

J. J. BOURGEOIS.
WATER-WHEEL.

No. 171,088.

Patented Dec. 14, 1875.

Fig. 1.

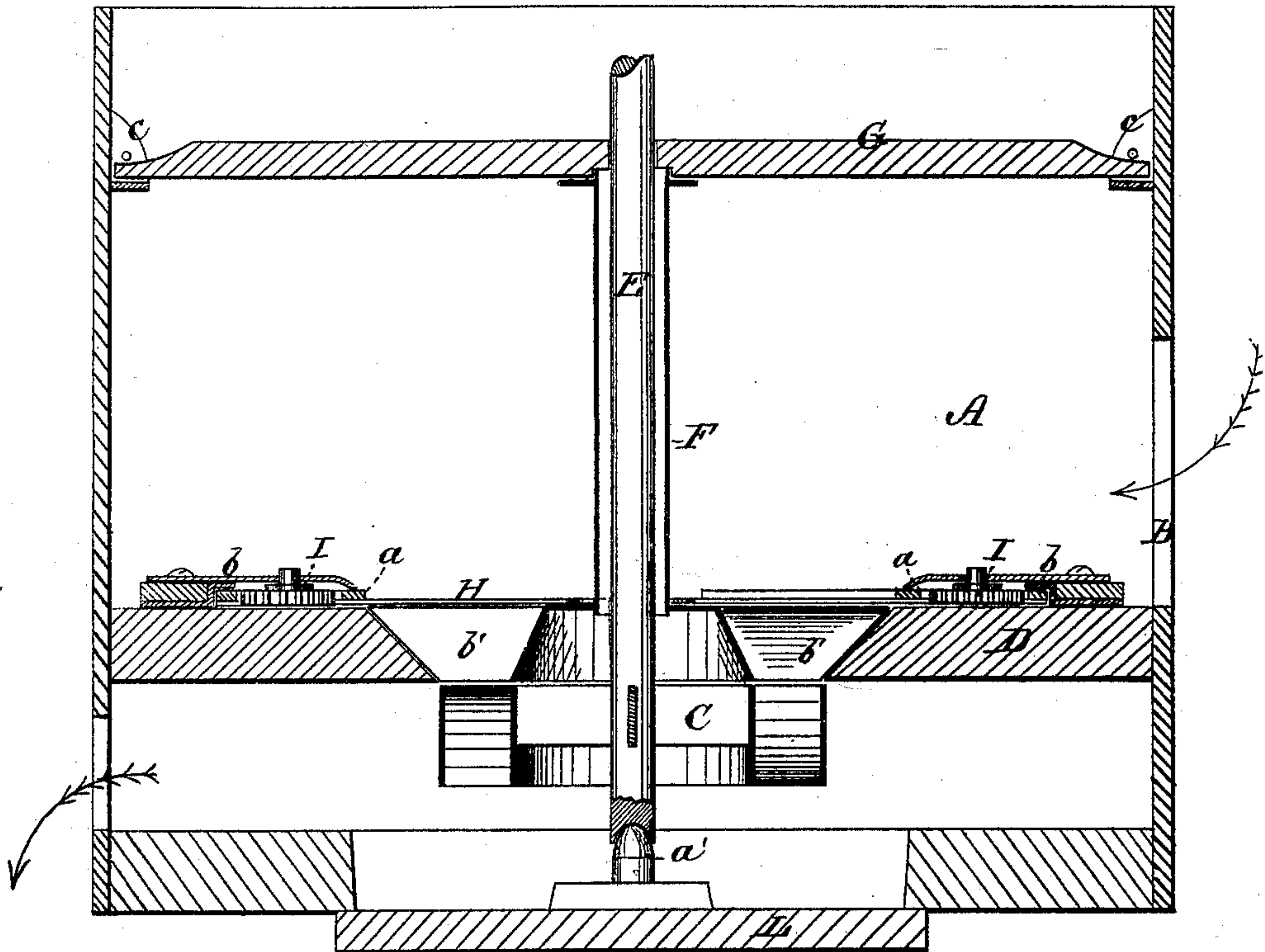
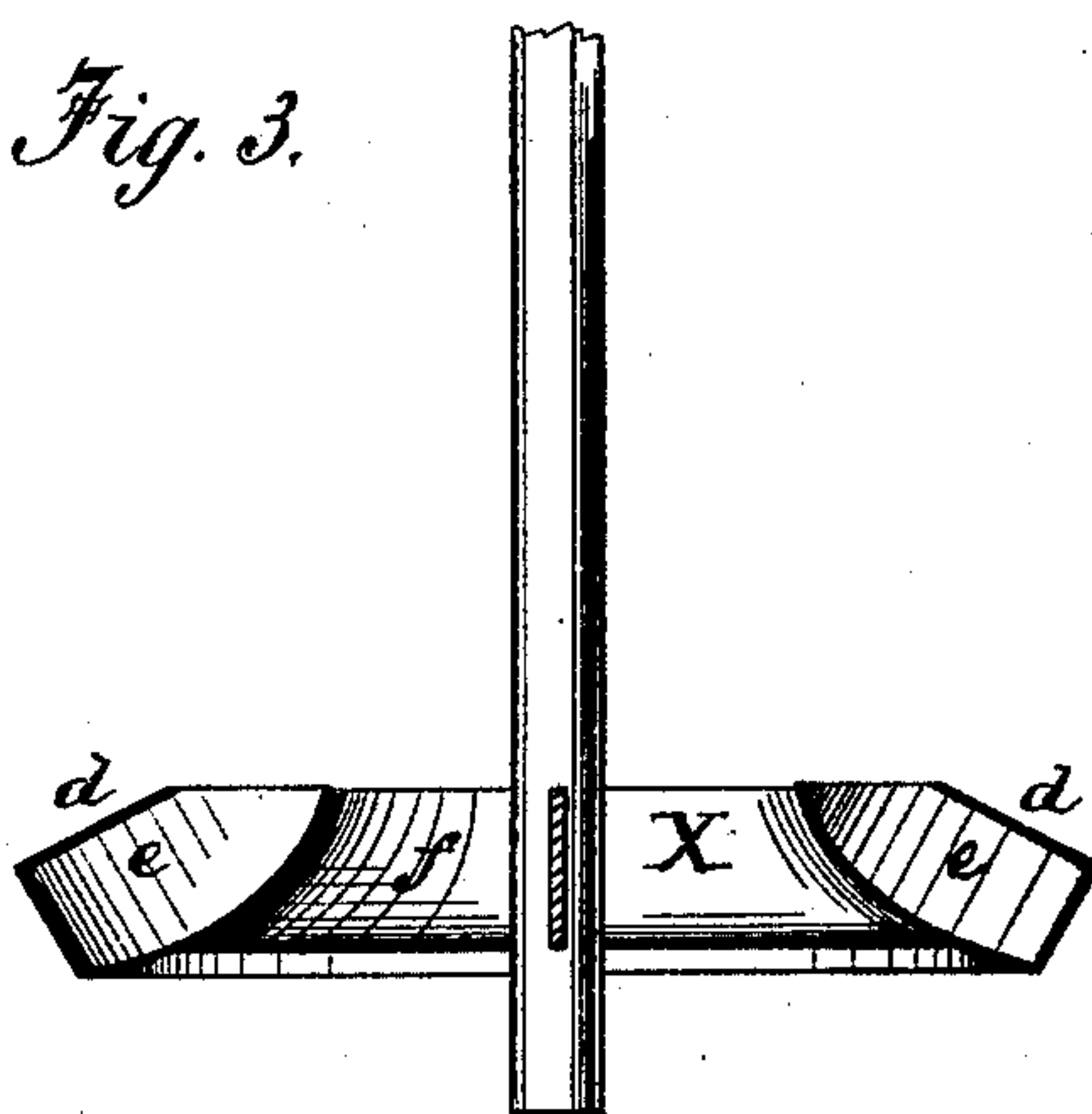


Fig. 3.



WITNESSES:

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JAMES J. BOURGEOIS, OF ST. CLOUD, MINNESOTA.

IMPROVEMENT IN WATER-WHEELS.

Specification forming part of Letters Patent No. 171,088, dated December 14, 1875; application filed October 30, 1875.

To all whom it may concern:

Be it known that I, JAMES J. BOURGEOIS, of St. Cloud, in the county of Stearns and State of Minnesota, have invented a new and Improved Water-Wheel; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification, in which—

Figure 1 is a vertical section; Fig. 2, a plan view, with parts broken away; Fig. 3, a detail of one of the wheels.

This invention relates to certain improvements in turbine water-wheels; and it consists in the particular construction and arrangement of a gate or cut-off, in combination with the wheel and the detachable chutes and sleeve around the wheel-shaft, as hereinafter more particularly described.

In the drawing, A represents the flume, which receives its water through a lateral opening, B, and discharges it through a central opening upon the wheel C. Said wheel is pivoted upon a step, *a'*, in the bottom of the discharge-chamber, and is located just beneath the hole in the partition D, which separates the flume from the discharge-chamber. E is the shaft of the wheel, which extends up through an incasing-sleeve, F, and is journaled in the detachable bridge-piece G. Said sleeve is fitted also beneath said bridge-piece, and is attached below to a drum provided with flanges *b'*, which are made to fit in the tapering central hole just above the wheel. The drum being above the center of the wheel, causes the water to be delivered upon the outer edge or periphery of the wheel, where it will exert the greatest amount of leverage, and the flanges are inclined in opposite directions to the buckets of the wheel, forming with the tapering sides of the hole chutes which deliver the water full upon the buckets. Just above the partition D is located the gate or cut-off, which regulates the flow of water to the wheel. It consists of two sliding gates, H H', provided each with two rack-bars, *a a* and *b b*, which move upon opposite sides of the pinions I I, so that when one of the gates H is advanced the other approaches it, and they are made to close in the center above the chutes and cut off the supply of

water to the wheel. The gates are operated by means of a rack-bar, J, attached to one of them, which is worked by a vertical shaft and pinion, K, engaging therewith. The bridge-piece G is detachably fastened in the sockets *c c*, and the base L, upon which the wheel is pivoted, is also made detachable, so that one wheel may be readily taken out and another substituted. X represents one form of wheel which I use with my devices as thus described; and it consists of curved buckets *e*, arranged near the outer edge of the wheel, upon a tapering base, *f*, with a side delivery, and having at the top, upon the outer edge, near the issue, an annular roof or top, *d*, which prevents the water from surging up over the top of the partitions, and insures a lateral discharge.

I am aware of the fact that a pivoted double gate, operated by racks and pinions, is not new, and that a sliding double gate, operated separately and independently by racks and toothed segment headed levers, is also old, but with both these forms the discharge of the water is greater upon one side of the wheel than the other, because in the pivoted form the side farthest from the pivot opens widest, and in the sliding gate referred to each gate has to be operated separately, and this throws the full weight of the water upon one side of the wheel when the gate is first opened. I therefore confine my invention to my particular construction, as shown and described.

Having thus described my invention, what I claim as new is—

1. The combination, with the pinions I I of the sliding gates, provided with rack-bars *a a* *b b*, and arranged to move in unison in opposite directions, so as to open and close evenly upon both sides of the wheel, substantially as and for the purpose described.

2. The combination, with the wheel and its shaft, the partition D, the sleeve F, and the attached chutes, of the pinions I I and the oppositely-sliding gates, having rack-bars *a a* *b b*, substantially as described.

JAMES JOSEPH BOURGEOIS.

Witnesses:

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