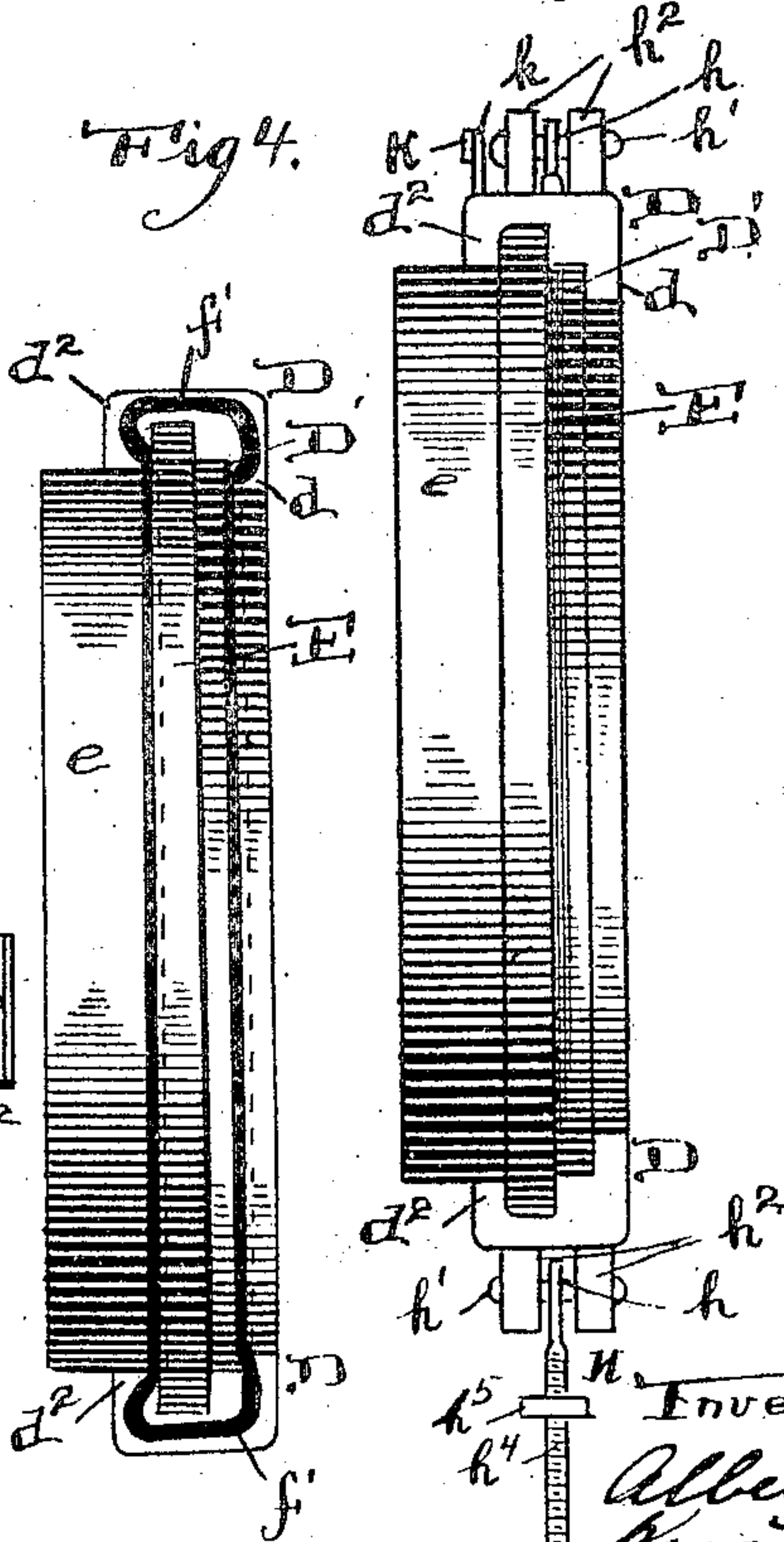
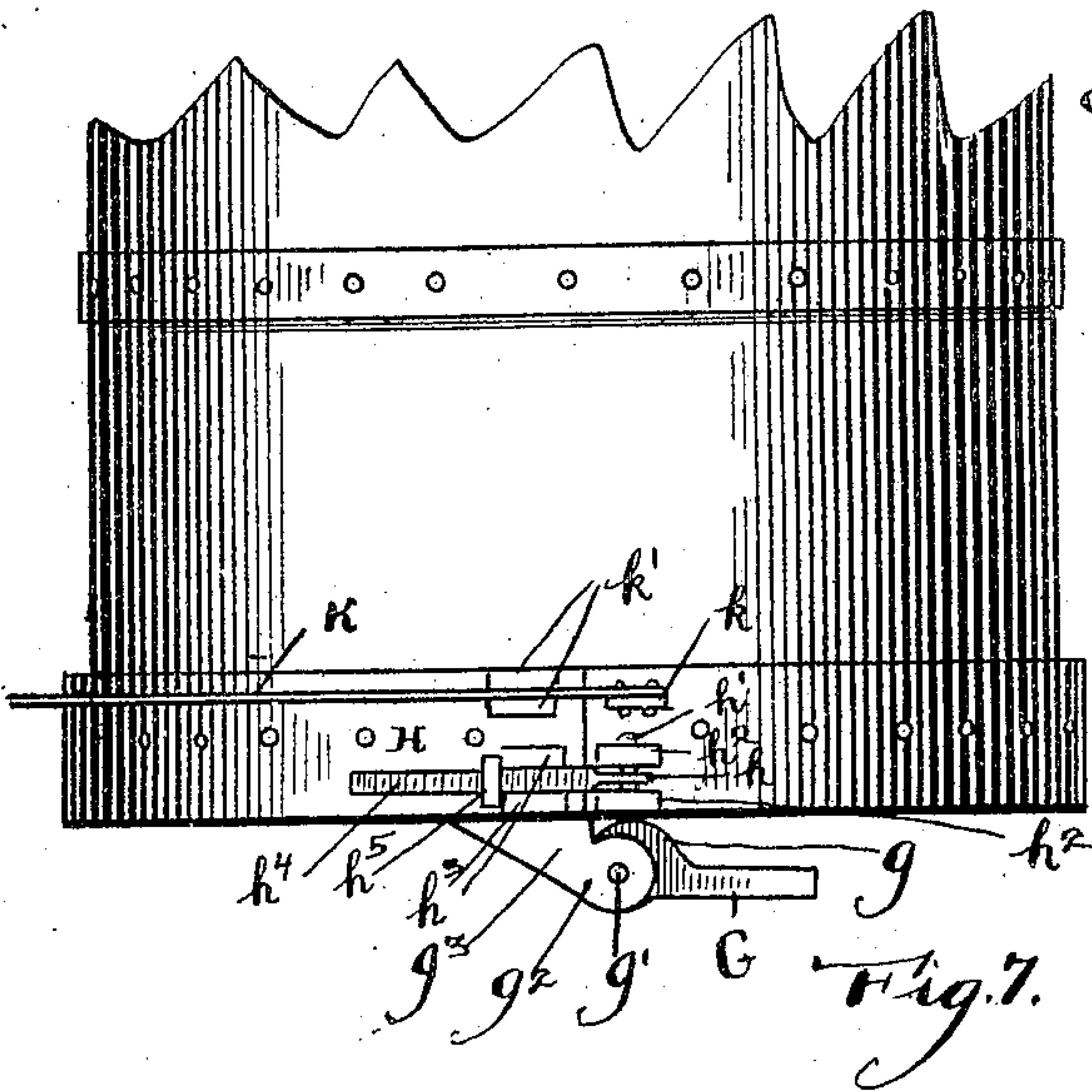
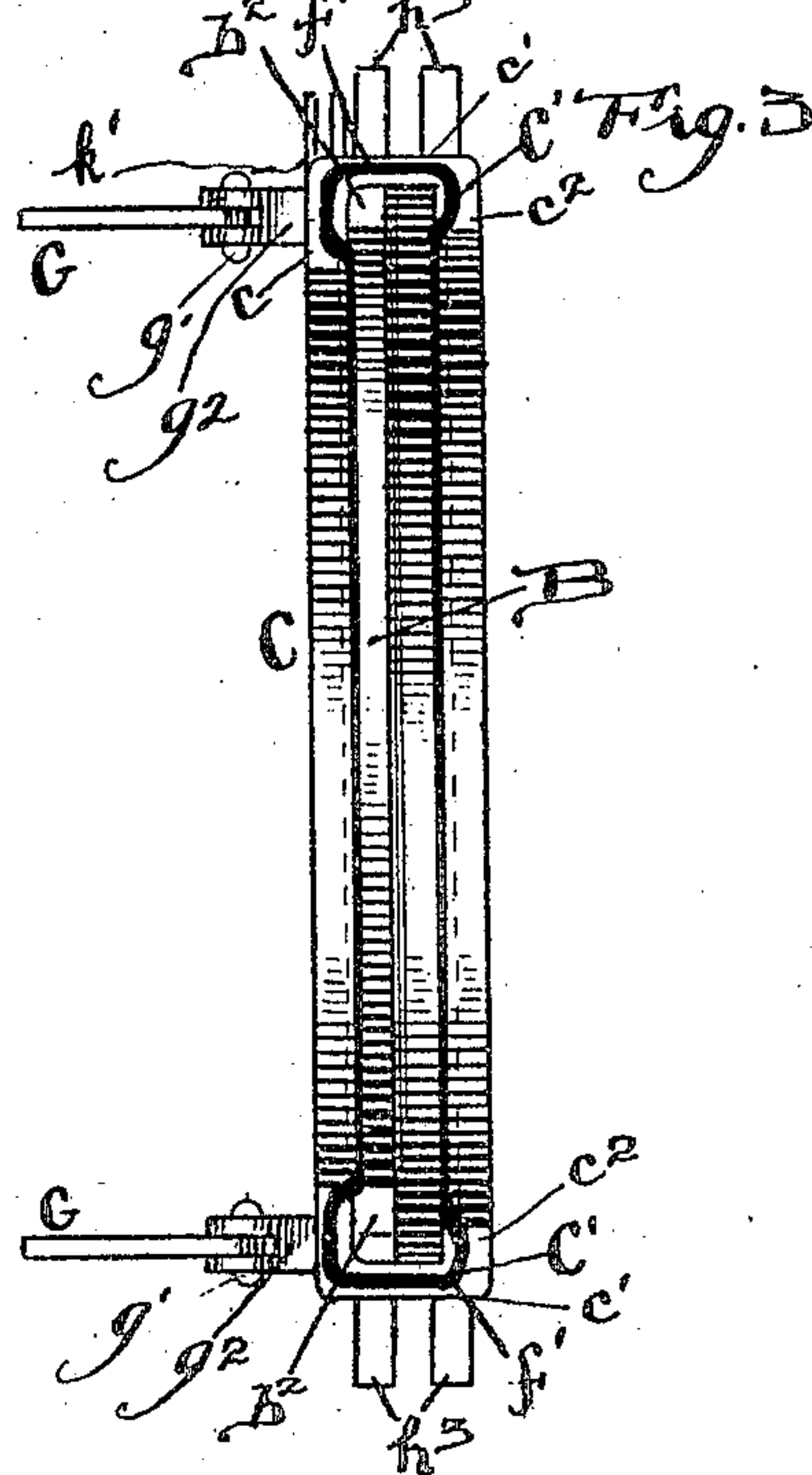
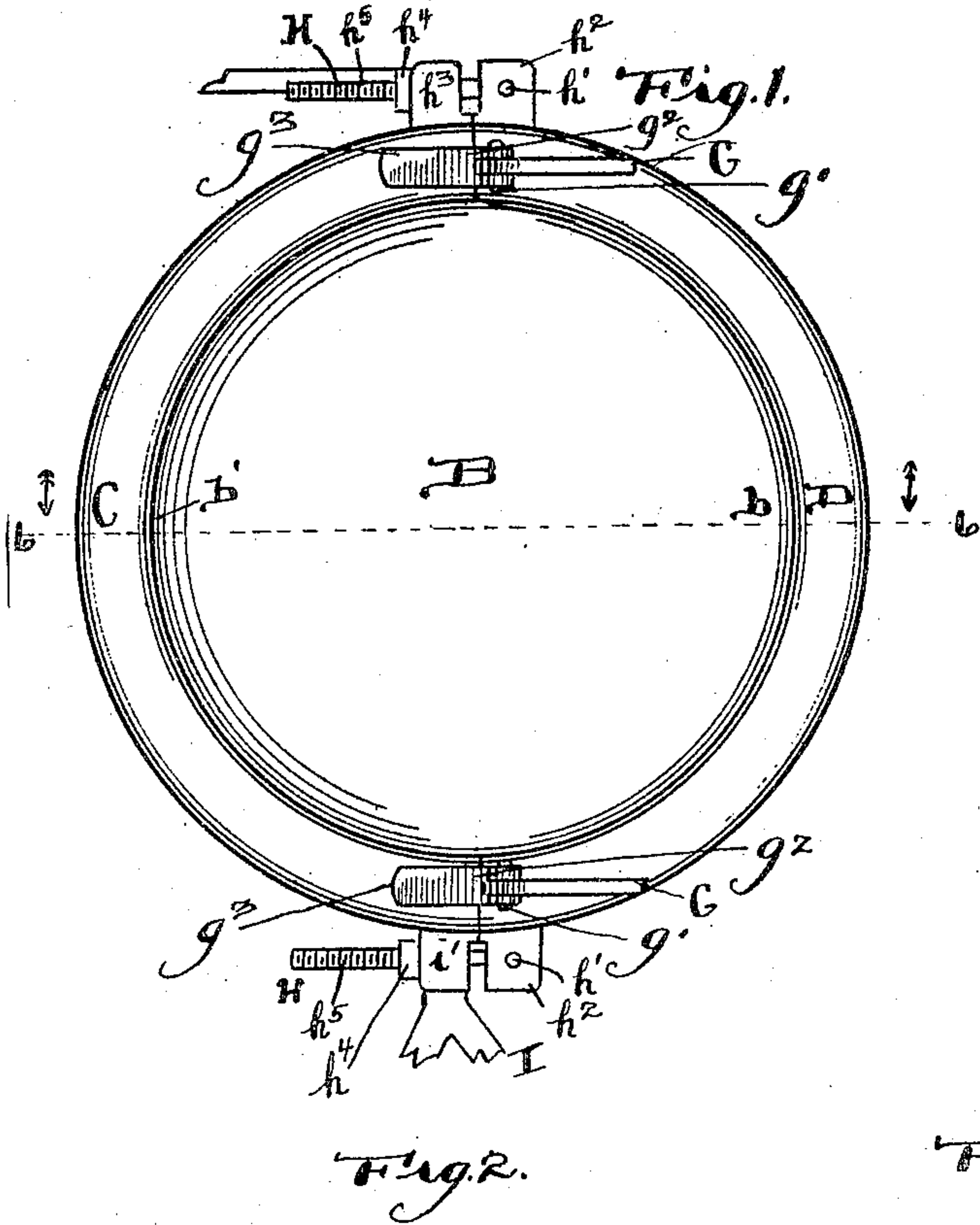


No. 798,136.

PATENTED AUG. 29, 1905.

A. KRAETZER.
HEAD FOR BOILERS AND TANKS.
APPLICATION FILED FEB. 20, 1905.

2 SHEETS—SHEET 1.



Witnesses:
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Dean W. Bond

Inventor.
Albert Kraetzer
By [Signature]
[Signature]

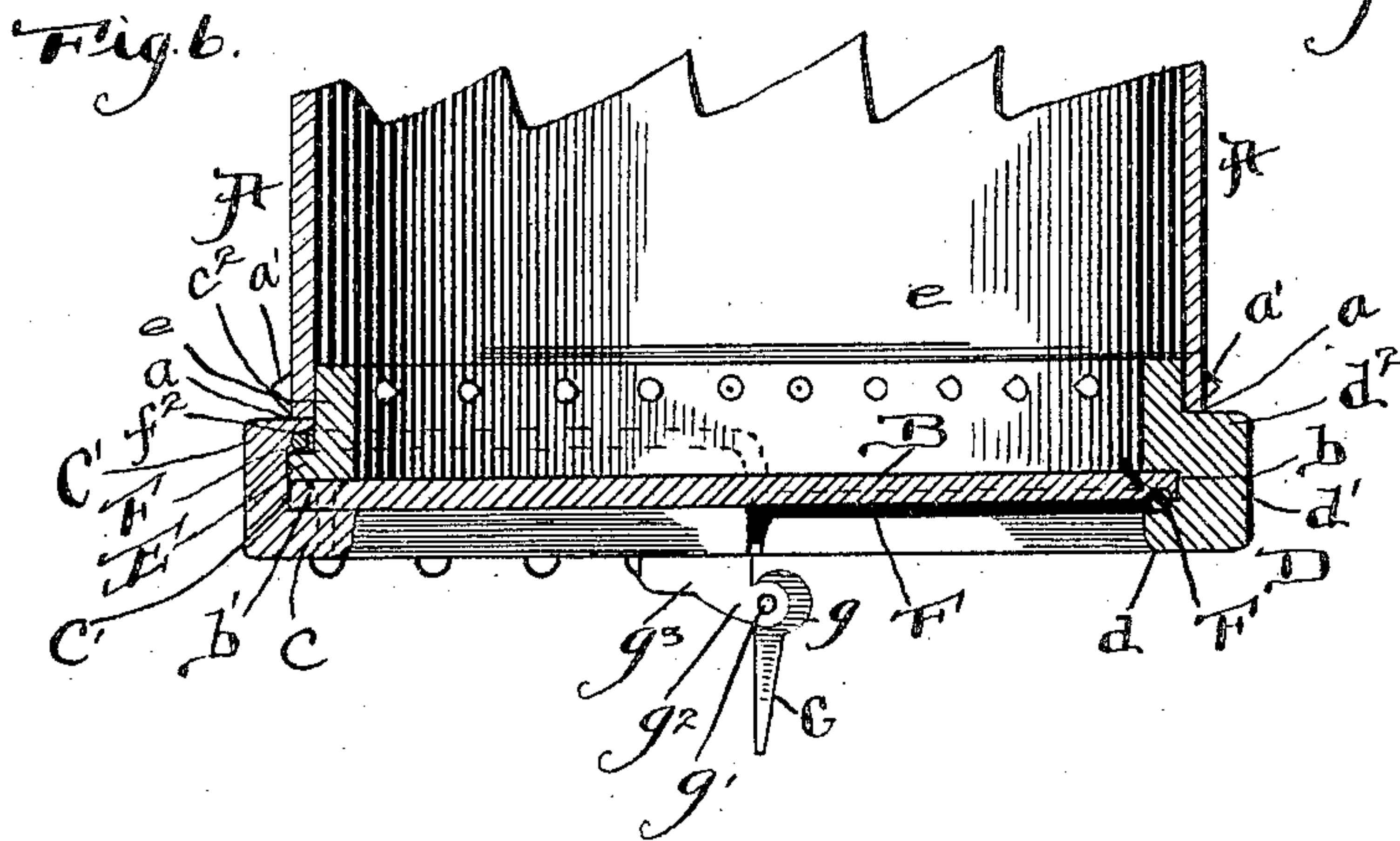
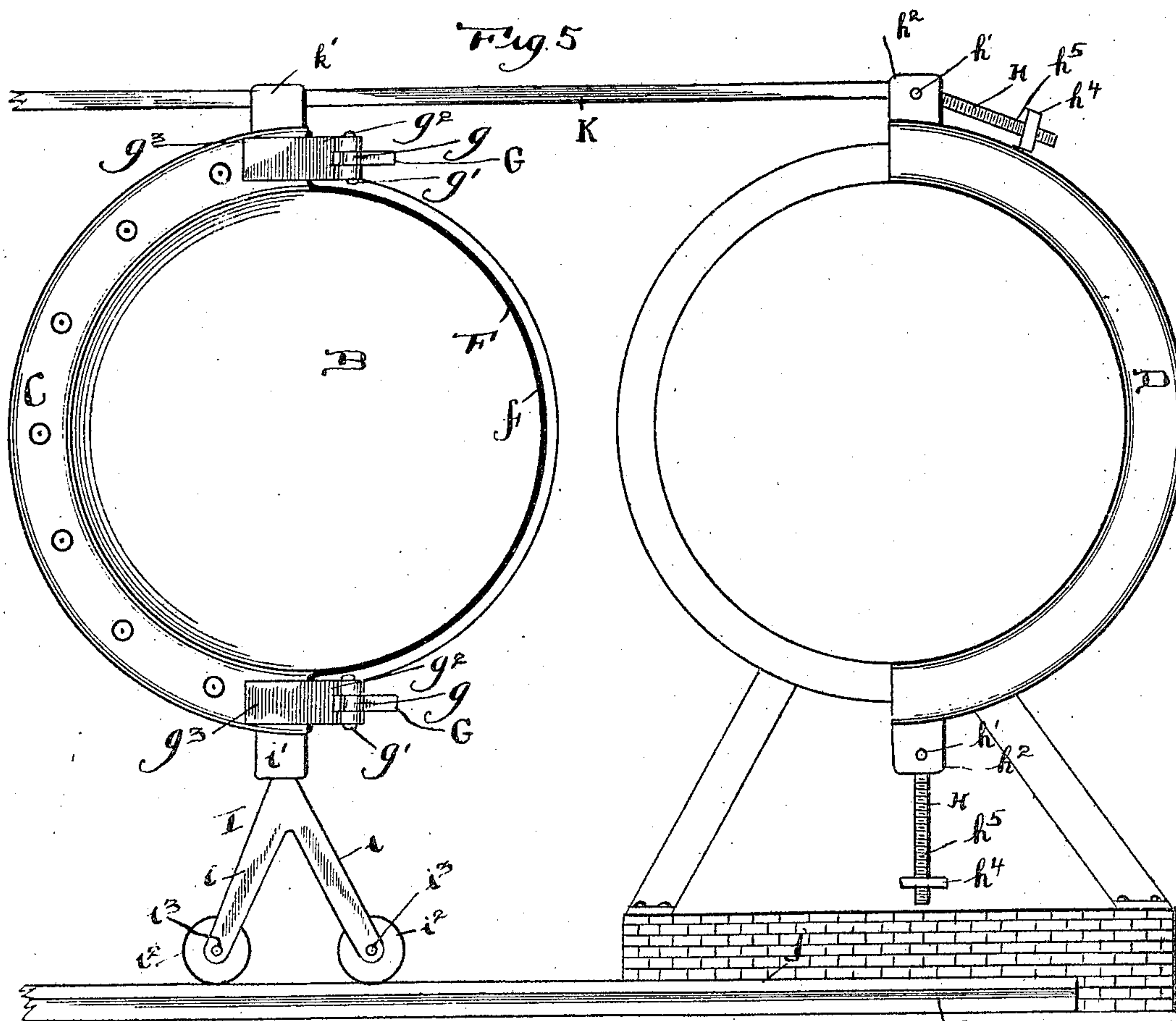
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2 SHEETS--SHEET 2.



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HEAD FOR BOILERS AND TANKS.

No. 798,136.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed February 20, 1905. Serial No. 246,618.

To all whom it may concern:

Be it known that I, ALBERT KRAETZER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Heads for Boilers and Tanks, of which the following is a specification.

The objects of the present invention are to construct a detachable head for boilers and tanks which can be applied and made pressure-tight by the action of the pressure itself without the use of bolts and which can be readily removed when required or necessary; to construct a head for a boiler or tank having on one-half of its periphery or circumference a rim or flange which coacts with a rim or flange on the end of the boiler or tank and into which the non-rimmed half of the head enters; to apply to a head for a boiler or tank a circumferential or peripheral rim extending one-half of the circumference of the head and to apply to the end of the boiler or tank a circumferential rim extending one-half around and adapted to have entered thereinto the non-rimmed half of the head; to furnish the head-rim and the boiler-rim with cams for clamping a packing adjacent to the edge of the head; to furnish clamping-bolts for the rim of the head and the rim of the boiler or tank end, by which the two rims are drawn snugly together at their abutting ends; to apply a packing on the head and its half-rim by means of which leakage of pressure is prevented when the head is in position; to support the head on carrying-wheels and a track for ready application to and removal from the end of the boiler or tank, and to improve generally the construction of the head and the manner of its application to the end of a boiler or tank.

The invention consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings, Figure 1 is an end elevation showing the frame for the carrying-wheels broken off and showing the head in its closed position; Fig. 2, a top or plan view of the end of the boiler with the head in closed position; Fig. 3, an edge elevation of the head and its rim, showing the packing; Fig. 4, an edge elevation of the rim attached to the end of the boiler or tank; Fig. 5, an end elevation showing the head removed from the end of the boiler or tank; Fig. 6, a cross-section on line 6 6 of Fig. 1 looking in the direction of the arrow, and Fig. 7 an edge elevation show-

ing the packing or gasket applied to the rim of the boiler end.

The boiler or tank A can be made of boiler-iron or other suitable material and of any usual form of construction. The end of the boiler or tank A is all that is deemed necessary to show, as the invention relates to the application of the head to the end of the boiler or tank, and the boiler has an end face *a*, which, as shown, is in a flat or straight plane. The head B can be made of any suitable material and is to be of the requisite diameter to furnish a closure for the end of the boiler. The head shown has one half, *b*, on a smaller circle than the other half, *b'*, the ends of the half or section *b'* furnishing shoulders or abutments *b''* at the point of juncture between the two halves or sections. The half or section *b'* has extending around its periphery a rim C, having on the outer side a flange *c*, by means of which and suitable bolts or rivets the rim is attached to the head. The rim C has a circumferential or peripheral wall or plate *c'* and on the inner edge has a lip or flange *c''*, leaving a space *C'* between the lip or flange *c''* and the face of the head B, and the end face of the flange *c*, wall *c'*, and lip *c''* are in the cross-plane of the shoulder or abutment *b''* of the head B, so as to present a flat face for the rim C and the shoulder or abutment *b''* of the head.

The end of the boiler has secured thereto a rim D, having a front lip or flange *d*, a peripheral wall or plate *d'*, and an inner lip or flange *d''*, extending from the inner face of which is a projecting flange E, extending from the rim D circumferentially and having a collar or wall *e* to enter, as shown in Fig. 6, the interior of the boiler or tank, with a space or channel *D'* between the flange *d* and the flange E, into which space or channel enters the edge of the half or section *b* of the head, while the flange E enters the space or channel *C'* of the rim C when the head is in its closing position. The rim D and the projecting flange E can be a single casting or piece, and the rim D is secured to the end of the boiler A by entering the collar or wall *e* into the end of the boiler, as shown in Fig. 6, for the end face *a* of the boiler or tank to abut against the side face of the lip or flange *d''*, and when inserted the rim is secured in place by rivets *a'*, passing through the collar or wall *e* and the wall of the boiler or tank, as shown in Fig. 6. Instead of having

the end of the boiler encircle the collar or wall e the collar or wall could be placed on the exterior end of the boiler or tank, in which arrangement the end face a of the boiler or tank would terminate in the plane of the outer face of the flange E, so as to present a straight face for the end of the boiler or tank and the flange.

It will be understood that the rim C occupies one-half of the circumference or diameter of the head and that the rim D also occupies one-half of the circumference or diameter of the head, so that when the head is in place, as shown in Figs. 1 and 6, the head B, with the rims C and D, furnish a closure or covering for the end of the boiler or tank.

A packing F, of any suitable material, is entered into a recess f adjacent to the edge of the half or section b of the head B, and at the juncture of the two halves or sections b and b' of the head the packing is carried across the end face of the rim C on both sides in a groove or recess f' , and after crossing the rim C the packing is entered into a groove f'' in the lip or flange c^2 , completing a continuance of the packing, so as to cover or embrace the full head, one half of the packing being in the face of the head and the other half of the packing being in the face of the lip or flange c^2 of the rim C, with the packing extending across the end face of the rim, as shown in Fig. 3. The packing projects on the half of the head to which it is applied and on the lip or flange c^2 and on the end faces of the rim C, so that when the head is in its closing position the packing will contact the flange d , the flange e , and the end faces of the rim D to make a tight joint against the escape of pressure. The space or channel D' is wider than the width of the head with the packing thereon, and the space or channel C' with the packing projecting from the lip or flange c^2 is wider than the flange E, so that in entering the head into position and withdrawing the head from position the packing will not be caught or torn out of place or disengaged in operating the head. The packing after the head has been entered into closing position is drawn outward, so as to impinge against the flange d and the flange E in the construction shown by means of a lever at the top and bottom of the head. Each lever G has a cam or eccentric g adjacent to the rim D, and each lever is mounted on a pin or pivot g' between ears g^2 on a block g^3 , attached to the rim C, so that when the lever is in the position shown in Fig. 6 the head can be slid into position, and when in position by turning the lever into the position shown in Figs. 1 and 2 the cam or eccentric g will press against the fixed rim D and draw the head B and the rim C outwardly, causing the packing F to impinge closely against the flange d and the flange E, making a close tight joint which is rendered pressure-tight against leakage when steam or

other fluid pressure is in the boiler or tank. The head is locked and held in its closed position with the packing in the end of the rim C compressed against the end of the rim D by means of threaded stems or bolts H at the top and bottom of the head. Each bolt H has an eye or loop h through which passes a pin or pivot h' , pivoting the stem or bolt between ears h^2 on the rim D, so that the stem or bolt can be swung for its body to lie between ears or lugs h^3 on the rim C, and when the body of the stem or bolt is between the ears h^3 by advancing the nut h^4 and the washer h^5 the ears h^3 at the top and bottom will be drawn toward the ears h^2 , closing the joint between the abutting ends of the rims C and D, as shown in Figs. 1 and 2. The loosening of the nut h^4 on the threaded stem or bolt H allows the bolt to be swung from between the ears h^3 and into the position shown in Fig. 5, and with the threaded stem or bolts H in the position shown in Fig. 5 and the tightening-levers G in the position shown in Fig. 6 the head can be carried away from the end of the boiler, as shown in Fig. 5, leaving the end of the boiler or tank open.

The head in the arrangement shown is supported from the under side by a frame I, consisting of two legs or standards i , extending down from a lug i' on the rim C, and each leg or standard i has a wheel i^2 mounted on a journal or pin i^3 at the lower end of the leg, as shown in Fig. 5. The wheels travel on a rail j , supported on a beam or girder J or otherwise, so as to be solid and firm. A guide-bar K is attached at one end to a lug or ear k on the rim D and extends longitudinally from the lug, passing between ears k' on the rim C, so that the top of the head is maintained in a straight line of travel when advanced into closing position or receded from the closing position. The head is traveled into position and out from position by the carrying-wheels i^2 and is given a direct line of travel by the rail j and the guide-bar K, and in traveling in either direction the half or section b is entered into and withdrawn from the rim D, and the flange E is entered into and withdrawn from the rim C, with a clearance between the parts by which the packing will not be disturbed or torn away.

The operation, briefly, is as follows: The head when in its withdrawn position is removed from the end of the boiler or tank, as shown in Fig. 5. The head is carried and supported by the wheels i^2 on the track or rail j , and in advancing the head toward the end of the boiler or tank to its closed position the half or section b , with the packing F thereon, enters the space D' of the rim D and the flange E enters the space C' of the rim C between the packing F on the lip c^2 and the face of the head. The advance of the head is continued until the abutting ends of the rims C and D meet, and when this position is reached the

levers G are turned to cause the cams or eccentrics to bear against the face of the rim D and draw the head and the rim C outwardly, causing the packing F to impinge against the flange d and the flange E, making a close joint between the head and the end of the boiler or tank. The head is secured in its closed position by turning or swinging the clamping stems or bolts H for the body of the bolts to pass between the ears h^3 , when by tightening or advancing the nuts h^4 the abutting ends of the rims C and D will be drawn together, completing the attachment of the head to the end of the boiler or tank for the admission of pressure to the boiler or tank. The head is withdrawn from its closed position by loosening the clamping stems or bolts H, disengaging these stem or bolts from the ears h^3 , and loosening the cam or eccentric levers G, leaving the head free and clear to be traveled back into its opened position, as shown in Fig. 5. It will be seen that the head of the present invention is readily and quickly placed into and withdrawn from position; that when in position it is made tight against the initial escape of pressure by means of the packing and the cam or eccentric lever; that with the admission of pressure to the boiler or tank such pressure acts against the head and forces it outward, further compressing the packing and insuring the making of a tight joint for the head, so that the pressure at once makes a tight joint around the head against the escape of pressure, the increase of pressure acting to make the joint more close and tight; that the head is locked and held in position by the swinging clamping stems or bolts against accidental withdrawal and the packing between the ends of the engaging rims on the head and the boiler end is compressed by the clamping stems or bolts, so as to insure a tight joint between the ends of the rims, and that by means of the carrying-wheels and track the head can be traveled forward and backward as required without any inconvenience or trouble.

The rim C could be formed with a flange corresponding to the flange E of the rim D, in which case the head could be made of boiler iron or steel and riveted or otherwise secured to the rim C and its extended flange. The packing F instead of being secured to the face of the head and to the face of the lip or flange c^2 could be secured in a groove or recess formed in the inner face of the lip or flange d , and a groove or recess formed in the end face of the rim D, and a groove or recess formed in the exterior face of the flange E, and this manner of applying the packing or gasket F is shown in Fig. 7. It will be seen that the turning of the cam or eccentric levers into position for the cams or eccentrics to bear against the face of the rim D will draw the head B and the lip or flange c^2 against the packing in the rim D and the

flange E, the same as described for the construction having the packing or gasket on the head and the rim C, making an initial closing for the joint around the head, so that the pressure will act and insure a tight joint around the head.

The locking stems or bolts serve more particularly to compress the packing between the ends of the rims C and D, as when the pressure is on the boiler or tank it will be impossible to move the head, even if the clamping or locking stems or bolts were not provided, as the pressure would hold the head securely in place, and instead of locking stems or bolts locking-cams could be applied mounted in ears on the rim D and engaging lugs or ears on the rim C, so as to tightly compress the packing between the ends of the rims.

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

1. A head having on one-half of its circumference a peripheral rim rearwardly projecting and provided with a channel in its inner face, in combination with a boiler or tank having at the end on one-half of its circumference a peripheral rim arranged in opposition to the peripheral rim of the head and forwardly projecting and provided with a channel on its inner face and having a flange laterally extending, for the channel in the head-rim to receive the lateral flange of the boiler-rim and for the channel of the boiler-rim to receive the non-rimmed edge of the head, substantially as described.

2. A head having on one-half of its circumference a peripheral rim rearwardly projecting and provided with a channel in its inner face, and a packing applied to the front face of the head and to the face of the rim rearwardly of the channel therein, in combination with a boiler or tank having at the end on one-half of its circumference a peripheral rim arranged in opposition to the peripheral rim of the head and forwardly projecting and provided with a channel on its inner face and having a flange laterally extending, for the channel in the head-rim to receive the lateral flange of the boiler-rim and for the channel of the boiler-rim to receive the non-rimmed edge of the head, with the packing in position to prevent leakage at the head, substantially as described.

3. A head having on one-half of its circumference a peripheral rim rearwardly projecting and provided with a channel in its inner face, and a packing applied to the front face of the head and to the face of the rim rearwardly of the channel therein, in combination with a boiler or tank having at the end on one-half of its circumference a peripheral rim arranged in opposition to the peripheral rim of the head and forwardly projecting and provided with a channel on its inner face and having a flange laterally extending, for the channel in the head-rim to receive the lateral

flange of the boiler-rim and for the channel of the boiler-rim to receive the non-rimmed edge of the head, with the packing in position to prevent leakage at the head, and means for moving the head outwardly to compress the packing, substantially as described.

4. A head having on one-half of its periphery a rim provided with a rearward lip and a space or channel, and a packing applied to the face of the head and to the face of the rearward lip on the inside, in combination with a boiler or tank having on one-half of its circumference a rim provided with a forward lip and a space or channel and with a peripheral flange completing the circle laterally from the rim rearward of the space or channel, whereby the head-rim receives in its space or channel the flange of the boiler-rim and the boiler-rim receives in its space or channel the edge of the head, with the packing in position to prevent leakage at the head, and levers having cam-faces and operating to outwardly draw the head to compress the packing, substantially as described.

5. A head having on one-half of its circumference a peripheral rim rearwardly projecting and provided with a channel in its inner face, and a packing applied to the front face of the head and to the face of the rim rearwardly of the channel therein, in combination with a boiler or tank having at the end on one-half of its circumference a peripheral rim arranged in opposition to the peripheral rim of the head and forwardly projecting and provided with a channel on its inner face and having a flange laterally extending, for the channel in the head-rim to receive the lateral flange of the boiler-rim and for the channel of the boiler-rim to receive the non-rimmed edge of the head, with the packing in position to prevent leakage at the head, and means for drawing together the abutting ends of the head and boiler rim, substantially as described.

6. A head having on one-half of its periphery a rim provided with a rearward lip and a space or channel, and a packing applied to the face of the head and to the face of the rearward lip on the inside, in combination with a boiler or tank having on one-half of its circumference a rim provided with a forward lip and a space or channel and with a peripheral flange completing the circle laterally from the rim rearward of the space or channel, whereby the head-rim receives in its space or channel the flange of the boiler-rim and the boiler-rim receives in its space or channel the edge of the head, with the packing in position to prevent leakage at the head, and clamping-stems operating to draw together the abutting ends of the head and boiler rim, substantially as described.

7. A head having on one-half of its periphery a rim provided with a rearward lip and a

space or channel, and a packing applied to the face of the head and to the face of the rearward lip on the inside, in combination with a boiler or tank having on one-half of its circumference a rim provided with a forward lip and a space or channel and with a peripheral flange completing the circle laterally from the rim rearward of the space or channel, whereby the head-rim receives in its space or channel the flange of the boiler-rim and the boiler-rim receives in its space or channel the edge of the head, with the packing in position to prevent leakage at the head, levers having cam-faces and operating to outwardly draw the head and compress the packing, and clamping-stems operating to draw together the abutting ends of the head and boiler rim, substantially as described.

8. A head having on one-half of its circumference an engaging rim on its periphery and a boiler having at the end on one-half of its circumference a peripheral engaging rim with a laterally-extending flange, in combination with a frame consisting of two inclined legs attached to the rim of the head, a carrying-wheel for the outer end of each inclined leg, and a fixed rail on which the carrying-wheels run, substantially as described.

9. A head having on one-half of its circumference an engaging rim on its periphery and a boiler having at the end on one-half of its circumference a peripheral engaging rim with a laterally-extending flange, in combination with a frame consisting of two inclined legs attached to the rim of the head, a carrying-wheel for the outer end of each inclined leg, a fixed rail on which the carrying-wheels run, and a guide-bar attached at one end to the rim of the boiler end and laterally extending and passing through an ear on the rim of the boiler-head, substantially as described.

10. A head provided on one-half of its circumference with an engaging rim rearwardly extending from the head and having in its inner face a channel, and a rim adapted to be attached to and embrace one-half of the end of a boiler and arranged in opposition to the head-rim when on the boiler end and forwardly projecting from the boiler end with a channel in its inner face and having a lateral-extending flange, for the flange to enter the channel in the head-rim and for the non-rimmed edge of the head to enter the channel in the boiler-rim, substantially as described.

11. A head having on one-half of its circumference a peripheral engaging rim with a channel in its inner face, a boiler having at the end on one-half of its circumference a peripheral engaging rim with a channel in its inner face, a boiler having at the end on one-half of its circumference an engaging rim with a channel in its inner face and having a flange laterally extending from the rim, and a packing carried by the head and its rim and com-

pressed by the action of the pressure within the boiler to make a tight joint for the head, substantially as described.

12. The combination of a boiler end, a rim 5 attached to the boiler end and forwardly projecting with a channel in its inner face and having a flange laterally extending, a head having on one-half of its circumference a peripheral rim rearwardly projecting with a 10 channel in its inner face, and a packing between the head and the rims of the head and boiler end and compressed by the pressure within the boiler against the boiler-head, substantially as described.

13. A head for closing the end of the boiler 15 and having on one-half of its circumference a peripheral rim rearwardly projecting and provided on its rear edge with an inwardly-turned rib, a boiler having at the end on one- 20 half of its circumference a rim forwardly pro-

jecting and provided on its forward end with an inwardly-turned lip, and a packing for the head compressed, between the inwardly-turned lip of the head and boiler rims and the boiler-head by the pressure inside of the boiler 25 against the head, substantially as described.

14. A head having on one-half of its circumference a peripheral engaging rim, a boiler having at its end on one-half of its circumference a peripheral engaging rim arranged 30 in opposition to the rim on the boiler-head, and a packing carried by the boiler-head and its rim and compressed, between the rims of the boiler-head and the boiler, by the pressure in the boiler against the boiler-head, substan- 35 tially as described.

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Witnesses:

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