

F. DU M. FOWLER.
 SCREEN FOR PAPER STOCK.
 APPLICATION FILED AUG. 6, 1910.

973,493.

Patented Oct. 25, 1910.

2 SHEETS—SHEET 1.

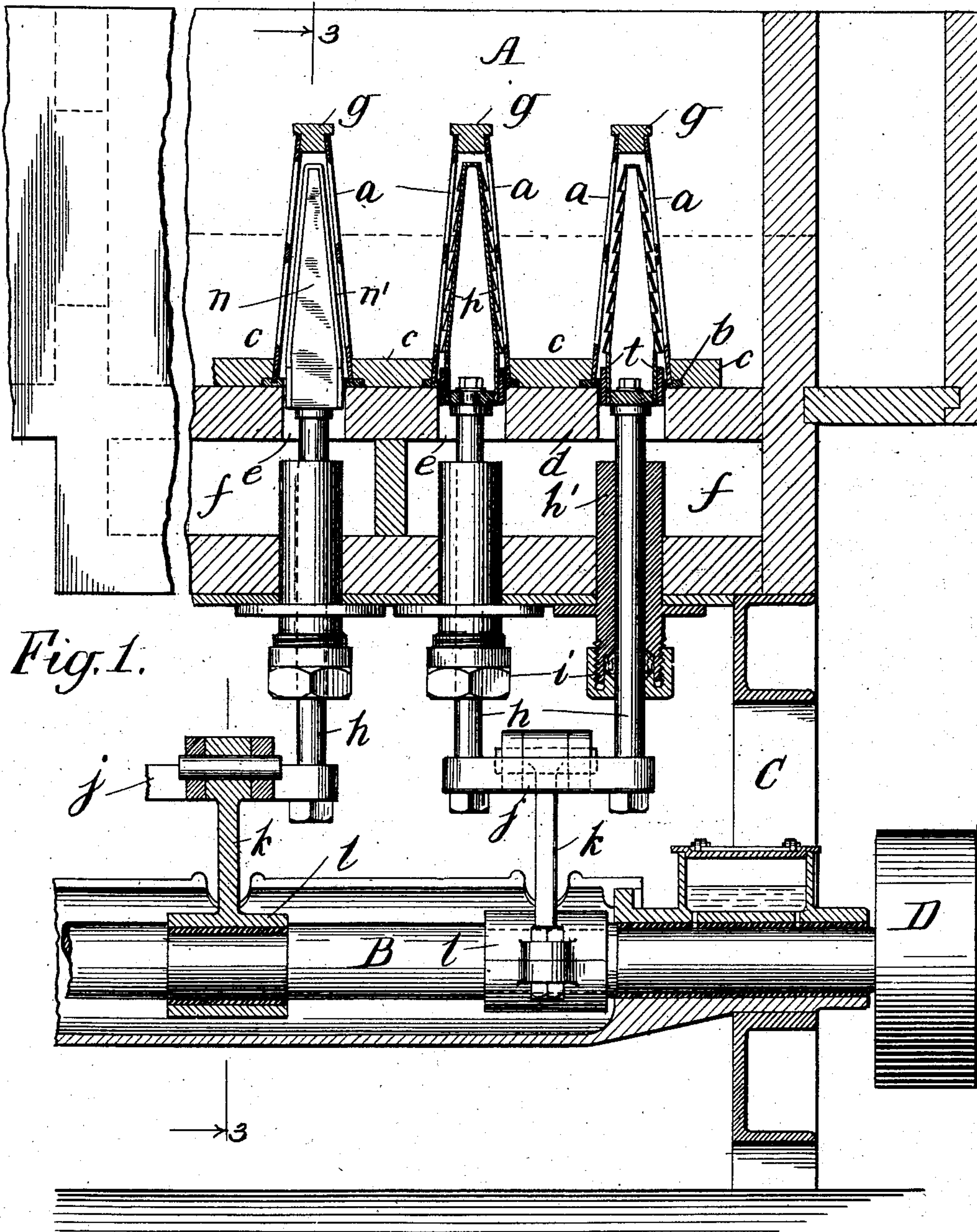


Fig. 1.

WITNESSES:
Carolyn T. O'Keefe
Josephine W. Linn

INVENTOR:
Fred D. Fowler,
 BY
Henry S. Edwards,
 ATTORNEYS

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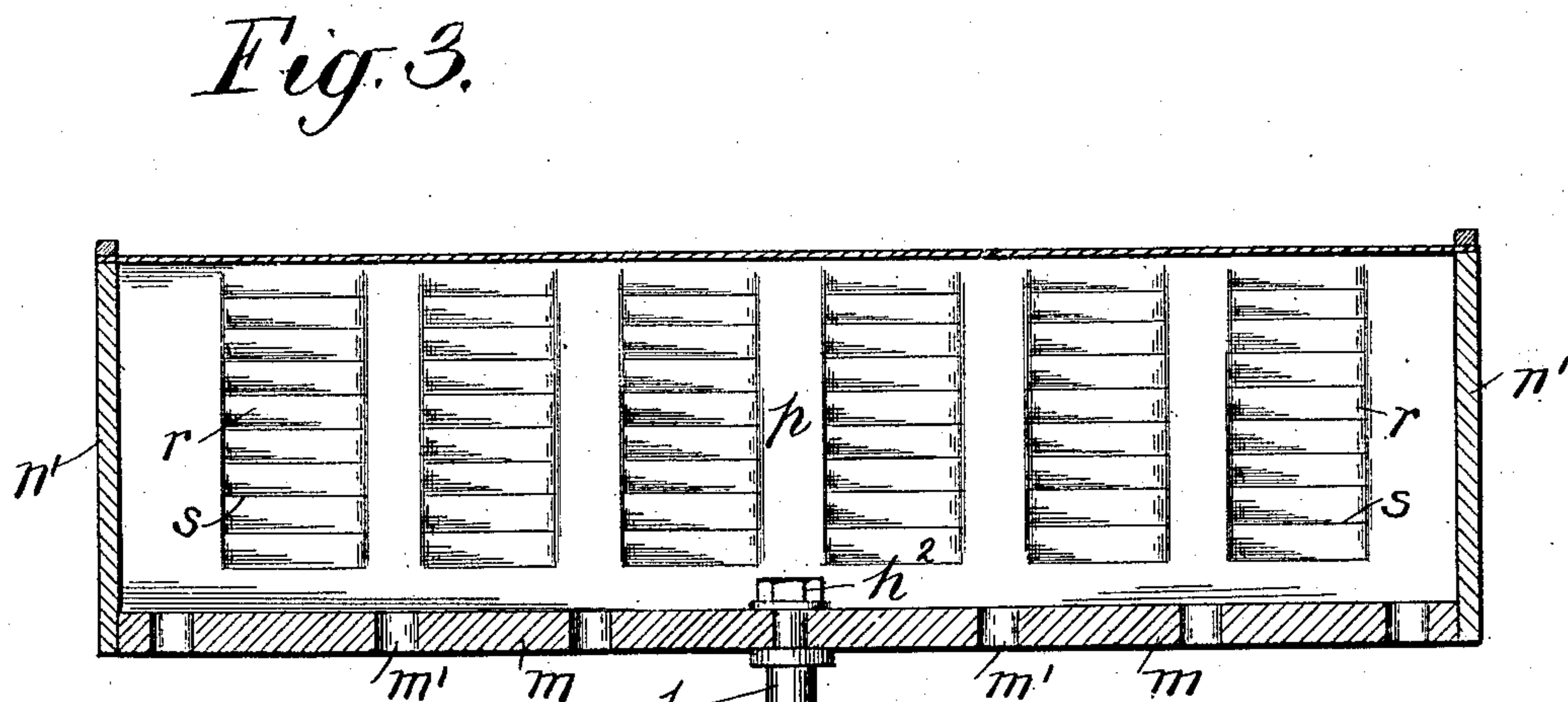
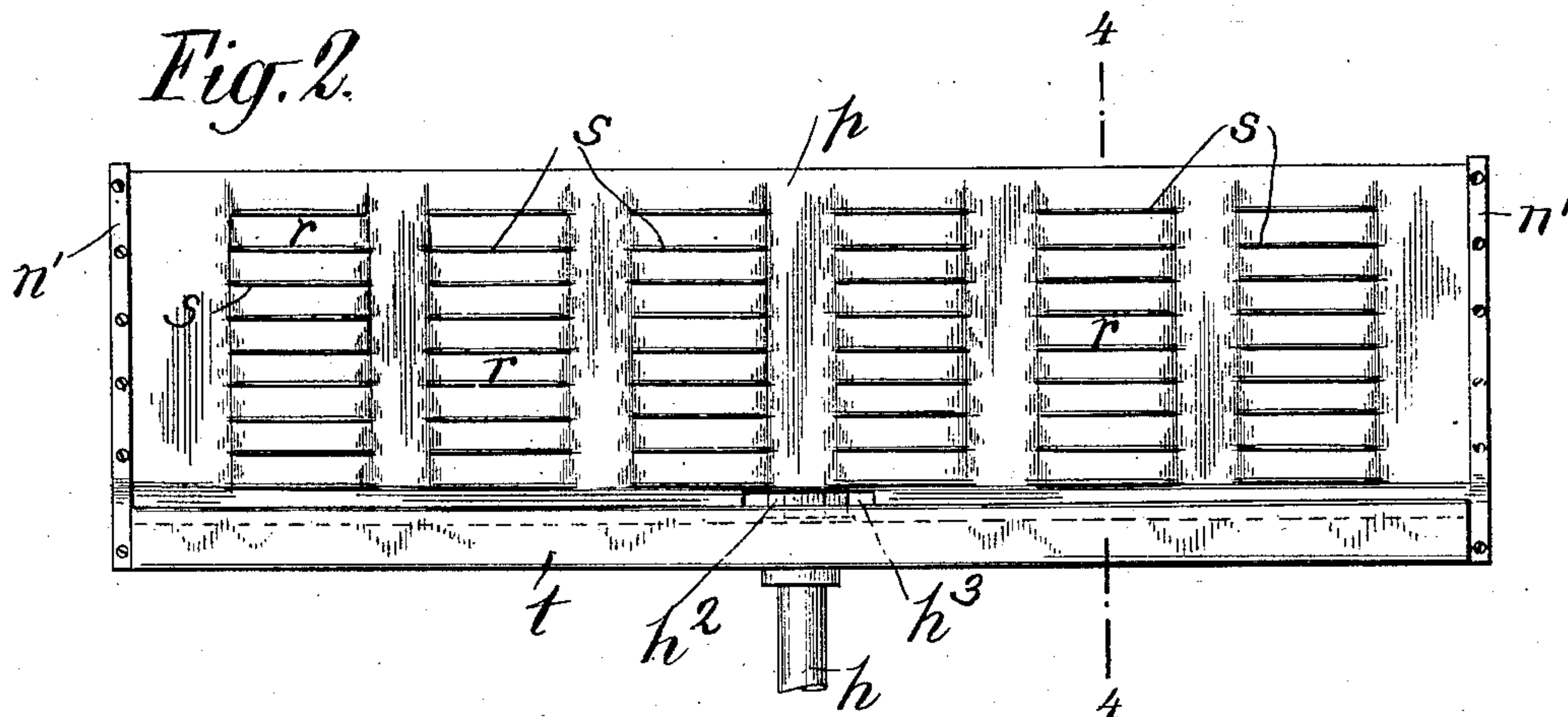
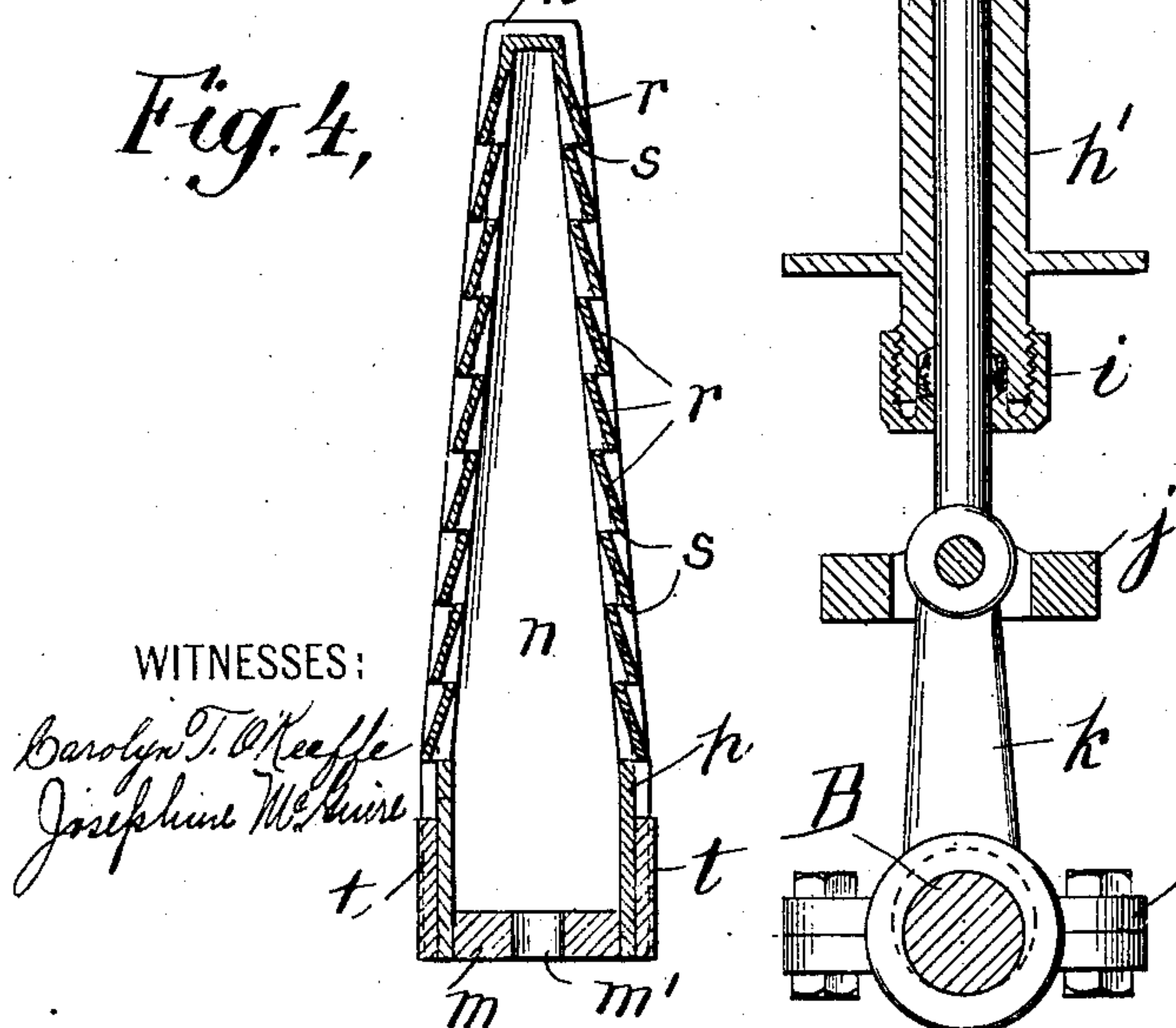


Fig. 4,



WITNESSES:

Carolyn T. O'Keeffe
Josephine McQuire

INVENTOR:

Fred D. Fowler,

BY

Samuel Goldsmith,
 ATTORNEYS

UNITED STATES PATENT OFFICE

FRED DU MONT FOWLER, OF GLENS FALLS, NEW YORK, ASSIGNOR TO INTERNATIONAL PAPER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

SCREEN FOR PAPER-STOCK.

973,493.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Application filed August 6, 1910. Serial No. 575,876.

To all whom it may concern:

Be it known that I, FRED D. FOWLER, a citizen of the United States, residing at Glens Falls, Warren county, State of New York, have invented certain new and useful Improvements in Screens for Paper-Stock; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in apparatus for screening paper pulp; and particularly to improvements in that type of such apparatus wherein the screen plates form a series of substantially vertical screen compartments projecting upwardly from the bottom of the screen into the body of the pulp, and within which reciprocate a like series of suction pistons.

In the accompanying drawing, Figure 1. represents, partly in longitudinal section and partly in elevation, a fragmentary view of a pulp screen embodying my improvements; Fig. 2. represents, in side elevation, my preferred form of screen piston, constituting the main characteristic feature of my invention; Fig. 3 represents a longitudinal sectional view of the piston and its operating connections; and Fig. 4. represents, on a somewhat larger scale a section taken on a plane indicated by the line 4—4 of Fig. 2.

Similar letters of reference indicate similar parts throughout the several views.

Referring to the drawings, A indicates the main body portion or receiving vat of the screen, adapted to be supplied with the stock to be screened, from any suitable source, in the continuous manner familiar to the art, and with the maintenance of the desired head appropriate to the conditions of use. A typical form of screen to which my invention is applicable is illustrated, for instance, in the U. S. Patent to J. W. Reynolds No. 947,125 dated January 18, 1910. My improvements are concerned only with the screening parts *per se* of apparatus of the general type of which the Reynolds screen and others of its kind are particular examples.

Extending upwardly in the screen vat A are a number of screening compartments. The sides *a* of these screening compartments are made up of the usual screen plates

for paper stock, these plates being preferably somewhat inclined toward each other, as indicated in Fig. 1. At their lower edges, the screen plates may conveniently be set in suitable recesses of metal retaining strips *b*, which strips may further be secured in place by means of wood lagging *c* secured to the wooden bottom *d* of the screen vat. The bottom *d* is provided with suitable apertures *e* extending from end to end of the several screen compartments, putting the interior of the screen compartment in communication with the chamber *f* for the screened stock, said chamber leading the screened stock off to the usual overflow weir (not shown). At their upper ends, the screens *a* are spaced apart and united by any suitable cap piece *g*.

Within each of the screened compartments reciprocates a piston constructed in accordance with my invention, and each of these pistons is provided with a piston rod *h*, passing through a guide tube *h'* and stuffing box *i*. Adjacent piston rods are connected by a cross head *j*, link *k*, and eccentric box *l*, with a shaft B, mounted in suitable bearings in the frame C of the screen, and driven by a power pulley D, or the like, from any suitable source of power. The revolution of the shaft B, through the connections described, imparts a series of rapid reciprocations to the pistons within the screen compartments.

As shown more fully in Figs. 2, 3, and 4, the piston, in the specific form therein illustrated, is provided with a bottom *m* having a number of apertures *m'*, of such dimensions as to permit of the free discharge from the interior of the piston of any screened stock which enters it in the operation of the screen. The bottom *m* is secured to the piston rod *h* by a nut *h²* engaging the upper screw threaded end of the piston rod; and, in order to disassemble the piston from the piston rod, when desired, a slot *h³* is provided in one of the sides of the piston, for the insertion of a suitable spanner wrench, to back off the nut *h²*.

At each end, the piston is provided with an end plate *n*, and the sides of the piston are formed, in my preferred practice, from a sheet of copper, or the like, bent upon itself, and secured to the end plates *n* by means of metal straps *n'* and suitable wood-screws, or the like. Each side *p* is provided

with a series of slots, which are formed by making corresponding slits in the metal and swaging the metal out from the plane of the copper sheet, thereby forming corresponding vertical rows of overlapping strips *r* with the intervening slots *s*.

The dimensions of the parts are such that at the complete end of the up stroke of the piston the iron straps *n'* will fall just short of the under surface of the caps *g*, and, as shown fully in Fig. 4 these straps will protect the projecting strips *r* from coming in contact with the screen plates *a*. It will also be noted that along the base of each of the sides of the piston is affixed a wooden strip *t*, these two strips serving to substantially fill out the space between the base of the piston and the inner surfaces of the apertures *e*.

The mode of operation of the screening devices will be apparent, from the foregoing description, to those skilled in the art. The rotation of the shaft, as has been said, causes the pistons to reciprocate rapidly within the screen compartments. The characteristic function of the pistons made in accordance with my invention is that they give a positive blowing action on the up-stroke, and a positive screening or suction action on the down-stroke. Consequently, at every up-stroke the slits of the screen plates are cleared of slivers, and, on the down-stroke, the full suction action is obtained. In practice, it is found that the screening capacity of the screen is very considerably increased by reason of its duplex effect, that the screen can be started into action much more promptly than is customary, and that it will maintain its suction or "prime" even though the stock should temporarily fall in the vat to a considerable distance below the top of the screen plates.

Having thus described my invention, what I claim is:

1. Apparatus for screening paper stock, provided with a series of upright screen compartments, in combination with a series of pistons reciprocating in said compartments, said pistons having a hollow interior and slotted walls; substantially as described.

2. Apparatus for screening paper stock, provided with a series of upright screen compartments, in combination with a series of pistons reciprocating in said compartments,

said pistons having a hollow interior, and having side walls provided with a series of slots separated from each other by overlapping projections; substantially as described.

3. Apparatus for screening paper stock, provided with a series of upright screen compartments, in combination with a series of pistons reciprocating in said compartment, said pistons having a hollow interior, and having side walls provided with a series of slots separated from each other by overlapping projections, and having end straps of such dimensions as to protect said projections from coming in contact with the walls of the screen compartment; substantially as described.

4. Apparatus for screening paper stock, provided with a series of upright screen compartments, in combination with a series of pistons reciprocating in said compartments, said pistons having a hollow interior, and having slotted side walls, and having a bottom plate provided with discharge apertures; substantially as described.

5. Apparatus for screening paper stock, provided with a series of upright screen compartments, in combination with a series of pistons reciprocating in said compartment, said pistons being provided with projections for giving a positive blowing action on the up-stroke and having a hollow interior for insuring a positive suction on the down-stroke, the pistons being of such dimensions as to substantially fill the interior of the compartments at the termination of the up-stroke; substantially as described.

6. In apparatus for screening paper stock, a suction piston having a hollow interior and having sheet metal sides provided with a series of outwardly swaged slots leaving intermediate inclines one above the other; substantially as described.

7. In apparatus for screening paper stock, a suction piston having a hollow interior and an apertured bottom and having sides provided with a series of slots having intermediate inclines one above the other; substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses.

FRED DU MONT FOWLER.

Witnesses:

J. GILBERT COOL,
C. W. COOL.