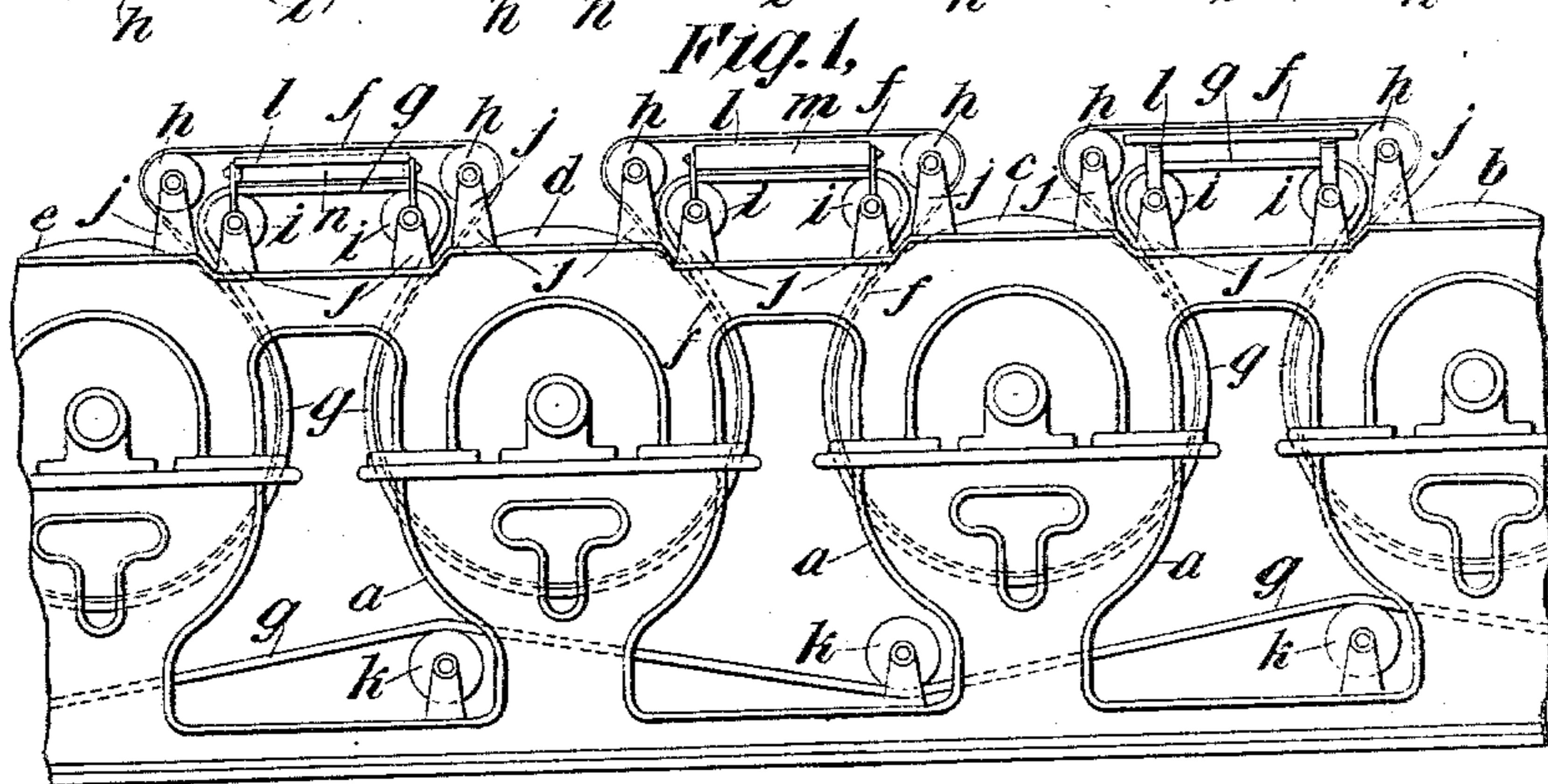
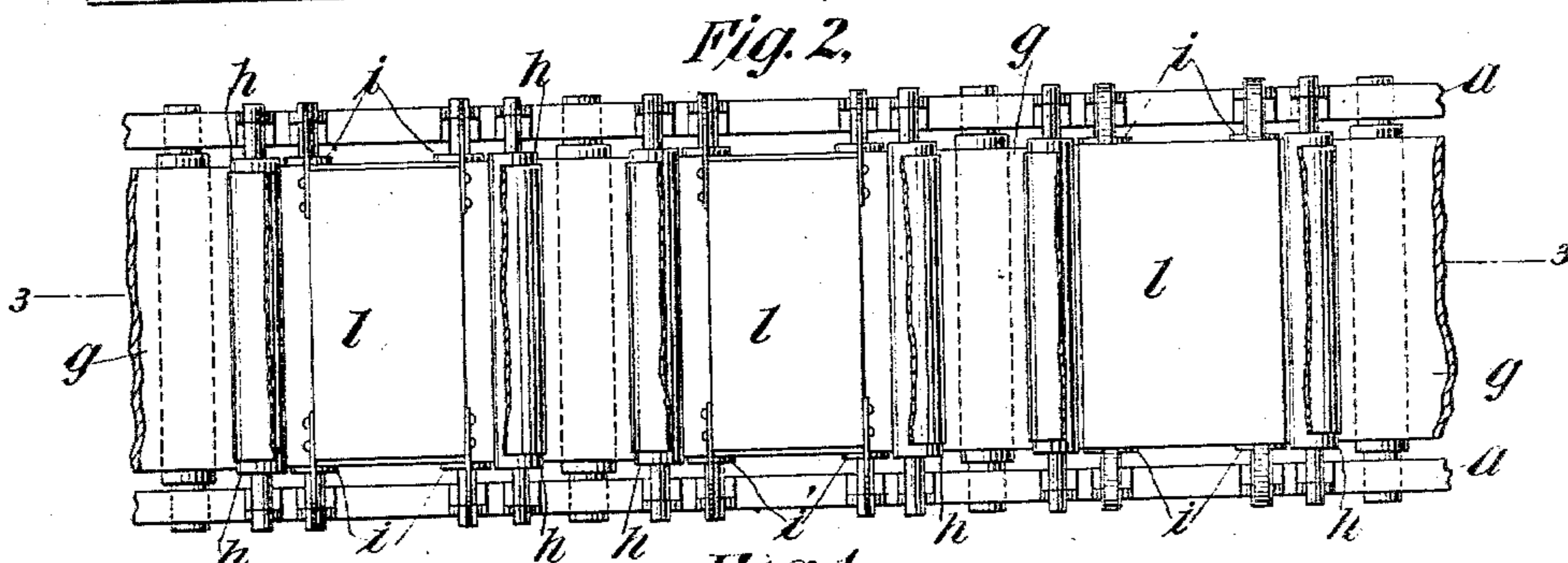


2 Sheets—Sheet 1.

No. 571,787.

Patented Nov. 24, 1896.



Nicholas M. Goodlett Jr

Inventors  
Andrew G. Paul  
Herbert A. Joslin  
By their Attorneys  
Witter & Kenyon

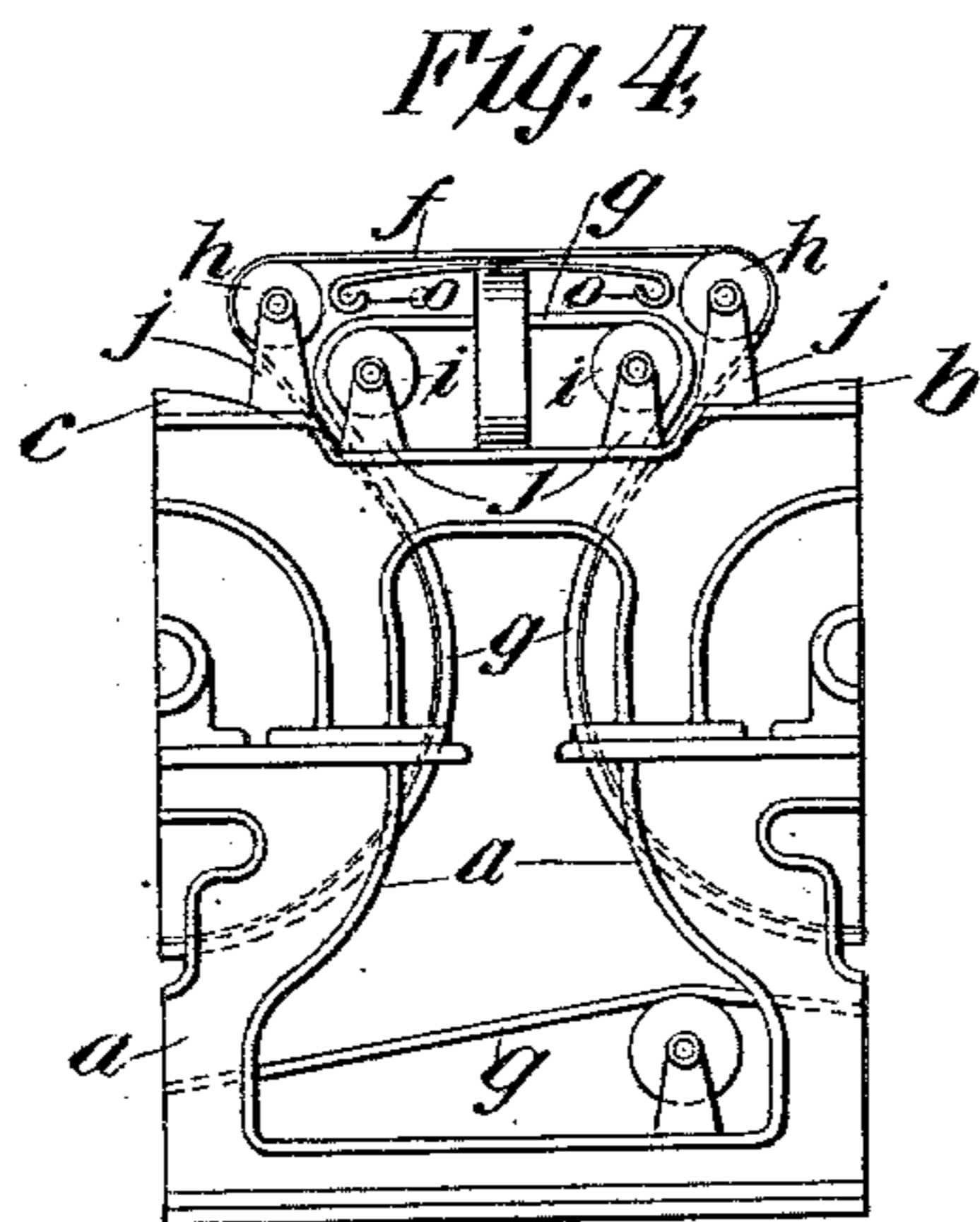
(No Model.)

2 Sheets—Sheet 2.

A. G. PAUL & H. A. JOSLIN.  
PAPER DRIER.

No. 571,787.

Patented Nov. 24, 1896.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ANDREW G. PAUL AND HERBERT A. JOSLIN, OF BOSTON, MASSACHUSETTS;  
SAID JOSLIN ASSIGNOR TO SAID PAUL.

## PAPER-DRIER.

SPECIFICATION forming part of Letters Patent No. 571,787, dated November 24, 1896.

Application filed June 15, 1893. Serial No. 477,634. (No model.)

*To all whom it may concern:*

Be it known that we, ANDREW G. PAUL and HERBERT A. JOSLIN, citizens of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Apparatus for Drying Paper, Cloth, and other Articles of a Similar Nature, of which the following is a specification.

10 This invention is applicable to drying-machines in which the paper or other material to be dried is passed over the surfaces of revolving cylinders, which are heated in any suitable way, as by steam, and in which the material to be dried is pressed against the drying-cylinders by means of a suitable ironer, such as an endless belt of canvas or felt or other suitable material, the ironer being caused to move with the paper and to hold  
15 the paper in close contact with the cylinder, thereby becoming an ironer for the paper and also preventing the air from getting in between the paper and the drying-cylinder, and in which the material to be dried and the ironer are separated between the cylinders and are fed from one cylinder to another on separate feeding or supporting devices.

20 In such drying-machines when the material to be dried is brought into contact with the drying-cylinder and forced against that cylinder by the ironing-belt some of the moisture which is expelled from the material is absorbed by the ironing-belt. The ironing-belt is thus more or less wet when it passes away  
25 from the first few cylinders. Between the successive drying-cylinders the ironing-belt is run over intermediate rollers. The paper or material to be dried is also passed over other intermediate rollers upon its way from one drying-cylinder to the next drying-cylinder. These intermediate rollers have been  
30 so arranged that the rollers for the ironing-belt have been mounted below the rollers for the material to be dried. In passing over these intermediate rollers on its way from one drying-cylinder to another the ironing-belt has thus been underneath the material to be dried. As a result of this arrangement the vapor which rises from the ironing-belt while  
35 it is passing over and between the interme-

mediate rollers rises directly up to the paper or other material which is passing over the upper rollers and is absorbed by that material or is deposited on its surface as a coating. This not only retards the drying of the material, but it is apt also to prevent the drying of the same from being uniform and may cause curling of the material. 55

The object of our invention is to prevent any moisture that passes from the ironing-belt at this stage from coming into contact with the material to be dried, and thus to secure a more rapid and uniform drying. 60

Our invention consists in suitable means, such as are hereinafter described, for controlling and directing the currents of vapor or moisture that pass off from the ironing-belt in a drying-machine, whereby this vapor or moisture is prevented from coming into contact with or being deposited upon or absorbed  
65 by the material which is being dried in the machine. 70

Our invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation view of a drying-machine embodying our improvement. 75 Fig. 2 is a top or plan view of the same, showing the paper or other material as broken away between the intermediate supporting-rollers. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 2. Fig. 4 shows a modified form of the diaphragm. 80

Similar letters denote similar parts in the different figures.

Referring to the drawings, *a* represents the framework of the machine. 85

*b*, *c*, *d*, and *e* are four successive drying-cylinders constructed and mounted in the usual way. The cylinders *b* and *e* are shown only in part. These machines usually contain a larger number of cylinders, but as the construction of such machines is well known only a few cylinders are represented in the drawings, as they are sufficient to clearly show the improvement herein described. 90

*f* is the paper or other material which is being dried in the machine. 95

*g* is the ironer, and consists of an endless belt or apron made of felt or canvas or other suitable substance. 100

# UNITED STATES PATENT OFFICE.

ANDREW G. PAUL AND HERBERT A. JOSLIN, OF BOSTON, MASSACHUSETTS;  
SAID JOSLIN ASSIGNOR TO SAID PAUL.

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In such drying-machines when the material to be dried is brought into contact with the drying-cylinder and forced against that cylinder by the ironing-belt some of the moisture which is expelled from the material is absorbed by the ironing-belt. The ironing-belt is thus more or less wet when it passes away from the first few cylinders. Between the successive drying-cylinders the ironing-belt is run over intermediate rollers. The paper or material to be dried is also passed over other intermediate rollers upon its way from one drying-cylinder to the next drying-cylinder. These intermediate rollers have been so arranged that the rollers for the ironing-belt have been mounted below the rollers for the material to be dried. In passing over these intermediate rollers on its way from one drying-cylinder to another the ironing-belt has thus been underneath the material to be dried. As a result of this arrangement the vapor which rises from the ironing-belt while it is passing over and between the interme-

mediate rollers rises directly up to the paper or other material which is passing over the upper rollers and is absorbed by that material or is deposited on its surface as a coating. This not only retards the drying of the material, but it is apt also to prevent the drying of the same from being uniform and may cause curling of the material.

The object of our invention is to prevent any moisture that passes from the ironing-belt at this stage from coming into contact with the material to be dried, and thus to secure a more rapid and uniform drying.

Our invention consists in suitable means, such as are hereinafter described, for controlling and directing the currents of vapor or moisture that pass off from the ironing-belt in a drying-machine, whereby this vapor or moisture is prevented from coming into contact with or being deposited upon or absorbed by the material which is being dried in the machine.

Our invention is fully illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation view of a drying-machine embodying our improvement. Fig. 2 is a top or plan view of the same, showing the paper or other material as broken away between the intermediate supporting-rollers. Fig. 3 is a vertical sectional view on the line 3 3 of Fig. 2. Fig. 4 shows a modified form of the diaphragm.

Similar letters denote similar parts in the different figures.

Referring to the drawings, *a* represents the framework of the machine.

*b*, *c*, *d*, and *e* are four successive drying-cylinders constructed and mounted in the usual way. The cylinders *b* and *e* are shown only in part. These machines usually contain a larger number of cylinders, but as the construction of such machines is well known only a few cylinders are represented in the drawings, as they are sufficient to clearly show the improvement herein described.

*f* is the paper or other material which is being dried in the machine.

*g* is the ironer, and consists of an endless belt or apron made of felt or canvas or other suitable substance.

of the heat from the ironer and the vapor is transmitted to the material to be dried, all substantially as and for the purposes set forth.

3. In a drying-machine for drying paper or  
5 other material in combination with a series of revolving drying-cylinders and an ironer moving with the cylinders, an arched diaphragm or partition so placed as to be between and to separate the material to be dried and the  
10 ironer while they are passing between the cylinders and provided with drains or gutters,

whereby the vapor which rises from the ironer is prevented from coming into contact with the material to be dried, and the moisture deposited on the diaphragm is caused to run off 15 through the drains, substantially as and for the purposes set forth.

ANDREW G. PAUL.  
HERBERT A. JOSLIN.

Witnesses:

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A. E. LITTLE.