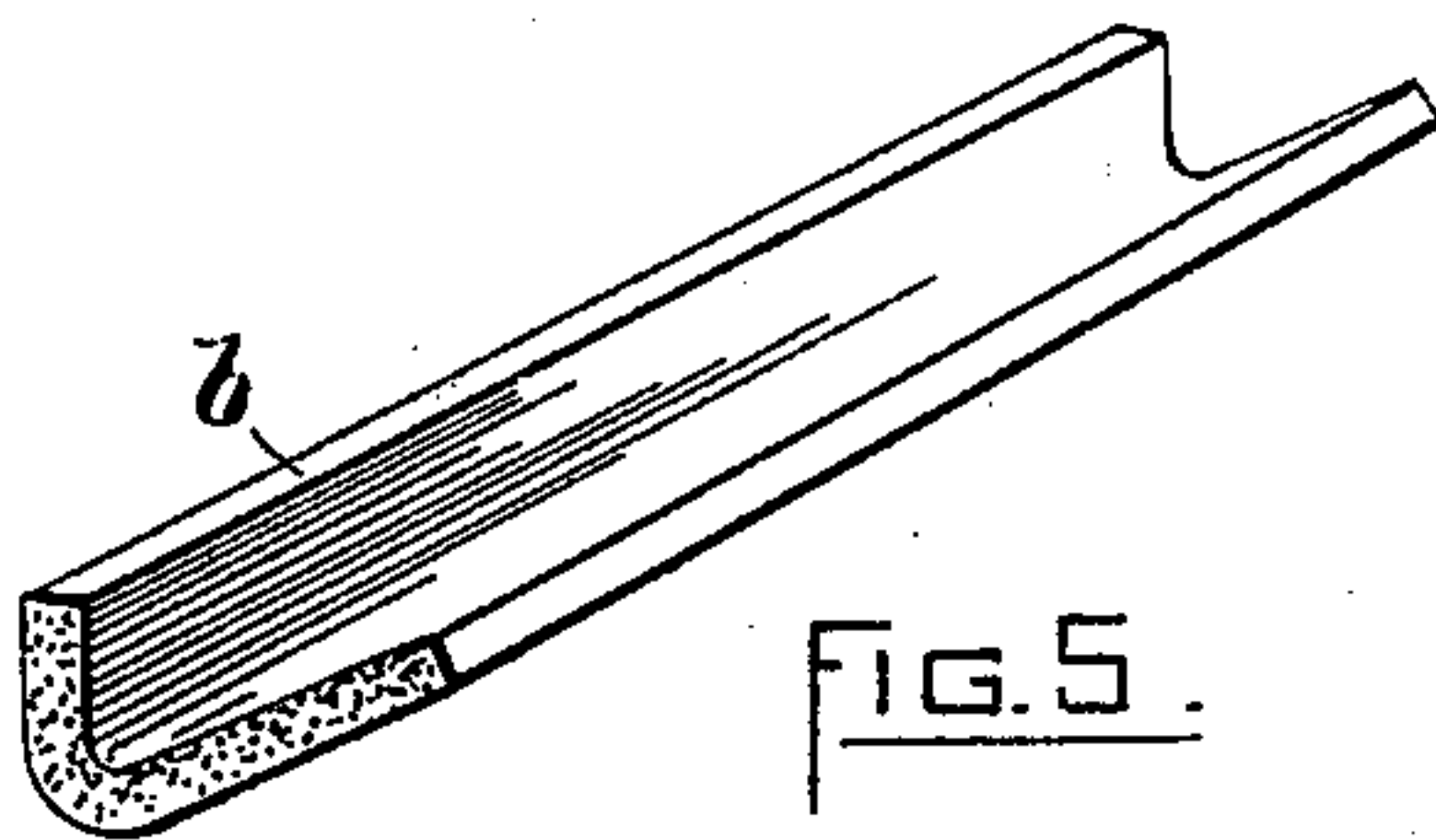
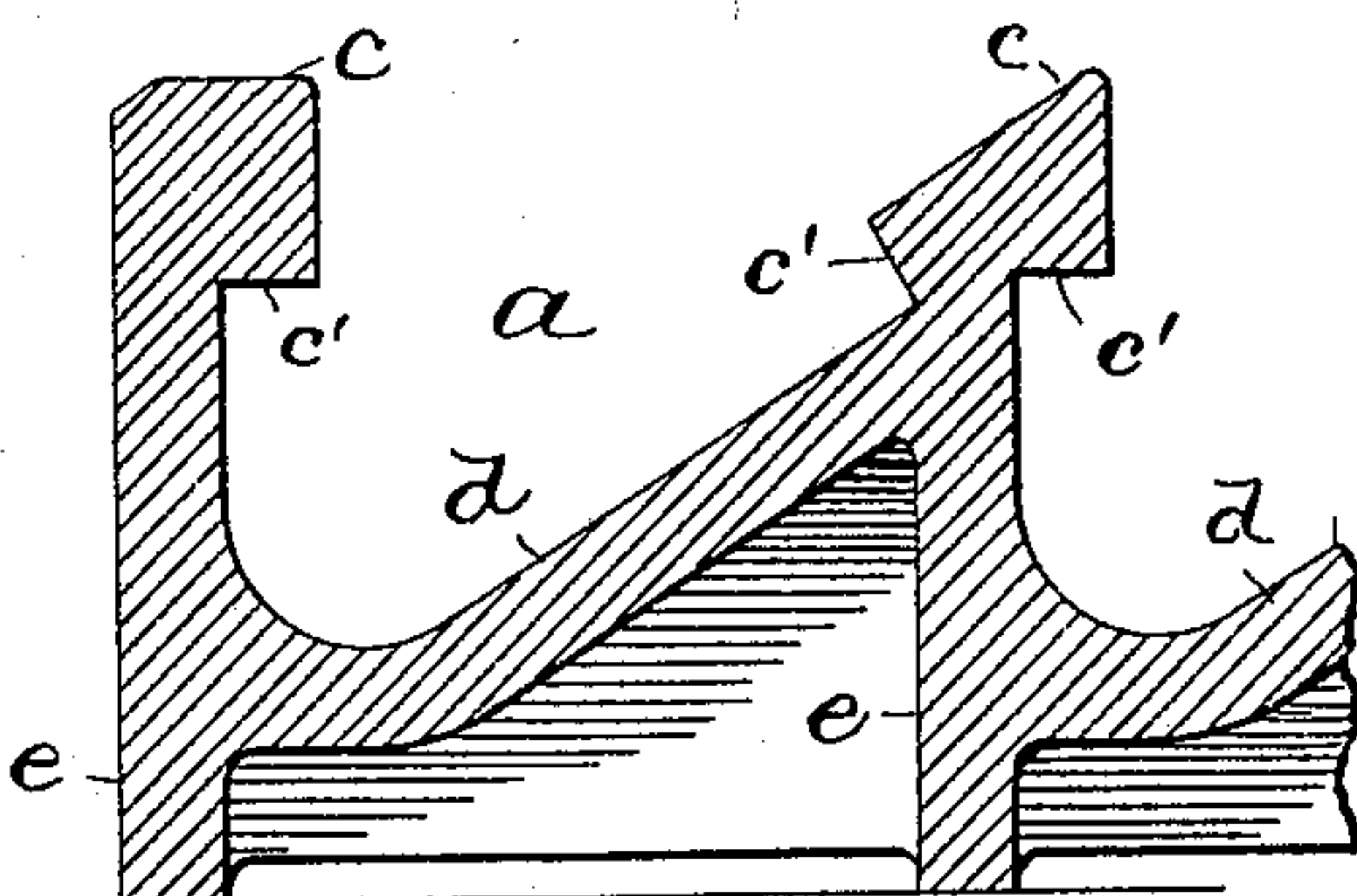
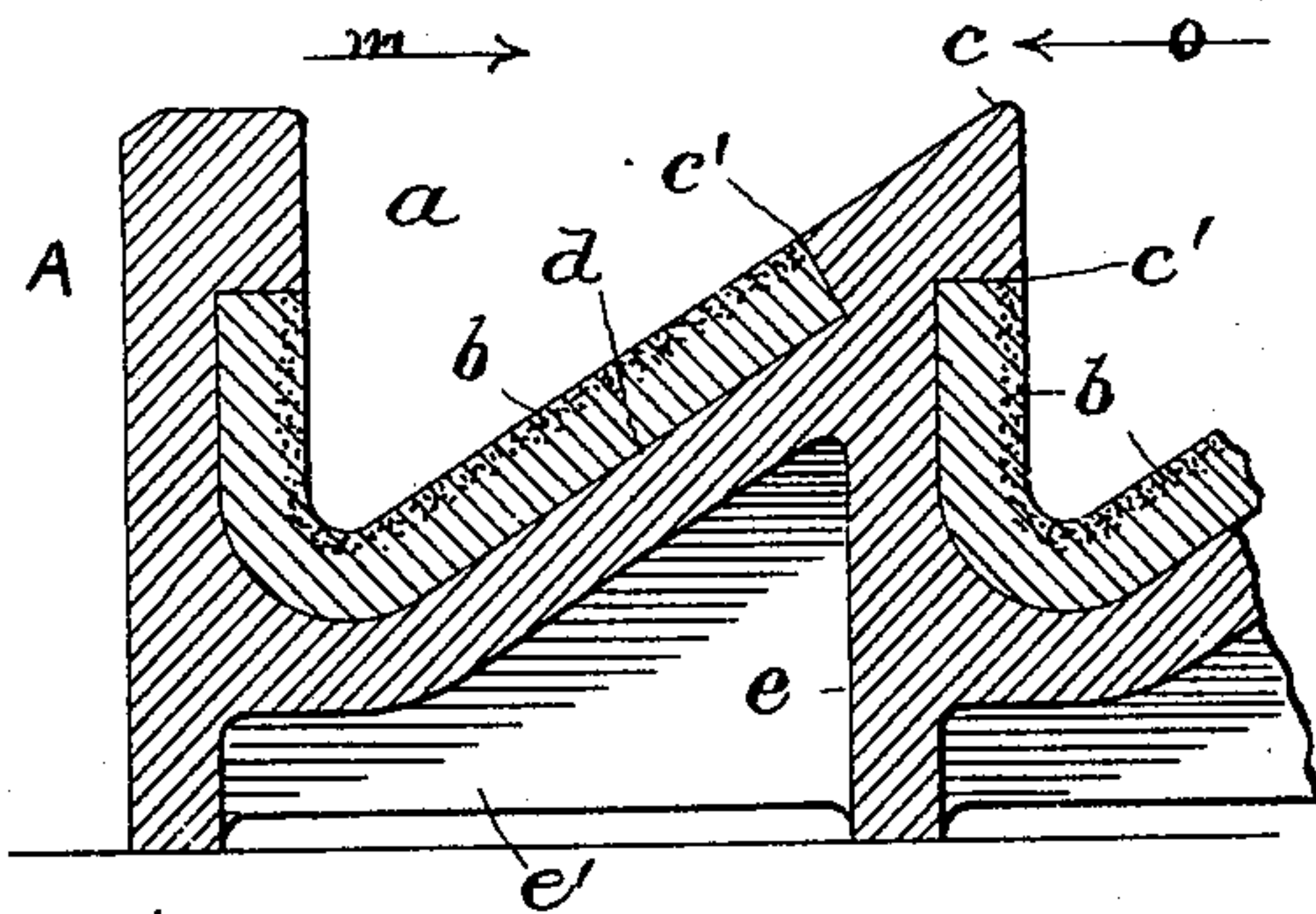
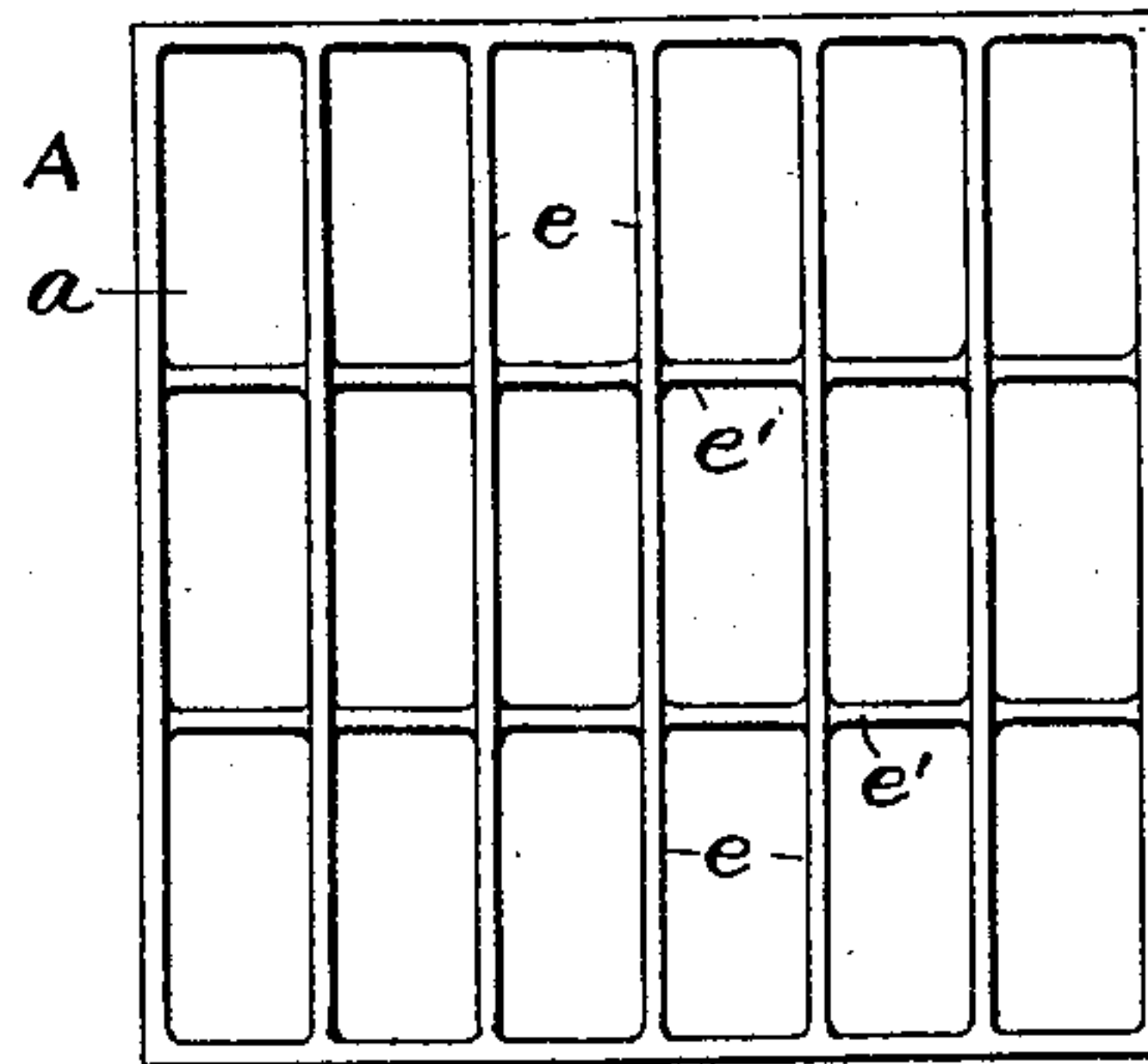
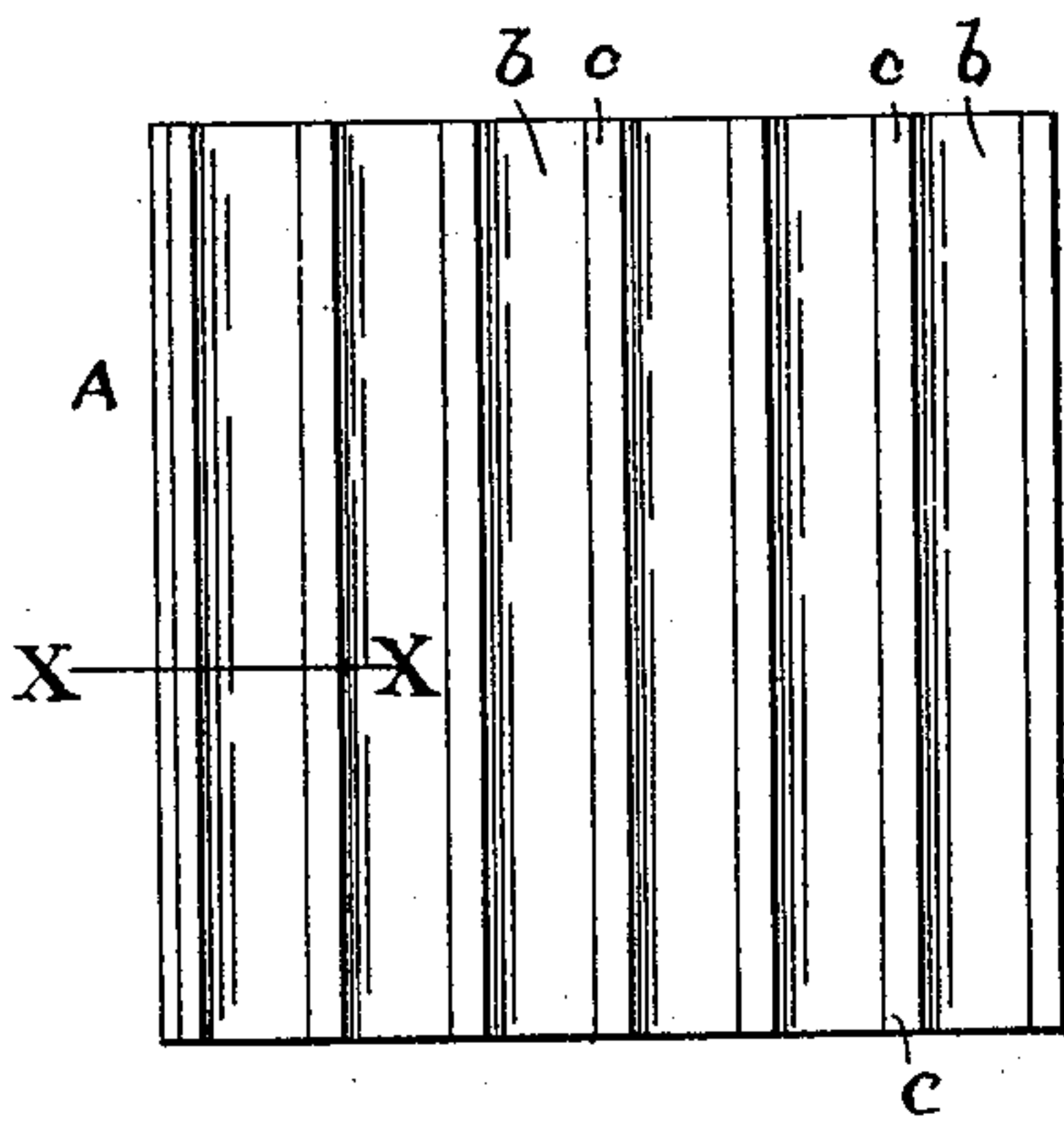
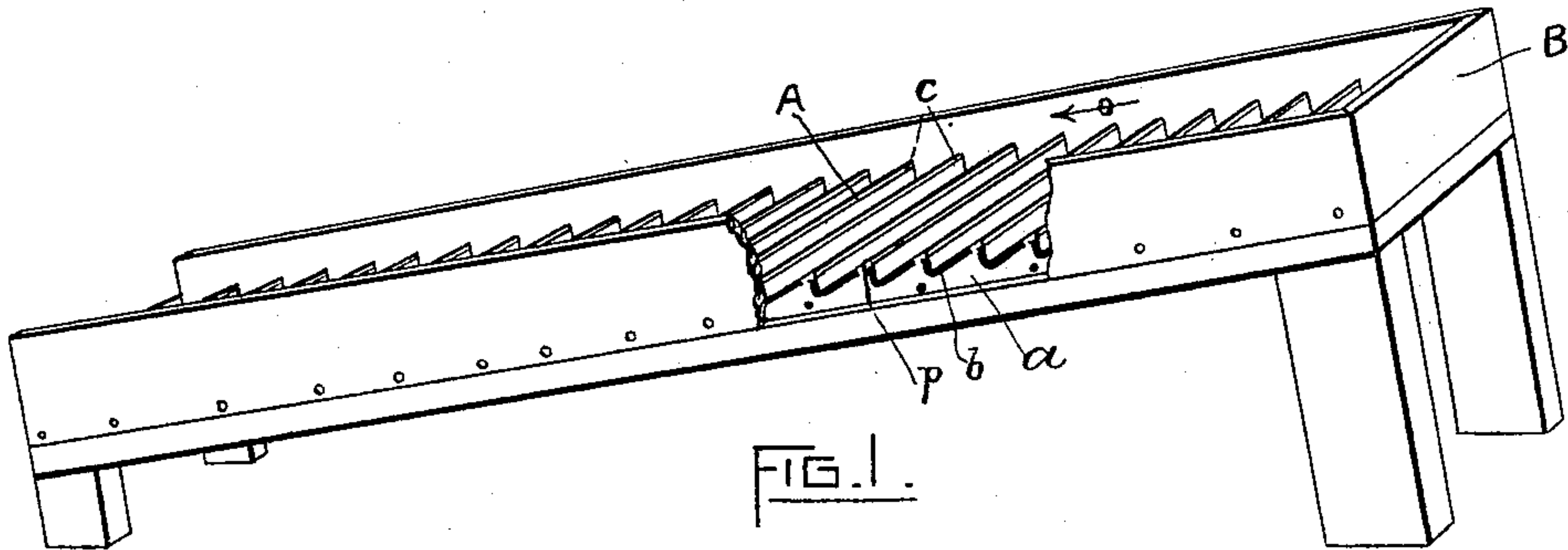


(No Model.)

C. E. GREENE.
RIFFLE PLATE.

No. 599,128.

Patented Feb. 15, 1898.



WITNESSES:

Harry J. Garcesen
Remington Sherman

FIG. 5.

INVENTOR:

Charles E. Greene.

BY *Geo. H. Remington & Co.*
ATTYS

UNITED STATES PATENT OFFICE.

CHARLES E. GREENE, OF PROVIDENCE, RHODE ISLAND.

RIFFLE-PLATE.

SPECIFICATION forming part of Letters Patent No. 599,128, dated February 15, 1898.

Application filed May 10, 1897. Serial No. 635,804. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. GREENE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Riffle-Plates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in "riffle-plates," so called, employed in gold-collecting apparatus or amalgamators.

In the construction of riffle-plates as hitherto made it has been usual, so far as I am aware, to cast or form the riffles or ribs integral with the plate or base, the entire surface of the plate, including the ribs, being covered with the quicksilver composition or amalgam, although in some cases riffle-plates have been devised in which mercury-holding troughs have been removably secured to one or both ends of the plates.

I am aware of the fact that it has been proposed to employ cast-iron sluice-boxes the bottoms of which were provided with holes, in which latter were seated removable amalgamated cups or cups adapted to hold free quicksilver and arranged to arrest and hold the particles of fine gold mingled with the sand and flowing over the surface of the sluice-box.

In such former construction the action of the sand and water flowing over the face of the plates operates to wear off the amalgam from the tops of the ribs or riffles, thereby impairing the efficiency and durability of the plates, and in cases where the plates are composed, say, of comparatively soft metal, as copper or composite metal, the force of the sand soon cuts through the ribs, thus necessitating correspondingly frequent renewals of the plates and greatly increasing the cost of maintenance.

The object I have in view is to produce a riffle-plate possessing superior advantages

and one in which the disadvantages or objections inherent in former devices of this class are practically eliminated.

To that end my invention consists, essentially, of a plate member of hard metal, as cast-iron, provided with a series of integrally-formed raised ribs or riffles and a corresponding series of suitably-shaped insertible amalgam or gold collecting lining pieces or strips mounted in the grooves or channels formed between the riffles, all as hereinafter set forth and claimed.

In the accompanying sheet of drawings, Figure 1 is a perspective view of a sluice or trough provided with my improved riffle-plates, a portion of the front side being broken away. Fig. 2 is a plan view, in enlarged scale, of one of the plates or sections. Fig. 3 is a bottom view. Fig. 4 is a transverse section, enlarged, taken on line *xx* of Fig. 2. Fig. 5 is a perspective view of one of the gold-collecting lining pieces or strips detached from the plate; and Fig. 6 is a sectional view similar to Fig. 4, the lining-pieces being omitted.

In the drawings, *A* designates an amalgam or gold collecting plate or section embodying my improvement, its size being, say, one foot square. I prefer to arrange and mount these plates end to end in the base of a suitable trough or sluice, substantially as shown in Fig. 1, thus forming a practically-continuous plate having any proper length. The adjacent edges of the sections may be machined and having a packing *p* of rubber between them, if desired.

The base or holder member *a* of my improved plate *A* may be made of cast-iron or other suitable material and provided on its upper or face side with a series of transversely-arranged ribs or riffles *c* integral therewith. The form and size of these ribs may be varied, according to the class of gold-bearing material or finely-divided ore employed. At or near the base of the ribs *c* the latter are provided with shoulders *c'*, the intervening part of the plate uniting each pair of ribs being concave and forming a seat or support *d* for the correspondingly shaped insertible gold-collecting or amalgam lining member *b* about to be described. The form of these concave

or grooved seats *d* may be varied at will, although the shape represented in the drawings produces good results.

In order to strengthen the base-casting *a*, it may be provided on its under side with thin stiffening-ribs *e*, extending downwardly from and coextensive with the riffles *c*. The plate is further strengthened by the addition on its under side of other ribs *e'*, formed at substantially right angles with and intersecting the ribs *e*, substantially as represented in the drawings. The ribs *e e'* render the plate stronger without materially increasing its weight and at the same time serve to keep it from warping.

The amalgam or gold collecting lining members *b* may be made of any suitable metal, as copper, or even a composition of metals susceptible or retaining successive layers or applications of the quicksilver solution. These lining members *b* may be cast or otherwise produced, their form cross-sectionally being substantially the counterpart of the said concave seats *d*. The edges of the pieces *b* may be dressed off, if desired, so as to fit snugly into and completely cover the seat and abut against the shoulders *c'* of the riffles *c*.

A series of my improved properly-prepared plates *A* may be arranged in an inclined trough *B*, substantially as shown in Fig. 1. I prefer to employ the wet process in separating or collecting the fine particles of gold from the sand or material—that is, the gold-bearing sand or quartz, in a finely-divided state, is shoveled or charged onto the upper part of the trough, at the same time directing a stream of water onto the material, as usual. The thus-mingled sand and water flows downwardly over the surface of the plates and passes off at the lower end as tailings. The riffles operate, as is well known, to interrupt the passage of the flowing material, thereby insuring that all parts of the latter will be brought into contact with the amalgam-covered or gold-collecting removable strips *b*, and as these members *b* have (through the properties of the mercury with which they are faced) an affinity for the gold the greater portion of the atoms of the latter metal will be arrested and retained on the surface of the said members *b*; the sand and other material or inferior metals at the same time flowing off to waste.

It will be apparent that the principal part of the wearing effect of the sand, &c., occurs at the top of the riffles or ribs *c*. These are or may be made integral with the base member *a* and formed of cast-iron or other suitable resisting metal, thereby adapting them to wear a comparatively long time. The gold-collecting or amalgam-covered members *b* are mounted in the transversely-arranged seats *d*, located at the base of the riffles and secured in place by the sides of the trough. These pieces *b* may be made of copper and covered on their upper faces with mercury in any

well-known manner. When the mercury becomes sufficiently charged with gold, thus forming an amalgam, another wash or coating of the mercury is applied, the operation being continued, say, until the amalgam possesses considerable thickness, after which the sides of the trough may be removed and the several amalgam-covered members *b* pushed endwise from the plates and then scraped or otherwise treated to remove the amalgam from them. Meanwhile, if desired, another set of prepared pieces *b* may be inserted into the plates and the operation of sand-washing continued, as before described. The several pieces *b* are interchangeable, so that no difficulty is experienced in removing them from or inserting them into the base-plate *a*. As thus constructed, my improved compound plates *A* are far superior and much more durable than single-member plates of this class as usually made, wherein the amalgam covers practically the entire surface of the plate, including the riffles.

By reversing the arrangement of the plates *A* in the trough *B*, so that the flow of water, &c., is in the direction of the inclined side of the riffle, (see arrow *m*, Fig. 4,) the space at the base of the riffles may, if desired, be used as a pocket for free mercury, since the arrangement is such that the force of the water would not then dislodge it. If, however, the direction of the water be reversed, so as to pass over the riffles in the opposite way, (see arrows *o*, Figs. 1 and 4,) its force would quickly expel the free mercury, the latter then flowing off at the end of the trough into the tailings and becoming lost.

In lieu of withdrawing the charged gold-collecting shells or lining members *b* from the base-plate *a*, substantially as before described, for the purpose of removing the gold or amalgam therefrom, the entire plate *A* may be detached from the trough *B* and another or uncharged plate substituted for it. If desired, the dimensions or area of the gold-collecting or exposed surface may be increased by simply multiplying the plates *A* sidewise.

I claim as my invention and desire to secure by United States Letters Patent—

1. As an improved article of manufacture, a gold-collecting riffle-plate for sluice-boxes, the same consisting of a cast or other suitably-formed integral metallic base member provided with a series of transversely-arranged raised parallel ribs or riffles separated from each other longitudinally of the said base plate or member and forming grooves or channels between them, and a corresponding series of gold-collecting or amalgam shells of less hardness than said base member removably secured to the base and located in the lower portion of the channels formed between the said ribs, the upper or crest portion of the latter being directly exposed to the action of the material or ore flowing over the plate, substantially as described.

2. In a gold-collecting riffle-plate, the combination with the hard-metal base member *a* having a series of suitably-shaped transversely-arranged parallel raised ribs *c*, and
5 seats *d* in the lower portion of the channels between the ribs and terminating in shoulders *c'* formed in the sides of the ribs, of the removable thin gold-collecting strips or shells
10 *b* mounted on said seats and in engagement with the shoulders thereof, and having the outer surface of the ribs above said shoulders

substantially even or flush with the upper or working surface of the shells *b*, substantially as hereinbefore described and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES E. GREENE.

Witnesses;

GEO. H. REMINGTON,
REMINGTON SHERMAN.

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