

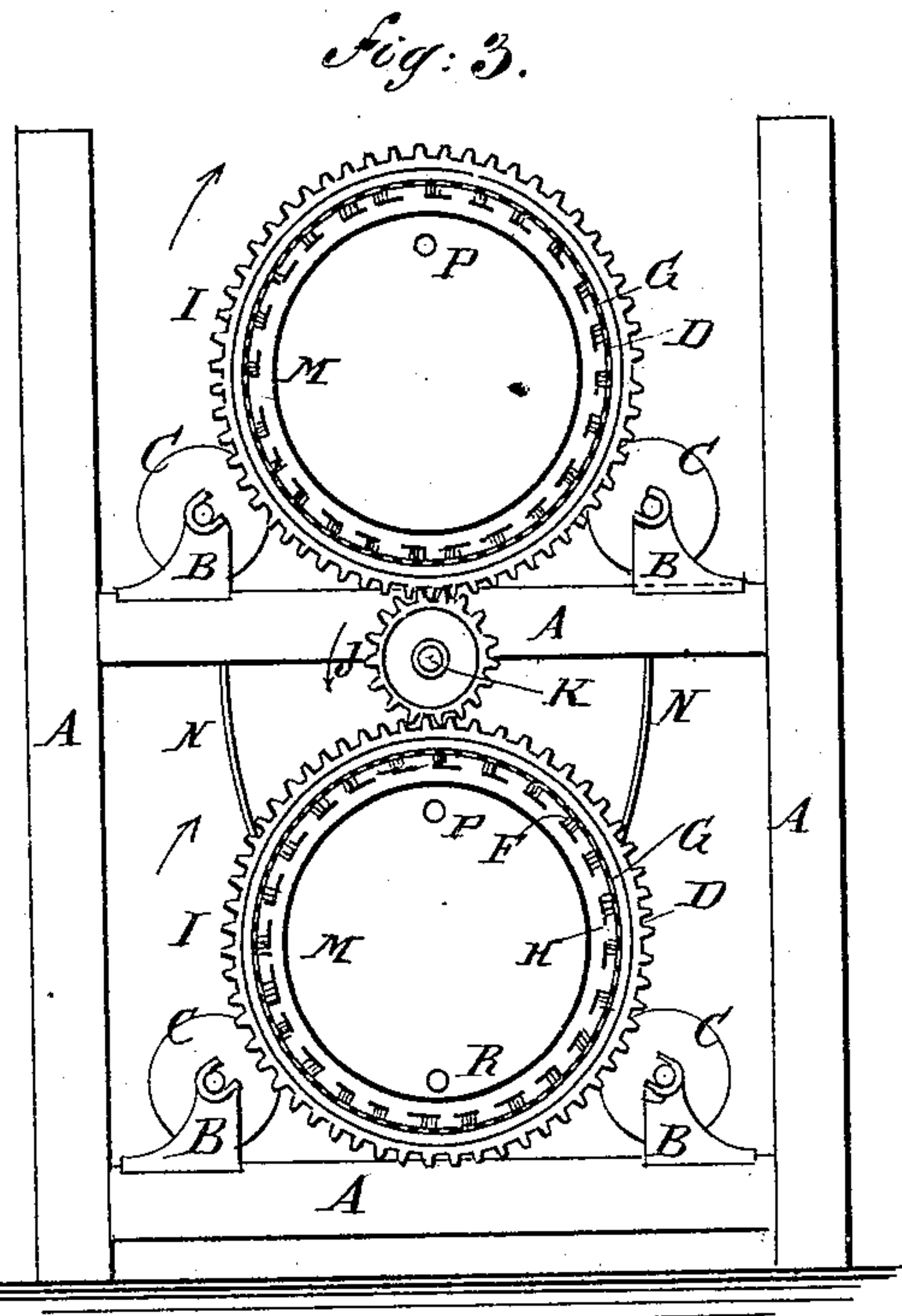
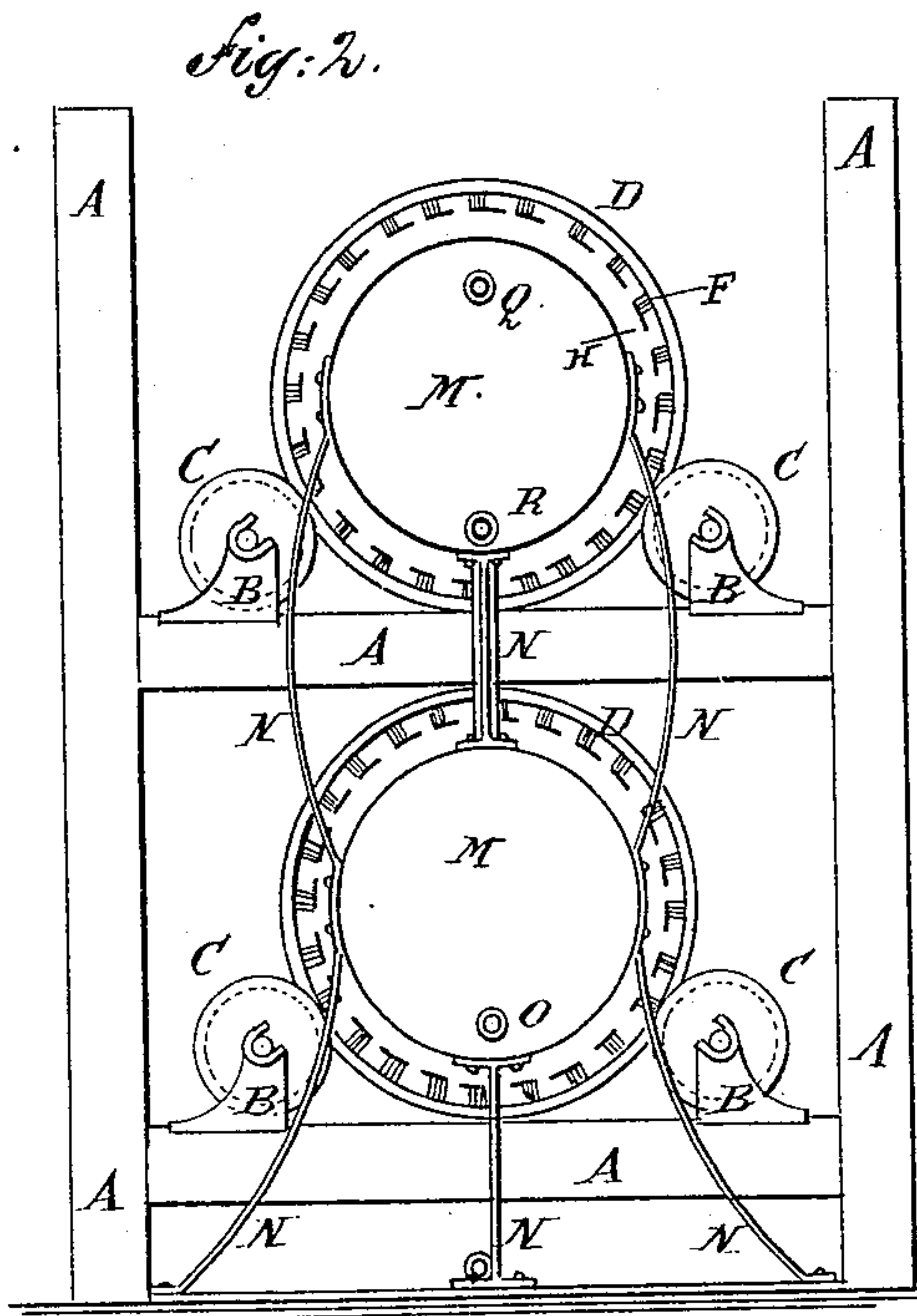
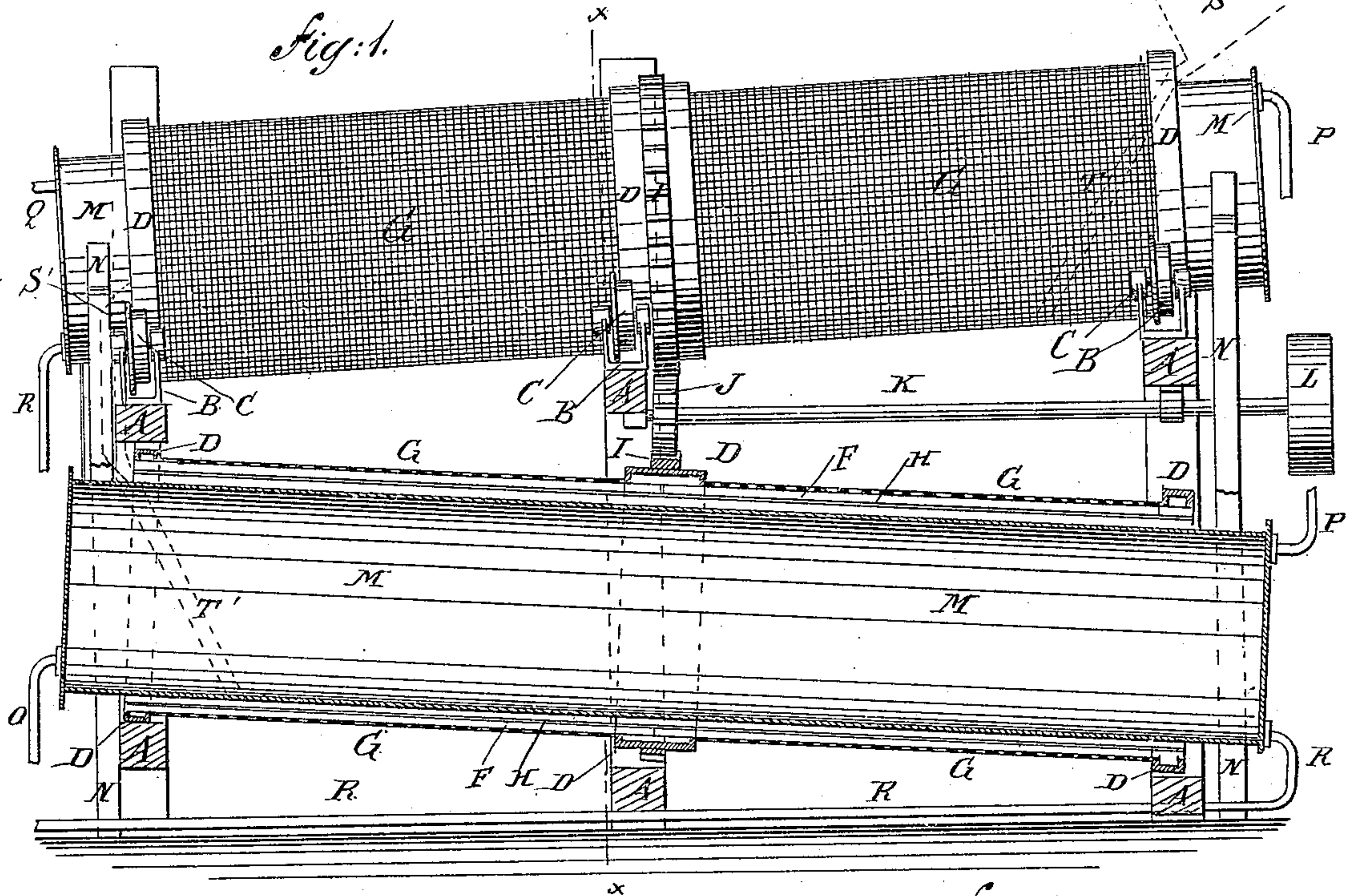
(No Model.)

2 Sheets—Sheet 1.

H. COKER.
STEAM GRAIN DRIER.

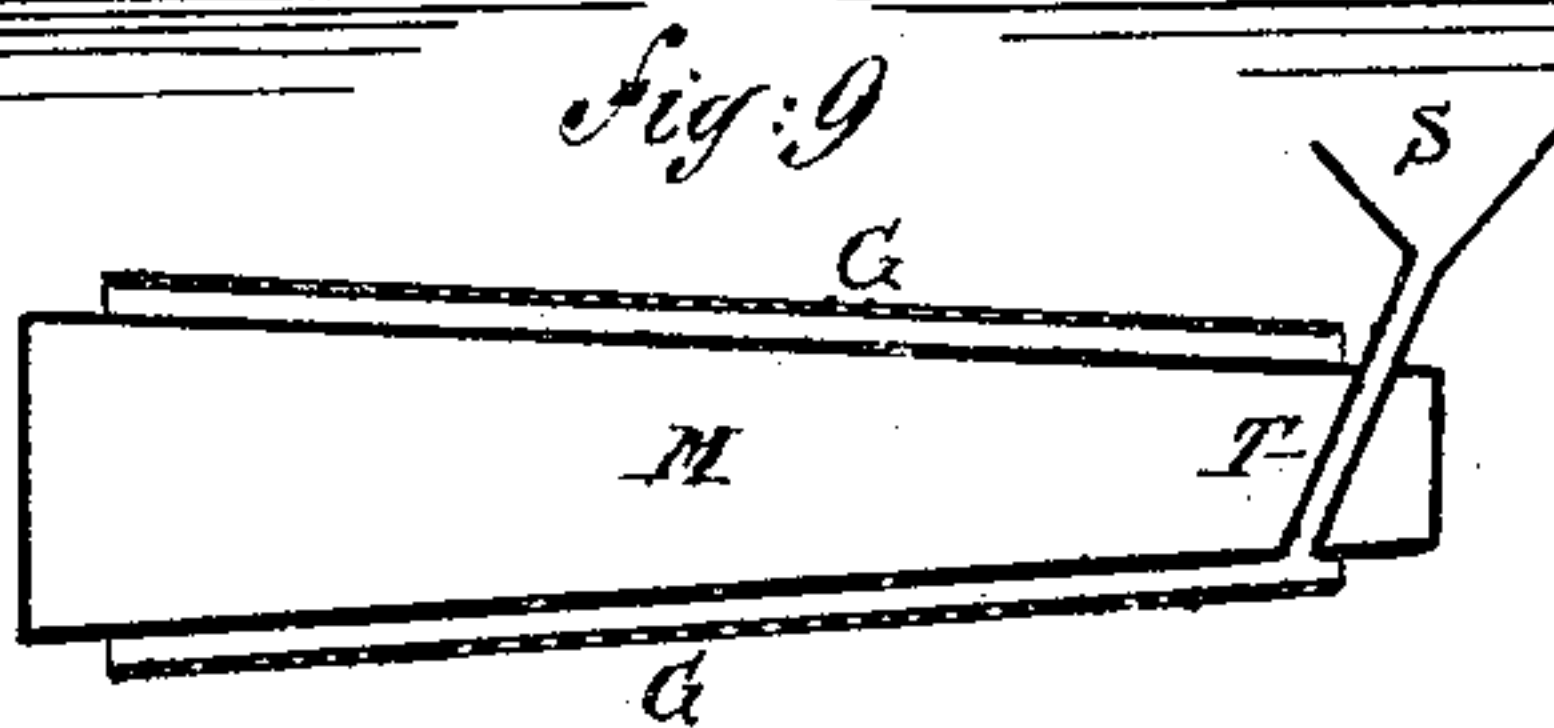
No. 249,009.

Patented Nov. 1, 1881.



WITNESSES:

Chas. Nida.
C. Sedgwick



INVENTOR:

H. Coker
BY *Mum & Co*
ATTORNEYS.

(No Model.)

2 Sheets—Sheet 2.

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STEAM GRAIN DRIER.

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Fig. 4.

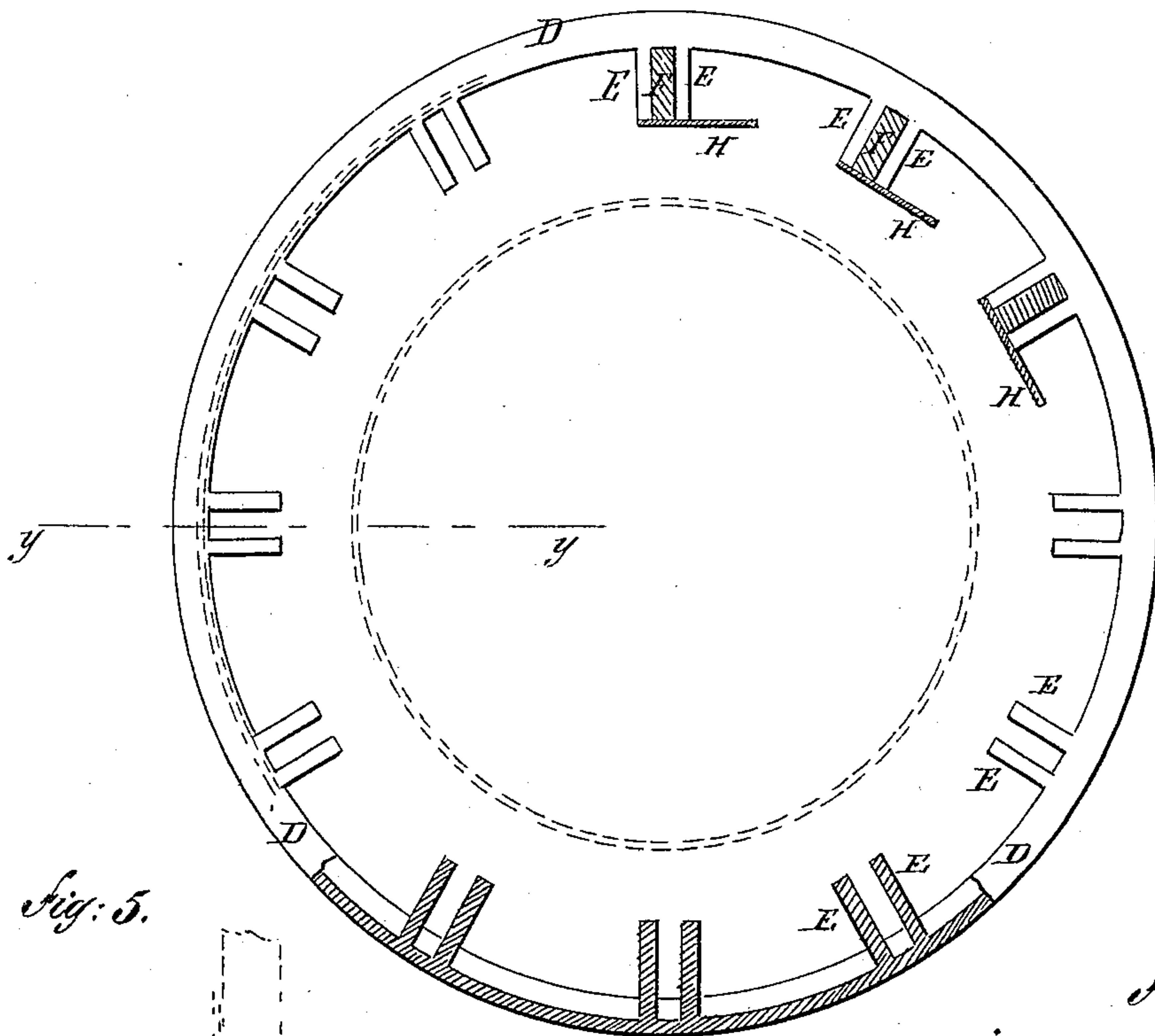


Fig. 5.

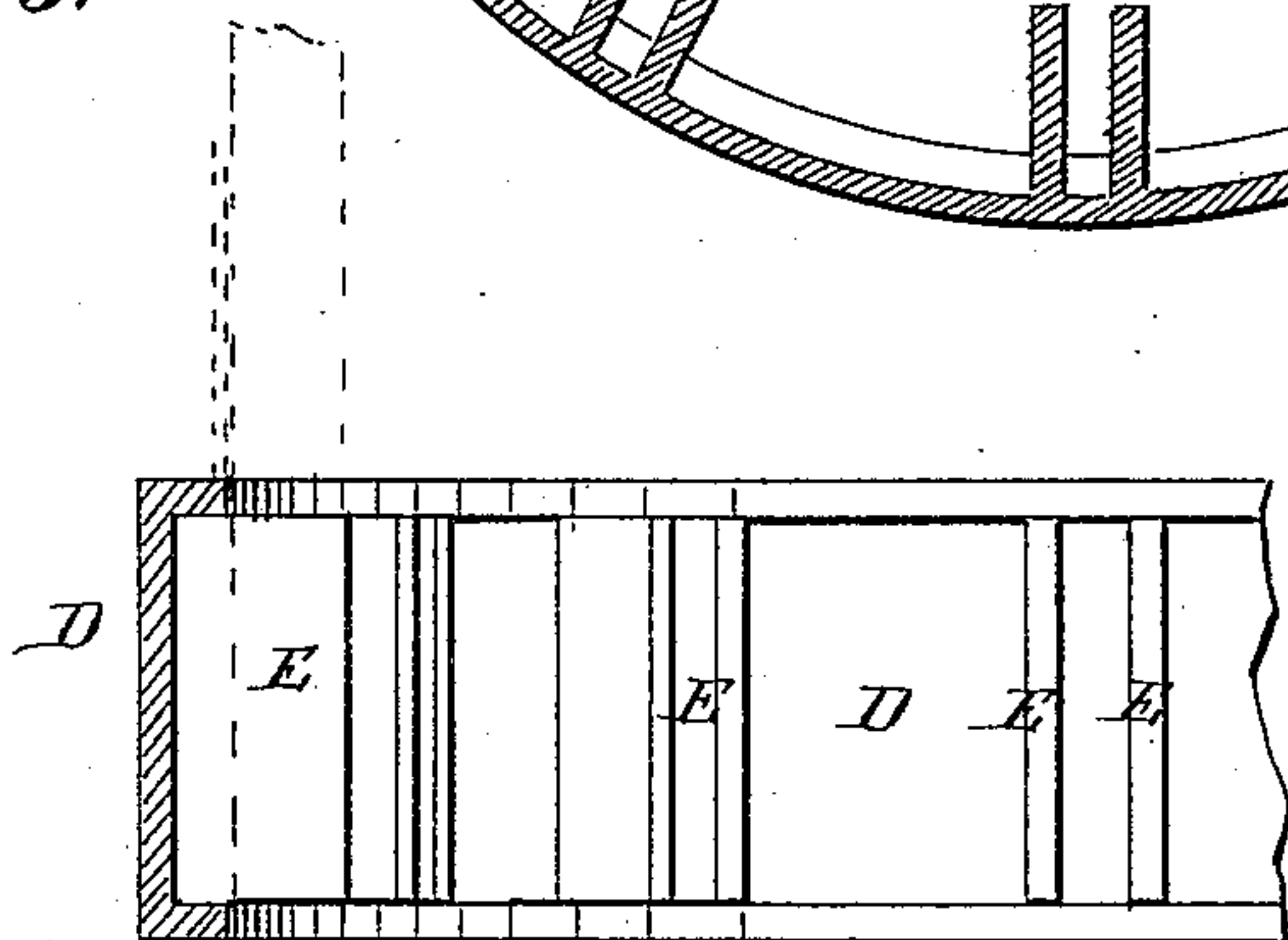


Fig. 7.

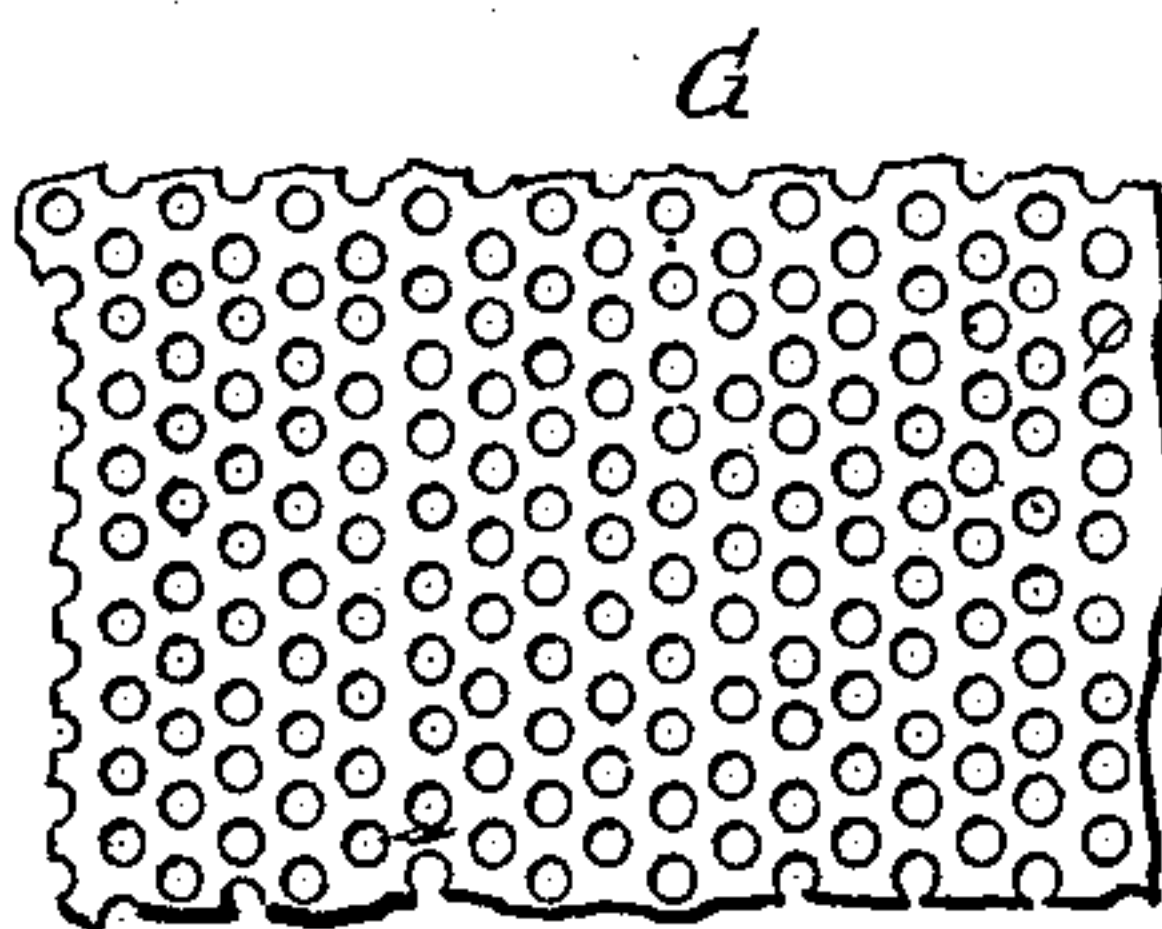


Fig. 6.

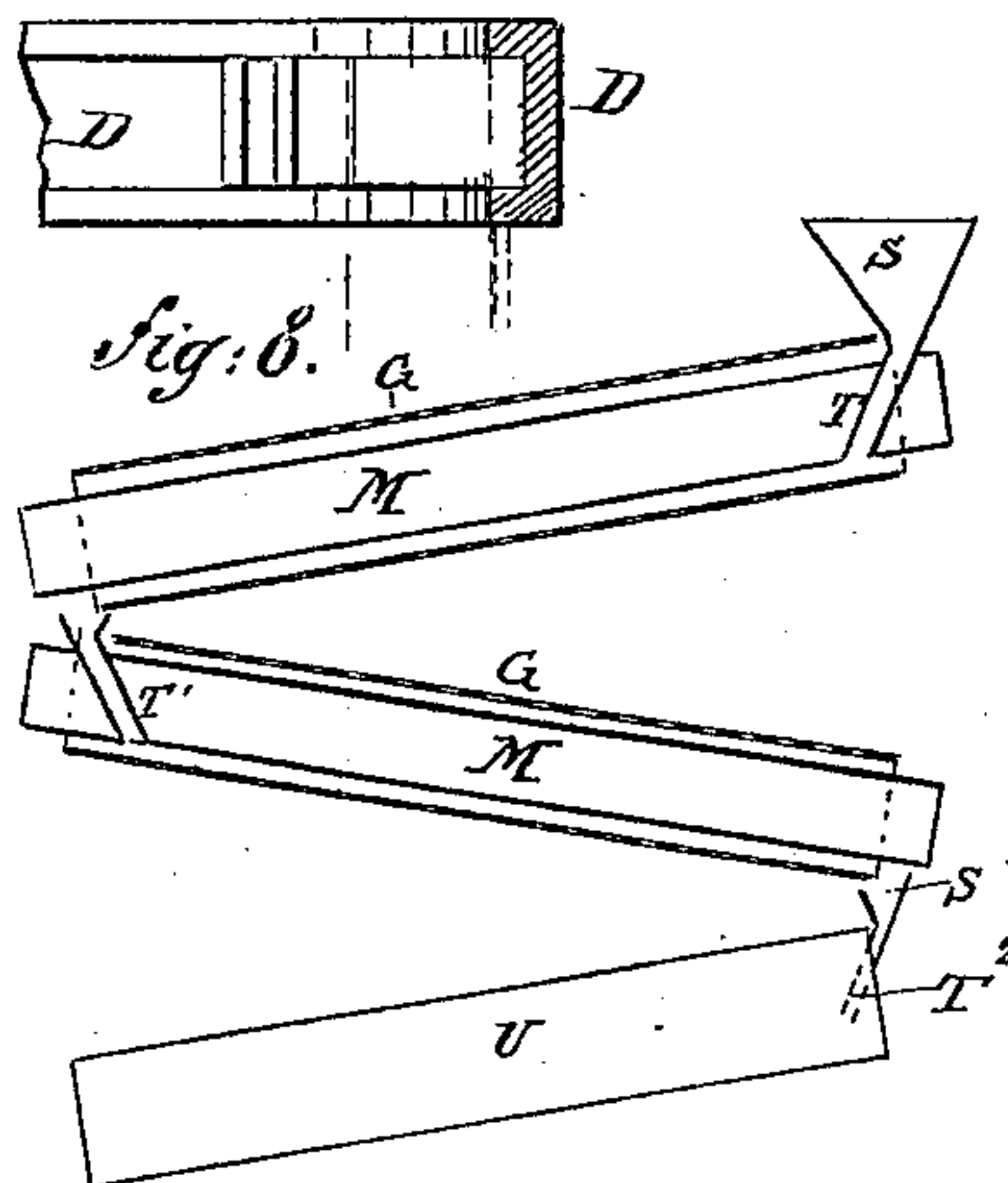


Fig. 8.

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UNITED STATES PATENT OFFICE.

HENRY COKER, OF INDIANAPOLIS, INDIANA.

STEAM GRAIN-DRIER.

SPECIFICATION forming part of Letters Patent No. 249,009, dated November 1, 1881.

Application filed August 27, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY COKER, of Indianapolis, in the county of Marion and State of Indiana, have invented a new and Improved Steam Grain-Drying Apparatus, of which the following is a full, clear, and exact specification.

Figure 1, Sheet 1, is a side elevation, partly in section, of my improvement. Fig. 2, Sheet 1, is an end elevation of the same. Fig. 3, Sheet 1, is a sectional end elevation of the same, taken through the line *x x*, Fig. 1. Fig. 4, Sheet 2, is a side elevation, partly in section, of the center drum or band, the gear-wheel being removed. Fig. 5, Sheet 2, is a cross-section of a part of the same, taken through the line *y y*, Fig. 4. Fig. 6, Sheet 2, is a cross-section of a part of one of the end drums. Fig. 7, Sheet 2, is a plan view of a part of the outer cylinder-shell. Fig. 8, Sheet 2, is a sectional side elevation, showing a cooling-cylinder connected therewith. Fig. 9 represents a longitudinal section of a modification of the drying-cylinders.

Similar letters of reference indicate corresponding parts.

The object of this invention is to facilitate the drying of grain and other substances.

A is the frame of the machine, to the cross-bars of which are attached brackets B. To the brackets B are journaled flanged wheels C, upon which rest the drums or bands D, the flanges of the said wheels resting against the lower edges of the said drums D and keeping them in place. Upon the inner or concave sides of the drums D are formed pairs of lugs or flanges E, to and between which are secured longitudinal bars F. The drums D and bars F thus form skeleton-cylinders, which are covered with perforated sheet metal or wire-cloth, G, to allow the air to pass through freely and carry off the moisture expelled from the grain or other substance being dried.

To the inner edges of the longitudinal bars or ribs F are attached plates H, which project at the forward sides of the said bars or ribs, forming buckets that raise the grain from the lower part of the cylinder, carry it up to the upper part of the said cylinder, and then discharge it in a shower, so that every kernel will be fully exposed to the heated air rising through the said cylinder. The drying-cylinders are

arranged in inclined positions, so that the grain will gradually work its way from the upper to the lower ends of the said cylinders; or the same thing can be accomplished by making the cylinders conical.

One, two, or more cylinders can be used in each machine, and when more than one are used they are placed one above the other and are inclined in opposite directions, the lower end of each upper cylinder being over the upper end of the next lower cylinder, so that the grain can be conducted from the lower end of each upper cylinder into the upper end of the next lower cylinder.

To the central drum or band, D, is attached, or upon it is formed, a gear-wheel, I, into the teeth of which mesh the teeth of a small gear-wheel, J, attached to the inner end of a shaft, K. The shaft K revolves in bearings attached to the frame A, and to its projecting outer end is attached a pulley, L, or gear-wheel, to which rotation can be given from a steam-engine or other convenient power. In case two cylinders are used, one above the other, they can both be driven by the same gear-wheel J, as shown in Fig. 1.

Within each cylinder D E F G H, and concentric therewith, is placed a steam tight hollow cylinder, M, made of sheet-iron or other suitable material. The inner cylinder, M, is made longer than the outer cylinder, D E F G H, and projects at both ends, so that the said projecting ends can be attached to the frames N, by which the said cylinders M are supported, and which are attached to the floor of the room or to the frame A. With this construction the inner cylinders are stationary, and the material to be dried is in the space between the inner and outer cylinders, and is continually being raised by the buckets of the said outer cylinder and being poured in a shower upon the said inner cylinder.

The cylinders M can be heated to dry the grain by steam or hot air, which is introduced into the upper end of the lower cylinder through a pipe, O, is conducted from the lower end of the lower cylinder to the upper end of the upper cylinder through a pipe, P, and escapes from the lower end of the upper cylinder into the air through the pipe Q.

The water of condensation escapes from the lower ends of the cylinders M through the pipes

R, and may be returned to the hot-water tank and pumped back into the boiler as distilled water. The grain or other material to be dried is introduced into the upper end of the upper
 5 cylinder D E F G H through the hopper S and spout T, which spout T is extended in an inclined direction through the heating-cylinder M and discharges the grain upon the lower part of the said cylinder D E F G H. The
 10 grain is conducted from the lower end of the upper cylinder into the upper end of the lower cylinder through a hopper, S', and spout T', in the same manner as it was introduced into the said upper cylinder, the spout T' extending
 15 down through the heating-cylinder M in an inclined direction. With this construction, should the drier be stopped while the grain continues to flow, the said grain will bank up at the lower ends of the spouts T T', and its escape into the
 20 cylinders will be stopped to prevent it from flowing down through the said cylinders and escaping without being thoroughly dried.

From the lower end of the lower cylinder D E F G H the dried grain passes through a hop-
 25 per, S², and spout T² into a cylinder, U, placed below the said lower cylinder in an inclined position, and which may be made close or perforated, as may be desired, and through which a strong blast of cold air will be drawn by an
 30 exhaust-fan connected with the upper end of the said cylinder, so that the grain will be cooled, and all the dust and other impurities removed from the kernels will be drawn out, and thus separated from the grain. With this
 35 construction the friction of the kernels of grain upon each other and upon the surfaces of the cylinders will rub off any mold, dust, or other impurities that may adhere to the kernels, so that the grain when discharged will be bright
 40 and clear and in good condition for market or shipment.

I am aware that it is not new in driers to combine a hot-air chamber with a series of hollow cylinders, or to combine buckets with a
 45 perforated cylinder, so that the grain is passed in a continuous stream through a current of air, or to make a shaft hollow at one end to receive steam and perforated at the other end to discharge the water of condensation, the head be-

ing cast with one or more chambers connecting 50 with the steam-supply and the circulation pipes; but

What I claim as new and of my invention is—

1. In a steam grain-drying apparatus, the 55 drying-cylinder constructed substantially as herein shown and described, and consisting of the drums D, having inwardly-projecting pairs of lugs E, the ribs F, having flanges H, and the perforated cover G, as set forth. 60

2. In a steam grain drying apparatus, the combination, with the drums D, having inwardly-projecting pairs of lugs E, the perforated cover G, and the ribs F, of the flanges H, substantially as herein shown and described, 65 whereby the grain will be carried to the upper part of the said cylinder and discharged in a shower, as set forth.

3. In a steam grain-drying apparatus, the combination, with the frame A and the drying- 70 cylinder D E F G H, of the flanged wheels C, the gear-wheels I J, and the driving-shaft K, substantially as herein shown and described, whereby the said drying-cylinder can be readily rotated, as set forth. 75

4. In a steam grain-drying apparatus, the combination, with the frame A and the rotating drying-cylinder D E F G H, of the stationary interior heating-cylinder, M, and its supporting-frames N, substantially as herein shown 80 and described, whereby the grain will be dried evenly while passing through the said drying-cylinder, as set forth.

5. In a steam grain-drying apparatus, the combination, with the rotary drying-cylinder 85 D E F G H and the stationary heating-cylinder M, of the inlet-spout T, arranged to pass through the said heating-cylinder, substantially as herein shown and described, whereby the grain will be introduced into the lower part 90 of the drying-cylinder, and will be stopped automatically should the movement of the drying-cylinder cease, as set forth.

HENRY COKER.

Witnesses:

RICH. L. BOYD,
 W. A. HAUGH.