

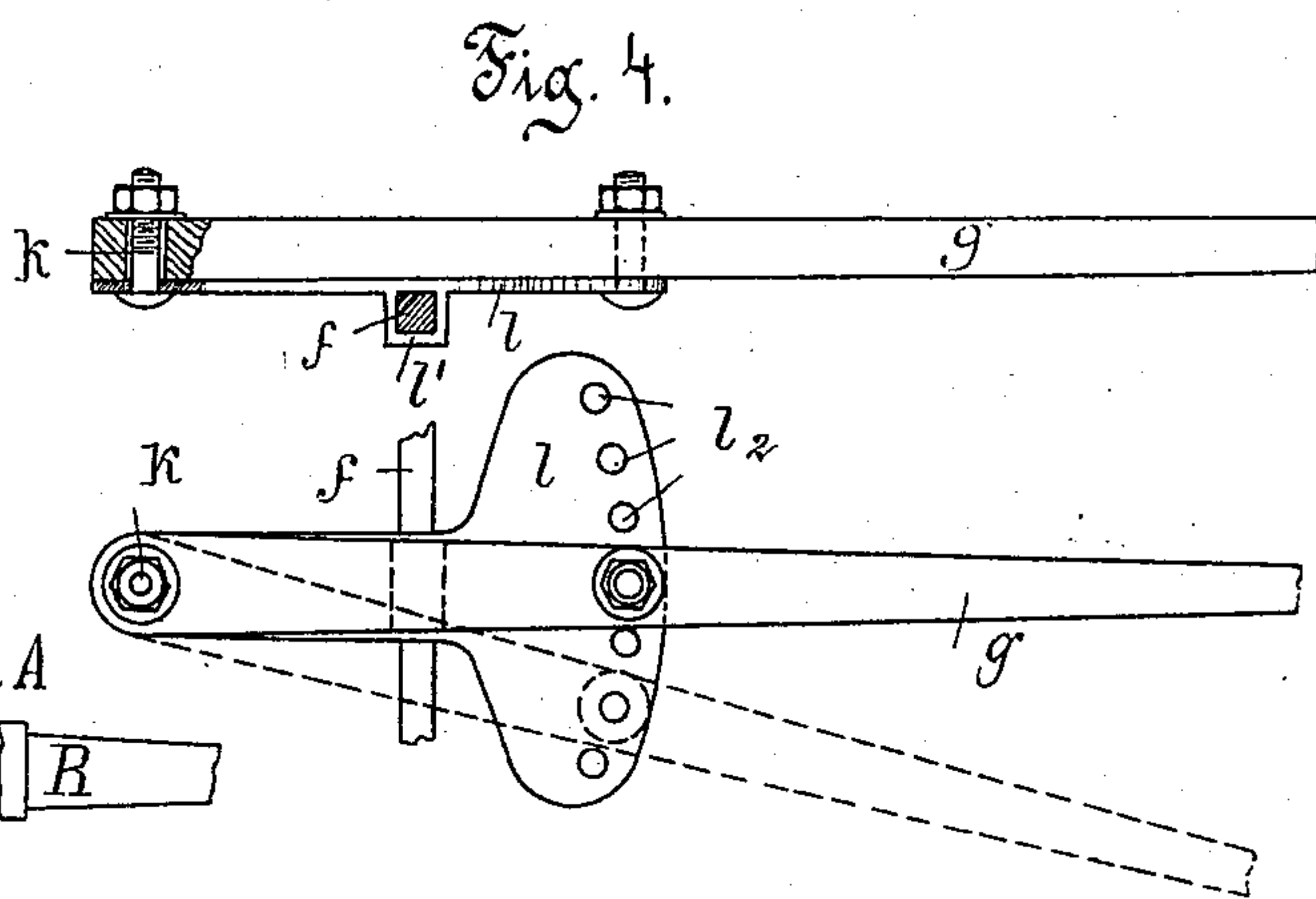
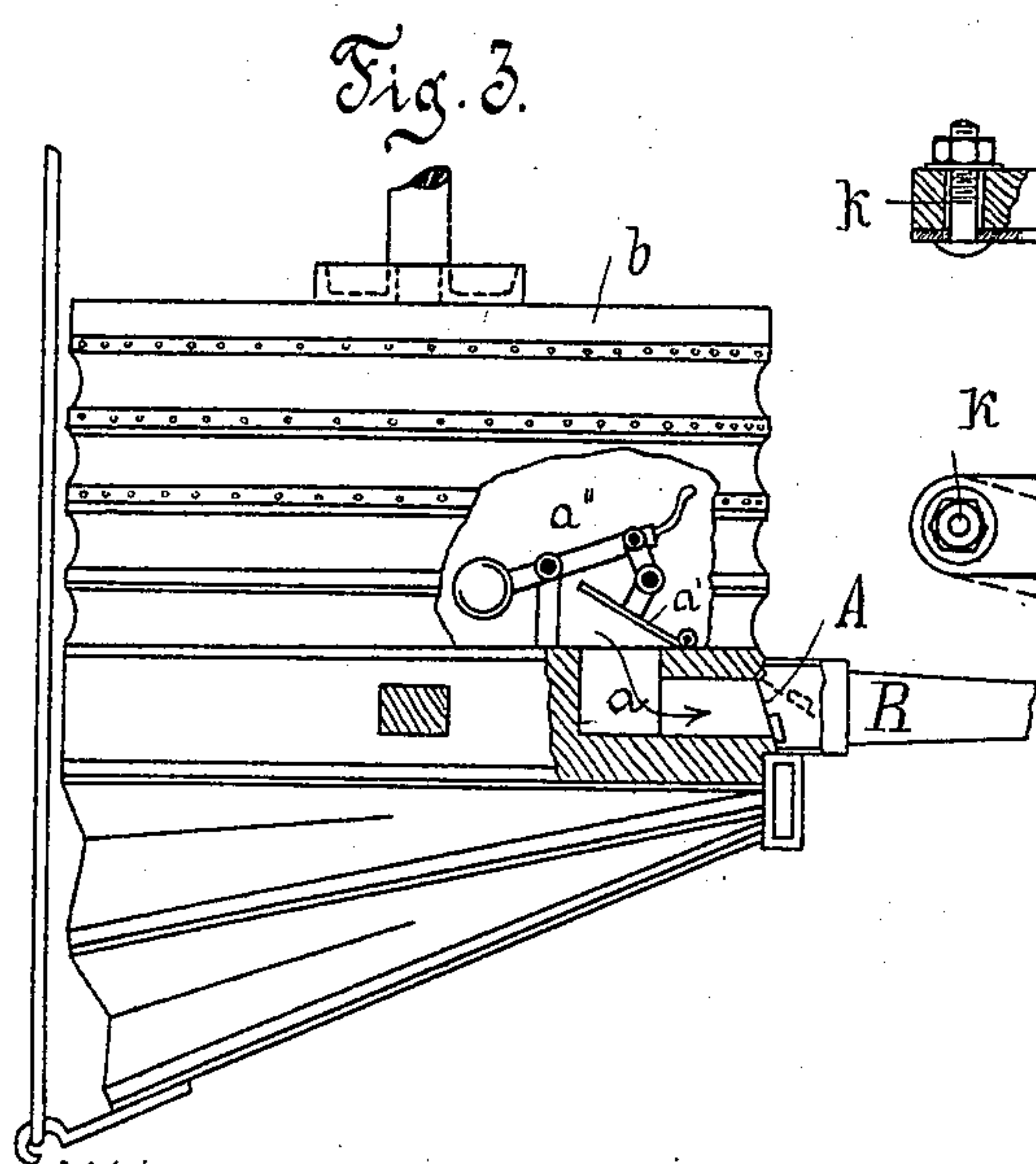
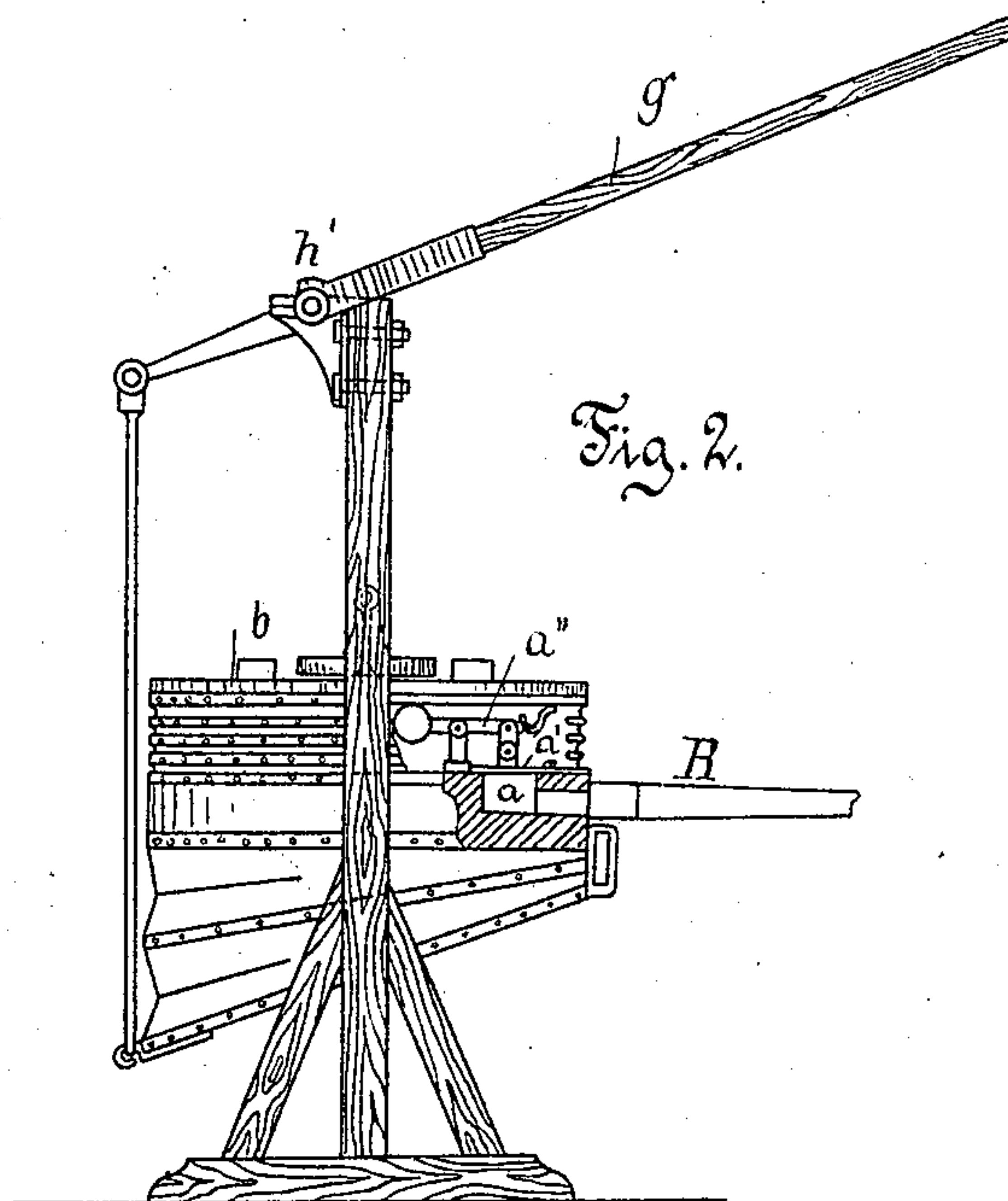
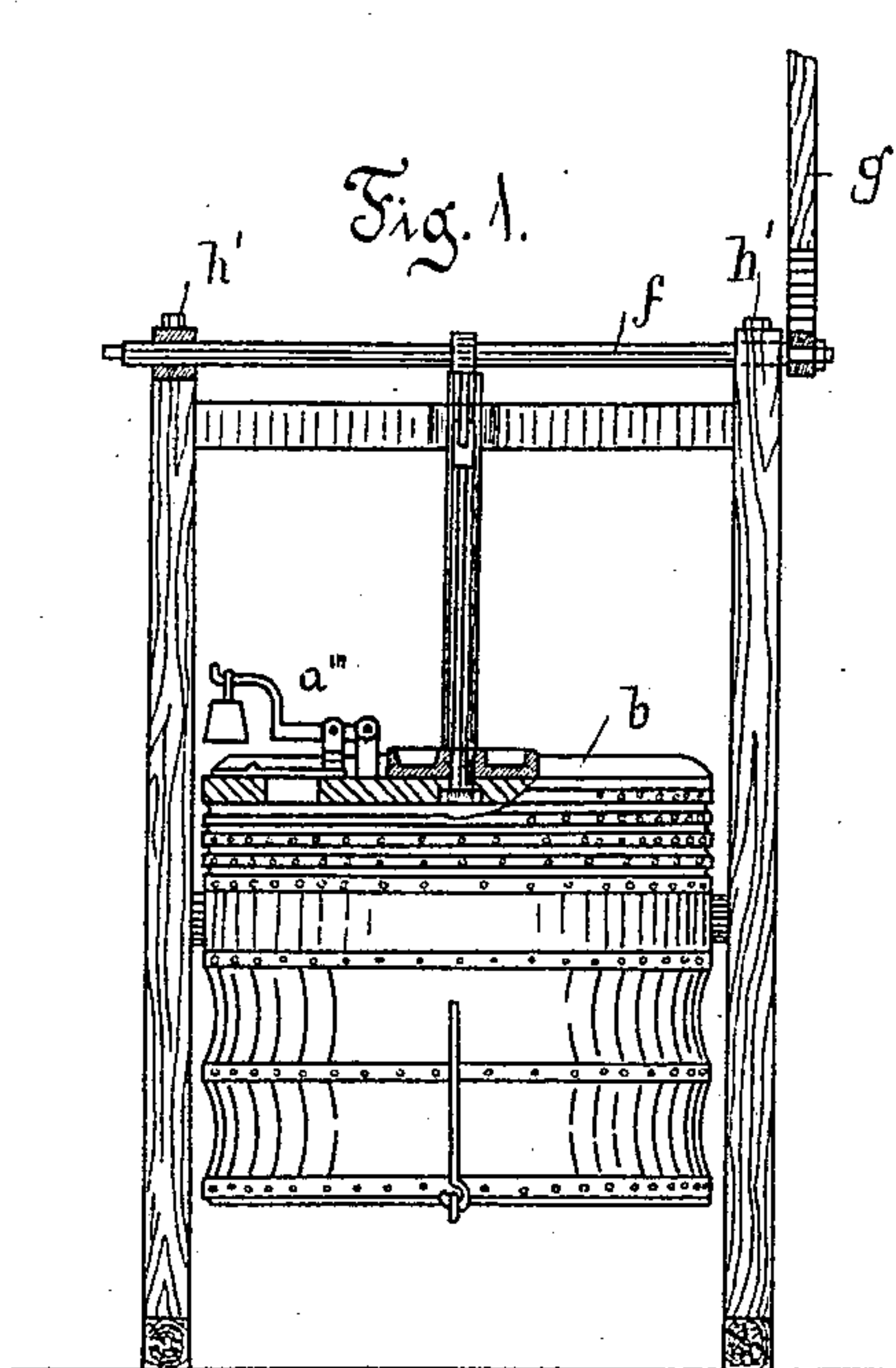
(No Model.)

5 Sheets—Sheet 1.

C. F. SCHALLER.
BLOWING ENGINE.

No. 538,352.

Patented Apr. 30, 1895.



Witnesses
Thomas Durant
Malcolm Murdoch

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Carl F. Schaller
by Chas. Schaller
his Atty

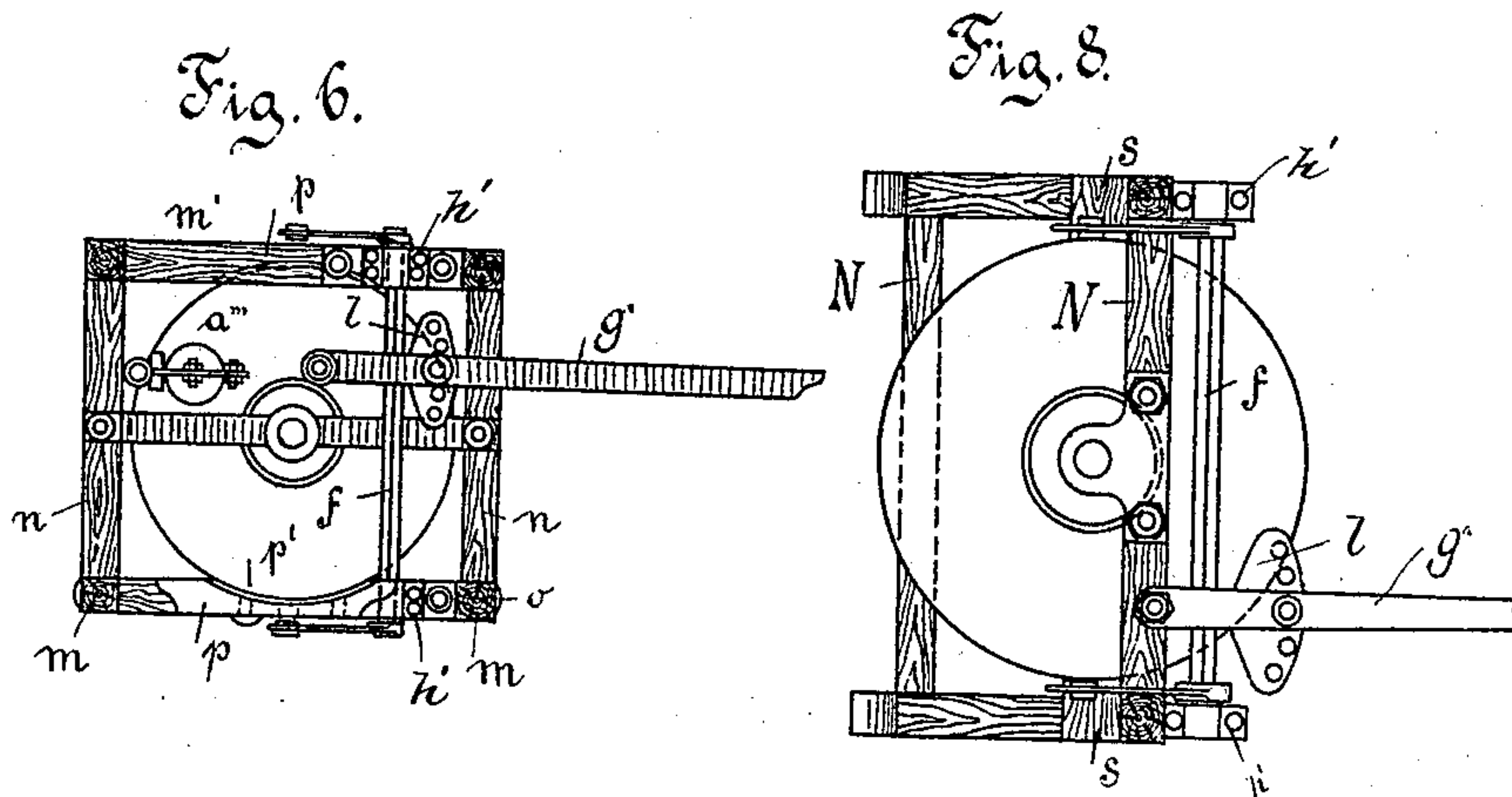
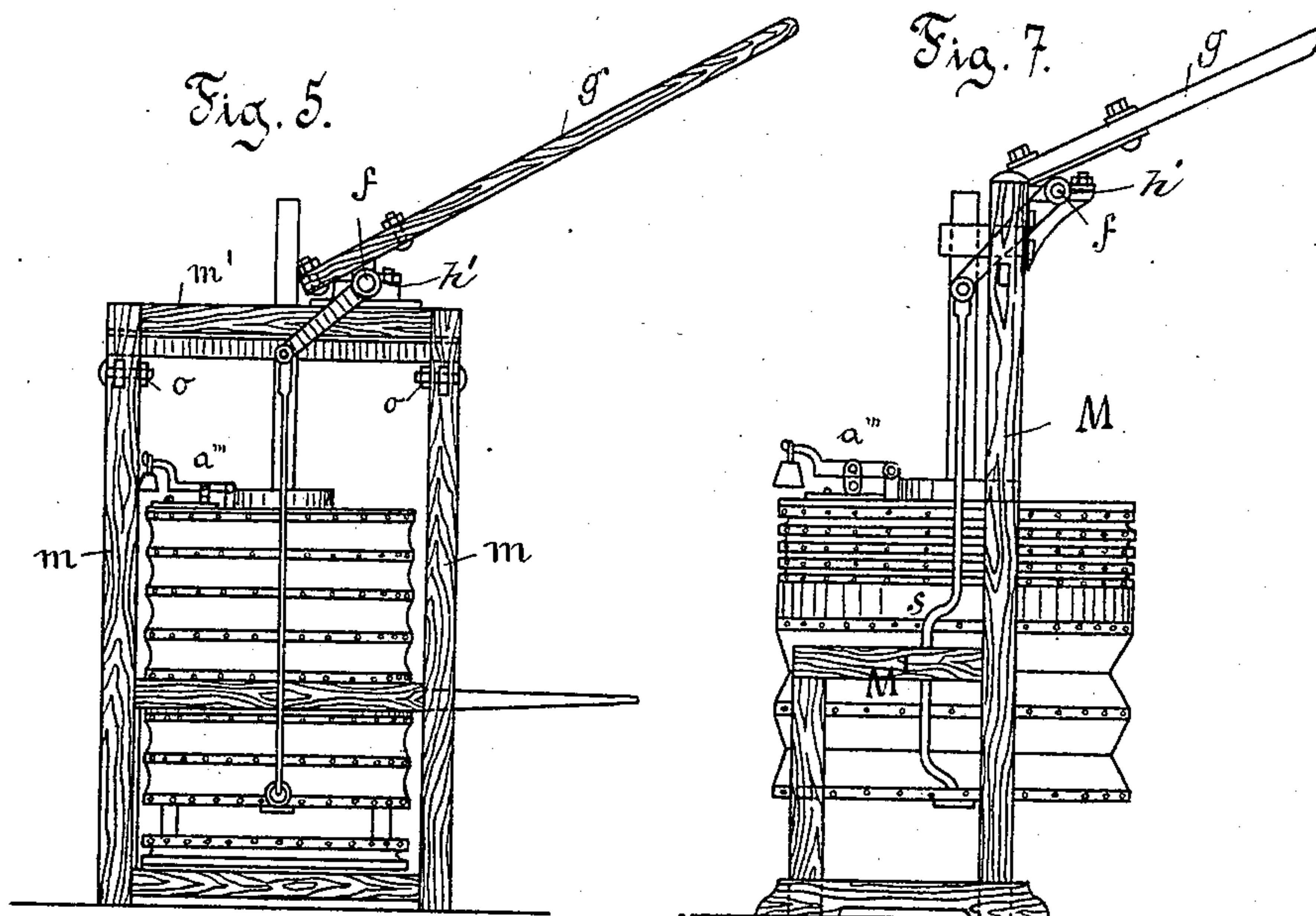
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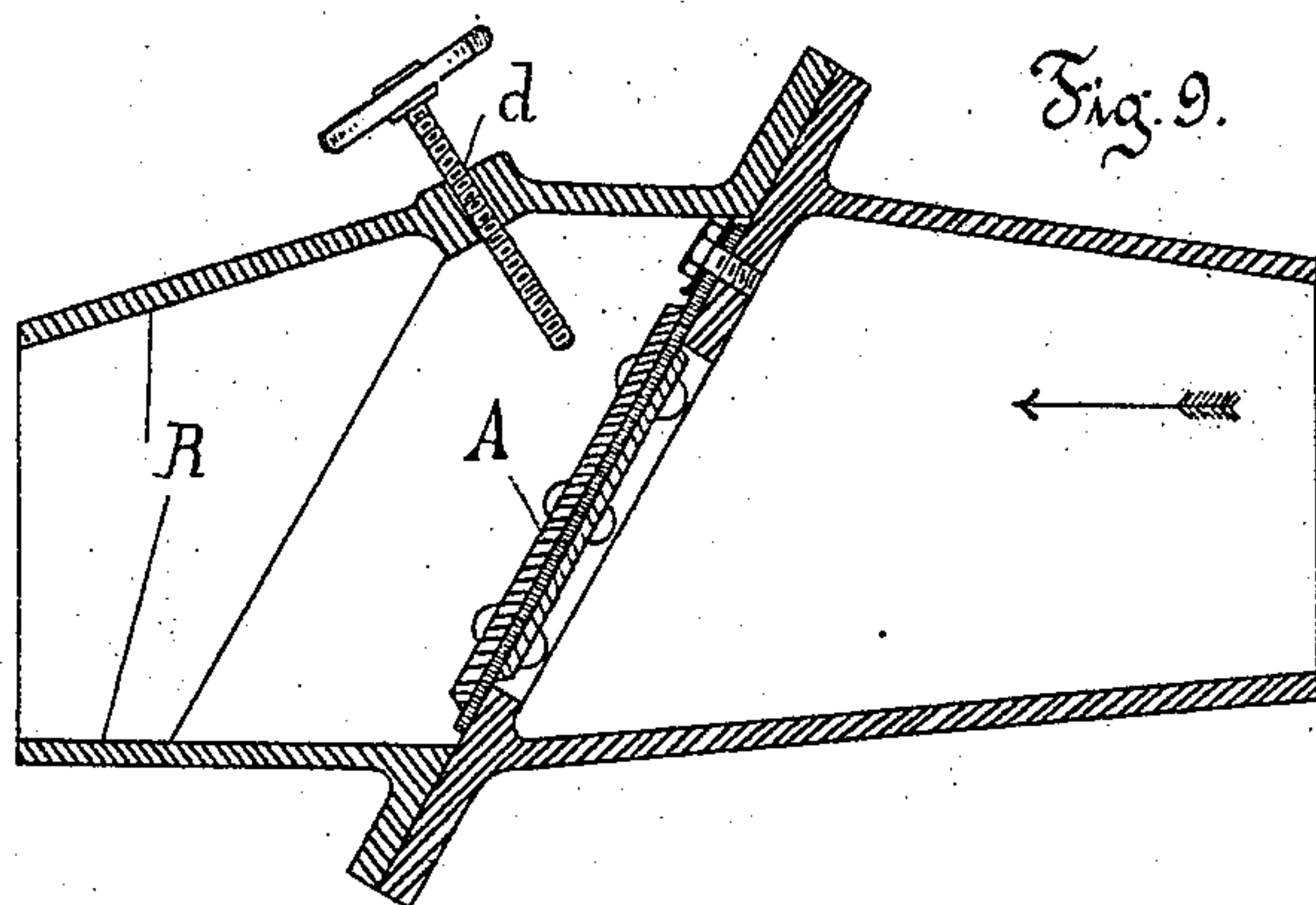
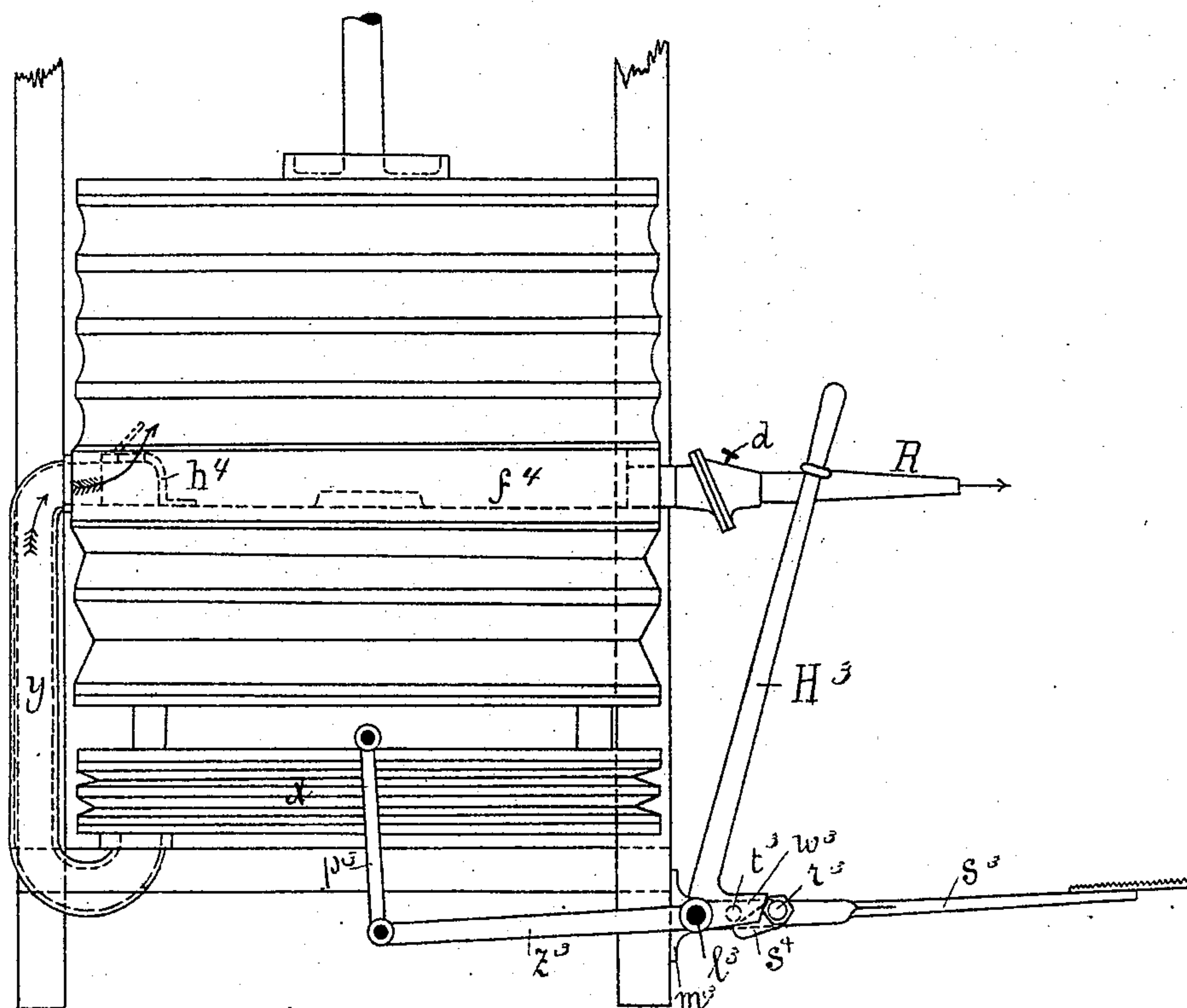


Fig. 10.



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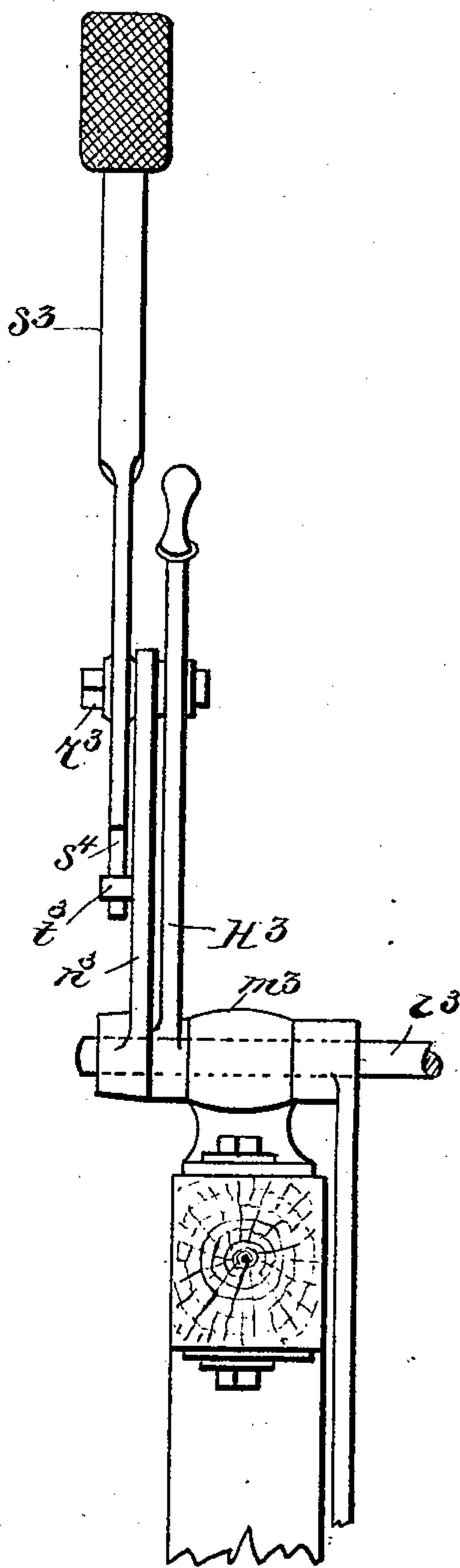
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Fig. 11.



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Fig. 12.

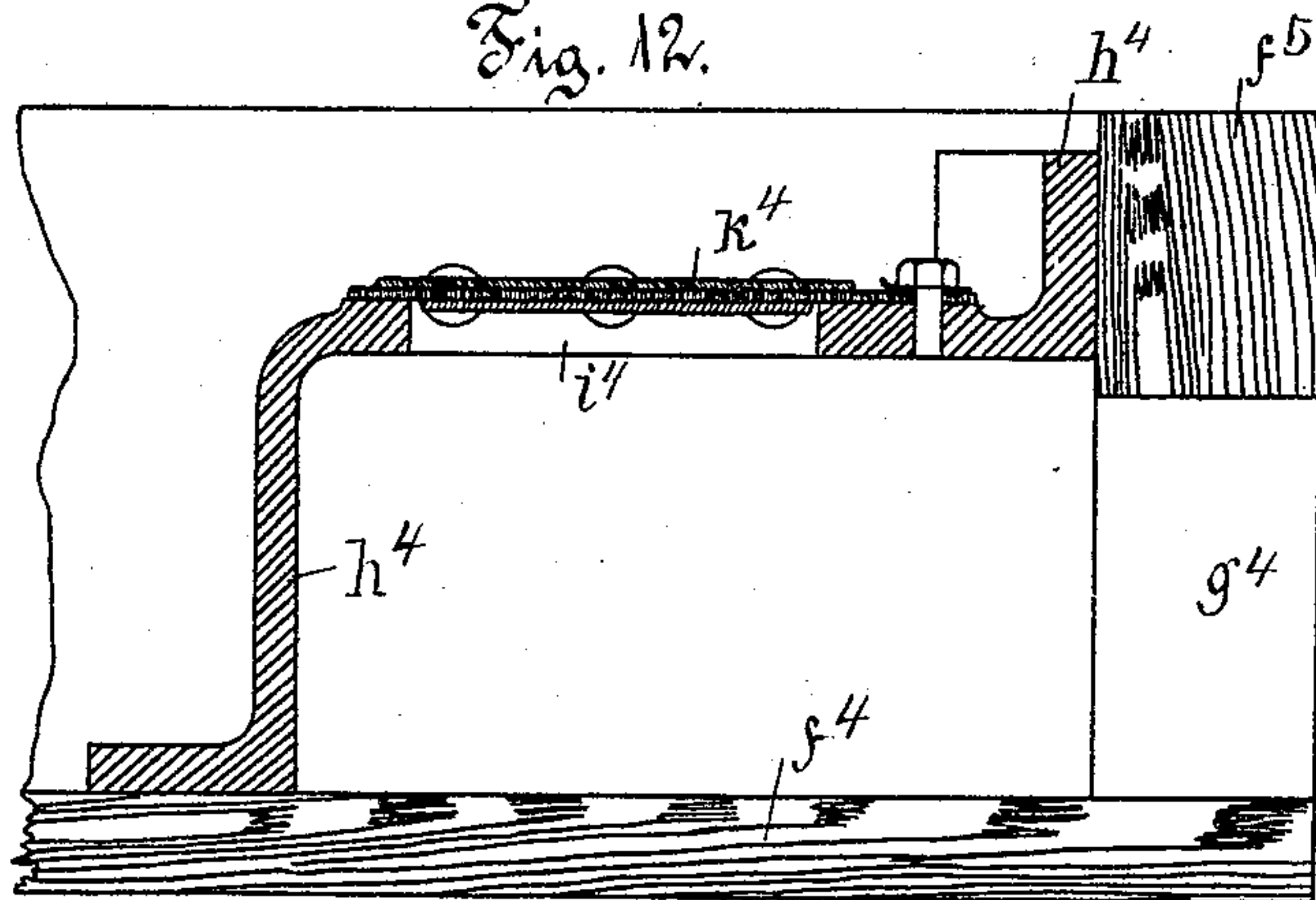
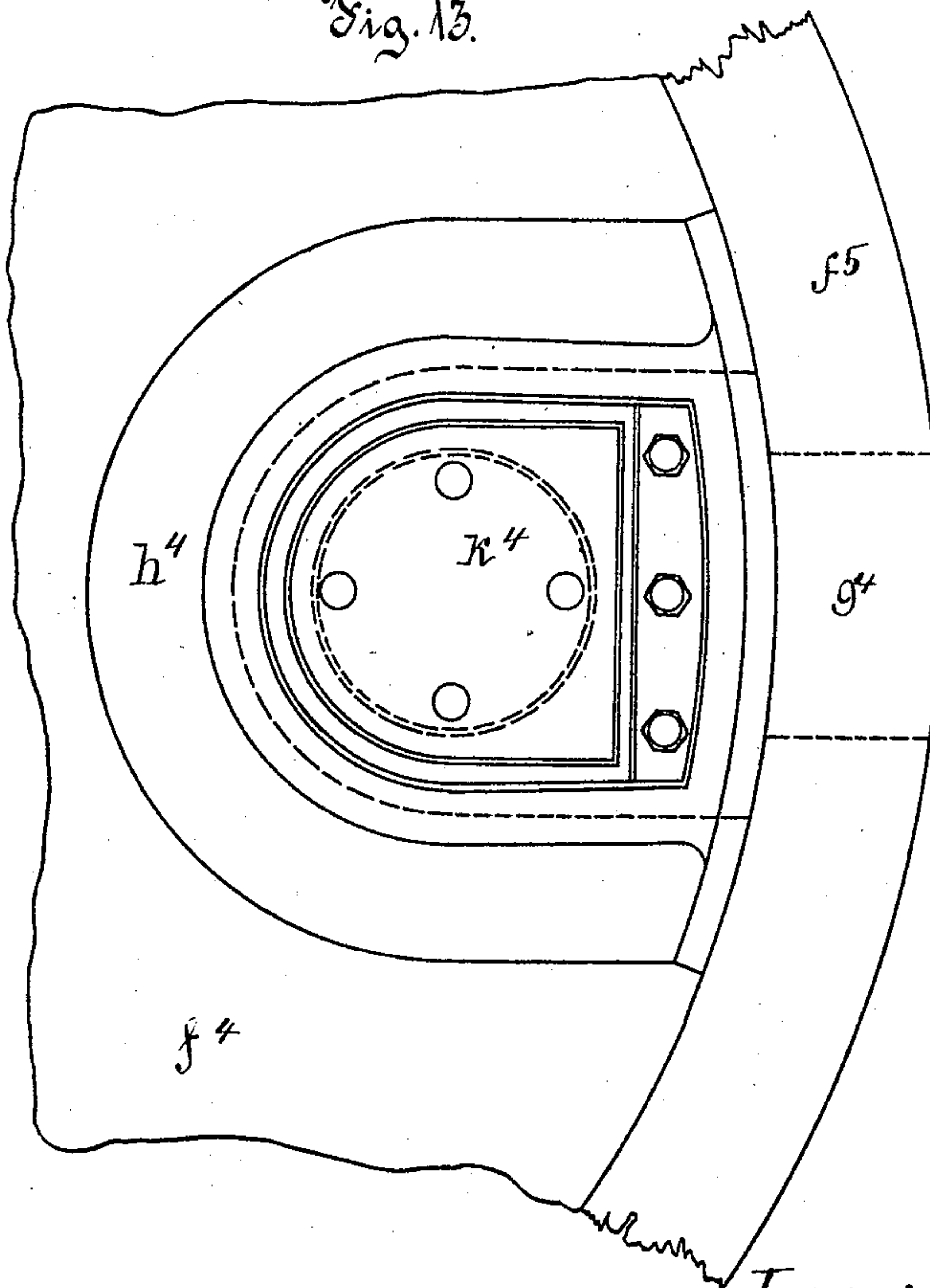


Fig. 13.



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UNITED STATES PATENT OFFICE.

CARL FRANZ SCHALLER, OF VIENNA, AUSTRIA-HUNGARY.

BLOWING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 538,352, dated April 30, 1895.

Application filed March 17, 1893. Serial No. 466,466. (No model.)

To all whom it may concern:

Be it known that I, CARL FRANZ SCHALLER, a subject of the Emperor of Austria-Hungary, residing at Vienna, Austria-Hungary, have
5 invented certain new and useful Improvements in Blowing-Engines, of which the following is a specification.

This invention relates to blowing-engines and consists in a novel construction of the
10 safety-valve, a simplified and more convenient arrangement of the blower or blast-head, operating mechanism and frame and a better provision for and control of the blast.

The invention will be best understood by
15 reference to the accompanying drawings, in which—

Figures 1 and 2 represent a blower or fan arranged for single action and provided with some of the improvements forming the subject of this invention. Fig. 3 is a single blower or fan drawn on an enlarged scale and provided with the improved safety-valve *a'* A. Fig. 4 is a detail view of the operating mechanism. Figs. 5 and 6 represent a double acting or compound blowing engine, provided with some of the improvements herein described, such as an improved frame, safety-valve and operating mechanism. Figs. 7 and 8 show a single blower with a simplified frame.
30 Fig. 9 is a vertical section of a door shaped safety valve, the extent of motion of which at each stroke, is adjustable at will. Fig. 10 is a side view of a blower provided with an improved air-inlet device and operating mechanism. Fig. 11 is another detail view of the operating mechanism shown in Fig. 10, on an enlarged scale looking on top of the mechanism. Fig. 12 is a vertical section of the improved air-inlet. Fig. 13 is a plan thereof.

It is a well-known fact that when a fresh
40 batch of coal is put in the furnace and water added to the boiler, and when the operation of the machine is discontinued, say during the luncheon hour of the operatives at noon,
45 gases are generated in the furnace of the forge which cannot escape into the chimney, but pass through the exhaust-pipe into the blower or fan. When therefore the work is recommenced these gases mix with the air
50 in the blower and thereby not unfrequently cause explosions. To obviate this danger,

the attempt has hitherto been made to provide the exhaust-pipe with a damper which was to be closed during the time that the fan or blower remained out of use. This however
55 has failed to attain the desired object as in most cases the men from neglect or ignorance omitted the prescribed precaution of shutting the damper. It has further been tried to arrange the exhaust pipe for automatic action
60 by providing it with a valve allowing any air coming from the fan to pass through; but this arrangement has proved defective because it prevents the products of combustion which have reached the fan from returning to the
65 furnace. All these inconveniences are effectively removed by the arrangement illustrated by the accompanying drawings notably in Figs. 1, 2, 3, 9 and 10 in which various forms of protecting devices are shown.

The improved arrangement consists of a
70 door or valve *a'* connected with a double lever *a''* one end of which is weighted. This valve is adapted to close the exhaust pipe or channel *a*, but the weight attached to the
75 lever tends constantly to keep it open until the fan or blower itself descends into its position of rest, when the bottom surface of its top *b* depresses and closes the valve as indicated in Fig. 2. The top *b* of the blower is, more-
80 over, provided with a safety-valve *a'''* of any well-known construction. In addition to the valve *a'* the exhaust pipe is provided with an ordinary door-shaped valve *A* as indicated in dotted lines in Fig. 3. This valve or door
85 may either be secured directly to the head of the blower or be arranged in a separate valve-chest and provided with a device for controlling its extent of motion at each stroke, as shown in Fig. 9, where this device simply con-
90 sists of a screw spindle *d* which may be moved away to a greater or less extent from the valve.

Another improvement consists in the simplified arrangement of the main frame of the
95 blowing-apparatus. This is illustrated in two modifications in Figs. 5 and 6 and in Figs. 7 and 8. The latter form is mainly intended for single blowers, while the form shown in Figs. 5 and 6 is more particularly adapted for
100 double or compound blowers, being materially stronger. For convenience of transport

the whole framing is arranged to be taken to pieces, so that the complete machine may be readily removed from one spot and carried to and erected at another. Thus in the vertical frame the sides or uprights m are fitted together with the horizontal cross beam n of the opposite frame m' by means of a groove-and-tongue connection and of a screw o passing through both as illustrated by Fig. 5. To save space, the two cross pieces p between which the fan or blower is arranged are each provided with a slot p' (Fig. 6) fitting the circumference or outer shape of the fan, so that the two frames m and m' may be erected closer to each other and the whole of the framing thereby made narrower. Space is also saved, stability insured and the erection of the apparatus simplified by replacing the frame composed of four uprights by one consisting of two uprights only as shown at M (Figs. 7 and 8). This will be sufficient especially in the case of single blowers. The frame M has a support M' to which the blower is secured by means of the cross-piece s . In this arrangement also, as will be readily understood, the two uprights or supports M M' may be connected with the cross-piece N by a groove-and-tongue joint and a screw.

A further improvement relates to the operating device and may be carried out in two different forms as shown in the drawings one form, of which Fig. 4 is a detail view, while Figs. 5, 6, 7, and 8, show it in its operative position, consists of a shaft f supported in bearings h' . This shaft at both ends terminates in squares which enables the operating lever g to be fitted to either end at will (Fig. 1). To enable the operating lever g to take up any required position, it is adjustable upon the shaft and capable both of turning and of shifting horizontally. As shown in Figs. 4 to 6 this lever is at k connected with the washer l by means of a pivot or pin, and this washer is loosely placed upon the shaft f by means of its sleeve l' . This loose washer or disk l is provided at its segment-shaped end with a number of openings l^2 in which the lever g may be secured at any desired angle of inclination by means of screw-bolts (Fig. 4). It will therefore be seen that this disk or washer l enables the lever g to be brought to any desired point of the shaft and to be inclined at will which is extremely convenient in case of scarcity of room in front of the blower.

The other form of the improved operating mechanism is illustrated by Figs. 10 and 11. In this case it is arranged for operation by hand and foot and suitable for blowing apparatus of any description whatsoever. The mechanism consists of a shaft l^3 revolvably mounted in bearings m^3 provided in the frame of the blower. Upon this shaft is rigidly secured a lever n^3 to the end of which is attached the pedal s^3 adapted to turn on the pivot r^3 . This pedal has an extension s^4 at its lower part which is arranged to meet a tappet t^3 rigidly secured to the lever n^3 . When the

pedal is depressed, the lever n^3 therefore is moved along with it. There is further revolvably mounted upon the shaft l^3 a lever H^3 which at its lower part carries a projection or tappet w^3 adapted to come up against the pivot r^3 which, when it does, also sets the lever n^3 or the shaft l^3 in motion, as the case may be, as is clearly shown in the drawings. When the hand lever H^3 is employed, the pedal s^3 is turned back, and conversely, when it is desired to use the pedal s^3 , the hand lever H^3 is turned out of the way; or either the pedal or the handle may be removed altogether as the case may be. From the shaft l^3 motion is conveyed through the medium of the lever z^3 and the rod p^3 to the movable bottom of the blower or fan. This arrangement is applicable to fans, bellows and blowing apparatus of any description in forges and elsewhere.

The next point of the invention is the simplified and more compact construction of the blower-head and of the air-inlet device, as illustrated in Figs. 10, 12 and 13. The blower-head f^4 has hitherto been made of a solid piece of wood with the air-channel or ports bored in it. In the present arrangement this head merely consists of a bottom plate around which a ring composed of narrow segments f^5 is fixed or glued. The air-channel g^4 is provided with a valve-chest h^4 which may be made of any suitable material and in any convenient shape. This chest or casing is provided with an opening at i^4 which is closed by means of a valve or door k^4 . It will be seen from Fig. 10 how the air forced out of the lower bag or pocket x passes through the tube y and valve h^4 into the upper bag.

It has been pointed out before that if gases from the furnace are allowed to enter the blower, accidents of the most disastrous nature, such as explosions, must be anticipated. This serious danger the present invention completely avoids, since in the first place gases are prevented by valves from forcing their way into the blower, while should they by any accident reach it, the safety-valve or door a''' is arranged to open and to allow of their escape into the atmosphere as soon as their pressure becomes sufficient to operate the valve, thereby effectually obviating the possibility of an explosion or of any damage to the fan.

I claim—

1. In a blowing apparatus, the combination with an exit opening of a valve controlling the same, held positively closed by the blower when in a position of rest, substantially as described.

2. In a blowing apparatus, the combination with the bellows, or similar device having an exit aperture, of an automatic check valve for preventing the backward movement of air through said aperture, and a normally open valve controlling the passage of air through said aperture and held closed by the bellows when in a position of rest; substantially as described.

3. In a blowing apparatus, the combination with the blowing or air compressing mechanism having an exit aperture, of a valve for closing said aperture, held in closed position
5 by the air compressing mechanism when in a position of rest and a weight for opening said valve when the air compressing mechanism is in operation.

4. The combination with the bellows of a
10 blowing apparatus having an exhaust aperture, of a valve located within said bellows in position to be struck and closed by the downward movement of the top of the bellows for closing the exit aperture, and a weight
15 for opening said valve when the top of the bellows is raised, substantially as described.

5. In a blowing apparatus, the combination with the bellows and operating lever, of a plate
20 *l* pivoted on a horizontal axis with connections between said plate and bellows a pivotal connection between the lever and plate having a vertical axis with means for holding said lever in different positions of adjustment when
25 turned on said pivotal connection; substantially as described.

6. In a blowing apparatus, the combination

with the bellows, the frame on which the same is mounted, a squared shaft journaled in said frame and connections between said shaft and bellows for operating the same when
30 the shaft is oscillated, of a plate *l* carried by the shaft and having the segmental portion provided with apertures, the operating lever pivotally connected with the plate to swing in a horizontal plane and an adjustable con-
35 nection between the lever and segmental portion of the plate; substantially as described.

7. In a bellows for blowing apparatus, the combination with the expansible sections, of the blower head having the apertured ring
40 *F*⁵ and bottom plate *F*⁴, the valve chest *h*⁴ into which the aperture in the ring opens and the valve *k*⁴ secured on said chest; substantially as described.

In testimony whereof I have hereto set my
45 hand in the presence of the two subscribing witnesses.

CARL FRANZ SCHALLER.

Witnesses:

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A. SCHLESSING.