(No Model.)

4 Sheets—Sheet 1.

J. HAWORTH.

APPARATUS FOR WASHING FABRICS.

No. 485,695. Patented Nov. 8, 1892.

FIG. 1.

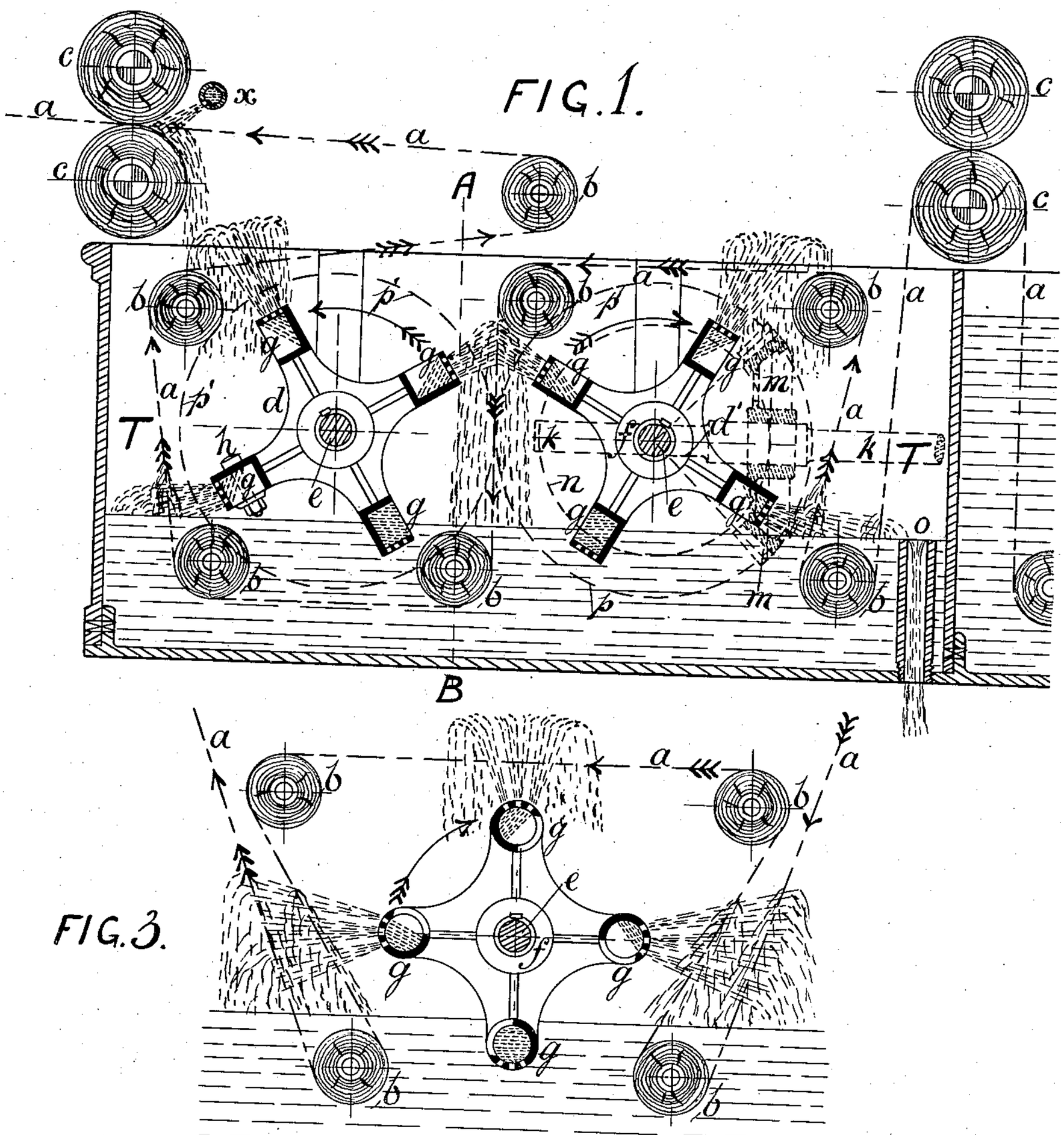

FIG. 3.

Witnesses.
William Hibbert.
William Ingram Hart

Inventor.
Joseph Haworth.
per Edw. Pitt. Bayley,
Attorney.

(No Model.)

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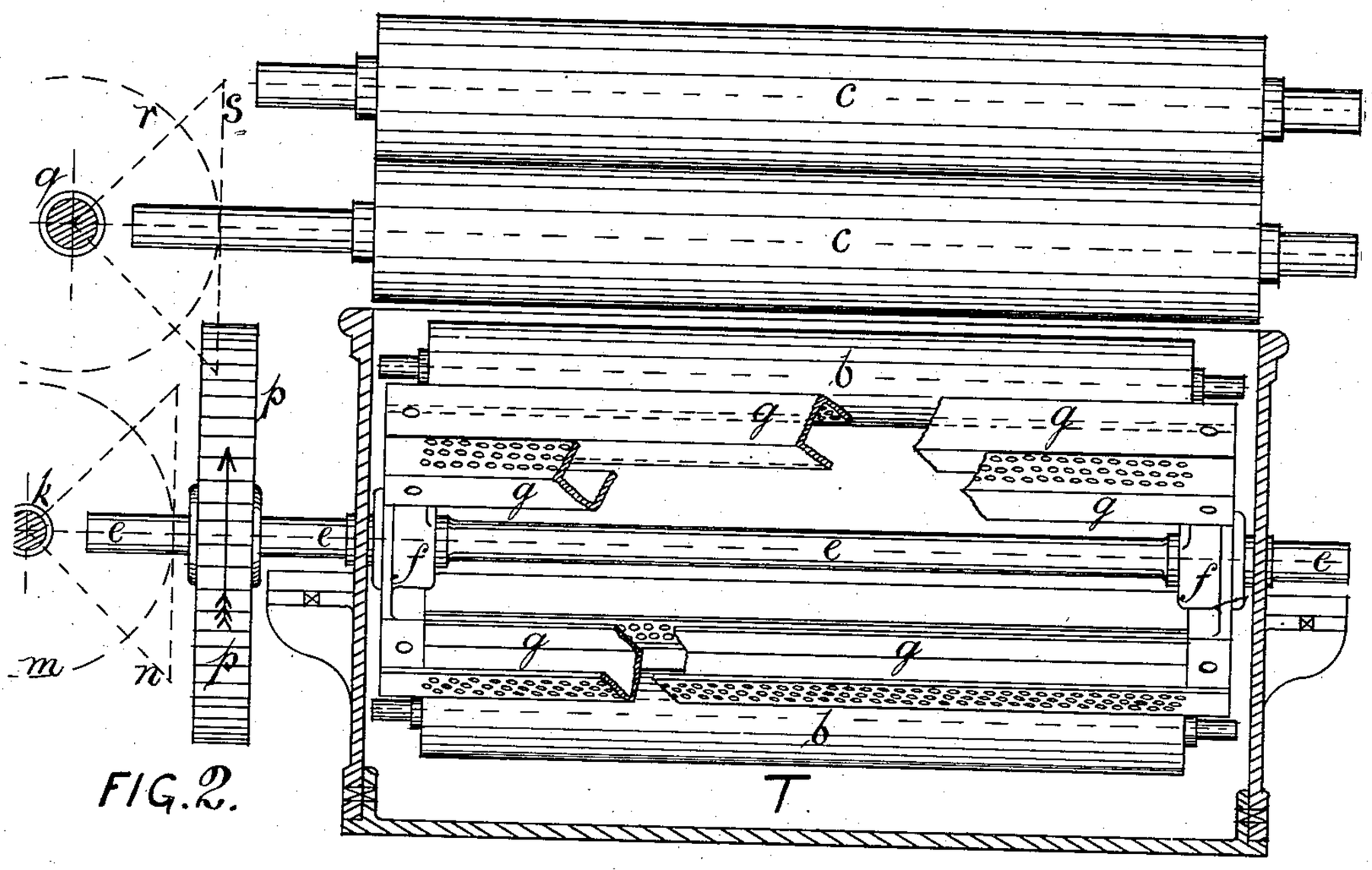

FIG. 2.

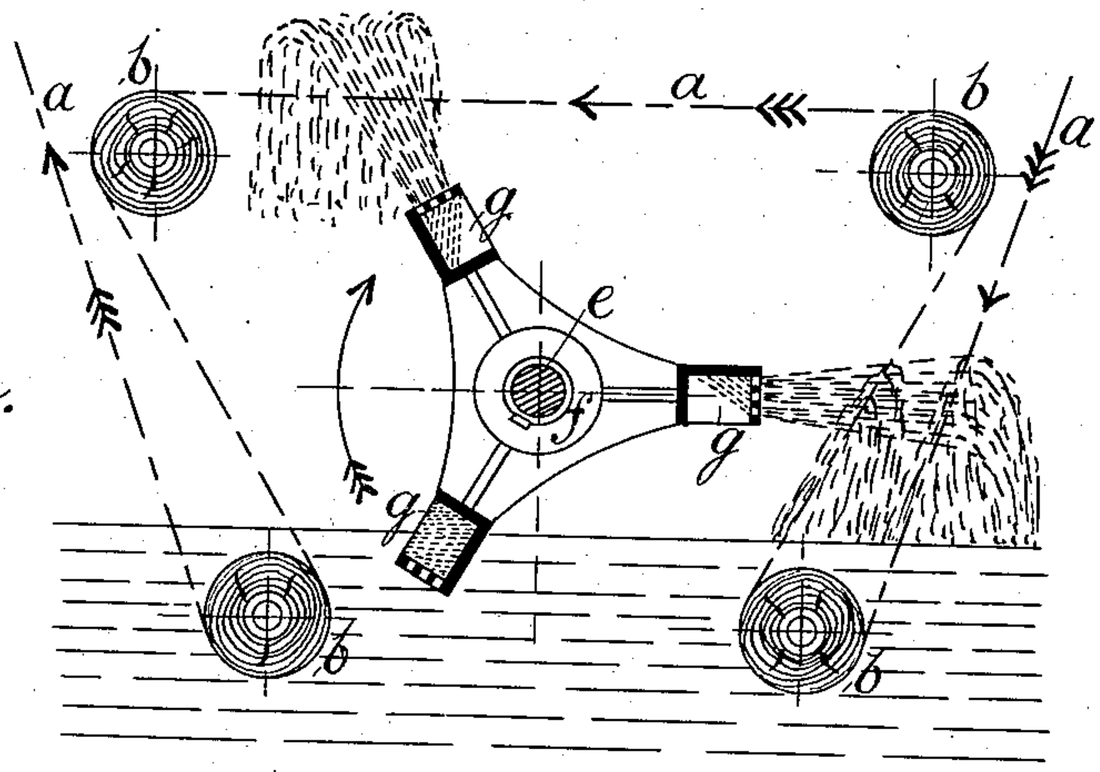

FIG. 4.

Witnesses.
William Hibbert.
William Ingram Hart.

Inventor.
Joseph Haworth
per John Pitt Bayly,
attorney.

(No Model.)

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J. HAWORTH.

APPARATUS FOR WASHING FABRICS.

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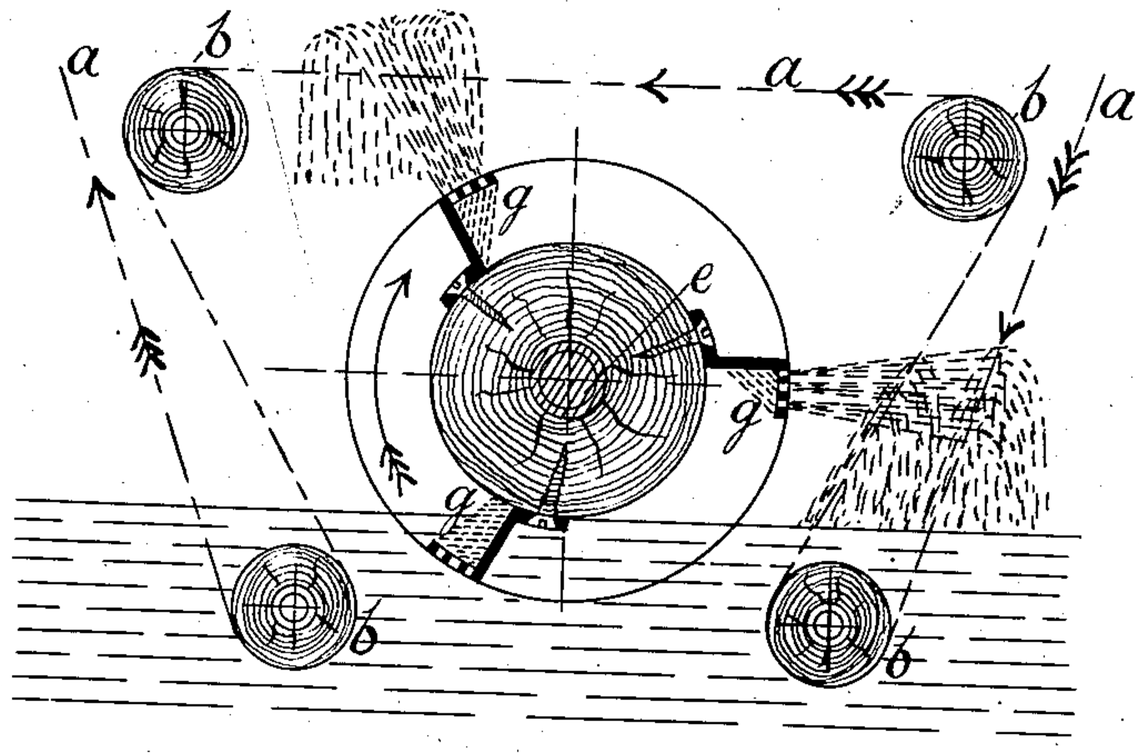
FIG. 5.



Witnesses.
William Hibbert.
William Ingram Hart

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(No Model.)

4 Sheets—Sheet 4.

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APPARATUS FOR WASHING FABRICS.

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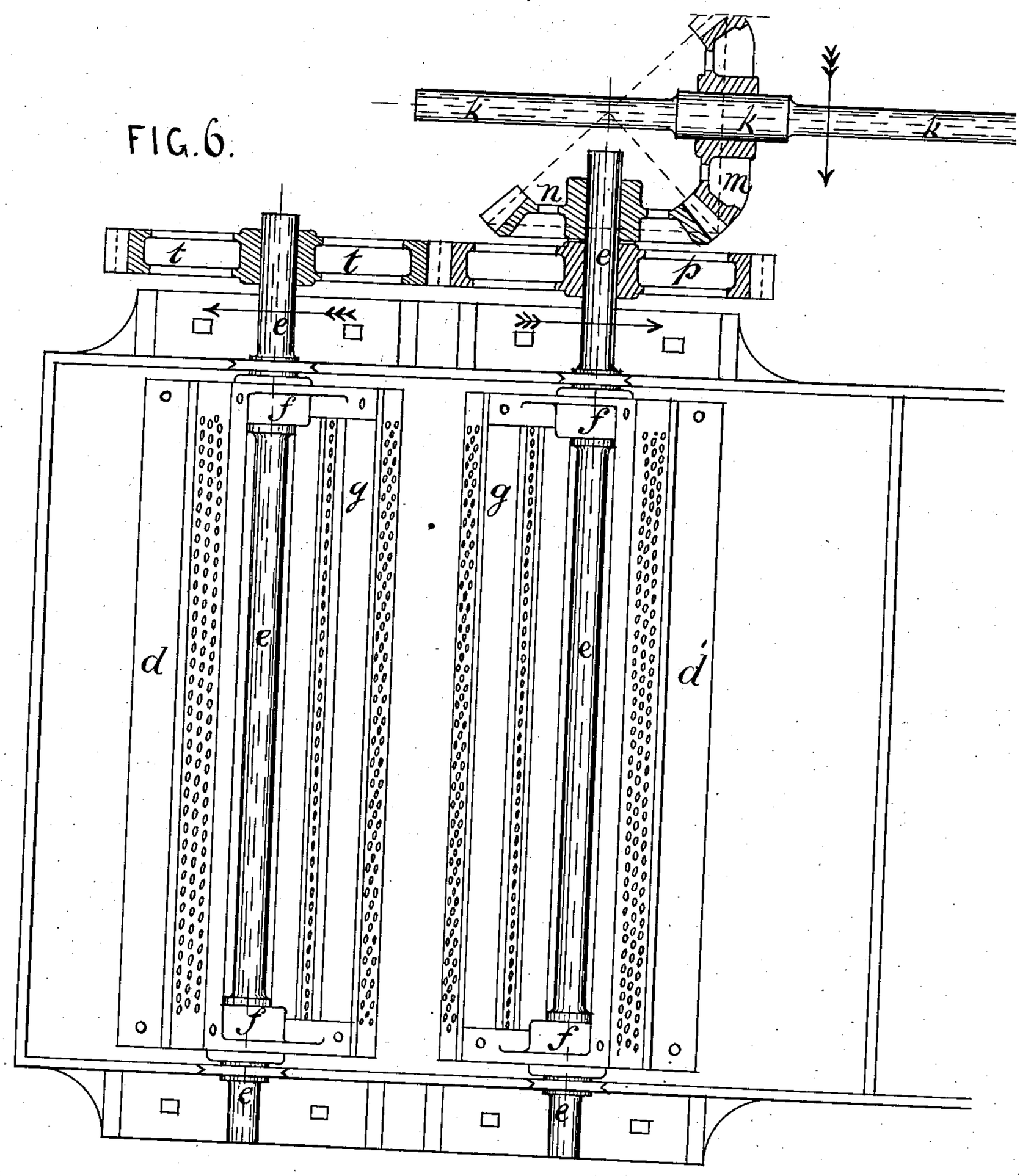
FIG. 6.



Witnesses.
Jos. L. Coombs
Bennet S. Jones.

Inventor,
Joseph Haworth
By Louis Bagger & Co
Attys.

UNITED STATES PATENT OFFICE.

JOSEPH HAWORTH, OF CHURCH, ENGLAND.

APPARATUS FOR WASHING FABRICS.

SPECIFICATION forming part of Letters Patent No. 485,695, dated November 8, 1892.

Application filed February 4, 1891. Serial No. 380,249. (No model.) Patented in England November 28, 1890, No. 19,367.

To all whom it may concern:

Be it known that I, JOSEPH HAWORTH, engineer, a subject of the Queen of Great Britain, residing at Church Hall, Church, in the county of Lancaster, England, have invented a new and useful Improvement in Machinery or Apparatus for Washing and Cleansing Textile Fabrics, (for which I have obtained a patent in Great Britain, No. 19,367, bearing date November 28, 1890,) of which the following is a specification.

The object of my improvement is to provide means for thoroughly washing and cleansing (without injury or anywise damaging the lightest) fabrics of all impurities while passing it through a machine containing the improved apparatus, and at the same time to use a minimum of water. To accomplish this object, I use revolving beaters or spurters of special design or arrangement, which consist of a number of troughs—by preference four, but may be more or less—which are arranged around or upon a center shaft or roll in such a manner that in revolving they shall dip into water or other cleansing liquid and take up the same by virtue of their great velocity. The sides of these troughs which are farthest away from the center of rotation are pierced with a great number of small holes, through which the liquid will fly at a great speed in a fine spray or small jets, according to the size of holes and the speed at which the beater or spurter is revolving. The fabric is passed around rollers in such a manner that it is brought in contact with the spray or jets from these revolving beaters or spurters, which will wash away any impurity or loose matter that may be in the fabric. Any suitable number of these improved revolving beaters or spurters may be used to act on each side of the fabric as required according to class of work. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a washing-machine in section containing the improved apparatus. Fig. 2 is a cross-section of the same on line A B. Figs. 3, 4, and 5 are sections of different arrangements of beaters or spurters which may be used to accomplish the same object, letters of reference being same as in Figs. 1 and 2. Fig. 6 is a plan of arrangement for driving beaters or spurters with the spur-wheels and bevel-wheels in section.

In Figs. 1 and 2, T is a washing-cistern containing water or other cleansing liquid, O being the overflow to keep the water or other liquid at a constant level.

x is a spurt-pipe of clean water or liquid, and may be the only water-supply.

a is the fabric, which passes over and under the guide-rollers *b* in the open state and through the nip-rollers *c*, which draw the fabric through the machine.

d and *d'* show the improved beater or spurter, which consists of its center shaft *e*, with the end disks or spiders *f* keyed or otherwise fixed upon it. Upon these disks or spiders is bolted a series of troughs *g*, as shown, by bolt *h*, these troughs being perforated, as shown, on the side which is farthest from its center shaft *e* and revolving at a great speed in the direction of the arrows, being driven from the shaft *k* by means of bevel-wheels *m* and *n* and spur-wheels *p*. As the nip-rollers *c* are driven from the side shaft *q* by means of the wheels *r* and *s* and drawing the fabric through the machine the spurters *d* and *d'* are revolving at a great speed and taking up water or cleansing liquid and spurting the same with great force against the fabric. The spurter or beater *d'* is driven from the shaft *k* by means of the bevel-wheels *m* and *n*, the other beater or spurter *d* being driven from the beater or spurter *d'* by the pair of spur-wheels *p* and *t*, as shown in Fig. 6.

It will be seen that when each of the series of troughs is at the lowest point they will get filled with water or cleansing liquid, and as they rise out of it by virtue of their great velocity and centrifugal force the liquid or water is spurted in small jets or spray with great velocity and force against the fabric. This washes away all the loose matter or other impurities which the fabric may contain, and this without anything striking the fabric only the liquid, so there is no rough usage of it. The fabric will run through the machine without any creases with these improved beaters or spurters, as they throw the water or liquid in a finely-divided spray or small jets, and not in great bulk or weight, as in the existing beaters, which in almost all cases strike the

cloth or fabric and cause it to go in creases; also, less water will wash better than with existing beaters.

What I claim, and desire to secure by Letters Patent of the United States, is—

In a washing and cleansing machine, the combination of a series of troughs mounted or fixed upon a center shaft or roll adapted to revolve, said troughs being open at one side for the admission of water or other liquid and perforated upon that side which is farthest away from the center shaft, through which perforations the liquid is sprayed upon the fabric being treated, substantially as herein set forth.

JOSEPH HAWORTH.

Witnesses:
GEO. W. PICKUP,
Notary Public, Accrington.
RICHARD H. RILEY,
His Clerk.