B. H. C. H. RATHSFELD.

WEB ADVANCING MECHANISM FOR DRYING FRAMES.

APPLICATION FILED OCT. 30, 1913.

1,167,216.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

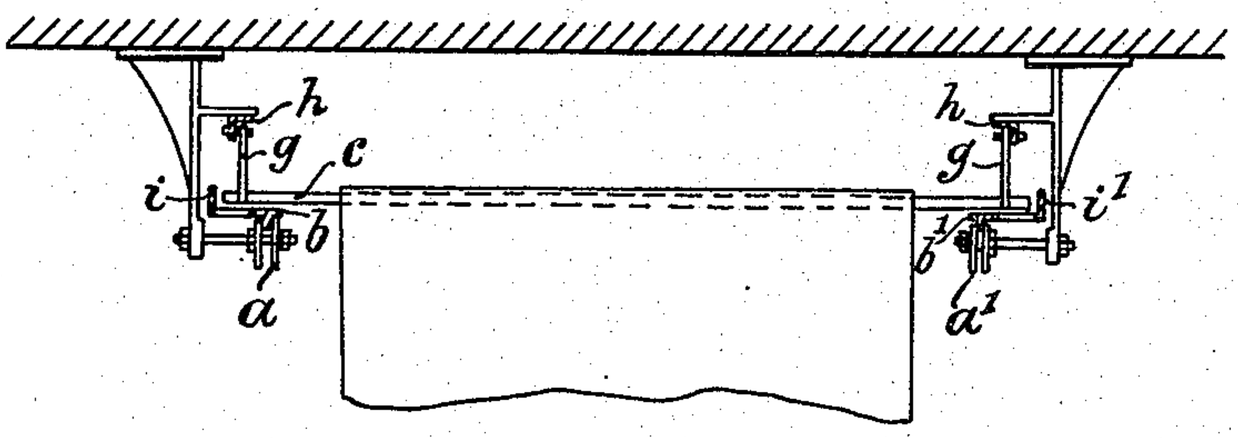

Fig. 1.

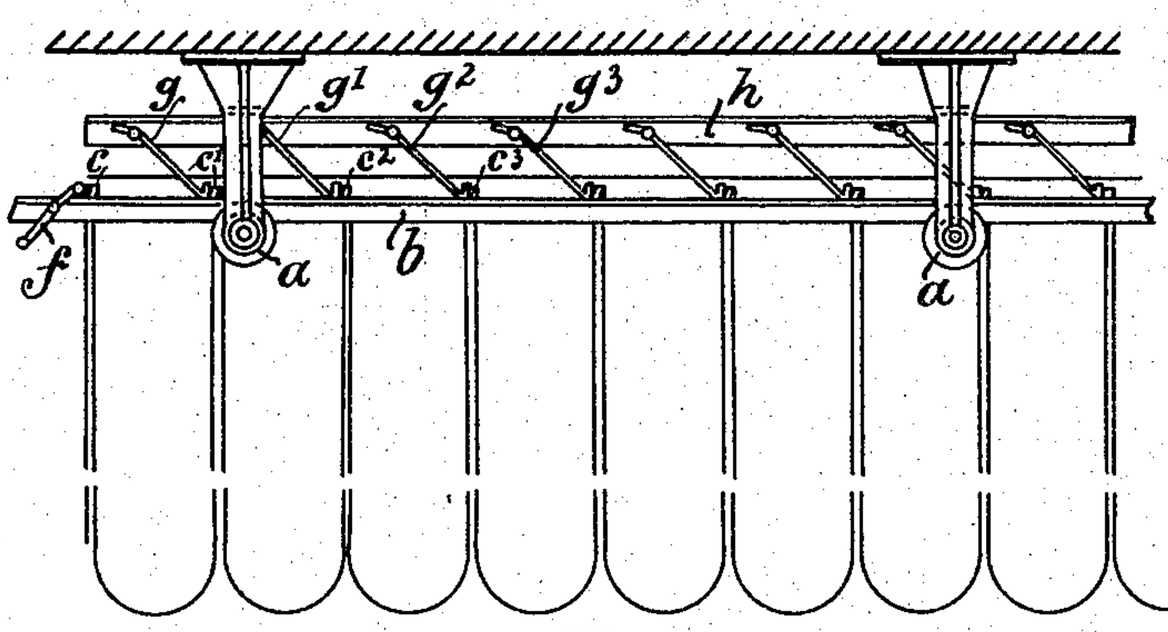

Fig. 2.

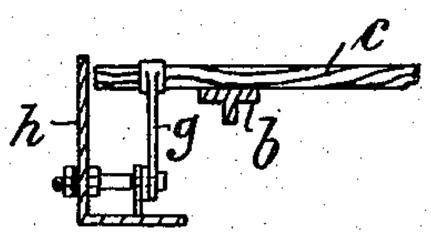

Fig. 3.

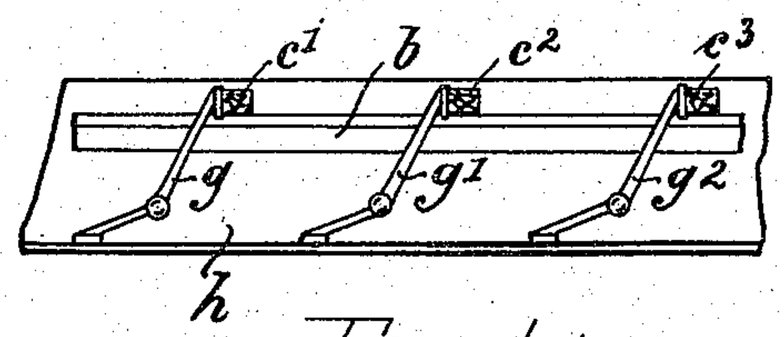

Fig. 4

Witnesses:
B. Sommers
E. Leckert

Inventor.
Berthold H. C. H. Rathsfeld,
By Henry Orth & Son Atty.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

B. H. C. H. RATHSFELD.

WEB ADVANCING MECHANISM FOR DRYING FRAMES.

APPLICATION FILED OCT. 30, 1913.

1,167,216.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 2.

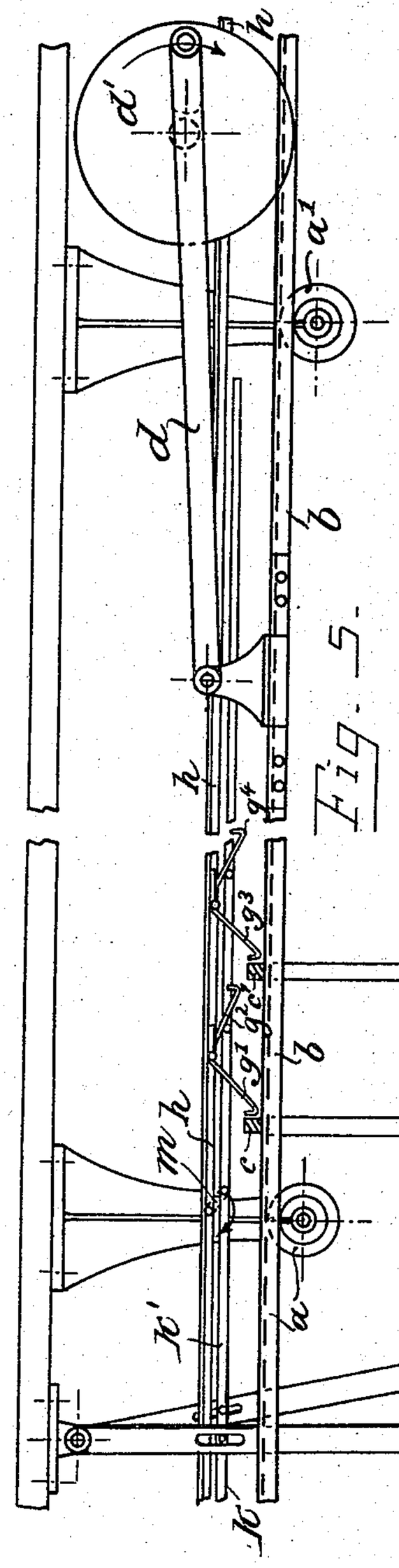

Fig. 5.

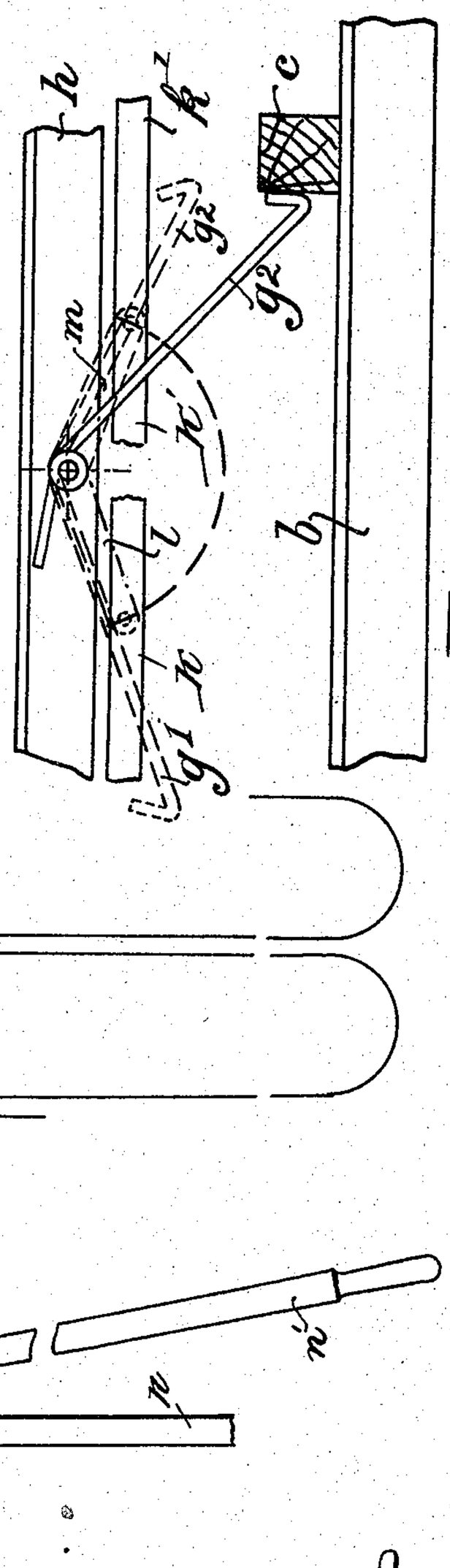

Fig. 6.

Witnesses:
P. Sommers
E. Leckert.

Inventor.
Berthold H. C. H. Rathsfeld.
By Munn & Co
Atty.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

BERTHOLD HEINRICH CARL HERMANN RATHSFELD, OF NORDHAUSEN, GERMANY.

WEB-ADVANCING MECHANISM FOR DRYING-FRAMES.

1,167,216. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed October 30, 1913. Serial No. 798,244.

To all whom it may concern:

Be it known that I, BERTHOLD HEINRICH CARL HERMANN RATHSFELD, a subject of the King of Prussia, German Empire, residing at the city of Nordhausen, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Web-Advancing Mechanism for Drying-Frames, of which the following is a specification.

In the frames hitherto employed for drying webs of paper or woven fabrics hanging in long folds the supporting bars carrying these folds were advanced by means of chains or by fingers which were pivoted to reciprocating frames, or by means of cams which were rigidly secured to reciprocating rods.

The advancing of the supporting bars by means of chains had the disadvantage, that the bars could fall down and the chains could break. The method of advancing the supporting bars by means of fingers pivoted to reciprocating frames entailed too many moving and dust collecting parts above the supporting bars and the material to be dried. The advancing of the supporting bars by means of cams rigidly secured to reciprocating rods had the disadvantage, that the cam rod had to have a duplex motion, one longitudinally and one around its own axis; this necessitated a complicated journaling a difficult lubrication and the restriction of the length of the stroke of the cam rod to the distance of the cams between each other, so that this method could not be employed at all when the bars were to be arranged very close to each other.

The new arrangement has the object of obviating these drawbacks, by imparting to the rails carrying the supporting bars a reciprocating movement, and providing pawls on stationary rails, which pawls will allow of the bars passing on their forward stroke, but will retain them at the return stroke, or, when disengaged, will discontinue the advance of the material being dried.

The present improvement further affords the advantage, that the attendance and lubrication are reduced to a minimum, so much the more if the rollers carrying the rails are fitted with ball bearings, and that the distance between the supporting bars is determined only by the stroke of the connecting rods of the cranks reciprocating the rails, which stroke may be variable at will. Accordingly whether the supporting bars and with them the paper or fabric webs shall be moved forward only or forward and backward, a set of pawls is provided either for the forward travel only, or for the forward travel and the backward travel each. By disengaging the pawls for the forward travel and engaging the pawls for the backward travel, for instance, the forward travel will be discontinued and the backward travel will be produced. If all pawls are disengaged, the travel of the material is entirely stopped.

The new possibilities for the movement of the paper webs hereby obtained are of great importance in practice, so much the more as it is thereby rendered possible to reverse the direction of the travel or disengage the travel altogether in a very simple manner.

When the travel of the supporting bars is stopped they will participate in the reciprocating movement of the supporting rails. The material being dried is thereby swung to and fro and will dry much faster, than if it were to uniformly travel in one direction. The travel is, therefore, stopped when the material is not sufficiently dried in the ordinary travel.

After the material has been sufficiently dried and shall then be removed from the drying room, the pawls for the advance travel can be disengaged and the travel be reversed. The forward or return travel of the supporting bars is stopped for producing a reciprocating movement of the material being dried by disengaging the pawls, for instance by lifting these pawls with the aid of a rod provided with cams, so that the supporting bars on the supporting rail are not touched by the pawls and participate in the reciprocating motion of said rail. In order to allow of a return travel of the material under treatment, pawls are provided, which are arranged in a direction opposite to that of the pawls for the forward movement, and also these pawls are fitted with a lifting device of known design. The arrangement must be such, that either by means of the said lifting device the pawls can be moved into such position, that either only the pawls for the forward travel are in operative position, while the pawls for the return travel are disengaged, or vice versa, or, that both sets of pawls are disengaged, and the material under treatment is merely swung to and fro. The new ar-

rangement is shown in the accompanying drawings in which—

Figure 1 is a front elevation of a constructional form having only one set of pawls. Fig. 2 is a side elevation. Figs. 3 and 4 illustrate a second constructional form of the arrangement with one set of pawls. Fig. 5 is a side elevation of the arrangement with one set of pawls each for the forward travel and for the return travel respectively, and Fig. 6 is a detail view with the pawls on an enlarged scale.

The operation of the new improved arrangement is as follows: To the rails b, b^1, carrying the supporting bars c, c^1, c^2, c^3, . . . for the material to be dried, and running on rollers a, a^1, are rigidly secured lateral guide plates i, i^1 (Figs. 1 and 2). The rails b, b^1 with the guide plates i, i^1 are reciprocated by means of connecting rods d adjustably connected to crank disk d^1 to vary the stroke (Fig. 5). At the return stroke of the rails b, b^1 the bar c, which has been raised by known chain gears, is received by the rails b, b^1, a pawl f passing beneath the said bar c and rising behind it, so as to prevent the said bar c from moving backward (Fig. 2). At the side of the web to be dried and at a pitch which corresponds to the smallest distance, at which it is desired to arrange the supporting bars c, pawls g, g^1, g^2, g^3 . . . are fitted to fixed rails h, h^1 (Figs. 1, 2 and 3, 4). During the forward stroke of the rails b, b^1 the supporting bars c, c^1, c^2, c^3, . . . resting on them are advanced, and pass clear beneath the pawls g, g^1, g^2, g^3, . . . The pawls g, g^1, g^2, g^3 . . . will then retain the bars c, c^1, c^2, c^3 . . . when the rails b, b^1 are performing their return stroke. If the stroke of the connecting rods d is increased, the supporting rods c, c^1, c^2, c^3 . . . will during the forward stroke of the rails b, b^1 pass beneath two or more pairs of pawls instead of one single pair, whereby the distance between the supporting bars may be varied at will. The guide plates i, i^1 rigidly secured to the sides of the rails b, b^1, and reciprocating therewith will at the same time prevent the supporting bars from being laterally displaced or from falling out.

From Figs. 3 and 4 it is evident that the pivoting point of the pawls g, g^1, g^2, g^3, . . . may also be arranged beneath the supporting rails b, b^1. When a separate set of pawls is arranged, each, for the forward and the return travel respectively (Figs. 5 and 6) the pawls g^1, g^3, g^5, g^7, . . . are provided for the advance travel of the supporting bars c, c^1, c^2, c^3 . . ., and the pawls g^2, g^4, g^6, g^8, . . . are provided in a similar manner for the return travel. For disengaging the pawls g^2, g^4, g^6, g^8, . . . during the advance of the material under treatment, or for disengaging the pawls g^1, g^3, g^5, g^7 during the return travel of the said material, and for disengaging both sets of pawls for swinging the material to and fro, two parallel rods k k^1 are provided.

As shown in Fig. 6, the bar k is connected to the fixed rail h by link l and the other bar k^1 is connected to said rail by links m. The pawls are mounted between said bars and in Fig. 5 the bar k for operating the pawls g^1, g^3, has been partially broken away for the sake of clearness. By referring to Fig. 5, it will be seen that when the bar k^1, which is carried by the links m is moved to the right, by a lever n^1, pins which project laterally from the bar k^1 engage the pawls g^2, g^4, and raise the latter out of the path of the supporting bars e. If the bar k, which is supported by the links l is moved to the left by a lever, the pawls g^1, g^3, will be swung up, as indicated in dotted lines, Fig. 6, out of the path of the bars e and the latter may be reciprocated by the rails b, b^1 without being advanced on the latter in either direction.

I claim:

1. In a web swinging and advancing mechanism for drying frames, the combination of carrying rails, web-supporting bars loosely mounted on the rails, means for reciprocating the latter, pawls adapted to permit the supporting bars to move with the rails in one direction and to retain the bars during the movement of the rails in the opposite direction, and means to hold the pawls out of engagement with the bars to permit the latter to move with the rails in both directions.

2. In a web swinging and advancing mechanism for drying frames, the combination of carrying rails, web-supporting bars loosely mounted on the rails, means for reciprocating the latter, fixed rails adjacent the carrying rails, pawls pivoted on the fixed rails and adapted to permit the bars to move with the carrying rails during their forward stroke and to retain said bars during the return stroke of the carrying rails, means to hold the pawls out of engagement with the bars to permit the latter to move with the rails to impart a swinging movement to the web, and pawls on receiving ends of the carrying rails adapted to pass beneath said bars during the return stroke of said carrying rails and to advance the bars during the forward stroke.

3. In a web swinging and advancing mechanism for drying frames, the combination of carrying rails, web-supporting bars loosely mounted on the rails, means for reciprocating the latter, stationary supporting rails, two sets of pawls pivoted on the supporting rails, one set of pawls arranged to allow the bars to pass unobstructed during their forward stroke and to retain said

bars during the return stroke of the carrying rails, the other set of pawls arranged to allow said bars to pass unobstructed during the return stroke and to retain said bars during the forward stroke of the carrying rails, pawls on the receiving ends of the carrying rails adapted to pass beneath the bars during the return stroke of said carrying rails and advance the bars during the forward stroke, and an independently operable rod for each set of pawls to move the latter into and out of engagement with the rods.

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

BERTHOLD HEINRICH CARL
HERMANN RATHSFELD.

Witnesses:
GUSTAV HUCKEN,
ALFRED W. DONEGAN.