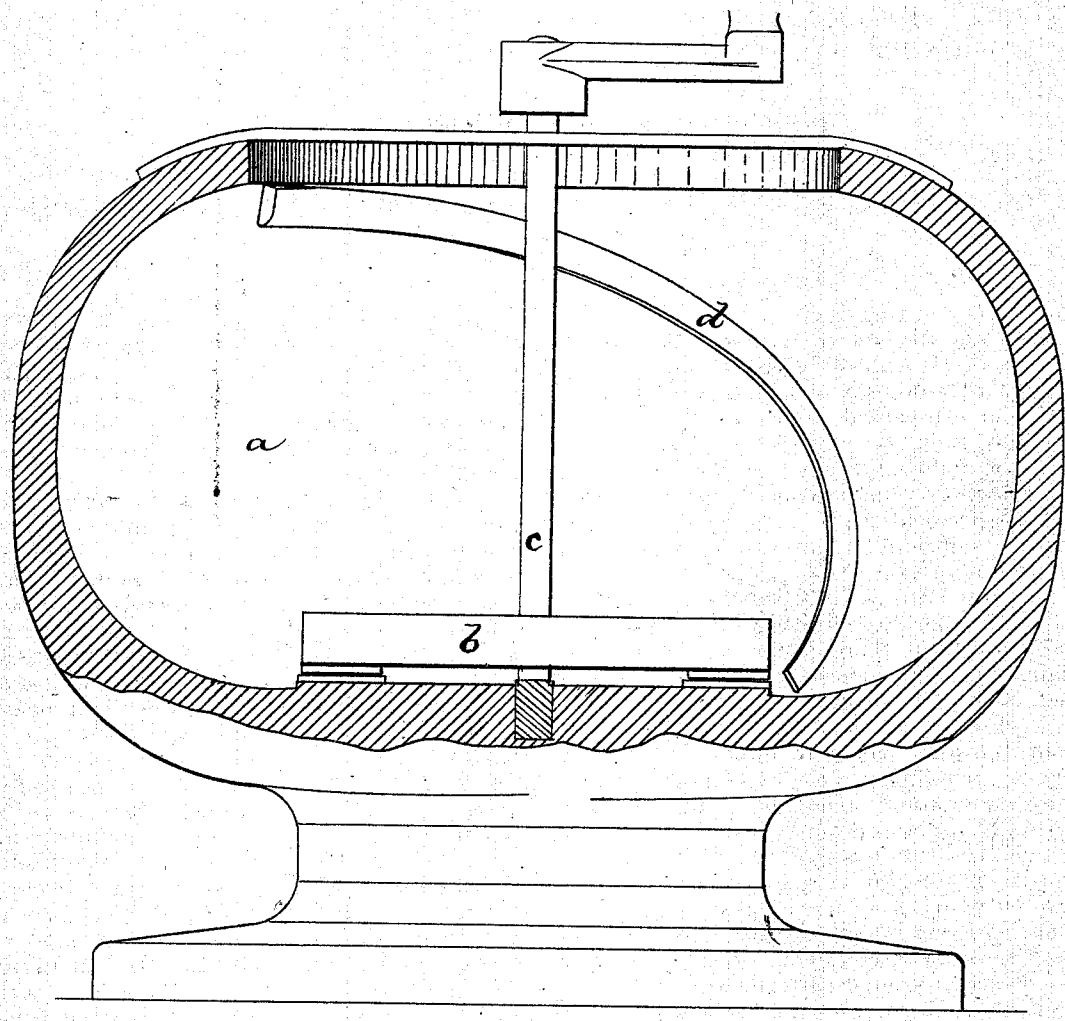
# S. MOORE & R. H. HURLBUT.

## Paper-Pulp Engines.

No. 144,557. Patented Nov. 11, 1873.




Witnesses.
M. W. Frothingham.
L. H. Latimer.

Inventors
Stephen Moore.
Rufus H. Hurlbut.
By their Attys.
Crosby & Gould.

# UNITED STATES PATENT OFFICE.

STEPHEN MOORE AND RUFUS H. HURLBUT, OF SUDBURY, MASSACHUSETTS, ASSIGNORS TO THEMSELVES AND HOMER ROGERS, OF SAME PLACE.

## IMPROVEMENT IN PAPER-PULP ENGINES.

Specification forming part of Letters Patent No. **144,557**, dated November 11, 1873; application filed October 2, 1873.

*To all whom it may concern:*

Be it known that we, STEPHEN MOORE and RUFUS H. HURLBUT, both of Sudbury, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Paper-Pulp Engines; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

In United States Letters Patent, No. 120,265, dated October 24, 1871, and reissued July 16, 1872, No. 4,976, there is shown, described, and claimed "a curb or case, a horizontal grinding-bed, and a superposed revolving grinding-disk, through the center of which, or thereabout, the stock passes to and between the contiguous grinding-surfaces of said bed and disk, the combination operating substantially as herein shown and described."

Our invention has particular reference to a construction embodying the said invention or arrangement. In connection with such combination there is shown in said patent "partitions to resist the tendency of the substances to be carried around with the wheel after they are thrown off therefrom." These partitions in said apparatus are in vertical radial planes, and in using the engine or apparatus we have found that they so far impeded the free circulation of the pulp as to require a great increase of power to effect such circulation. In seeking to obviate this defect, we have made the improvement forming the subject of this invention; and our improvement consists in applying to the tub of the engine, made substantially in accordance with the said patented invention, partitions or blades extending from the inner surface of the tub and placed spirally, or so as to incline forward from the wheel as they rise vertically, the pulp being taken from the wheel by these blades, but having imparted to it by the motion of the wheel force sufficient to cause it to rise upon the blade, and to be thrown over and back toward the center of the tub, so that it will again fall upon and pass through the wheel.

The drawing represents in sectional elevation an engine embodying our improvement.

*a* denotes the tub, case, or curb; *b*, the reducing-wheel at the bottom of the same, this wheel being fixed on a rotary shaft, *c*, the bottom of the wheel and the bed beneath it being provided with the cutters that reduce the stock. The form of the tub and the construction of the wheel and the reducing-blades are the same, or substantially the same, as shown in said patent. *d* denotes one of the spiral blades, the addition of which to the tub constitutes our invention. The inner edge of this blade extends from or is in contact with the inner surface the tub the whole length of the blade; but the blade inclines from the wheel upward, so that, in connection with the movement of the wheel, the pulp receives a combined rotative and upward movement that facilitates its circulation and return to the wheel, its rotative movement not being arrested, but being directly utilized to effect the continuous movement and circulation of the pulp.

We claim—

In combination with the tub *a* and wheel *b*, the spiral blade or blades *d*, substantially as described.

Executed this 25th day of September A. D. 1873.

STEPHEN MOORE.
R. H. HURLBUT.

Witnesses:
THEODORIC A. JONES,
HENRY E. GOULDING.