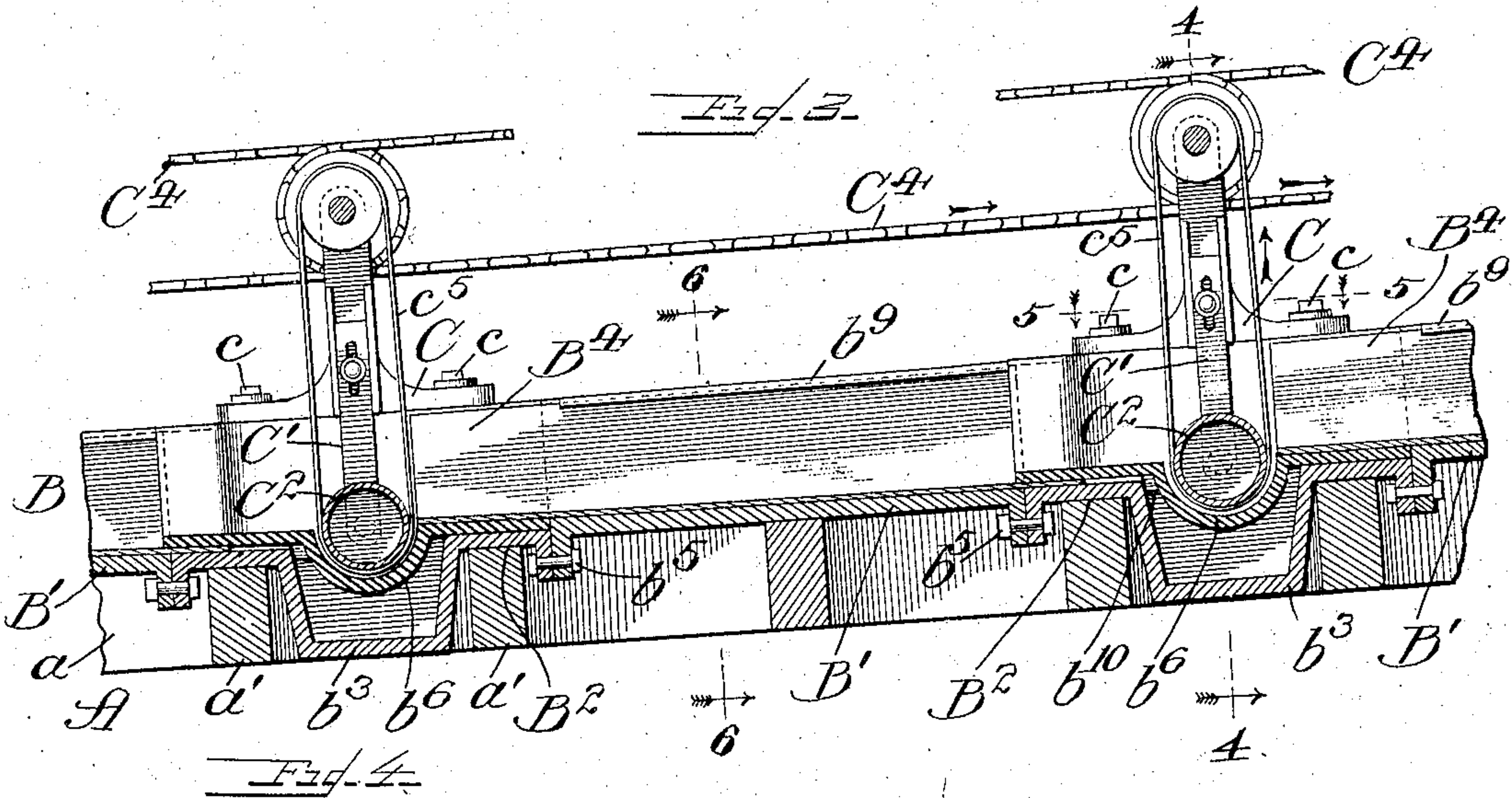


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2 SHEETS—SHEET 2.



Witnesses—

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# UNITED STATES PATENT OFFICE.

JOSEPH J. PEACOCK, OF CHICAGO, ILLINOIS.

## AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 790,000, dated May 16, 1905.

Application filed March 28, 1904. Serial No. 200,360.

*To all whom it may concern:*

Be it known that I, JOSEPH J. PEACOCK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Amalgamators, of which the following is a specification.

My invention relates particularly to amalgamators of the general construction shown in patent to Hoyt, No. 686,300, dated November 12, 1901.

My primary object is to provide a practical construction for amalgamators of the general character referred to, having regard for the practical working conditions under which the amalgamator must be employed.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 represents a broken longitudinal sectional view of an amalgamator embodying my improvements, the section being taken as indicated at line 1 of Fig. 2; Fig. 2, a plan view of the same; Fig. 3, a broken section similar to Fig. 1, but on an enlarged scale; Fig. 4, a transverse section taken as indicated at line 4 of Fig. 3; Fig. 5, a broken plan section taken as indicated at line 5 of Fig. 3; Fig. 6, a transverse section taken as indicated at line 6 of Fig. 3; Fig. 7, a broken perspective view showing the manner of joining two of the sluice-sections of the amalgamator, and Fig. 8 a perspective view of a removable amalgam-pan and a fragment of a copper lining employed for forming lap-joints as shown in Fig. 3.

In the preferred construction, A represents any suitable frame provided with a top having a desired inclination; B, an inclined sluice supported on said frame and composed of similar alternate sections B' B<sup>2</sup>, suitably joined together; B<sup>3</sup>, a series of amalgam-pans virtually forming linings for the sluice-sections B<sup>2</sup>; B<sup>4</sup>, lining-sections employed for making lap-joints; C, a series of pairs of standards adjustably supported on the sluice-sections B<sup>2</sup>; C', vertically-adjustable hangers or bearings connected with the standards C and having their lower ends extending within the sluice to near the bottom thereof;

C<sup>2</sup>, rollers or cylinders journaled in the lower ends of said hangers and dipping into concavities with which the removable amalgam-pans are provided; C<sup>3</sup>, a series of transverse shafts journaled in the upper ends of the standards C, and C<sup>4</sup> a series of chains or other flexible connections connecting the shafts in pairs, as shown.

I have shown the frame A composed of suitably-supported side members *a*, connected by suitably-spaced cross members *a'*. It will be understood, however, that any suitable frame may be employed.

In the preferred construction of the sluice B the sections B' comprise open troughs of rectangular cross-section and each having a plane bottom and sides and having external end flanges *b*, as shown, and the sections B<sup>2</sup> are somewhat similar in general formation and are equipped externally with end flanges *b'* and top flanges *b''*. The sections B<sup>2</sup> are preferably shorter than the sections B', and each of the sections B<sup>2</sup> is provided centrally at its bottom with a hollow enlargement *b<sup>3</sup>*, extending transversely of the sluice, and each of the sections B<sup>2</sup> is recessed internally at the upper portions of its sides, as shown at *b<sup>4</sup>*. The end flanges of the adjacent ends of adjacent sections abut against each other and are connected by bolts *b<sup>5</sup>*. The sluice-sections B<sup>2</sup> are of somewhat greater internal cross-section than are the lower ends of the sluice-sections B', so that when the amalgam-pans B<sup>3</sup> are inserted their internal surfaces are flush with the internal surfaces of the lower end portions of sluice-sections B'. The amalgam-pans B<sup>3</sup> are open-ended pans of rectangular cross-section and have plane sides and a plane bottom, except that the bottom is struck or curved downwardly to form a transversely-extending mercury-well of semicircular cross-section. The sides of each pan are provided at their upper portions with external handles *b<sup>7</sup>*, and said sides are struck inwardly, as shown at *b<sup>8</sup>*, at the lower or rearedges of the sides. The lining-sections B<sup>4</sup> comprise rectangular copper sheets having their lateral margins bent upwardly to form sides. In assembling the parts the en-



largements  $b^3$  of the sections  $B^2$  receive the wells  $b^6$  of the mercury-pans and the recesses  $b^4$  receive the handles  $b^7$ . Also the lateral recesses  $b^8$  of the mercury-pans receive the upper end portions of the sides of the lining-sections  $B^4$ , and each lining-section overlaps two joints of the sluice and terminates at its lower end adjacent to the upper margin of the well of the amalgam-pan at its lower end.

The sides of the sluice-sections  $B'$  are somewhat lower than the sides of the sluice-sections  $B^2$  and at their upper edges receive retaining-clips  $b^9$ , which serve both to aid in retaining the lining-sections in place and to present smooth surfaces at the upper edges of the sides of the sections  $B'$ . On the under surfaces of the amalgam-pans  $B^3$  and at the lower sides of the wells  $b^6$  are spacing-lugs  $b^{10}$ , which bear against the inner surfaces of the hollow enlargements  $b^3$  and insure the proper location of the amalgam-pans in the sluice.

The standards  $C$  have sufficiently wide bases to rest firmly on the flanges  $b^2$  of the sluice-sections  $B^2$  and upon the upper edges of the amalgam-pans  $B^3$ , and said standards are firmly adjustably secured to the flanges  $b^2$  by means of bolts  $c$ , which pass through perforations of greater diameter than themselves in the standard-bases, as shown in Fig. 5. The inner surfaces of the standards  $C$  are substantially flush with the inner surfaces of the amalgam-pans, as shown in Fig. 4. The hangers  $C'$  are provided at their upper ends with vertical slots, through which pass bolts  $c'$ , by means of which the hangers are adjustably secured to the standards. Each cylinder  $C^2$  comprises a hollow sheet-copper cylinder having inserted cast-metal ends  $c^2$ , backed internally by Babbitt metal  $c^3$  and provided externally with trunnions or journals. One of the Babbitt fillings  $c^3$  is backed by a disk  $c^4$ , and the adjacent cylinder end is perforated to permit the Babbitt metal to be poured in. Each shaft  $C^3$  is connected by a belt  $c^5$  with the corresponding cylinder lying below it. As will be understood from Fig. 4, the cylinders are so journaled in the hangers that they will be restrained from rising under the buoyant action of the mercury, which is of high specific gravity.

By preference the mercury-wells are graduated in size from the upper end of the machine to the lower end thereof, the upper well being the largest. The purpose of this arrangement is to permit the use of successively less quantities of mercury in the wells from the upper end of the machine to the lower end in order that the live quicksilver may be used up at about the same time at all the wells, it being a fact that the wells collect the precious metals in graduated quantities from the upper end of the machine to the lower end thereof, the largest quantity being collected at the upper end of the machine.

The hangers  $C'$  are preferably of wood fiber,

and the inner surfaces of the amalgam-pans are coated with aluminium-paint, as are also the outer surfaces of the cylinder ends. It is the purpose of the construction to employ as little iron as possible which shall come in contact with the mercury, and wherever iron does come in contact with the mercury the aluminium-paint will suffice as a preservative.

From the foregoing detailed description the manner of use of the machine will be readily understood. Power is applied to the machine in any suitable manner, as by means of the hand-wheel shown in Fig. 2, and sand and water are passed through the sluice in the usual way. During the operation the cylinders are revolved in the mercury-wells, thereby keeping the cylinders coated with a thin covering of mercury, which serves to collect the particles of gold as they pass over or under the cylinders, according to the direction of rotation of the cylinders. To overcome any tendency to clog the wells with particles of gravel or sand and also to enable the maximum amount of material to be passed through the machine, it usually is desirable to rotate the cylinders so that their upper portions will move with the current, as indicated by the arrows. When it is found that as much amalgam has been formed as is practicable, the lining-sections  $B^4$  and the amalgam-pans  $B^3$  are removed from the machine, which action is permitted by removing the standards  $C$  and the cylinders depending therefrom. If desired, the same result may be accomplished by loosening the standard-bolts and shifting the standards and then removing the hangers, with the cylinders supported thereby. Either course enables the cylinders to be removed from their bearings and thoroughly cleansed or replaced by substitute cylinders, and the lining-sections and amalgam-pans  $B^3$  may also be replaced, so that the operation of the machine need not be delayed while the amalgam is being collected.

It is noteworthy that in my improved construction provision is made for supporting and rotating the amalgam-cylinders without perforating the walls at the ends of the wells to provide bearings for the cylinders, so that there is no opportunity for the escape of mercury or amalgam, with consequent loss of material and injury to the machine. It is also noteworthy that all the parts upon which there is likelihood of any amalgam collecting are readily removable and replaceable. Furthermore, the adjustability of the cylinder-hangers upon the standards supporting them enables the capacity of the well (which is regulated by the space between the cylinder and the walls of the well) to be altered at will, so that any desired quantity of quicksilver may be employed. This is of great importance where economy of equipment



and operation must be considered. Moreover, the adjustability of the standards enables the cylinder to be shifted toward or away from the upper end of the machine, enabling the most advantageous arrangement to be obtained for any given conditions under which the machine must be operated.

In addition to what has been stated with relation to the merits of the improved construction it may be stated that any desired number of sections may be employed in making up a machine and the sections may be given the most advantageous arrangement for the conditions under which the machine is to be employed. For instance, the first five sections of the machine might be employed together, in which case only two cylinders would be required and one chain connecting the shafts C<sup>3</sup>. Thus the sectional construction as herein provided not only renders the machine readily portable—a matter of great importance—but enables the same machine to be taken apart and reconstructed into two or more machines when conditions require.

The amalgam-pans are interchangeable, and usually each machine is supplied with several pans of each size. Any desired arrangement of the pans in a given machine may be made, therefore. For instance, the machine may be equipped with pans all of the smallest capacity, and the machine may then be used for sampling purposes or for regular amalgamating-work when only a small amount of quicksilver is available.

It will be understood that many changes in details of construction within the spirit of my invention may be made. Hence I desire to be understood as intending no undue limitation from the foregoing detailed description.

What I regard as new, and desire to secure by Letters Patent, is—

1. In a machine of the character set forth, the combination with a suitable sluice provided with a well having imperforate end walls, of a cylinder rotatably mounted in bearings inside said end walls and dipping into the well, said cylinder being positively restrained by its bearings against rising, for the purpose set forth.

2. In a machine of the character described, the combination with a suitable sluice provided with a well, having imperforate end walls, of hangers depending into the sluice adjacent to the well and inside the end walls thereof and a cylinder rotatably mounted in said hangers and dipping into the well, the bearings in the hangers serving to restrain the cylinder from rising for the purpose set forth.

3. In a machine of the character described, the combination with a suitable sluice, of a removable amalgam-pan provided with a well having end walls, suitably-supported hangers depending within said amalgam-pan

inside of said end walls, and a cylinder rotatably mounted on the lower ends of said hangers.

4. In a machine of the character described, the combination with a sluice provided with a well, adjustably-supported hangers depending in the sluice at said well and provided with circular bearings, and a cylinder rotatably mounted in said bearings and dipping into the said well, for the purpose set forth.

5. In a machine of the character described, the combination with a suitable sluice provided with a well having end walls, of a cylinder rotatably supported in bearings inside said end walls and restrained against rising, and a shaft located above said cylinder and geared thereto, for the purpose set forth.

6. In a machine of the character described, the combination with a sluice, of a removable amalgam-pan provided with a well having imperforate end walls, hangers depending between said end walls, a cylinder journaled in the lower ends of said hangers and restrained against rising thereby, and a shaft geared to said cylinder.

7. In a machine of the character described, the combination with a suitable sluice provided with a well, of a vertically-restrained cylinder dipping into said well, means for adjusting the cylinder vertically, whereby the capacity of the well may be varied by adjustment of the cylinder, and means for rotating said cylinder, for the purpose set forth.

8. In a machine of the character described, the combination with a suitable sluice, of an amalgam-pan therein provided with a well, standards adjustably connected with said sluice, hangers adjustably connected with said standards, a cylinder mounted in the lower ends of said hangers, and a shaft geared to said cylinder.

9. In a machine of the character described, the combination with a plurality of suitably-connected aligned sluice-sections, one of said sections being provided with a hollow enlargement at its bottom, of a removable amalgam-pan provided at its bottom with a well received by said hollow enlargement, said well having imperforate end walls, and a suitably supported and actuated cylinder dipping into said well and having bearings independent of the end walls of the amalgam-pan, for the purpose set forth.

10. The combination of a plurality of sluice-sections provided with abutting end flanges, connecting means joining said end flanges, removable amalgam-pans provided with wells, and cylinders journaled independently of the amalgam-pans and dipping into said wells, for the purpose set forth.

11. A machine comprising a plurality of alternately-similar sluice-sections, removable amalgam-pans supported in alternate sections and having imperforate end walls,



lining-sections forming lap-joints with the amalgam-pans and sluice-sections, and suitably supported and actuated cylinders, for the purpose set forth.

5 12. A machine comprising a sluice-section B<sup>2</sup> provided at its bottom with a depression, sluice-sections B' joined to the upper and lower edges of said first-named section, a removable amalgam-pan provided with a well  
10 received by said depression, standards supported by the sluice-section B<sup>2</sup>, hangers supported by said standards, and depending into the amalgam-pan, a shaft journaled in said standards, and a cylinder journaled in  
15 said hangers and geared to said shaft, for the purpose set forth.

13. In a machine of the character described, the combination of a series of alternately-similar sluice-sections provided at  
20 their bottoms with depressions, a series of alternately-similar sluice-sections with plane bottoms, suitable connecting means between the sluice-sections, a series of removable amalgam-pans provided with wells received by said depressions, a series of pairs

of hangers depending in said amalgam-pans, cylinders journaled in the lower ends of said hangers, shafts located above said cylinders, flexible connections between said shafts and said cylinders, and connections between said shafts, substantially as and for the purpose set forth.

14. In combination with a sluice, a removable amalgam-pan for the purpose set forth, comprising an open-ended member having  
3 imperforate sides and a bottom provided with a well, and laterally-projecting handles at the upper portions of said sides.

15. A machine of the character described, comprising a plurality of interchangeable  
4 members provided with wells of different capacities, a plurality of cylinders, supporting means for said cylinders, and means for rotating said cylinders, for the purpose set forth.

JOSEPH J. PEACOCK.

In presence of—

WALTER N. WINBERG,  
W. B. DAVIES.