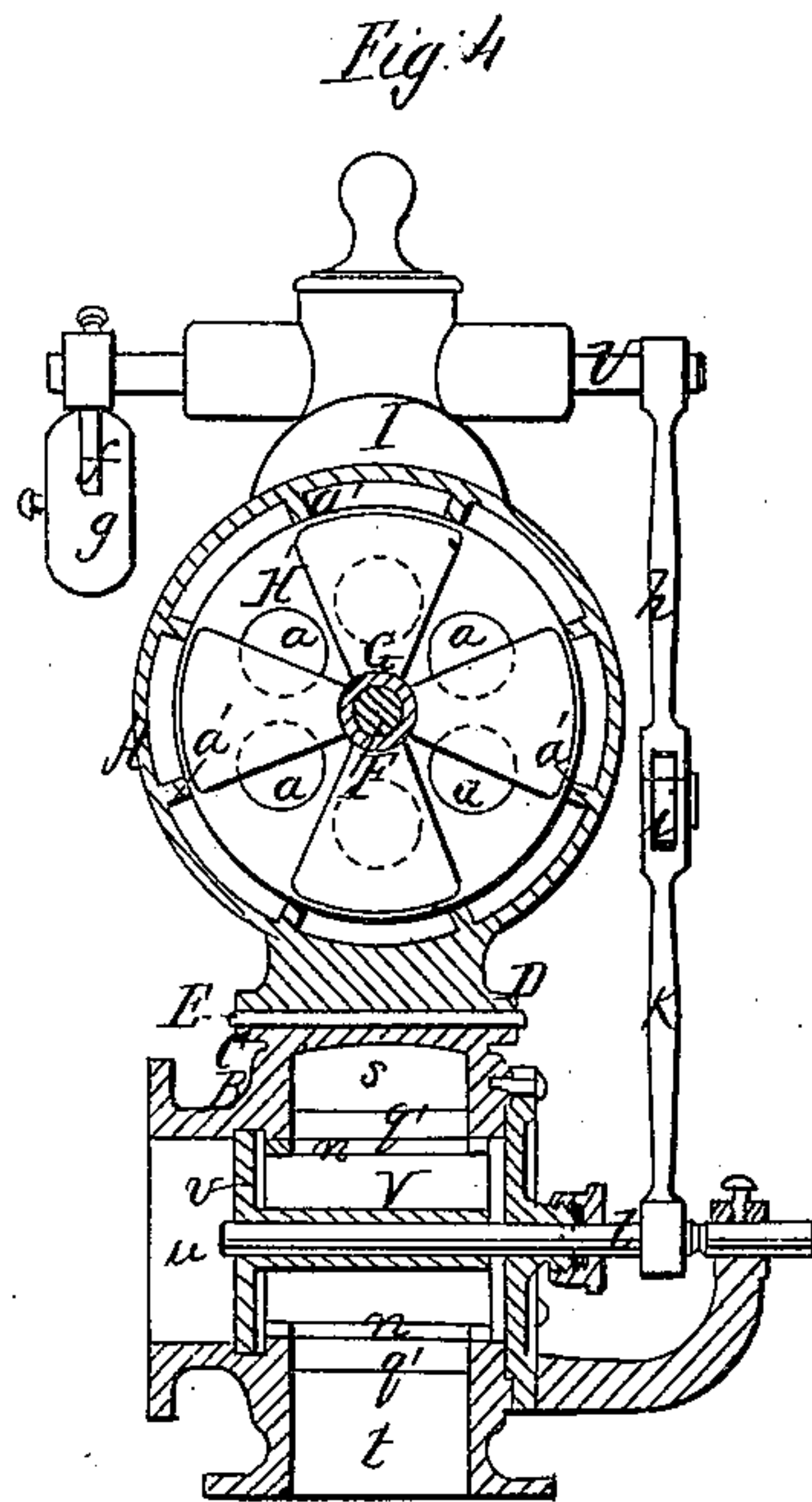
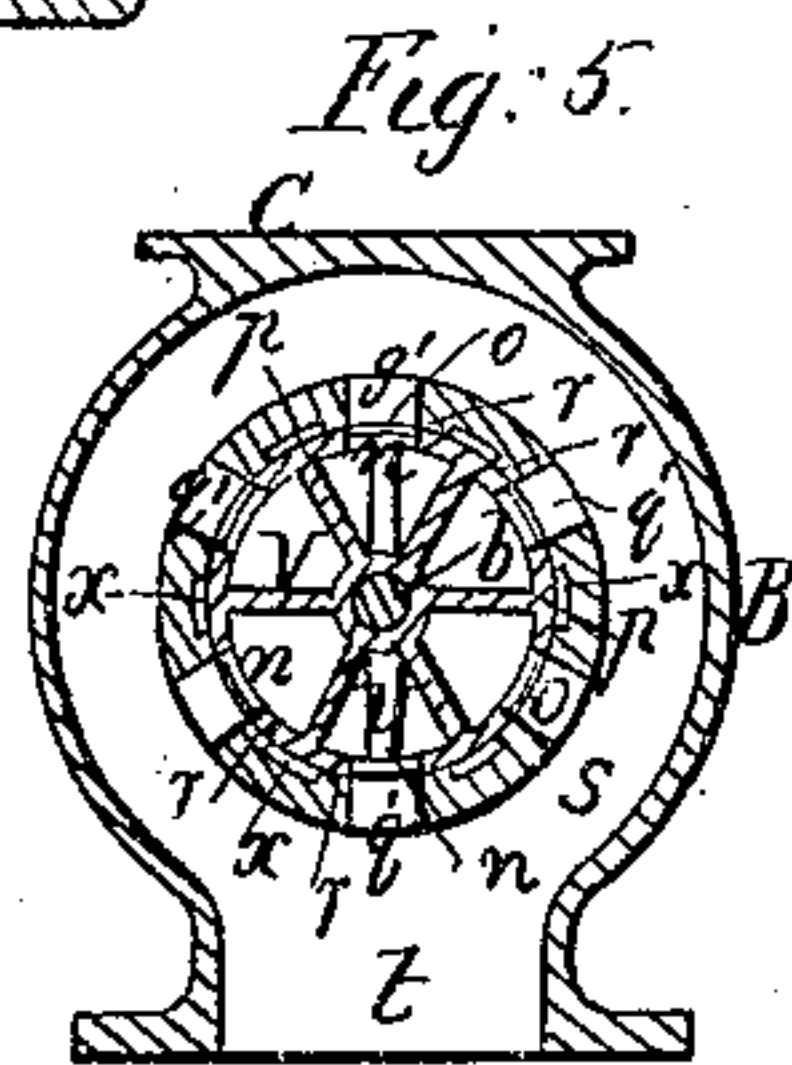
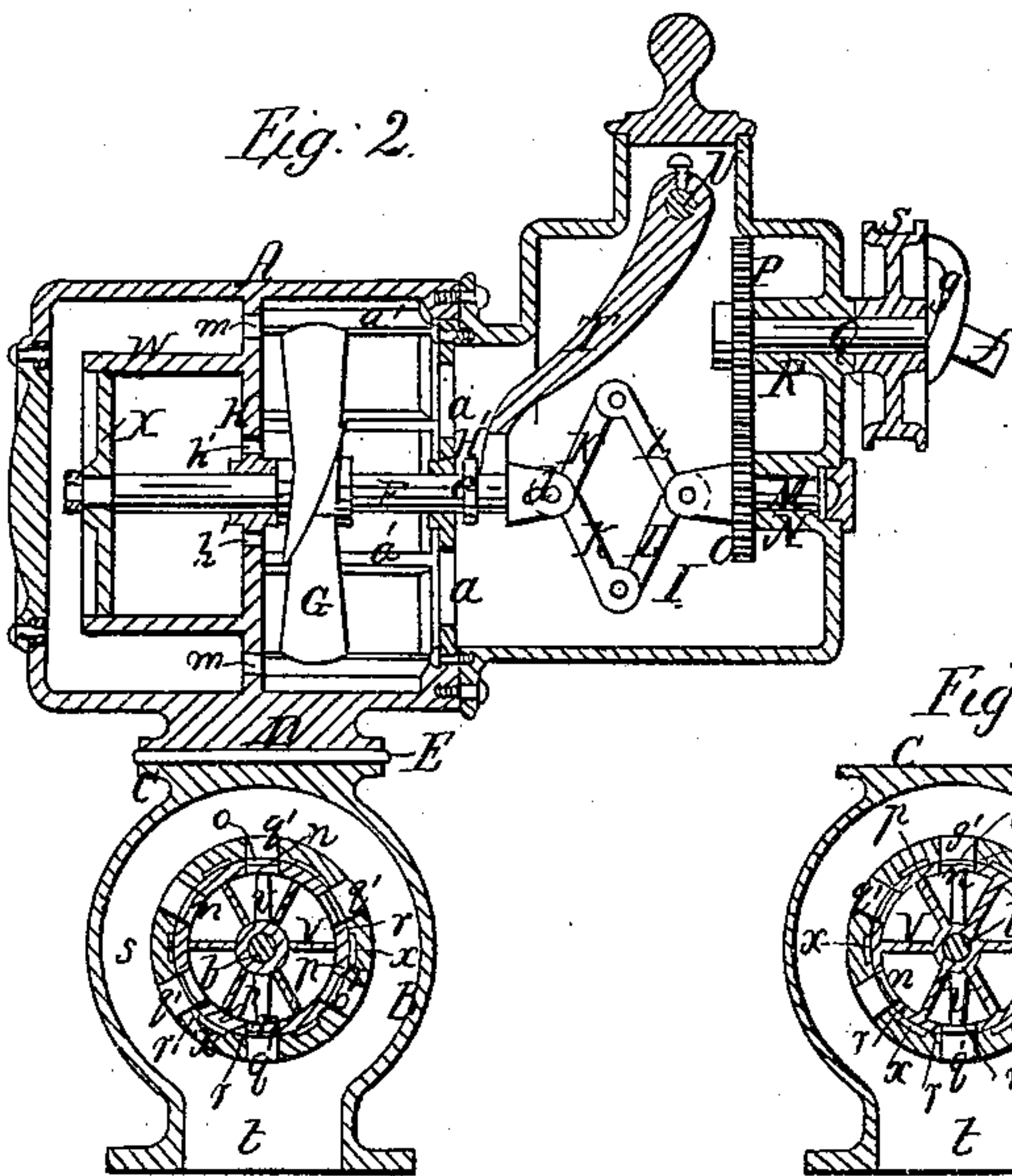
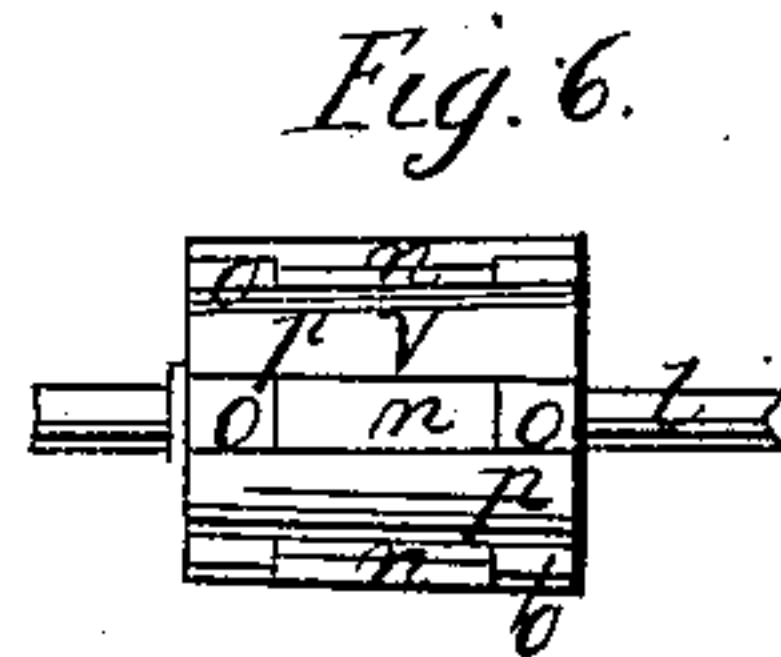
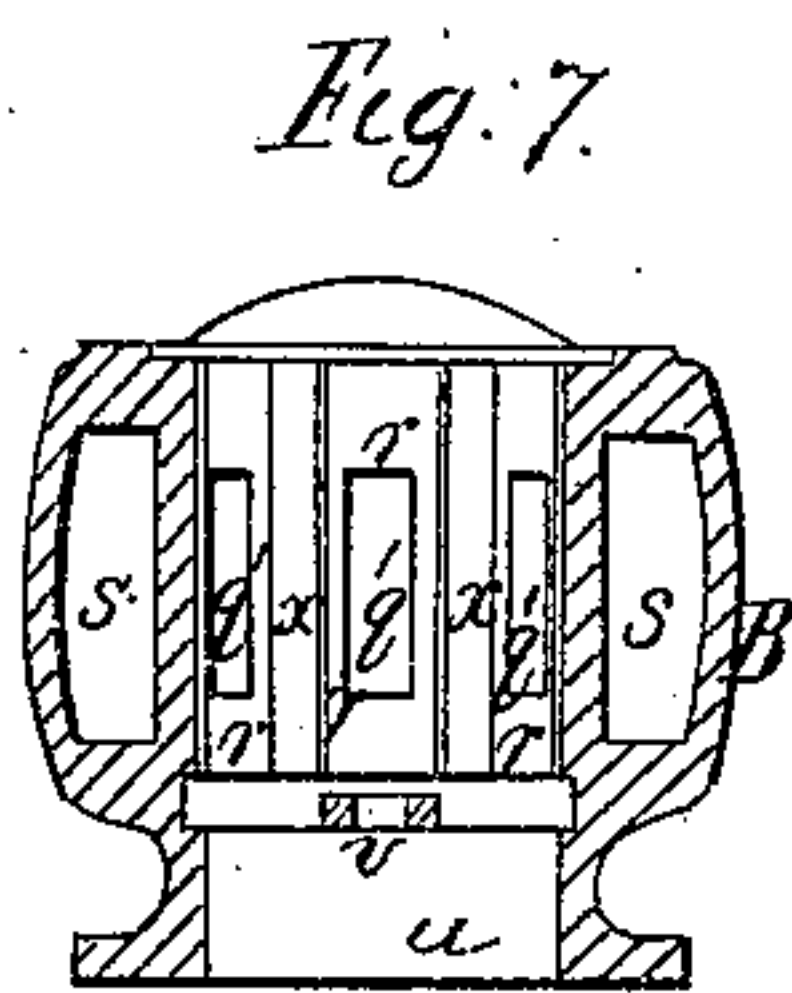
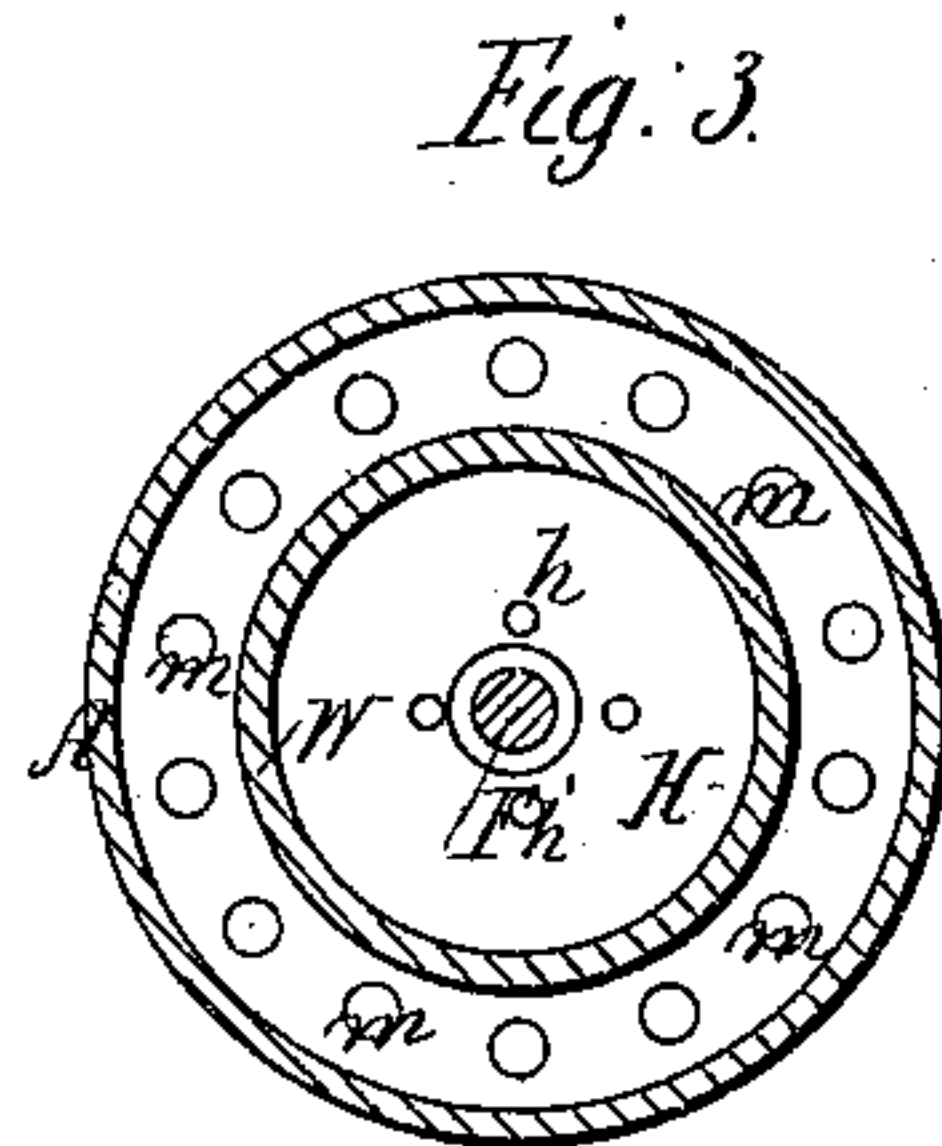
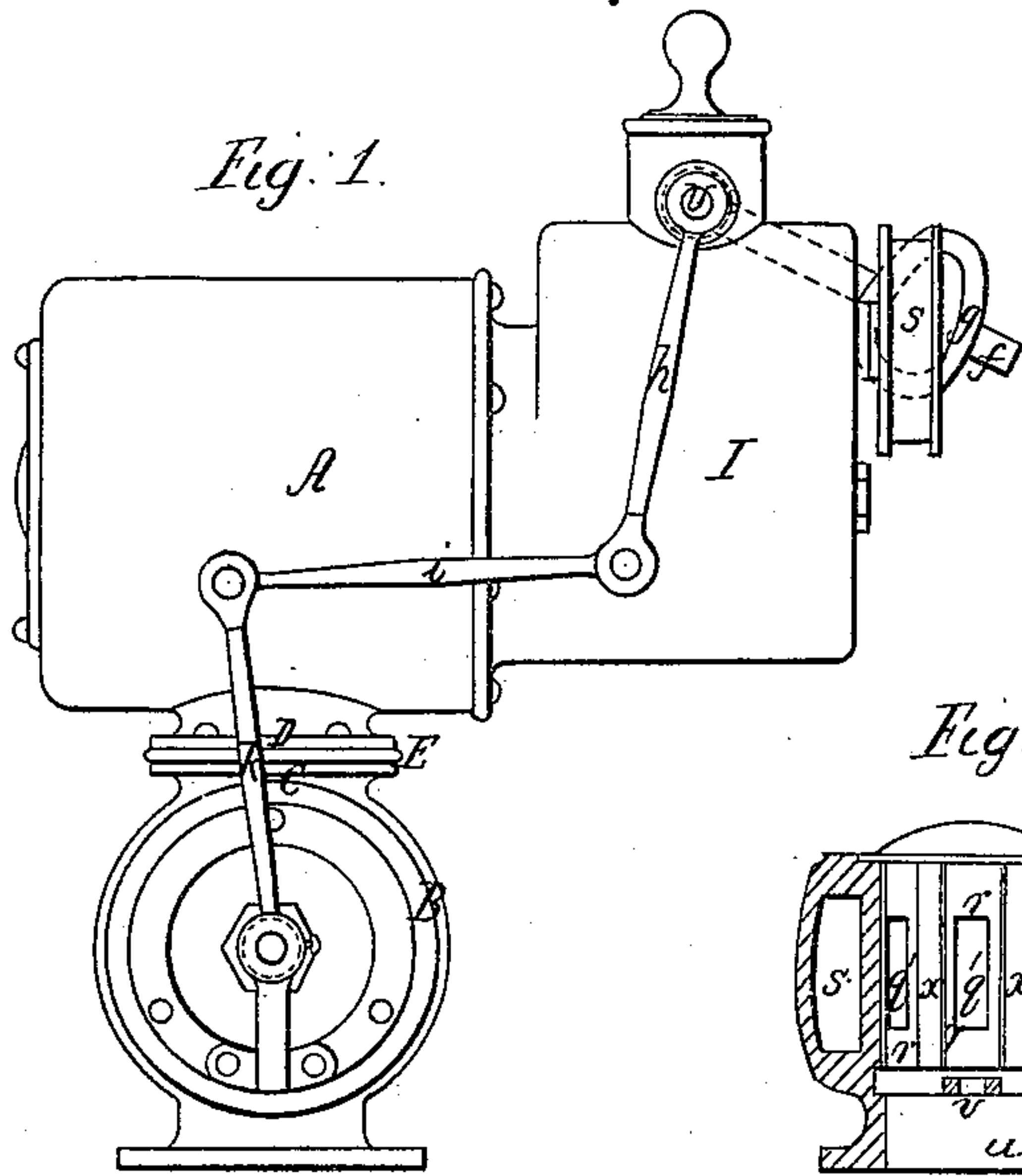


R. H. Huntoon.

Governor.

N^o 89,581.

Patented May 4, 1869.



Witnesses;
S. K. Piper.
J. Rehnour.

Inventor;
R. H. Huntoon.
by his attorney
H. H. Eddy

United States Patent Office.

REUBEN K. HUNTOON, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO
HIMSELF AND J. AUGUSTUS LYNCH, OF THE SAME PLACE.

Letters Patent No. 89,581, dated May 4, 1869.

IMPROVEMENT IN GOVERNOR FOR STEAM-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

To all persons to whom these presents may come:

Be it known that I, REUBEN K. HUNTOON, of Boston, of the county of Suffolk, and State of Massachusetts, have made a new and useful Invention, having reference to Governors for Steam-Engines; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a side elevation, and

Figure 2, a longitudinal section of one of my improved governors.

Figure 3 is a transverse section of the piston, its cylinder, and the case in which they are situated.

Figure 4 is a transverse section of the governor, such being taken through the valve.

Figure 5 is a transverse section of the valve and its case, to be hereinafter described.

In many respects, this improved governor is analogous to that represented in Letters Patent No. 71,015, dated November 19, 1867, and granted on an invention made by me.

In my present governor, I have combined with the screw-propeller, and its shaft and case, a cylinder and piston, the latter to be moved by the force, or waste force generated in the liquid by the screw-propeller.

I have also made an improvement in the mechanism for revolving the propeller-shaft.

Furthermore, I have also made an improvement in the valve, all of which I shall now proceed to describe.

In the drawings—

A denotes a close cylindrical vessel, supported over a valve-case, B, by means of a flanged foot, C.

Between the said foot, and a base-plate, D, cast on, or making part of the valve-case, a disk, E, of some substance, as wood, for instance, which is a poor conductor of heat, is interposed.

A horizontal shaft, F, supporting a screw-propeller, G, is, with such propeller, arranged in the case A.

The shaft extends through two supporting partitions, H H', through which, when in operation, it slides freely, in a longitudinal direction.

From the vessel A the shaft extends into another vessel, I, which is fixed to the vessel A, and communicates therewith through one or more holes, a a, made through the partition H'.

Both the vessels, A and I, are to be filled with a fluid, such as oil, for instance, which is preferable to any other.

At its front end, the shaft F is jointed to a pair of toggles, K K, which, in turn, are jointed, at their outer ends, to those of another pair of toggles, L L.

These latter are jointed, at their inner ends, to the end of another shaft, M, having its axis arranged in line with that of the shaft F, the whole being as represented.

The shaft M is supported by and so as to be capable of revolving in a bearing, N, projecting within the vessel I, and from its end.

A gear, O, fixed on the shaft M, engages with a larger gear, P, carried by a driving-shaft, Q, supported in a bearing, R, and arranged as shown in the drawings.

A driving-pulley, or wheel, S, is fixed on the shaft Q, outside of the case, or vessel I. It is about this pulley, or wheel, that the belt from an engine, to be regulated by the governor, is to run, in order to put the governor in operation.

When the shaft Q is in revolution, rotary motion will be imparted to the propeller, whose shaft will be free to move longitudinally, the system of toggles not only admitting such movements to take place, but aiding in effecting rotary motion of the propeller-shaft. These toggles enable me to maintain the pinion O in its normal position, and to avoid the use of a long gear to operate with it, as represented in the drawings of the patent hereinbefore mentioned. Besides, the toggles admit of the shaft M being disposed in alignment with the shaft F, instead of parallel with it, as would be necessary were a long gear used on the shaft F to engage with the pinion O.

Instead of the toggles to connect the two shafts, F and M, I have contemplated having one of the shafts tubular, and to receive the other with a feather-connection.

A forked arm, T, extended down from a shaft, U, spans the shaft F, between a shoulder, e, of the shaft F, and the joint d of the toggles.

An arm, f, carrying a counter-weight, g, projects horizontally, or thereabouts, from one end of the shaft U.

Another arm, h, extends down from the opposite end of such shaft, and is jointed to a connecting-rod, i, which is also jointed to an arm, k, that extends upward from the valve-shaft l, arranged concentrically with the valve V, and its case B.

While the propeller is in revolution within the liquid in the case A, and any increase of velocity of such propeller may take place, the propeller will be advanced toward the partition H'. A decrease in the velocity of revolution of the propeller will be attended with a falling back of the propeller, or away from such partition.

There projects back from the partition H, a hollow cylinder, W, which is open at its rear end.

Within the said cylinder is a piston-head, or disk, X, which is secured to the propeller-shaft F, so as to move with it, the shaft being capable of revolving within the said head X.

There are holes, m m, through that part of the partition H, which is outside of the cylinder W.

The said cylinder and piston, combined and arranged with the propeller, its shaft and case, in manner as represented, are of great advantage in moving the shaft.

The centrifugal force generated in the liquid is the greatest near the outer end of the blades of the pro-

PELLER. This force will cause the liquid to be driven through the holes *m*, and to impinge against the outer face of the piston-head, in which case the piston-head will be moved by it, or will aid in moving the propeller-shaft, to which it is connected.

Through the partition from which the cylinder extends, are one or more small holes, *h'*, such being for the discharge of any oil which may work into the cylinder, and between the said partition and the piston. Such oil will be driven out of the cylinder during the advance of the piston.

I would remark, that instead of having the propeller and piston fitted to one and the same shaft, so as to move together simultaneously in the direction of the axis of the shaft, when the propeller may be in revolution in the fluid, or medium of its case, they may be applied to separate shafts, the piston-shaft being movable lengthwise relatively to the propeller-shaft, which may be stationary in other respects, than capable of being revolved. In this case, the propeller would not move endwise in the liquid, but, when revolved, would cause the body of liquid to be driven against the piston, whose rod, or shaft would move and actuate the valve-operating mechanism connected with it.

I mention this change, or another mode in which I have contemplated the application of the piston and propeller with the cylinder and its case, and the valve-operating mechanism, as above explained, as connected with the propeller-shaft.

The valve *V* is formed like a wheel. It has a series of radial openings, *n*, arranged at equal distances apart through its rim, and such rim on its outer surface is channelled along such opening, in manner as shown at *o*, and particularly in Figure 6, which is a side view of the valve.

The parts *p p*, between these channels, are to operate with the rectangular valve-seats *r*, provided with rectangular passages, *q'*, leading out of them and into the circumscribing passage *s*, of the valve-case *B*.

The passage *s* has an outlet at *t*, the inlet being represented at *u* as at one end of the case, and opening into the end of the valve.

The shaft of the valve is pivoted in a bar, *u*, extending diametrically across the inlet.

There is a channel, *x*, formed between each two next adjacent valve-seats, *r r*, and across the valve-case, the same being as shown in Figure 7, which is

a horizontal section of the valve-case without the valve.

The channels *x* in the case, as well as the channels *o* in the valve, serve to intercept deposits of dirt, or foreign matters introduced by the steam, such matters being liable to clog the valve, and increase the friction between it and its case. The channels also serve to reduce the rubbing-surfaces of the valve and its case, with respect to what they would be were there none of the channels in them. The reduction of the rubbing-surfaces is attended with a proportionate reduction of friction, when the valve is in operation. The dirt and foreign matters intercepted by the channels will be blown out of them by the steam and through the openings *q'*.

A series of ribs, or flanges, *a a*, is arranged within the case *A*, in manner as represented, they being to operate as obstructions to prevent the liquid, when in the case, from being revolved by the propeller. They also act to cause the liquid to pass through the holes *m* in the partition.

I herein make no claim to the application of ribs, or wings to the inner surface of the propeller-case, when uncombined with the cylinder, for use with a piston and propeller, as described.

I claim the combination of the cylinder *W* and piston *X*, with the screw-propeller *G*, its shaft *F*, and case *A*.

I also claim the combination and arrangement of the auxiliary shaft *M*, and the toggles *K L*, with the propeller *G* and its shaft *F*, and mechanism for revolving the said auxiliary shaft *M*, such mechanism, as represented and described, being the gears *O P*, the shaft *Q*, and the pulley *S*.

I also claim the combination and arrangement of either or both the series of channels *o x*, with the seats *r* and passages *n q'* of the wheel-valve *V*, and its case *B*, applied together, and made in other respects substantially as set forth.

I also claim the arrangement and combination of the wings *a'* with the case *A*, the passages *m*, and the cylinder *W*, to be used with a piston, and the propeller and shaft, arranged, in such case, substantially in manner, and to operate as described.

REUBEN K. HUNTOON.

Witnesses:

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SAMUEL N. PIPER.