

B. J. NOYES.
 IRONING AND DRYING DEVICE FOR PAPER MAKING MACHINES.
 APPLICATION FILED JUNE 14, 1907.

916,482.

Patented Mar. 30, 1909.

3 SHEETS—SHEET 1.

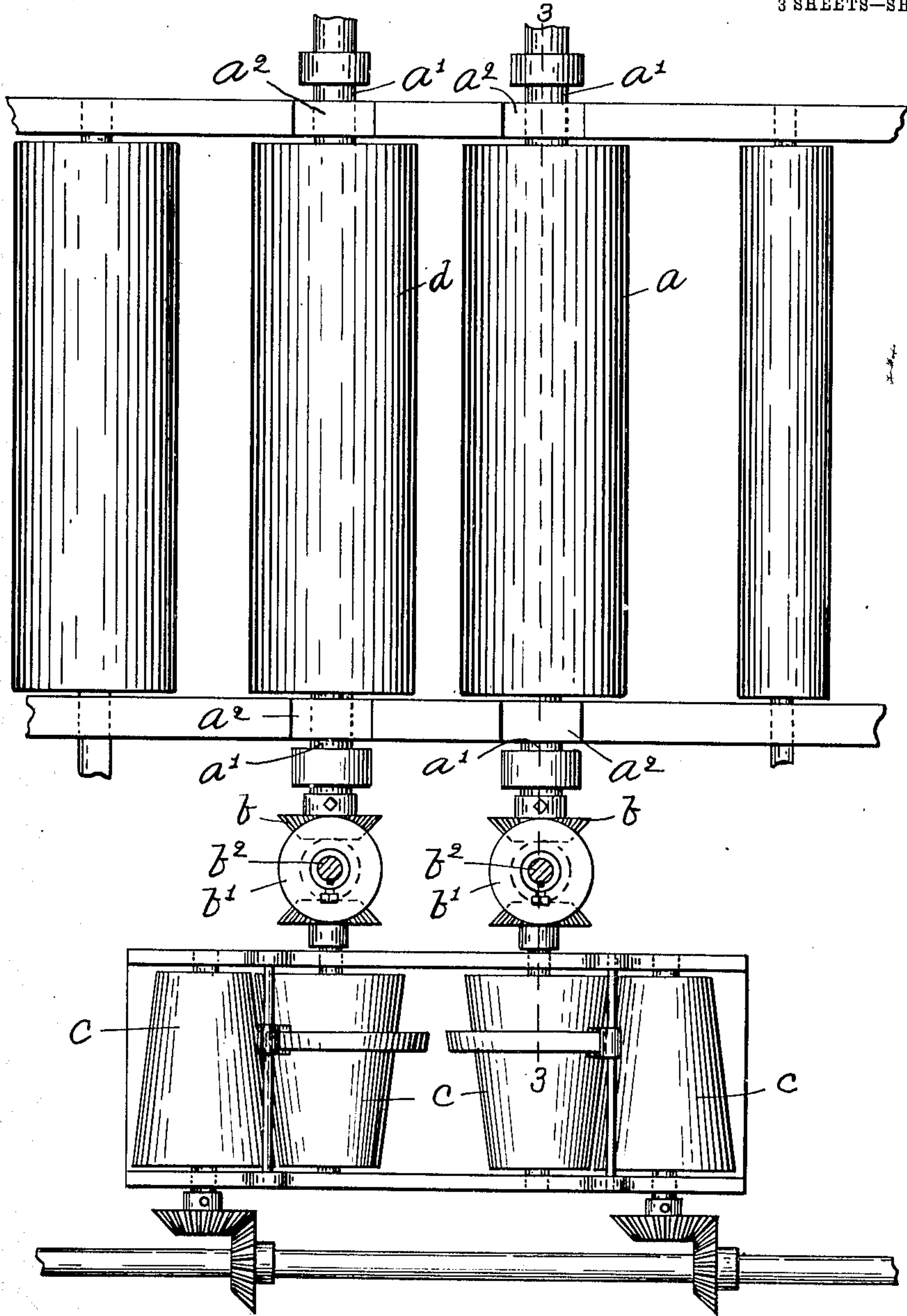


Fig. 1.

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 Cynthia Doyle.

Inventor:
 Bessie J. Noyes
 by Noyes & Harriman,
 Attys

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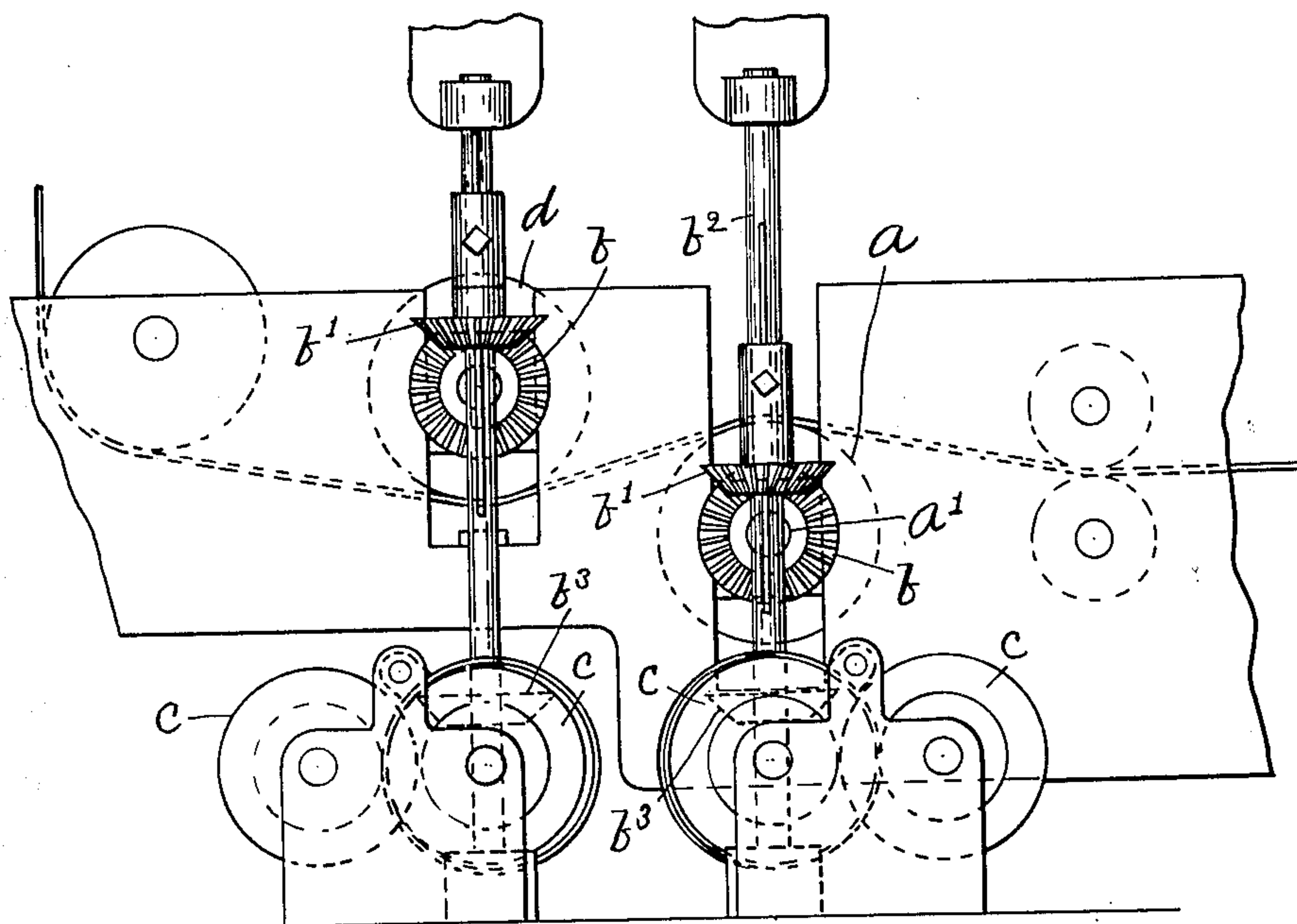


Fig. 2.

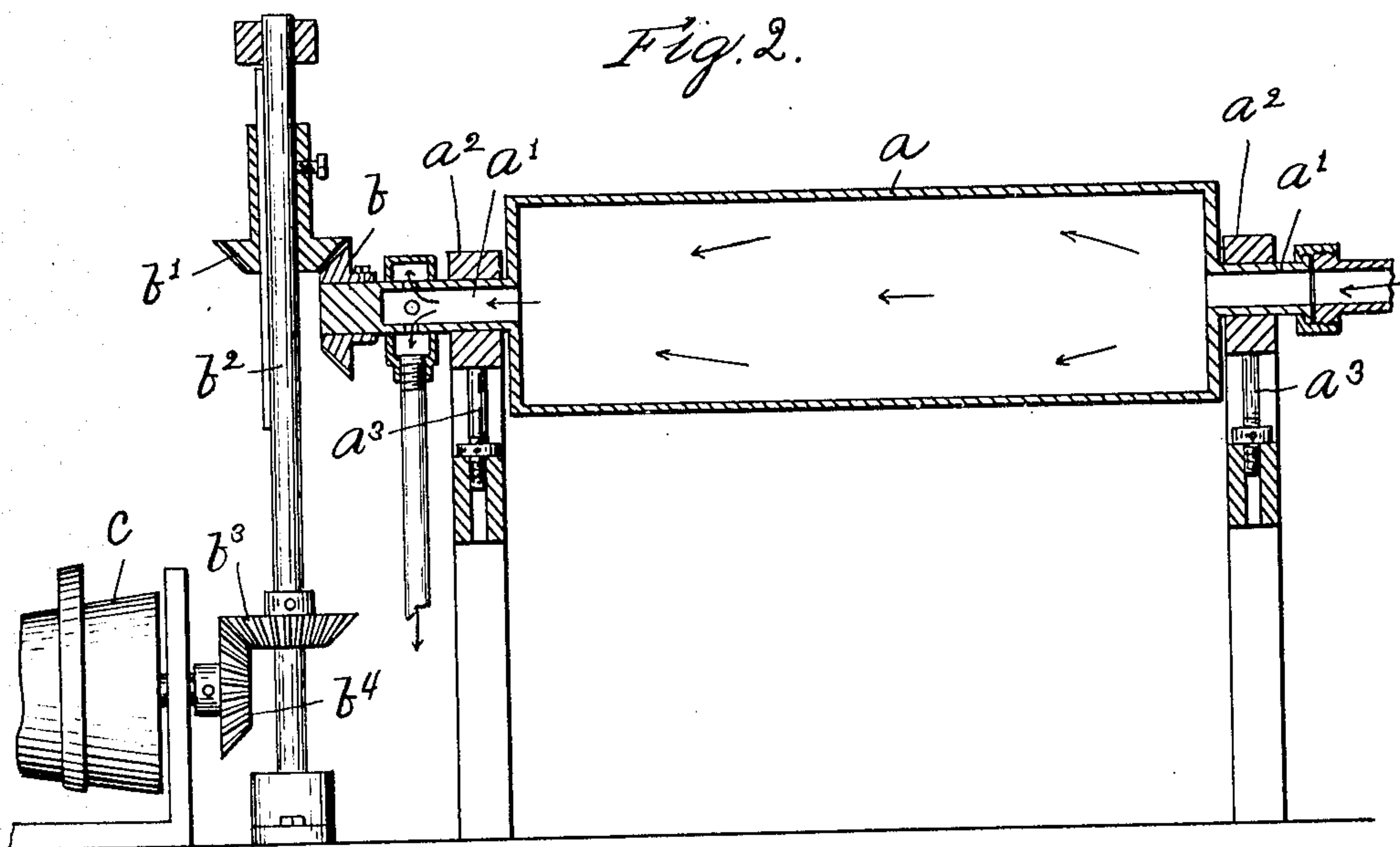


Fig. 3.

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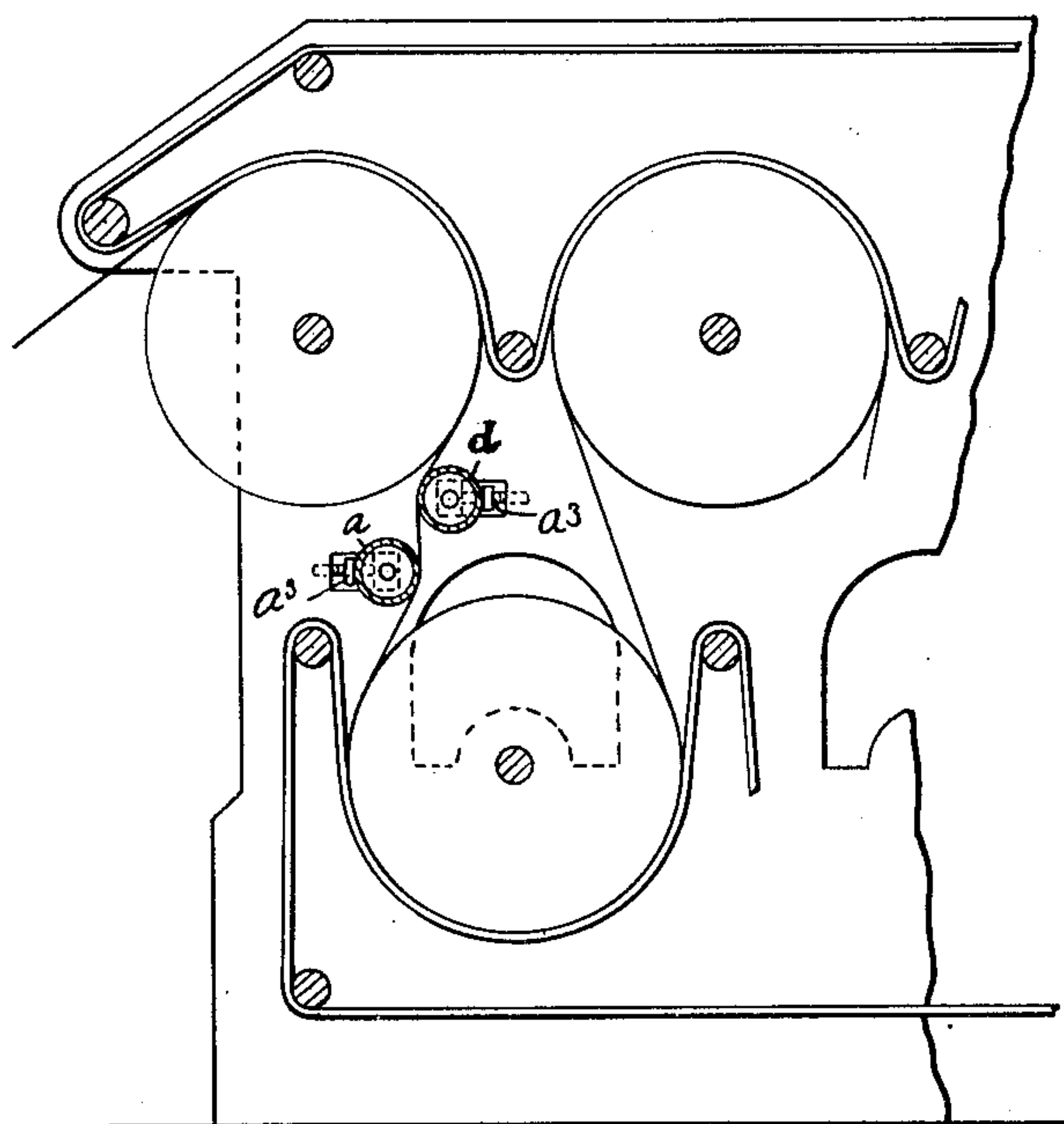


Fig. 4.

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UNITED STATES PATENT OFFICE.

BERNICE J. NOYES, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THAXTER N. TRIPP,
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IRONING AND DRYING DEVICE FOR PAPER-MAKING MACHINES.

No. 918,482.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed June 14, 1907. Serial No. 379,033.

To all whom it may concern:

Be it known that I, BERNICE J. NOYES, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Ironing and Drying Devices for Paper-Making Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to paper making machines and has for its object to construct an improved form of drying apparatus for the web, which is adapted to dry the web after it has been formed and partially dried by other means, and to so construct the drying apparatus that the web may be drawn over or moved with respect to its web-engaging surface, whereby the surface of the web is ironed or partially finished at the same time that the web is dried.

In carrying out this invention the drying and ironing device is movable in the direction of movement of the web, and has a curved surface over which the web is drawn.

It may be made as a cylinder, and means provided for revolving it at a speed at variance to the velocity of the moving web, as for instance, the surface speed of the cylinder may be less than the velocity of the web or it may be more, depending upon which way it is desired to lay the fibers, but in either event the direction of movement of the drying and ironing device is in the direction of movement of the web. At least two drying and ironing devices will be employed, which are arranged to engage the opposite sides of the paper and to deflect it. The drying and ironing devices are adjustable with respect to the paper, to vary the extent of deflection, so that the drying and ironing action may be varied.

The web from the drying cylinders of a Fourdrinier machine may be delivered to the drying and ironing apparatus forming the subject matter of this application and subsequently to the calender or to a winder.

Figure 1 shows in plan view a portion of a paper-making machine, having a drying and ironing apparatus embodying this invention.

Fig. 2 is a side elevation of the apparatus shown in Fig. 1. Fig. 3 is a transverse section of the apparatus shown in Figs. 1 and 2 taken on the dotted line 3—3. Fig. 4 is a modification showing in diagram a set of drying and ironing rolls arranged between

the drying cylinders of a paper-making machine.

Referring to the drawing, *a*, *d*, represent two cylinders of suitable dimensions which are adapted to be heated. These cylinders are made substantially alike and are operated by similar means, so that one only need be described in detail. The cylinder *a* is provided with hollow journals *a'*, for the inlet and outlet of steam, and said journals are supported in bearing boxes *a''* of any suitable construction. The bearing boxes are vertically adjustable, as for instance, they may be mounted on screws *a'''* arranged in suitable upright supports. The web passes over the cylinder *a*, and said cylinder is disposed to deflect the web, and the extent of deflection may be regulated by adjustment of the cylinder toward and from the web by means of the screws *a'''*. By varying the position of the cylinder with respect to the web and thereby varying the extent of deflection, the web will be acted upon with a varying degree of pressure so that the ironing action and also the drying action is varied.

The cylinder *a* is revolved by any suitable means so far as this invention is concerned, and, as herein shown, one of the journals *a'* has fixed to it a bevel-gear *b*, which is engaged by a bevel-gear *b'*, splined upon and adjustably secured to an upright shaft *b''*, having at its lower end a bevel-gear *b'''*, which is engaged by a bevel-gear *b''''*, secured to one of the journals of a pair of friction cone-pulleys *c*, of any usual or suitable construction. By means of the cone-pulleys, which are revolved by any suitable means, not shown, the cylinder *a* will be revolved and its speed regulated. It is designed and intended to revolve the cylinder in the direction of the moving web but at a speed at variance to the velocity of the moving web, as for instance, the surface speed of the cylinder may be less or more than the velocity of the moving web. The web will be fed forward by a pair of positively driven feed-rolls, and by said rolls will be drawn over the cylinder, and as the cylinder is revolved at such time in the direction of the moving web, it will be observed that the web is moved over the moving cylinder. As the cylinder is heated and as its surface is made smooth and polished, the web will be dried and also ironed to a certain extent, as it is drawn over it. The cylinder *d* is arranged at the opposite

side of the web and is operated in the same manner as the cylinder *a* and by similar means, so that both sides of the web will be acted upon.

5 It will be observed that the cylinders herein shown are isolated, that is to say, they are separated from each other and from the other operating parts and do not have co-operating with them another roll, to thereby
10 feed the web.

Referring to Fig. 4, the cylinders *a* and *d* are arranged between the usual drying cylinders of the paper-making machine, and they will be revolved and adjusted substantially
15 the same as the cylinders shown in Figs. 1 to 3.

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

20 1. In a paper making machine, the combination with means for moving a web, of an isolated roll arranged to deflect the web having a web-engaging surface, and means
25 for revolving said roll in the direction of movement of the web and at a speed at variance to the velocity of the moving web, substantially as described.

2. In a paper making machine, the combination with means for moving a web, of
30 an isolated roll arranged to deflect the web having a web-engaging surface, means for heating the roll, and means for revolving said roll in the direction of movement of the web and at a speed at variance to the ve-
35 locity of the moving web, substantially as described.

3. In a paper making machine, the combination with means for moving a web, of
40 an isolated roll, arranged to deflect the web, having a web-engaging surface, and means for adjusting it to vary the extent of deflec-

tion of the web, and means for revolving said roll in the direction of movement of the web and at a speed at variance to the velocity of the moving web, substantially as described. 45

4. In a paper making machine, the combination with means for moving the web, of two isolated rolls, arranged at opposite sides of the web, to deflect it in opposite ways, having web-engaging surfaces, and means
50 for revolving said rolls in the direction of movement of the web and at speeds at variance to the velocity of the moving web, substantially as described.

5. In a paper making machine, the combination with means for moving the web, of two isolated rolls, arranged at opposite sides of the web, to deflect it in opposite ways, having web-engaging surfaces, means for heating said rolls, and means for revolving
60 said rolls in the direction of movement of the web and at speeds at variance to the velocity of the moving web, substantially as described.

6. In a paper making machine, the combination with means for moving the web, of two isolated rolls, arranged at opposite sides of the web, to deflect it in opposite ways, having web-engaging surfaces, means for adjusting them to vary the extent of deflection of the web, and means for revolving
70 said rolls in the direction of movement of the web and at speeds at variance to the velocity of the moving web, substantially as described.

In testimony whereof, I have signed my
75 name to this specification, in the presence of two subscribing witnesses.

BERNICE J. NOYES.

Witnesses:

H. B. DAVIS,
CYNTHIA DOYLE.