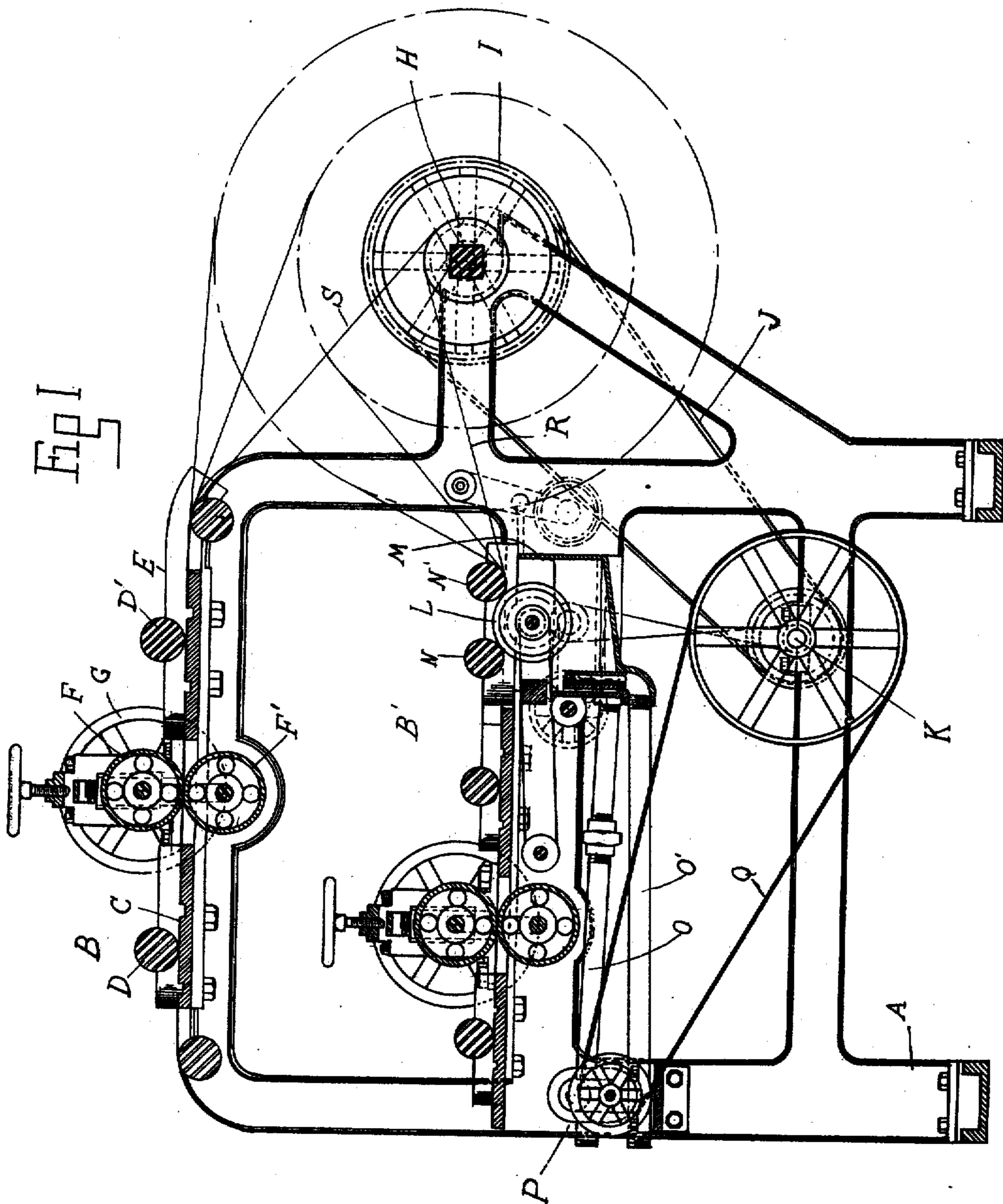


H. C. HERR.
 APPARATUS FOR MANUFACTURING MULTIPLY PAPER BOARD.
 APPLICATION FILED APR. 22, 1907.

913.007.

Patented Feb. 23, 1909.
 2 SHEETS—SHEET 1.



WITNESSES
W. H. Ford.
James P. Barry. By

INVENTOR
 HENRY C. HERR.
Whitney Hubert Whitney
 atty

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Fig. 2.

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 2 SHEETS—SHEET 2.

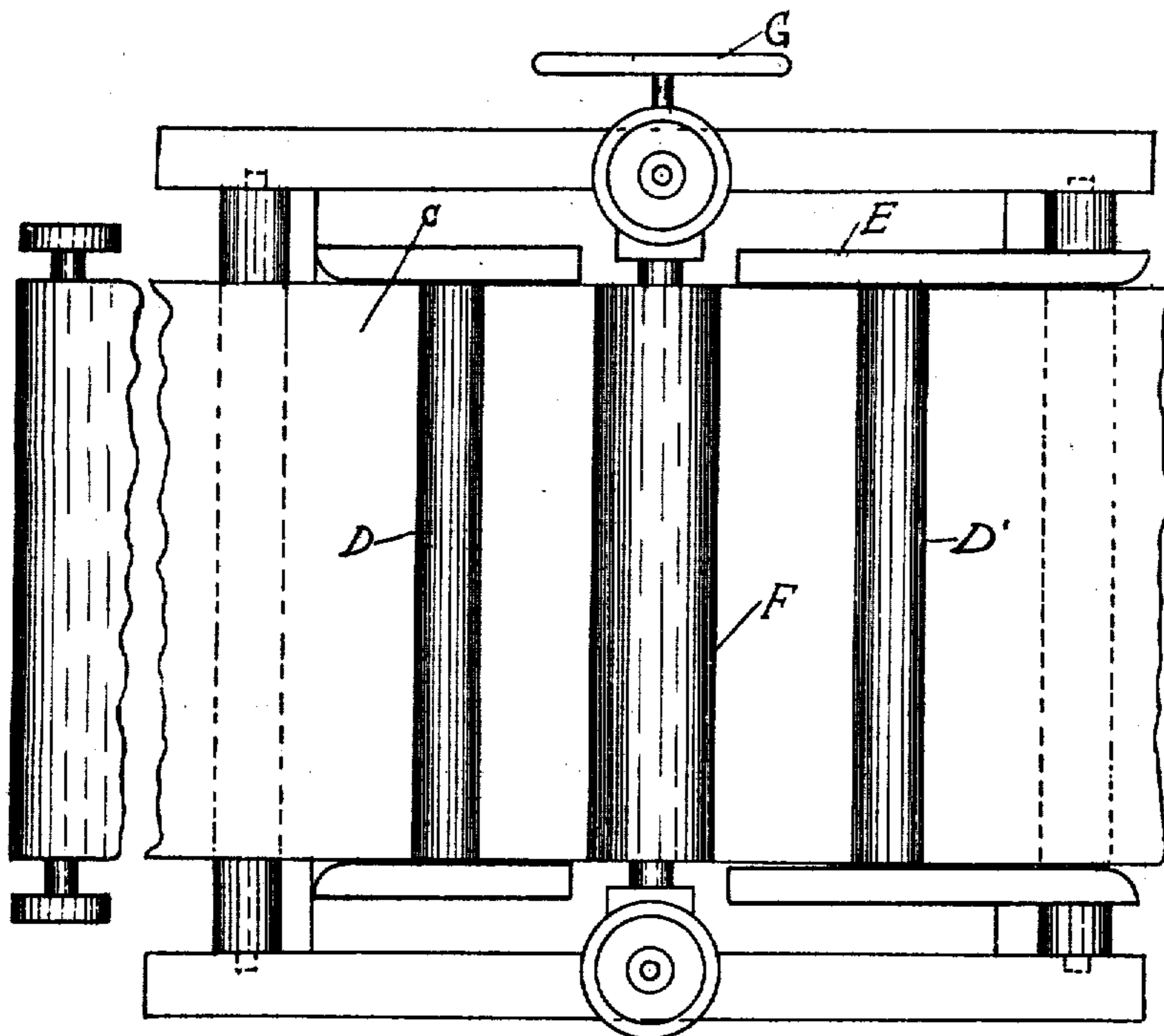
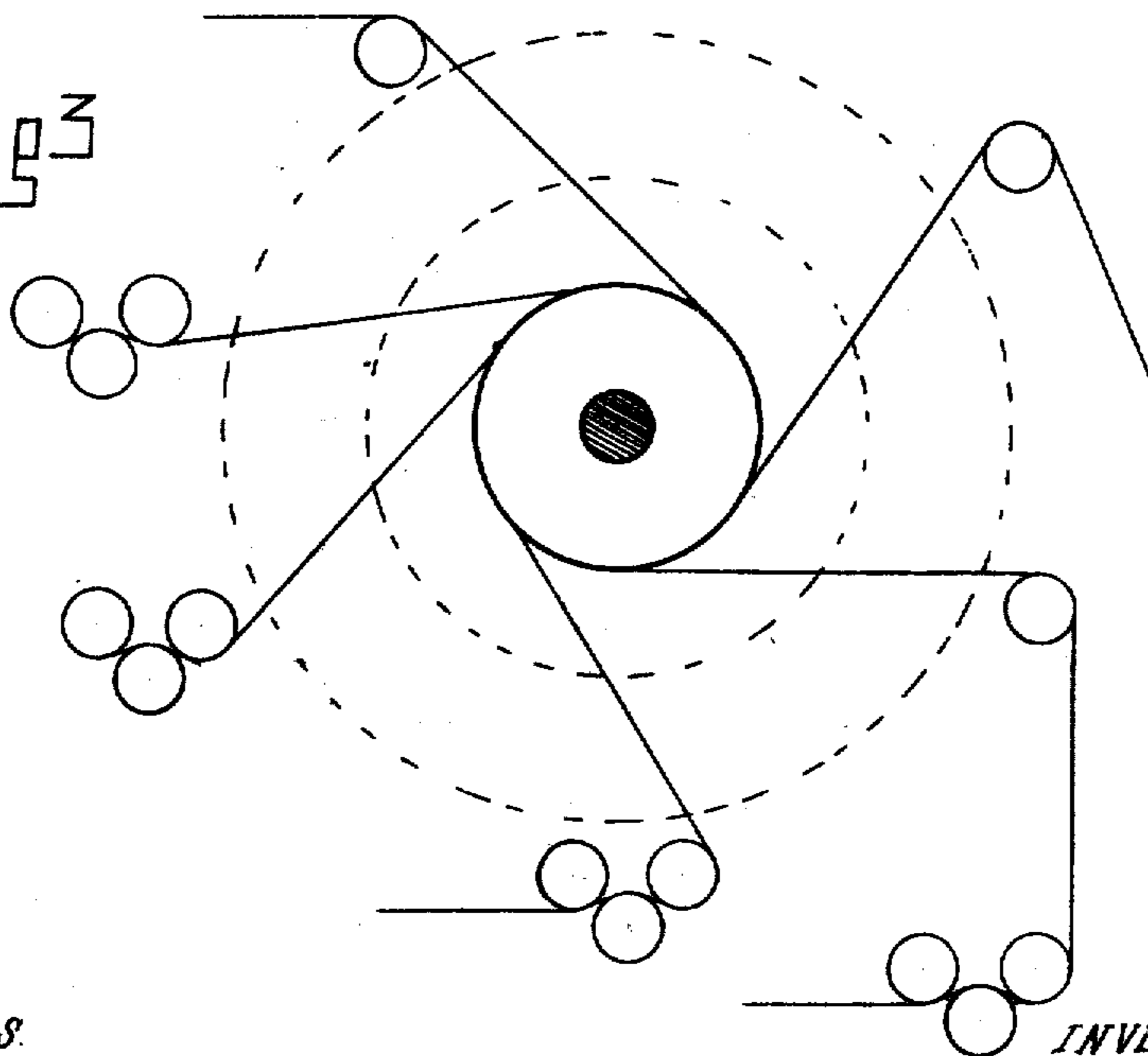


Fig. 3



WITNESSES:

W. K. Ford.
James P. Barry

By

Whitmore Hubert Whitmore
attys

INVENTOR

HENRY C. HERR

UNITED STATES PATENT OFFICE.

HENRY C. HERR, OF DETROIT, MICHIGAN.

APPARATUS FOR MANUFACTURING MULTIPLY PAPER-BOARD.

No. 913,007.

Specification of Letters Patent.

Patented Feb. 23, 1909.

Application filed April 22, 1907. Serial No. 369,597.

To all whom it may concern:

Be it known that I, HENRY C. HERR, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Apparatus for Manufacturing Multiply Paper-Board, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to apparatus for forming paper board from a plurality of plies of paper, and it is the object of the invention to provide means whereby strips of paper of considerable length may be accurately registered with each other, and firmly united to form the board.

To this end, the invention consists in certain features of construction as hereinafter set forth.

In the drawings, Figure 1 is a sectional side elevation of the machine; Fig. 2 is a plan view; and Fig. 3 is a diagram illustrating the principle involved in the construction of the machine.

Where two paper strips are united by being pasted and then fed into contact, it is difficult to form a perfect union. The difficulties encountered are, first, that the strips will not feed in perfect alinement and consequently, after once being attached, the greater the length which is fed, the more they will be out of registration. If guiding devices are employed for limiting the lateral deflection of the strips, these will only result in causing them to buckle and produce a blister or imperfect union wherever any correction in the direction of feed is made. With my invention, I overcome this difficulty, first, by alining all of the several strips before feeding the same into contact with each other; second, by separately adjusting each of the strips to a surface against which they are pressed when united; third, in providing freedom to each of the successively applied strips to adjust itself to the strip previously laid in contact with the holding surface; fourth, in applying the paste to the surface of the strip last laid and which adjusts itself to the previously laid strip; fifth, in effecting the union of the strips during the reeling of the same upon a roll; and sixth, by feeding the different strips tangentially to different points in the circumference of the reel.

As illustrated, A is a suitable frame work,

upon which is mounted a plurality of paper feeding and guiding devices B B'. Each of these preferably comprises a bed or table C, a plurality of rolls D D' for straightening the strips in contact with said table, and edge guides E for determining the line of feed. The several guiding devices B B' are alined with each other, so as to aline the strips respectively fed therethrough, and each is preferably further provided with a pair of hand-feeding rolls F F' operated by a hand-wheel G, by means of which the strip may be easily fed until its end is attached to the reel.

In the frame A is a reel H preferably comprising the roller journaled in bearings in the frame, and revolved through the medium of suitable drive connections, such as the pulleys I and belt J leading to a pulley on the drive shaft K. The reel H is accurately positioned, so that the several strips from the guiding devices B B' will be fed tangentially therethrough. The point of tangency of each of the several strips is separated from that of the other strips, and thus the reel passes through a greater or less angle before one strip wound thereon is covered by another strip. This permits the first strip contacting with the reel to adjust itself thereto before its movement is imparted by the pressure of a succeeding strip. As a consequence, each succeeding strip will perfectly adjust itself in contact with the strip wound in advance thereof, so as to produce a perfect contact.

To unite the strips, one surface of each pair is pasted and the adhesive material is preferably applied to the under surface of the pasted strip. The mechanism for accomplishing this is illustrated in Fig. 1 as comprising a roll L rotating in the paste tank M, and in working position projecting between two idler rolls N and N'. The paper strip is thus caused to pass around a segment of the roll L, which applies the paste uniformly to the entire surface of the strip. The paste tank is constantly supplied with paste or adhesive by circulating conduits O and O' and a pump P driven by the drive connection Q on the shaft K, but this mechanism forms no part of the present invention.

With the construction described, in operation each of the several strips is first passed over the table C of its guide device, and is then fed by the hand-roll F until the end of the strip is secured to the reel H. Movement is then imparted to the reel, which will

draw all of the strips simultaneously and wind them thereon. The pasted strips R, as indicated in Fig. 1, does not contact with the reel until the other strip S has been wound
 5 thereon and also adjusts itself in perfect contact with the roll. Furthermore, the point of tangency of this pasted strip being separated from the point of tangency of the strip S, it will adjust itself into perfect contact
 10 before being covered and held from movement by the succeeding convolution.

In Fig. 3, I have illustrated diagrammatically a similar apparatus, in which a larger number of strips is used, and in which
 15 the several strips are all tangent to the reel, but from spaced points and in its circumference.

It will be observed from the dotted lines in Fig. 1 that the separation in points of tangency of the two strips continues as the reel increases in diameter by the added convolutions thereof.

In addition to the function of first feeding the paper through the guides to the reel, the
 25 rolls F' F' perform the function of a resistance for placing a tension upon the paper strip. Furthermore, as these rolls are placed in the center of the guides, the alinement of the strip is not interfered with. As the paper strip is preferably fed to the guides from
 30 a free roll, it is permitted to perfectly aline itself with the guides, and as each of the guiding devices is in perfect alinement with the other, the strips, when delivered to the reel,
 35 will be in perfect registration.

What I claim as my invention is:

1. The combination with a reel, of a frame in which said reel is journaled and a plurality of guides for feeding separated paper strips
 40 tangentially to said reel and with their edges in the same plane, each of said guides comprising a table, a plurality of rolls for holding the paper strips in contact with said table, edge guides for said strips and an intermediate roll for placing a frictional resistance upon
 45 the strip.

2. A paper strip alining mechanism, comprising a plurality of parallelly arranged tables over which the strips are fed, rolls for
 50 holding the strips in contact with said tables

and an intermediate roll for placing frictional resistance upon the strip.

3. The combination with a reel, of a frame in which said reel is journaled, and a plurality of guides for feeding separated paper strips
 55 tangentially to said reel and with their edges in the same plane, each of said guides comprising a table, a plurality of rolls for holding the paper strips in contact with said table, and edge guides for said strips.
 60

4. The combination with a reel, of a frame in which said reel is journaled and a plurality of guides for feeding separated paper strips tangentially to said reel and with their edges
 in the same plane, each of said guides comprising a table and a plurality of rolls for
 65 holding the paper strips in contact with said table.

5. The combination with a reel, of a frame in which said reel is journaled and a plurality
 70 of parallel guides for feeding separated paper strips tangentially to said reel.

6. The combination with a reel, of a frame in which said reel is journaled and a plurality of parallel tables each provided with guide
 75 rolls for holding the paper strips in contact with the table, for feeding separated paper strips tangentially to said reel.

7. The combination with a reel, of means for feeding a plurality of strips tangentially
 80 to said reel, means associated with said reel for pressing said strips into contact, and means intermediate the reel and feeding means for maintaining the edges of the several strips in the same plane.
 85

8. The combination with means for pressing together and uniting a plurality of pasted paper strips, a plurality of means positioned in parallel planes for feeding the several
 strips to said uniting means, and means for
 90 guiding said strips into actual alinement with each other in advance of their delivery to said uniting means.

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

HENRY C. HERR.

Witnesses:

NELLIE KINSELLA,
 JAMES P. BARRY.