

S. W. Hudson,
Steam-Engine Attachment,
No 68,747, Patented Sep. 10, 1867.

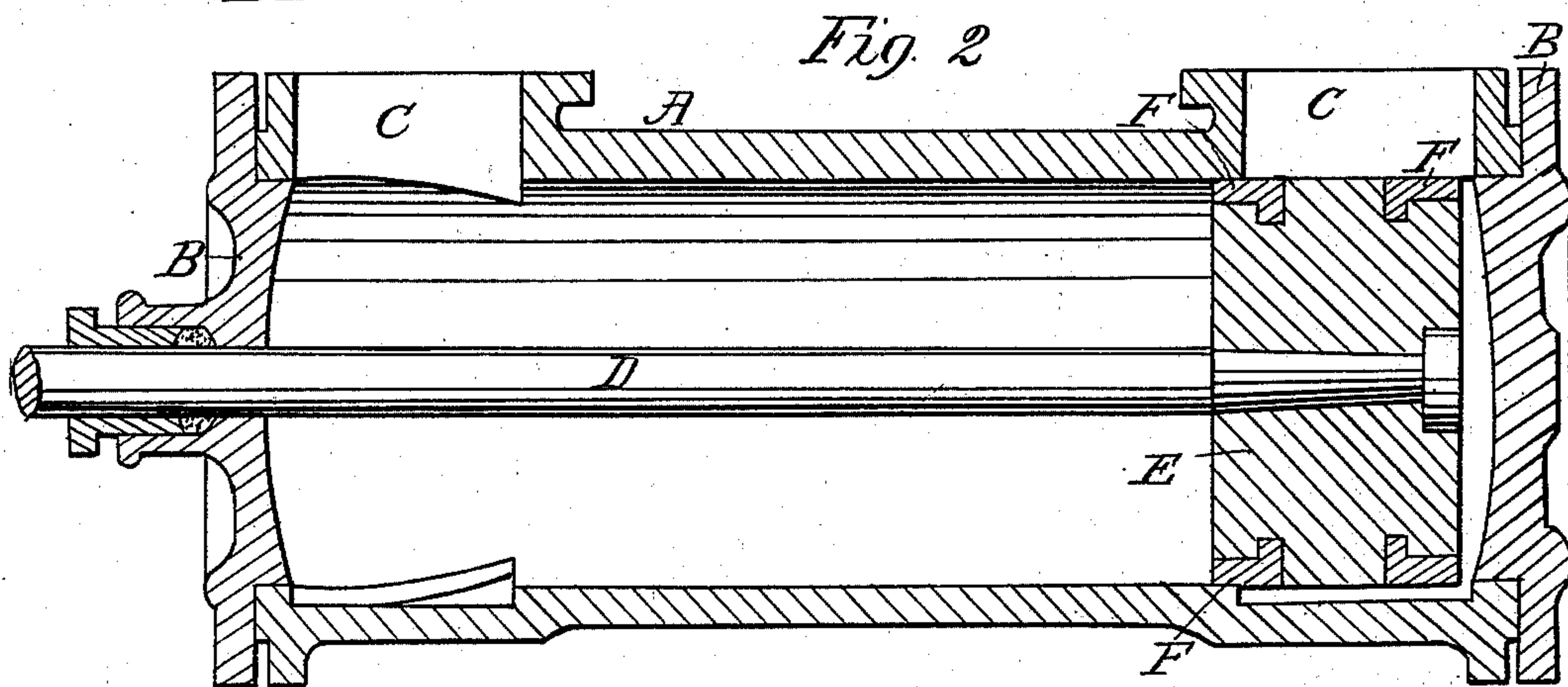
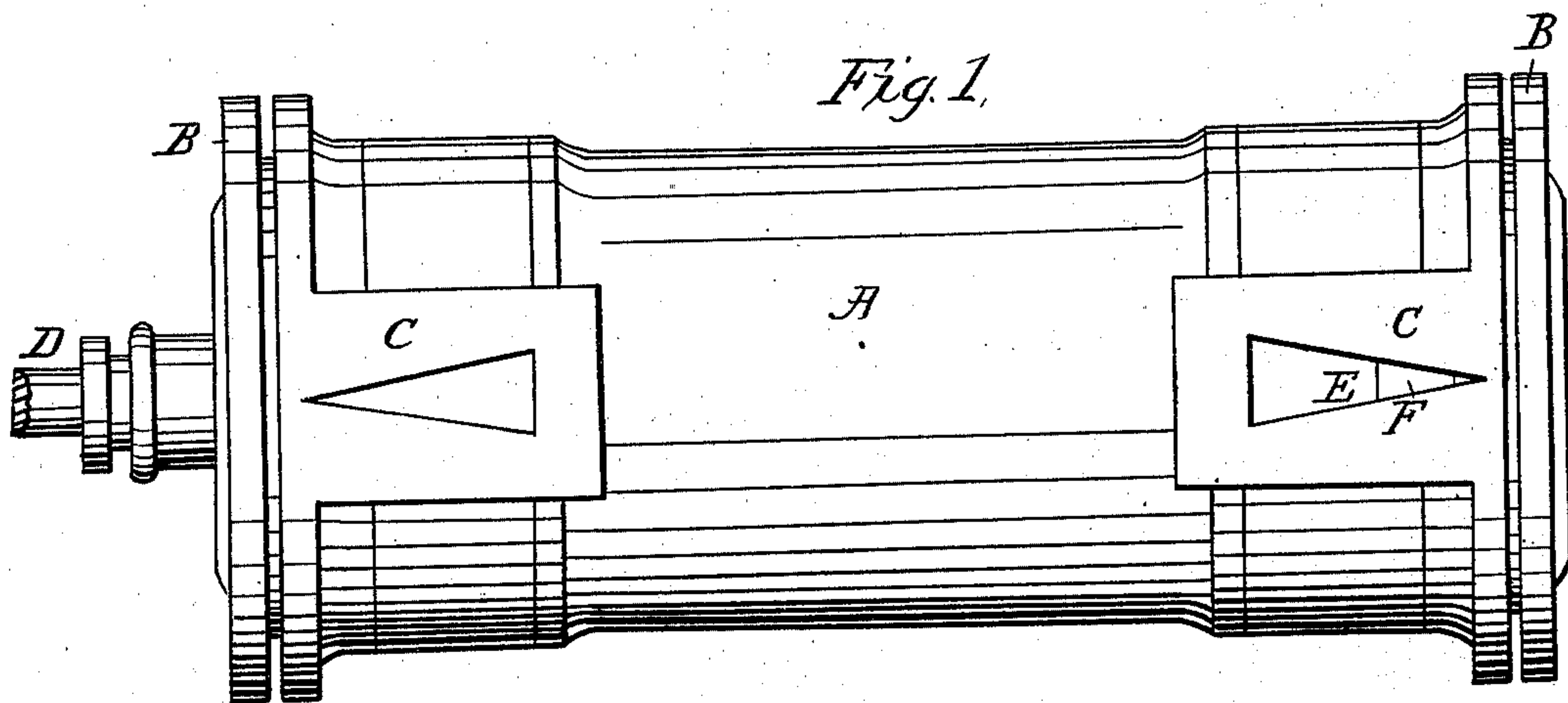
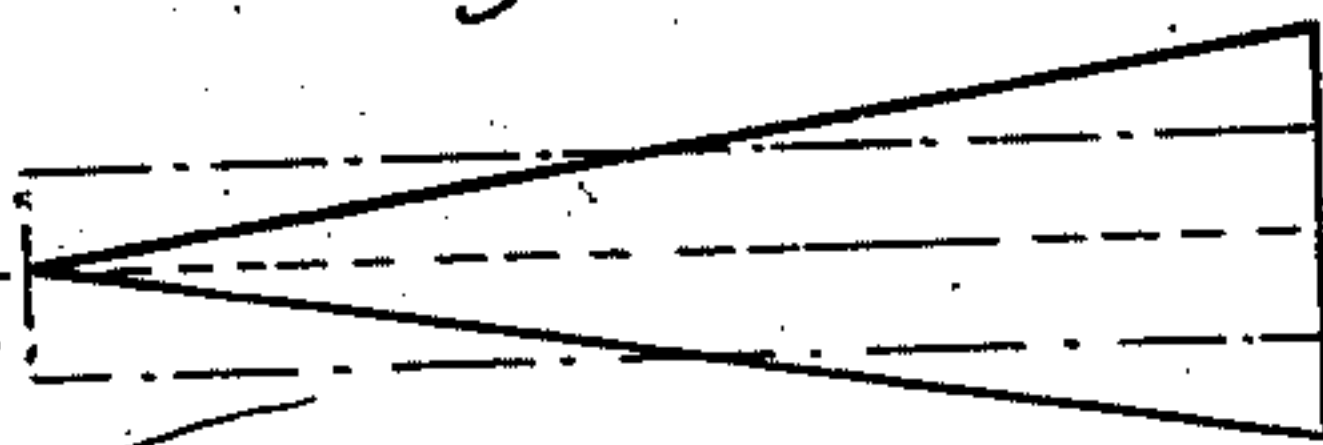


Fig. 3

Witnesses:

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SAMUEL W. HUDSON, OF PACKER TOWNSHIP, PENNSYLVANIA.

Letters Patent No. 68,747, dated September 10, 1867.

IMPROVEMENT IN STEAM ENGINES.

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, SAMUEL W. HUDSON, of Paeker township, in the county of Carbon, State of Pennsylvania, have made a new and useful Improvement in Steam-Cylinders and Piston; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, sufficient to enable one skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings which are made part of this specification, and in which the same letters indicate similar parts.

Figure 1 is a top view of the cylinder, the steam-chest removed.

Figure 2 is vertical longitudinal section.

Figure 3 is a diagram illustrating the form of the opening.

This improvement consists—

First, in the construction of the steam opening in the cylinder, so that as it is uncovered by the piston the width of the induction opening becomes relatively larger. This is especially intended for steam-pumps and blowing apparatus, and is intended to give a graduated pressure of steam upon the piston, increasing as it advances for the length of the steam-port, the port being triangular, the apex towards the end of the cylinder and extending through the thickness of the same. A depression of corresponding form is made in the opposite side of the cylinder to balance the pressure of steam on the periphery of the piston.

Secondly, in the construction of the piston, elastic rings are sprung open and inserted into the piston grooves, being retained by the inward flanges of the rings in the grooves, the peripheries of the rings extending the length of the piston, so as to make the wholelength of the latter available in determining the area of port opening.

This improvement is specially intended for steam-pumps and blowers, when used by direct action without a fly-wheel, and to state its peculiar utility in the former I will state that a great jar takes place in the engine when the steam is admitted in full force upon the piston when the engine is reversed.

In the case of a direct-action steam-pump, where the steam and pump-cylinders are in line, and no crank-motion or fly-wheel is used, I have found that a much better effect is produced by admitting steam gradually to the cylinder, starting the piston moderately at first and enlarging the area in a rapid ratio, so as to accumulate speed in the latter part of the stroke, making a stroke of increasing rapidity, but avoiding the jar incident to the sudden blow upon the water, or other fluid, water especially, when the engine is reversed.

In engines regulated by a fly-wheel, this device is not so necessary, as a certain uniformity of speed in the fly-wheel compels the not equal but a given relative proportional speed at the various proportions of the stroke, owing to the interposition of the crank and its well-known action.

The piston acts as a valve, as it covers and uncovers the steam-port, and in this respect has a peculiarity over others, the steam-opening being governed by the piston so long as it is contact therewith.

In the drawings, A is the cylinder, and B the cylinder-heads. C are the openings by which the steam is admitted to and ejected from the cylinder. As will be seen in fig. 1, these openings are of a triangular shape, each apex towards a cylinder-head. In the figures the steam-cylinder is shown without the steam-chest attached. D is the piston-rod, and E the piston, provided with packing-rings F, which are sprung upon the piston. These rings are made somewhat in the usual manner, that is, they are rings originally of a larger diameter than the piston; a piece is cut out and the ring being opened is made to clasp the piston. The peculiarity in my invention in the respect of the improvement in pistons consists in making it of an L shape in cross-section, so that at its edges it extends to the end of the piston, and so in connection with the triangular opening makes the piston act more efficiently as a valve. On the inside of the cylinder, opposite the triangular steam-opening, is a depression of similar form and size, to enable the steam to balance upon the respective sides of the piston.

Steam-valves of any suitable construction may be used in the steam-chest, not here shown, and the motion of such valves need not affect the graduation in the admission of steam, which is controlled by the gradual uncovering of the steam-ports.

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

1. The cylinder, provided with tapering steam-openings, for the purpose and substantially as described.
2. The cylinder, provided with the depression in the side opposite to the triangular steam-opening, substantially as and for the purpose described.
3. The piston, provided with the rings F, having flanges embedded in grooves of the piston-head, and with their peripheries extending to the ends of the piston, as and for the purpose described.

To the above specification of my improvement I have signed my hand this twenty-second February, 1867.

SAMUEL W. HUDSON.

Witnesses:

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