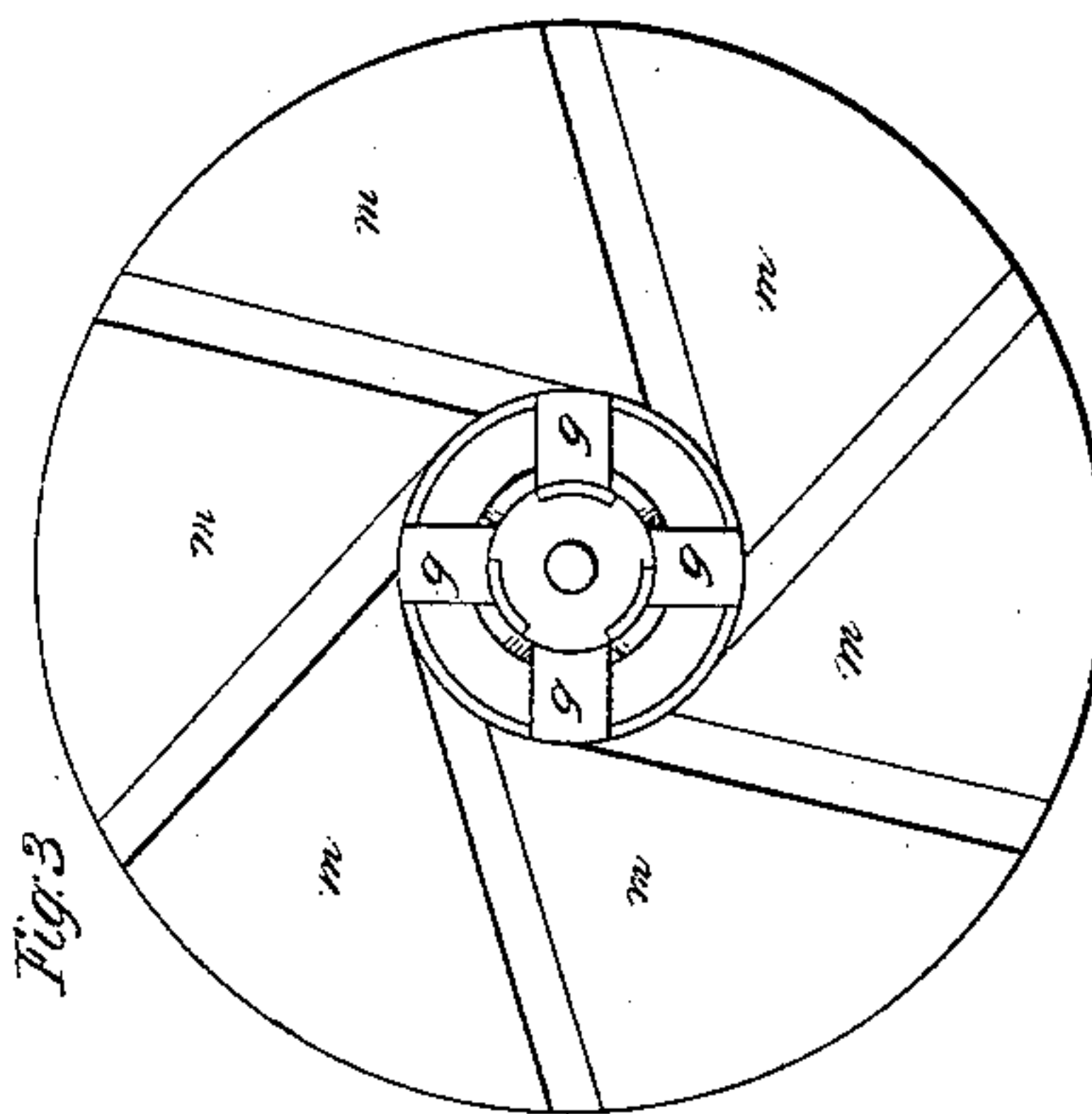
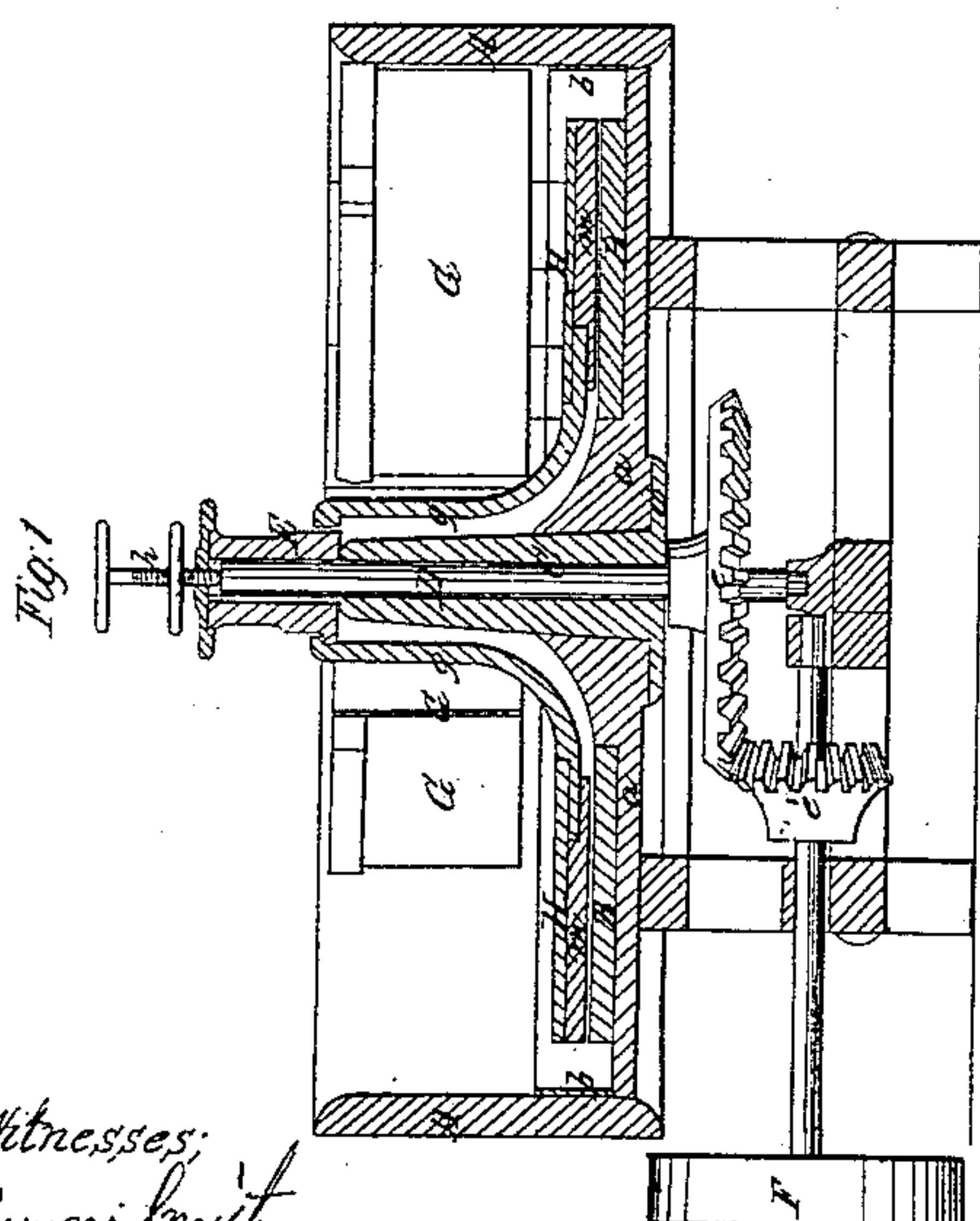
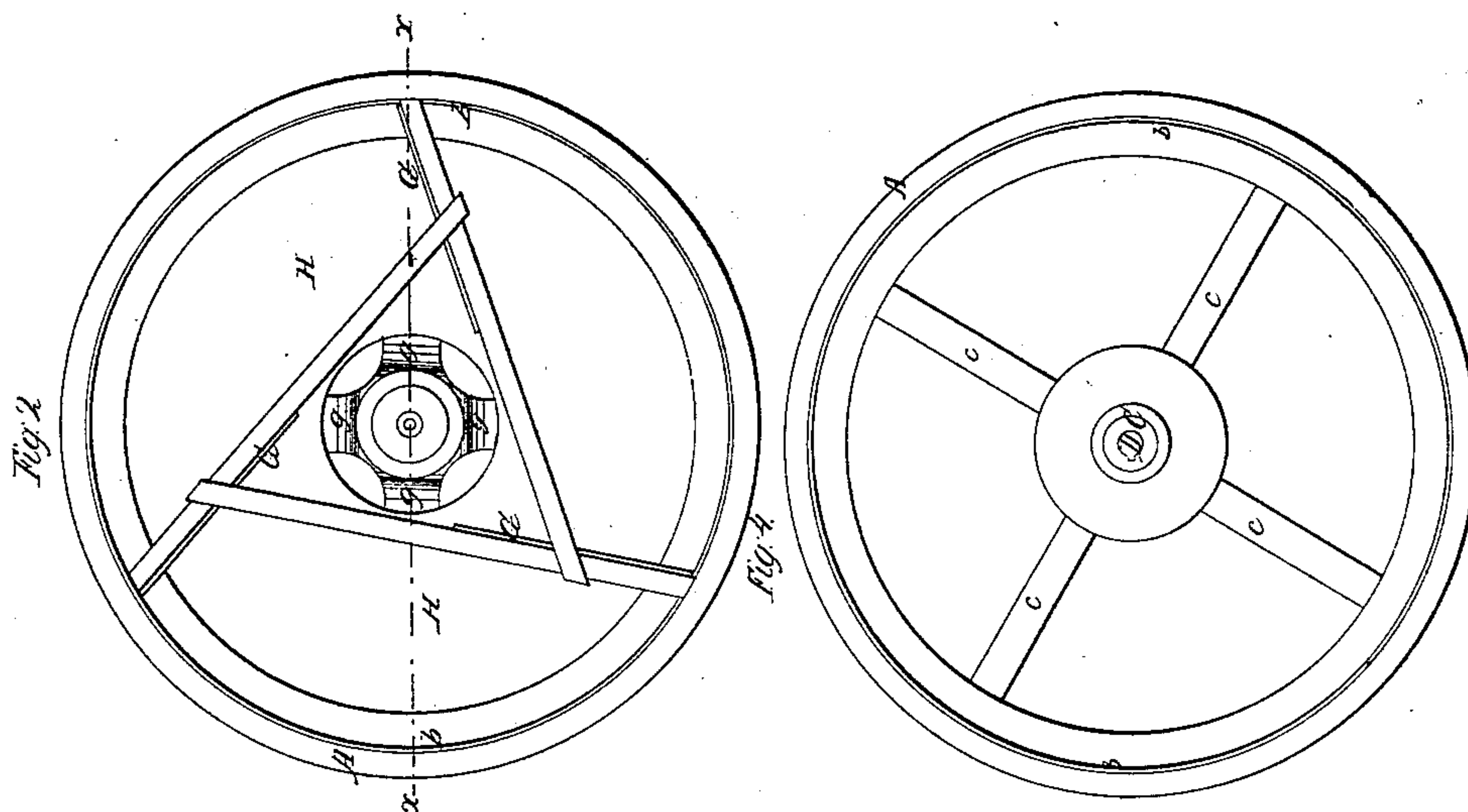


J. A. ROBINSON, Jr.
AMALGAMATOR.

No. 61,465.

Patented Jan. 22, 1867.



Witnesses:
Cyrus Smith
Levi H. Strong

Inventor,
Jesse Alfred Robinson

United States Patent Office.

JUAN A. ROBINSON, JR., OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 61,465, dated January 22, 1867.

IMPROVED AMALGAMATOR.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JUAN ALFRED ROBINSON, junior, of the city and county of San Francisco, State of California, have invented certain new and useful "Improvements in Amalgamators," for amalgamating the precious metals; and I hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

The nature of my invention consists in providing an amalgamator of such construction and materials that by its use a larger quantity of the precious metals can be saved than by any process hitherto adopted, while the base metals found in most ores are not amalgamated at all; thus reducing the cost of working and rendering a class of ores valuable that have hitherto been considered nearly worthless. For this purpose I employ a tub or pan constructed of wood or copper, in such a manner that by the friction of wood against copper, or copper against copper, the pulp is sufficiently agitated and the metallic particles kept bright so as to amalgamate with the mercury readily. By using copper, or an alloy of it, I am enabled to precipitate the silver from its sulphate, while the base metals are unaffected. In the drawings—

Figure 1 represent a side sectional elevation of my apparatus, taken through the line *x x*.

Figure 2 is a top view, showing the muller, and the wings or scrapers.

Figure 3 a bottom view of the muller, showing the shoes.

Figure 4 an inside top view of the pan or tub, with the muller removed, showing the false bottom.

Similar letters indicate like parts.

A, (fig. 1,) represents a tub of wood, having a bottom, *a*, upon which is a false bottom, B, of copper, or an alloy of copper, smaller than the inner circumference of the tub. This false bottom is made in sections, and between them are placed strips of wood, shown at *c c*, fig. 4. The inside circumference of the tub is lined for a portion of its height with copper, as shown at *b b*. In the centre of the tub is the hollow copper hub C, rising through and fastened to its bottom by the flange *d*. Within this hub turns the upright shaft D, which is moved by the gear *e* and *e'* and the pulley F. The hollow block E is supported upon the upper end of the shaft D. A four-armed yoke, *g*, is supported and turned by the block E, and in turn supports the muller H. The muller has wooden shoes, *m m*, attached, which turn upon the false bottom B. The muller is raised and lowered as required, by the screw *h*, which passes through the cap of the block E, and rests upon the shaft D. G G G are wings or scrapers, of copper, supported by a frame, and arranged to carry the moving pulp to the centre, and again under the muller.

In working ores in this apparatus, the pulverized and roasted ore is introduced, together with mercury and water. The muller is then set in motion, when the mass is subjected to a constant friction against the metallic portions of the apparatus passing under the muller to the circumference; then being brought to the centre over the top by the wings, and thence under the muller again, heat being applied during the operation. The object of this is not to subject the ore to a grinding process, but to pass the pulverized ore between moving surfaces, which may be both copper, or one of wood and the other of copper, or an alloy of copper may be used, so that the constant friction will bring the particles into contact with the copper, and thus precipitate the silver, and allow it to amalgamate with the mercury. As iron will precipitate copper and other base metals from their sulphates, while copper only throws down the silver, it is necessary that all parts of the apparatus with which the pulp comes in contact should be of copper, or wood and copper. It is well known that in the methods of using lixiviating tubs—Augustin, Ziervogel, and Von Pateras—the greatest care must be taken in the process of roasting or much of the silver will be lost. It therefore requires professional skill and care in different parts of these operations to save the silver, while if the ore contains any gold, that is also lost. In the Saxon or barrel process, ores containing copper, lead, bismuth, etc., cannot be worked to advantage, as they cause the amalgam to come out very impure, besides carrying off precious metals with them in the tailings, while not more than one-half the gold in the ore can be saved. Much care is also necessary in roasting. In the use of iron pans, certain classes of ores and their products, such as argentiferous "pig copper," "copper malt," "silver fahlerz," "silver copper glance," etc., have proved a complete failure, and where attempts have been made to work them after roasting and chloridizing, only part of the silver, not exceeding one-half, that

is contained in the ore has been extracted, and this alloyed heavily with other metals, great loss of mercury being sustained by the operation. It is also almost impossible to prevent the mercury becoming floured or covered with a black rag-like coating to such a degree as to prevent the further amalgamation of the precious metals.

The advantages gained by the use of my amalgamator are—

First, in roasting the ore no salt is required, as it is not necessary to chlorodize the silver. It is not necessary to stop the operation at a certain stage, as in some of the above-mentioned processes; consequently any common laborer can attend to the work, and professional skill be dispensed with.

Second, if any gold be contained in the ore it will be amalgamated as well as the silver; while, if a salt of copper or other base metal be present, it will not be precipitated or amalgamated; thus saving a larger quantity of precious metals and keeping the amalgam pure.

Third, the loss of mercury is very small, as it never becomes divided or coated, and there is no chemical loss, it being kept bright throughout the entire operation.

Fourth, much less time is consumed by this amalgamator than by any other now in use, while the work is very simple and effective, and if no metallic iron be present, the copper of the amalgamator will not be amalgamated at all.

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

An amalgamator constructed of copper and wood, or an alloy of copper, with frictional surfaces, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand and seal.

JUAN ALFRED ROBINSON, JR. [L. S.]

Witnesses:

C. W. M. SMITH,

GEO. H. STRONG.