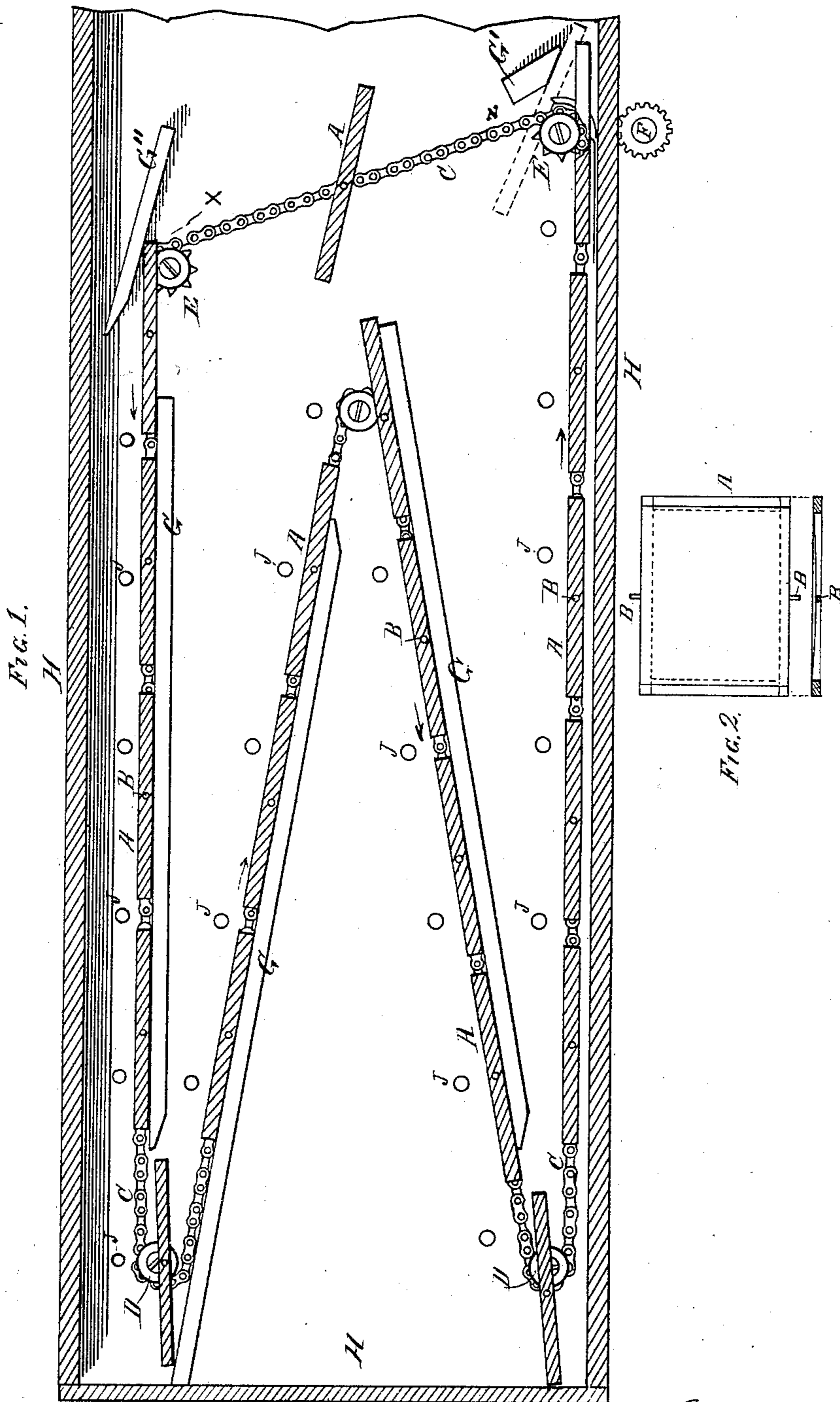


G. N. BLISS.  
Drying-Machine.

No. 222,982.

Patented Dec. 30, 1879.



Witnesses:  
Irish P. Tucker.  
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# UNITED STATES PATENT OFFICE.

GEORGE N. BLISS, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN DRYING-MACHINES.

Specification forming part of Letters Patent No. **222,982**, dated December 30, 1879; application filed April 26, 1879.

*To all whom it may concern:*

Be it known that I, GEORGE N. BLISS, of Boston, Massachusetts, have invented certain Improvements in Drying-Machines; and I do hereby declare that the same are fully described in the following specification and illustrated in the accompanying drawings.

The object of this invention is to furnish an improved apparatus for drying printed or varnished sheets of paper, or other light moistened articles, and to so construct and arrange the mechanism that the articles shall be carried to and fro horizontally, vertically, or obliquely thereon until sufficiently dried, and may be automatically delivered therefrom at a suitable point.

My invention consists in a series of hurdles suspended at their transverse centers horizontally from two endless chains provided with suitable revolving supporting-wheels, in combination with a driving mechanism and guides; also, in such devices in combination with a series of heating-tubes and an inclosing-case.

By means of my improvement I am enabled to utilize the otherwise vacant space usually found in the upper part of a room, where the air is warmest and best adapted for speedy drying, and to move the hurdles through such space without occupying valuable floor-room.

The best mode in which I have contemplated applying my invention will now be described with reference to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a side view of the supporting mechanism, with the hurdles in section, while Fig. 2 shows in plan and section a lighter hurdle.

A A are the hurdles; B B, the pivots placed at the middle of their opposite sides and connecting them with the carrying-chains C C. These chains extend, preferably, in a generally horizontal direction back and forth around flanged supporting-wheels D D and driving sprocket-wheels E E. The relative position of these several wheels determines the position the chains shall occupy, and, consequently, the route of the hurdles borne upon them. Motion is communicated to the chains and hurdles by the sprocket-wheels E E—one for each chain—through suitable gearing from the shaft F.

Adjoining each horizontal portion of the chains C C, and preferably beneath them, I place supports or guides G G, which prevent the chains from sagging, materially relieve the supporting-wheels, and serve to insure a substantially horizontal position to the hurdles during the trip over such parts of their route, and also while turning or changing direction at the wheels D D. The hurdles may be weighted somewhat on the under side and come in contact with the guides, whereby they are kept from turning over with the pivots B B, upon which they are hung, so that the sheets carried thereon are undisturbed.

My machine will usually be employed in connection with a printing or varnishing machine, and be driven directly therefrom by suitable apparatus, so as to bring a hurdle into position at the moment a sheet is ready to be received. In such printing and varnishing machines the sheet to be operated upon covers but a part of the periphery of the cylinder, owing to the difficulty of feeding continuously.

I avoid corresponding vacant spaces between the hurdles by giving an intermittent movement to the carrying-chains, to correspond with the delivery of the sheets to the hurdles. Such delivery will usually take place at the point marked X in the drawings, where the hurdles resume a horizontal position on rising from the point of discharge, (marked Z, and located at the end of the heating-chamber.) The sheets may here be removed by hand; but I prefer an automatic discharging apparatus—such, for instance, as the inclined deflector G'—to tilt the hurdles and slide off the sheets, or a device to nip and place them one by one in a pile or on a frame for further drying or storage. The changes of position which occur during these movements of the hurdle are indicated in the drawings by dotted lines. As the hurdles rise to receive another sheet and transport it, they are guided and their position is determined by projections G''.

To facilitate drying of the varnish or other liquid in the sheets, I inclose the apparatus in a long box, forming a heating-chamber, H, provided with suitable steam or other heating pipes J running through it. By this means I

am enabled to readily raise the temperature to which the sheets are exposed to 110° or more, and thus shorten the time necessary to a complete drying of the sheet, and at the same time protect it from dust. A material saving of expense is effected by thus inclosing the apparatus, since the length of circuit may thereby be reduced one-half, and may be brought within the limits of a small room.

The hurdles used will, preferably, consist of light frames with a netted or thin fabric stretched across them, as in Fig. 2, to give the heat access to every part of the sheet. They may be provided with a temporary clasp or a barrier of simple form, to prevent accidental displacement of the sheet during treatment.

I claim as of my invention—

1. The combination of the endless chains and their supporting and driving wheels with

a series of hurdles borne thereon and suspended centrally from the chains in a horizontal position, substantially as set forth.

2. The combination of the endless chains and the driving and supporting wheels with the horizontal hurdles suspended centrally, and the guiding or supporting bars G G, substantially as set forth.

3. The combination of the endless chains, their supports and driving-wheels, and a series of hurdles borne horizontally thereon with an inclosing heating-chamber, substantially as and for the purpose set forth.

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Witnesses:

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