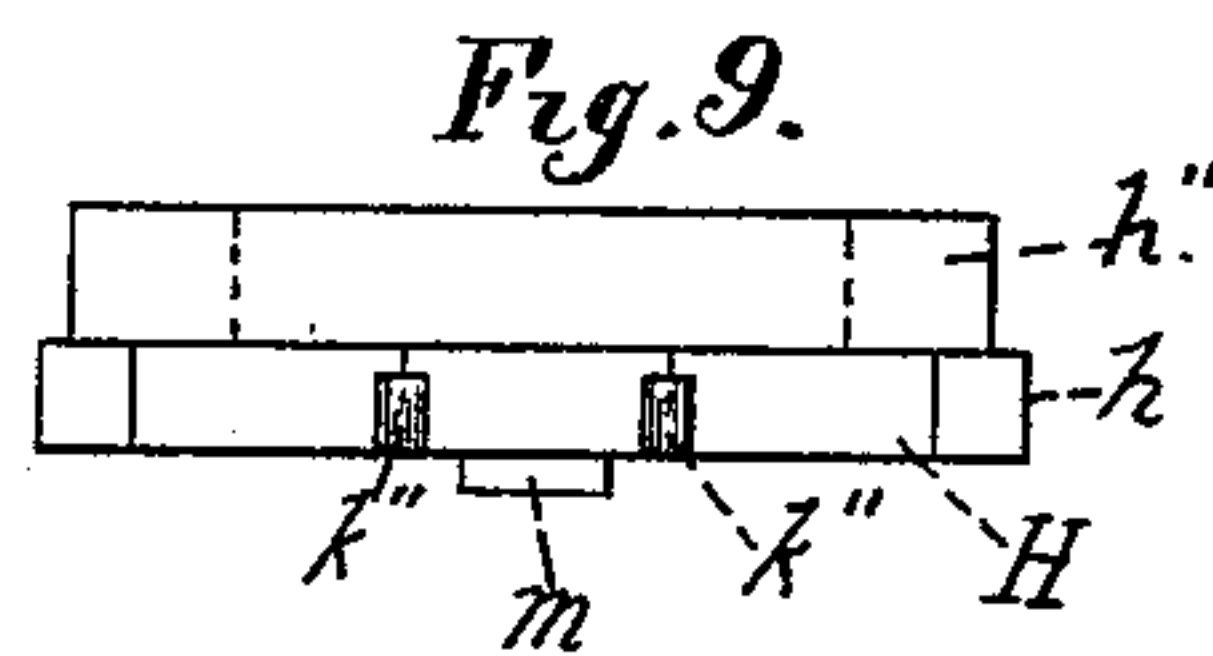
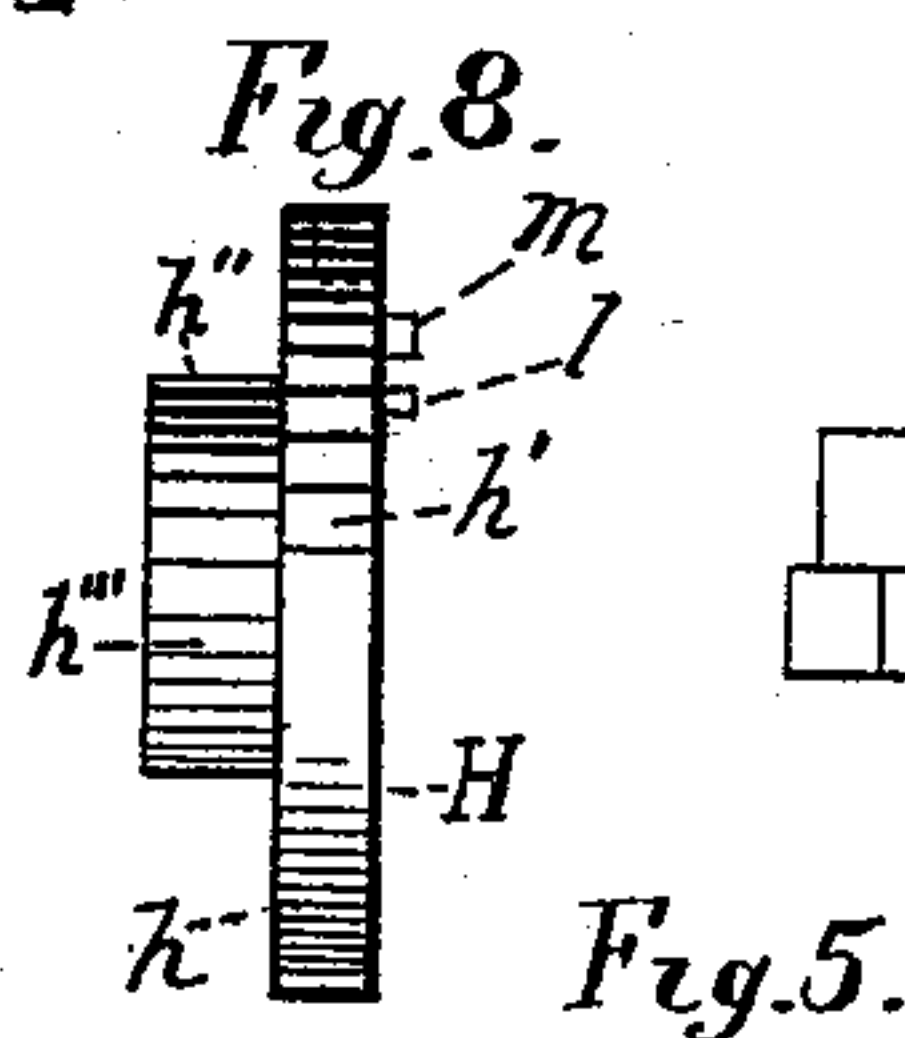
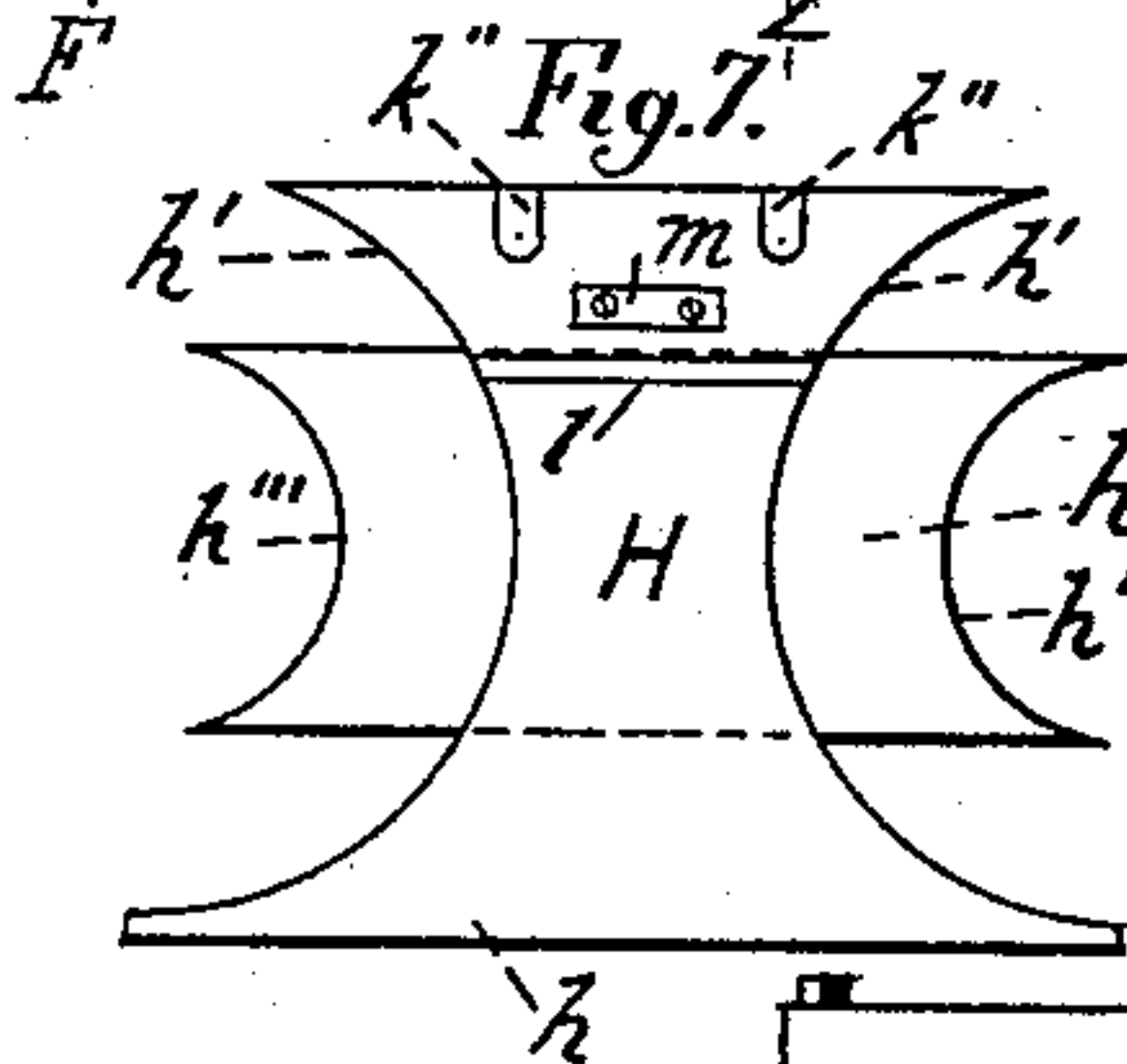
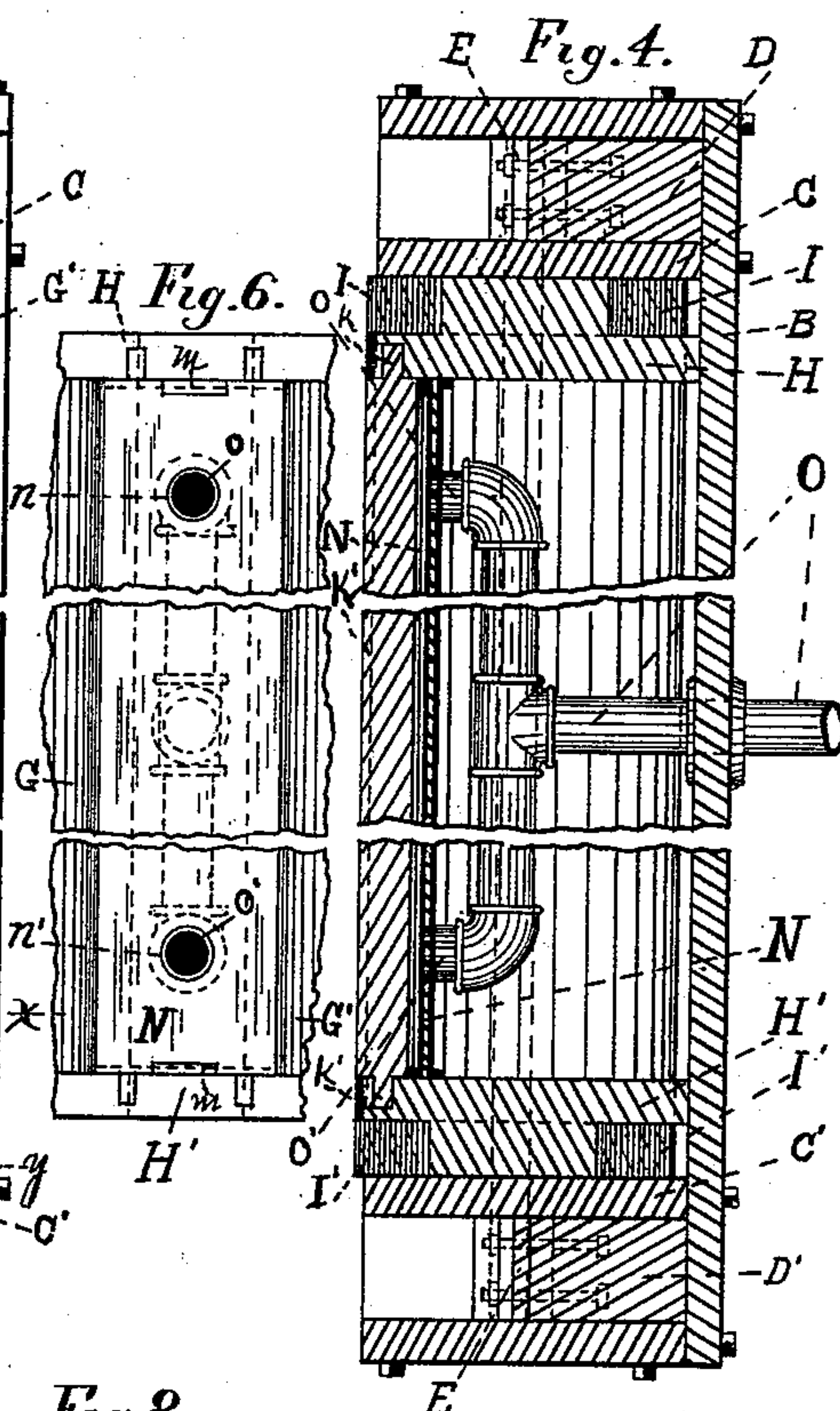
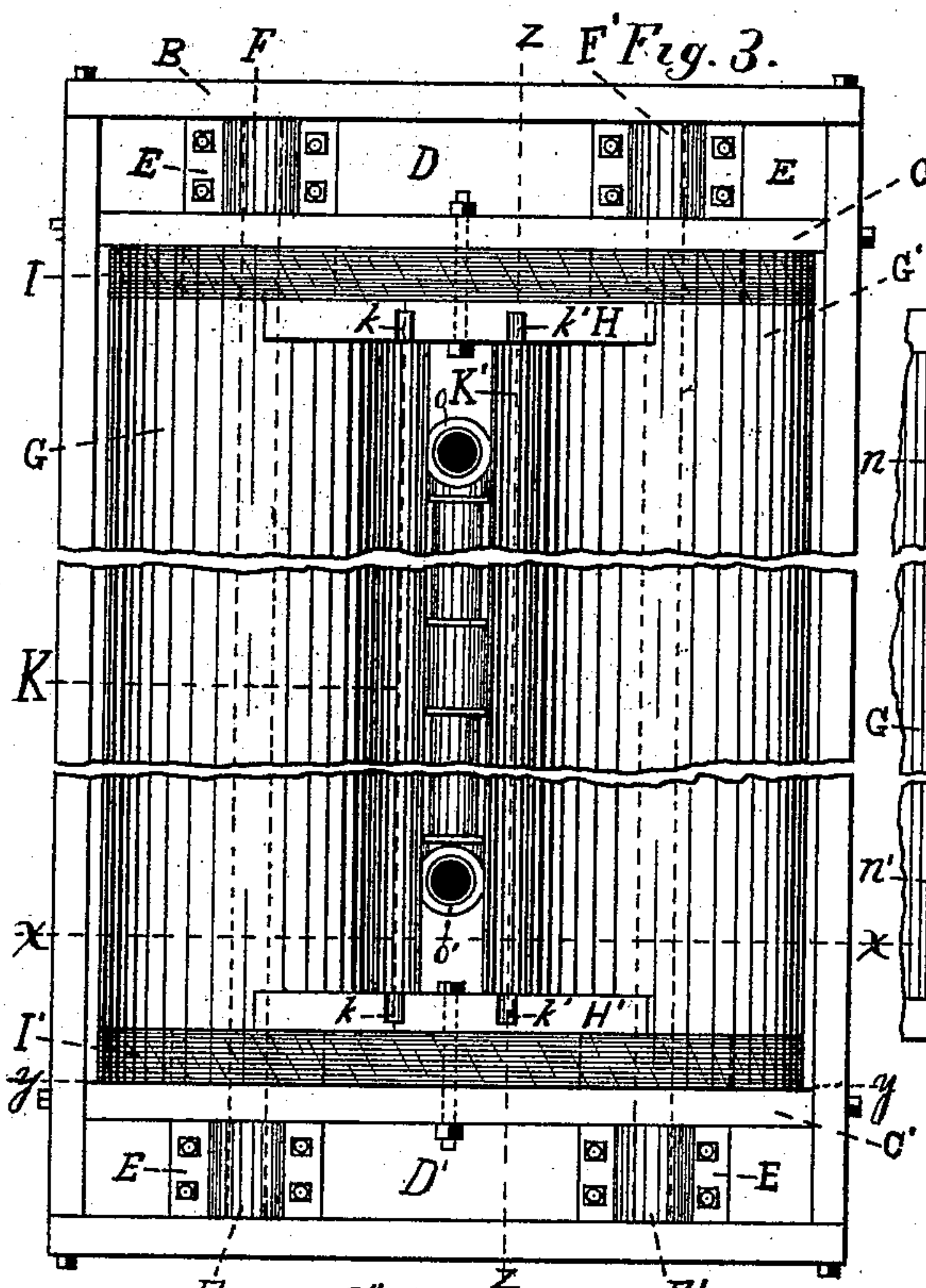
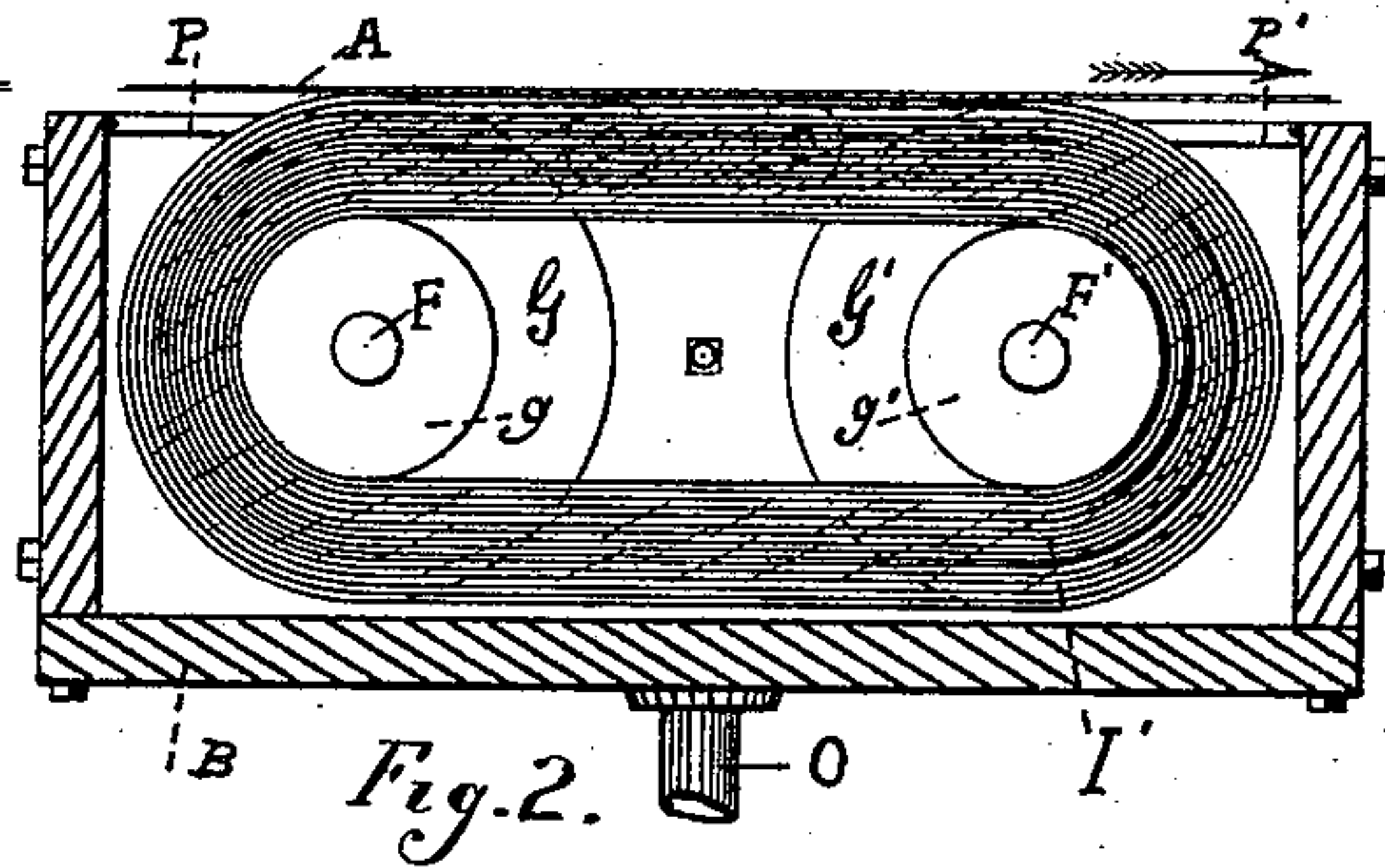
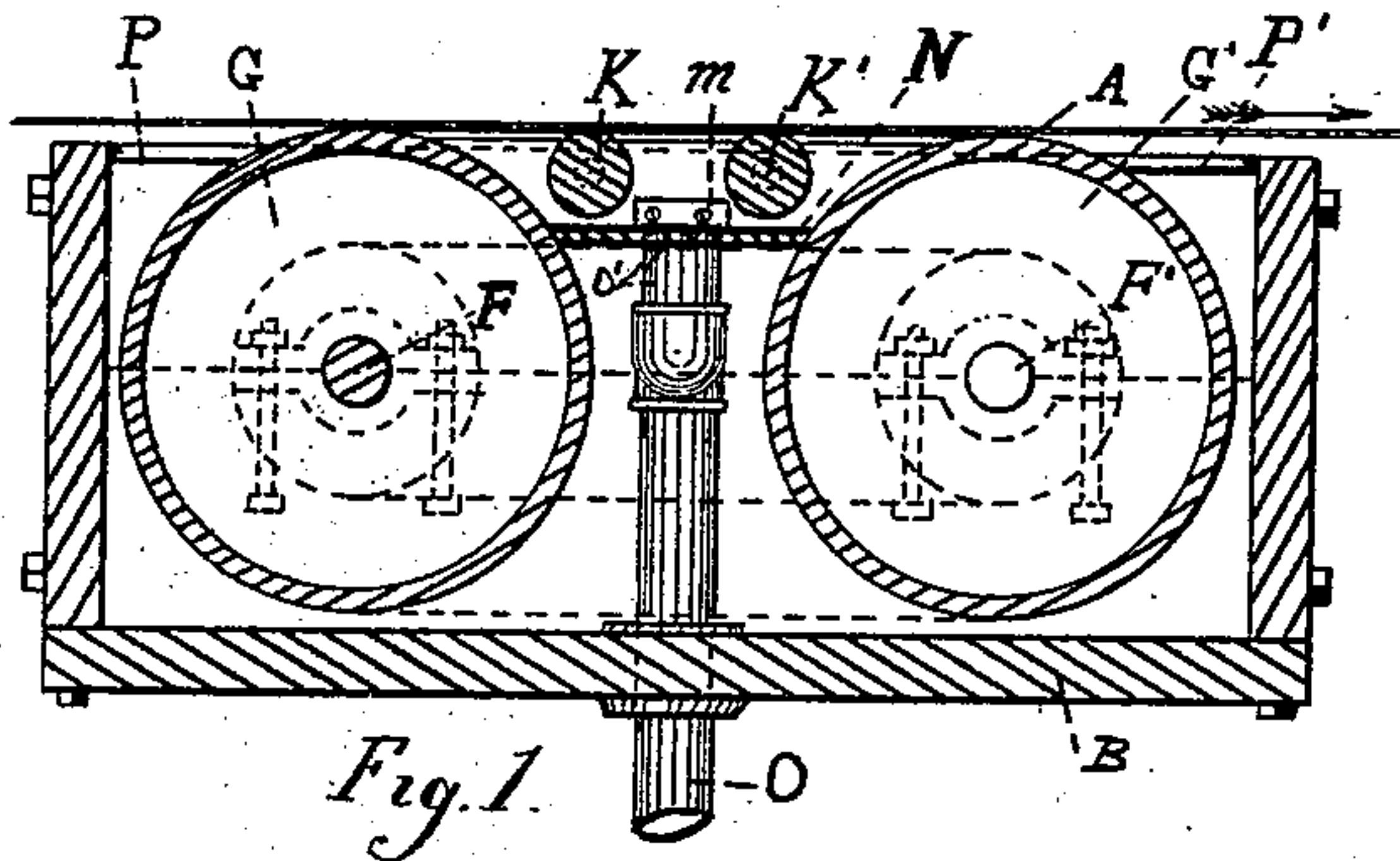


(No Model.)

E. SANDERSON.
SUCTION BOX FOR PAPER MACHINES.

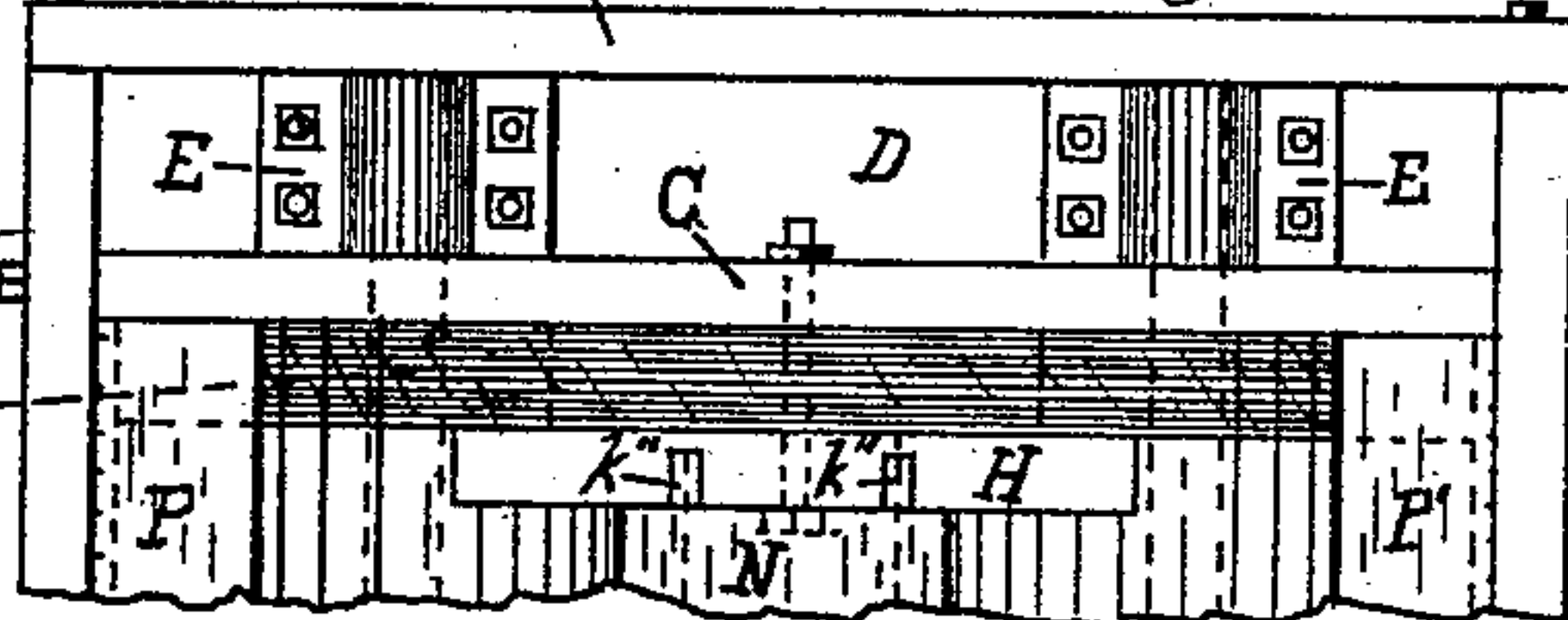
No. 528,261.

Patented Oct. 30, 1894.



WITNESSES.

W. M. Sawcett
E. E. Osborne



INVENTOR.
Ephraim Sanderson,
By
J. A. Osborne & Co.,
His attorneys.

UNITED STATES PATENT OFFICE.

EPHRAIM SANDERSON, OF CLEVELAND, OHIO.

SUCTION-BOX FOR PAPER-MACHINES.

SPECIFICATION forming part of Letters Patent No. 528,261, dated October 30, 1894.

Application filed December 8, 1893. Serial No. 493,093. (No model.)

To all whom it may concern:

Be it known that I, EPHRAIM SANDERSON, a subject of the Queen of Great Britain, residing at Cleveland, in the county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Suction-Boxes for Paper-Machines, of which the following, with the accompanying drawings, is a specification.

My invention relates to stationary suction boxes placed below the wire of a paper machine for the purpose of creating a vacuum that moisture will be extracted from the pulp as it is brought over the suction boxes by the travel of the wire.

The object of my invention is to improve such suction boxes to simplify their construction and to increase their durability and effectiveness. To this end, my invention consists in the details of construction and combination of parts illustrated in the drawings, described herein and defined in the claims.

In the drawings, Figure 1 is a section of one of my improved suction boxes longitudinally of the travel of the wire on the line $x-x$ of Fig. 3. Fig. 2 is a sectional view on the line $y-y$ of Fig. 3, and illustrates the relation of the head block and rubber or flexible traveling heads with reference to each other and to said rolls. Fig. 3 is a plan of my improved suction box, the wire and the retaining leathers and plates being removed. Fig. 4 is a longitudinal section through one of my suction boxes at right angles to the line of travel of the wire, and is taken on the section $z-z$ of Fig. 3. Fig. 5 is a fragmental plan of one end of my suction box with the retaining leathers and with the retaining plate in position. Fig. 6 is a fragmental section which illustrates the position of the retaining plate with reference to the head blocks and rolls. Fig. 7 is a side elevation of one of the head blocks. Fig. 8 is an end elevation of one of the head blocks, and Fig. 9 is a top view of the same.

My suction box is arranged for the formation of an air tight chamber below the mold or wire, of which suction chamber the pulp on the mold or wire with the dekle straps (not shown) constitute the top of the chamber. The mold or wire A and the dekle straps are of known construction and need no description.

My improved suction box is situated immediately below the line of travel of the mold or wire A, in contact with the under side thereof, as illustrated by Figs. 1 and 2, and as hereinafter described.

The rectangular box, B, of substantially the form illustrated, forms the inclosing case for my improved suction box. Inside of the ends of said rectangular box, B, are placed boards or partitions, C, C', which form the ends of the suction box proper. Between the partitions C and C' and the ends of the box B are placed blocks D and D' upon which are seated journal boxes E in which turn the axes F, F, and F', F', of the rollers G, G'. The axes F, F, and F', F', pass through bores (not shown) in the partitions C and C'. To the inside of the partitions C and C' are placed head blocks H and H' of the form illustrated by Figs. 7, 8 and 9. These blocks consist of an upright piece h having curved sides h' to fit against the periphery of the rolls G and G', and the cross piece h'' having the curved ends h''' to fit against the hubs g and g' of the rollers G and G'. The cross pieces h'' of the head blocks H are placed against the partitions C and C', and rubber or flexible heads I and I' encircle the hubs g and g' of the rollers G and G', and the cross piece h'' of the head blocks H and H', as illustrated. The rubber or flexible traveling heads fill in the space the full depth of the hubs g and g' of the rollers G and G', and fill up the entire space between the upright parts h of the head blocks H and H' and the partitions C and C'. The upright-pieces h of the head-blocks prevent the flexible traveling heads from being drawn inwardly on their upper lap, and the cross-pieces h'' prevent the flexible traveling heads from sagging on their upper lap.

The wire A with its dekles (not shown) form an air tight connection with the rubber or flexible traveling heads I and I', and said rubber or flexible traveling heads tightly close the ends of the vacuum chamber and prevent the passage of air and water there-through. The partitions, C, and C', being placed against the outer ends of the hubs g and g' of the rollers G, G', the rubber or flexible traveling heads I, I', fill the space between the ends of the rollers G, G' and said

partitions, as illustrated. Rollers, K, K', having axles k, k' are carried in journals k'' in the upper face of the head blocks H and H'. The rollers, K, K', may be dispensed with as well as the retaining plate herein-after described, in which case the head blocks H may be modified by dispensing with the upright part h , using only the part h'' .

On the inside of the head blocks H and H' are fastened cleats l and blocks m between which are placed the retaining plate N. The retaining plate N has two openings n, n' , through which projects the open ends o, o' of the T-headed suction pipe O.

The suction pipe O enters through the bottom of the rectangular box B, as illustrated, and is connected in any suitable manner with vacuum pumps. The open ends o, o' of the T-headed suction pipe O should be as near as practicable to the underside of the wire A without coming in contact therewith.

To the top of the rectangular box B, along each of its sides, are fastened retaining leathers, P and P', which have their outer edges fastened to the top edge of the rectangular box B and their inner edge resting upon the rollers G, G'. The wire A with the pulp thereon rests upon the upper sides of the rollers G and G', forming an air tight connection therewith; and the rollers K and K' support the wire between said rollers and prevent its sagging. The ends of the vacuum chamber are formed by the rubber or flexible traveling heads I and I' and the head blocks H and H', and the sides of the vacuum chamber are formed by the rollers G and G', while the top of the vacuum chamber is formed by the pulp carried by the wire A. When a vacuum is created beneath the wire A by means of vacuum pumps through the vacuum pipe O, the air pressure forces the wire A with the pulp thereon into intimate contact with the rubber or flexible traveling heads I and I' and the rollers G and G'.

The box B is preferably partly filled and kept constantly supplied with water from any convenient source, and the level of the water in the rectangular box B will be maintained

at any suitable point in any well known manner while the machine is in operation.

The object of the retaining leathers P and P' is to prevent air pressure upon the water below said plates from forcing the water up between the rollers G and G' and being carried away through the suction pipe O; and the object of the retaining plate N is to resist the tendency of water to rise to the openings o, o' of the suction pipe O within the vacuum chamber.

The rollers G, G' are represented in the drawings as cylinders. They are so represented because being made of metal this construction makes them lighter.

It will readily be understood that when connection is opened with the vacuum pumps a vacuum will be created in the air tight chamber and that the water and moisture in the pulp lying on the surface of the wire or mold will be extracted as the wire passes over the vacuum chamber.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a suction box, of a box, B; head blocks, H, H'; rollers G, G', having hubs g, g' ; flexible traveling heads encircling the hubs of said rollers and said head blocks; retaining leathers, P, P'; and a retaining plate, N, substantially as illustrated and described.

2. The combination, in a suction box, of rollers having hubs, flexible traveling heads to travel over said hubs, and head-blocks interposed between said rollers, the head-blocks having upright-pieces h to prevent the flexible traveling heads from being drawn inwardly on their upper lap and cross-pieces h'' to prevent the flexible traveling heads from sagging on their upper lap, substantially as described.

In testimony whereof I affix my signature, in the presence of two witnesses, this 18th day of November, 1893.

EPHRAIM SANDERSON.

Witnesses:

J. A. OSBORNE,
E. E. OSBORNE.