No. 753,014. PATENTED FEB. 23, 1904.

E. C. THORSCHMIDT.

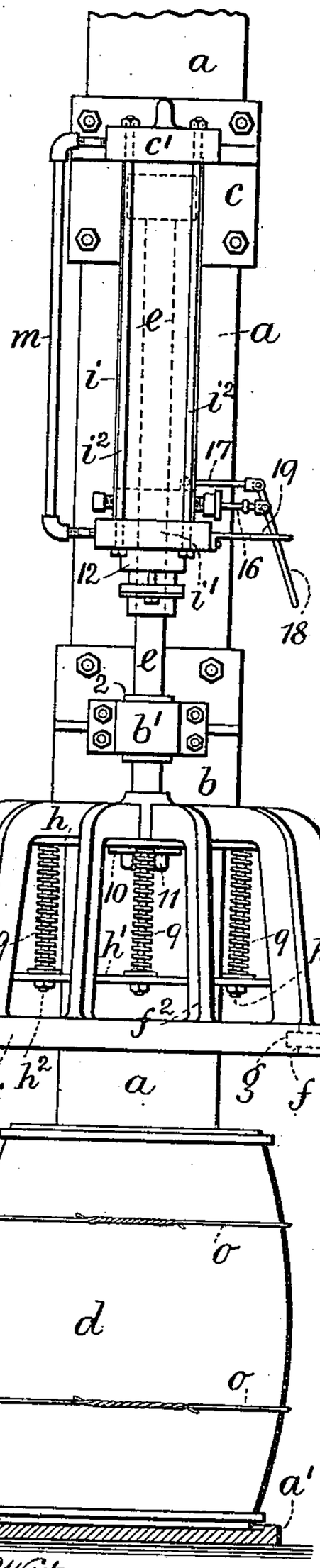
MACHINE FOR APPLYING BILGE HOOPS TO CASKS OR BARRELS.

APPLICATION FILED AUG. 31, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



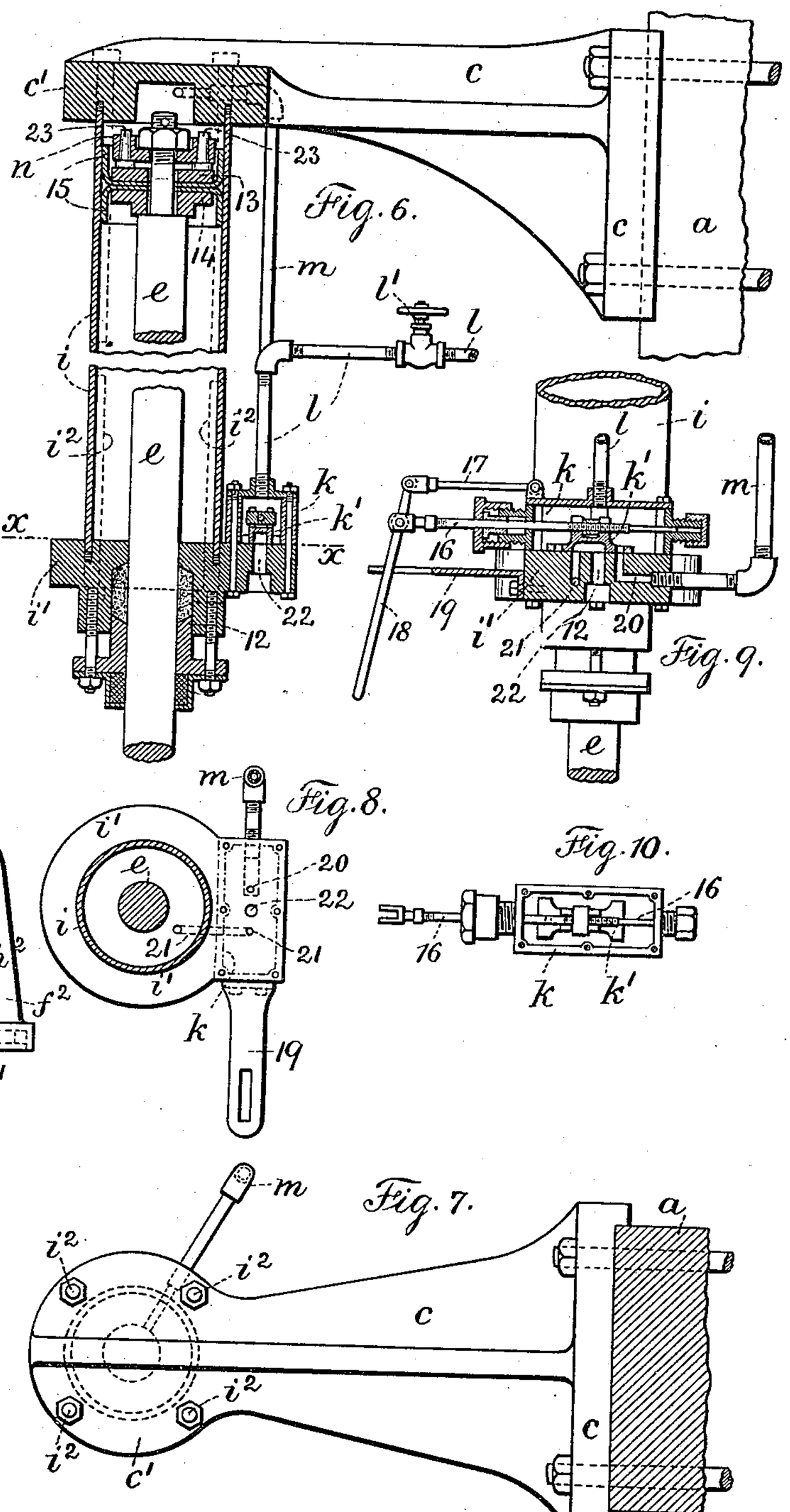


Fig. 6.

Fig. 9.

Fig. 8.

Fig. 10.

Fig. 7.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

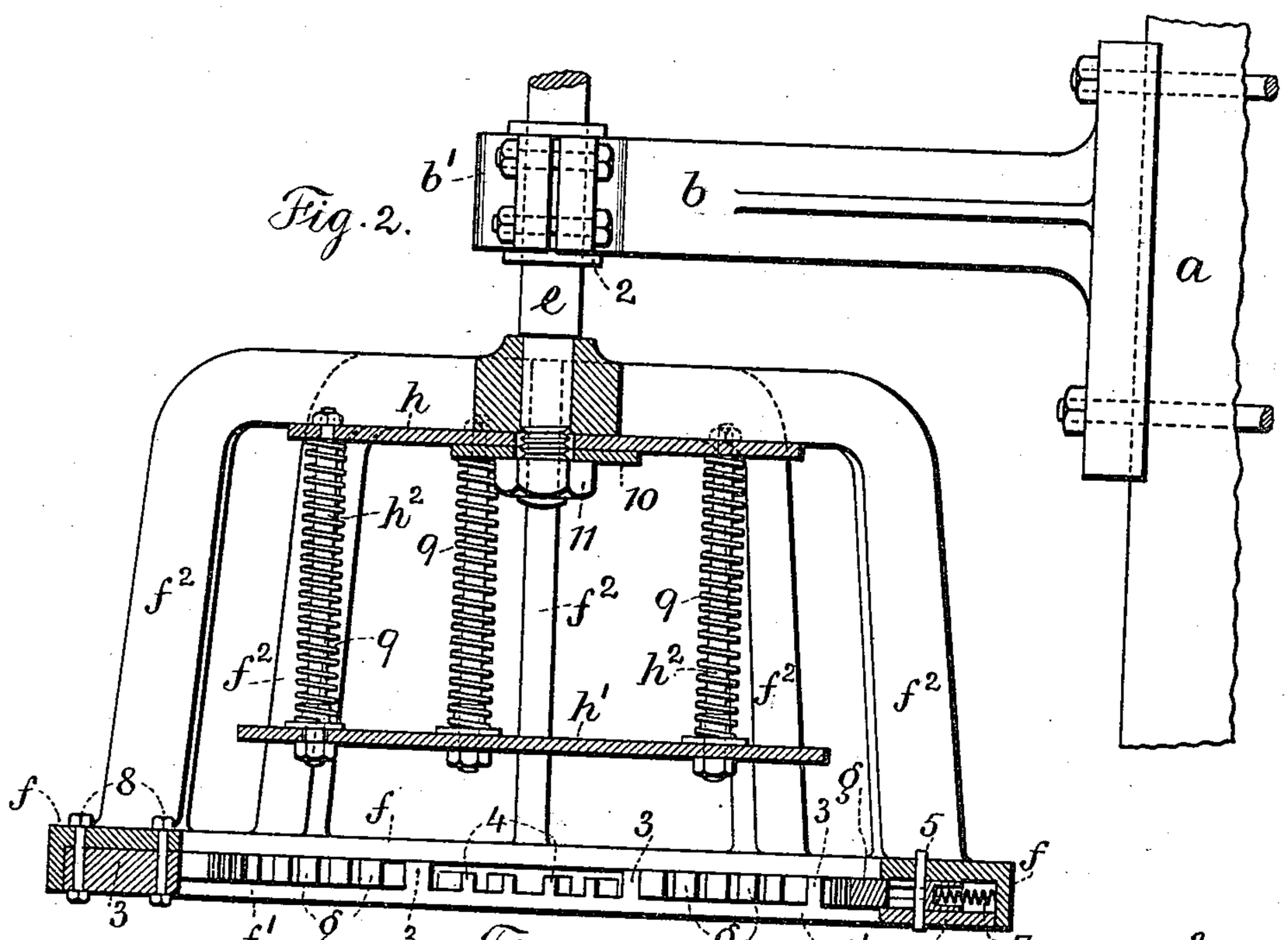


Fig. 3.

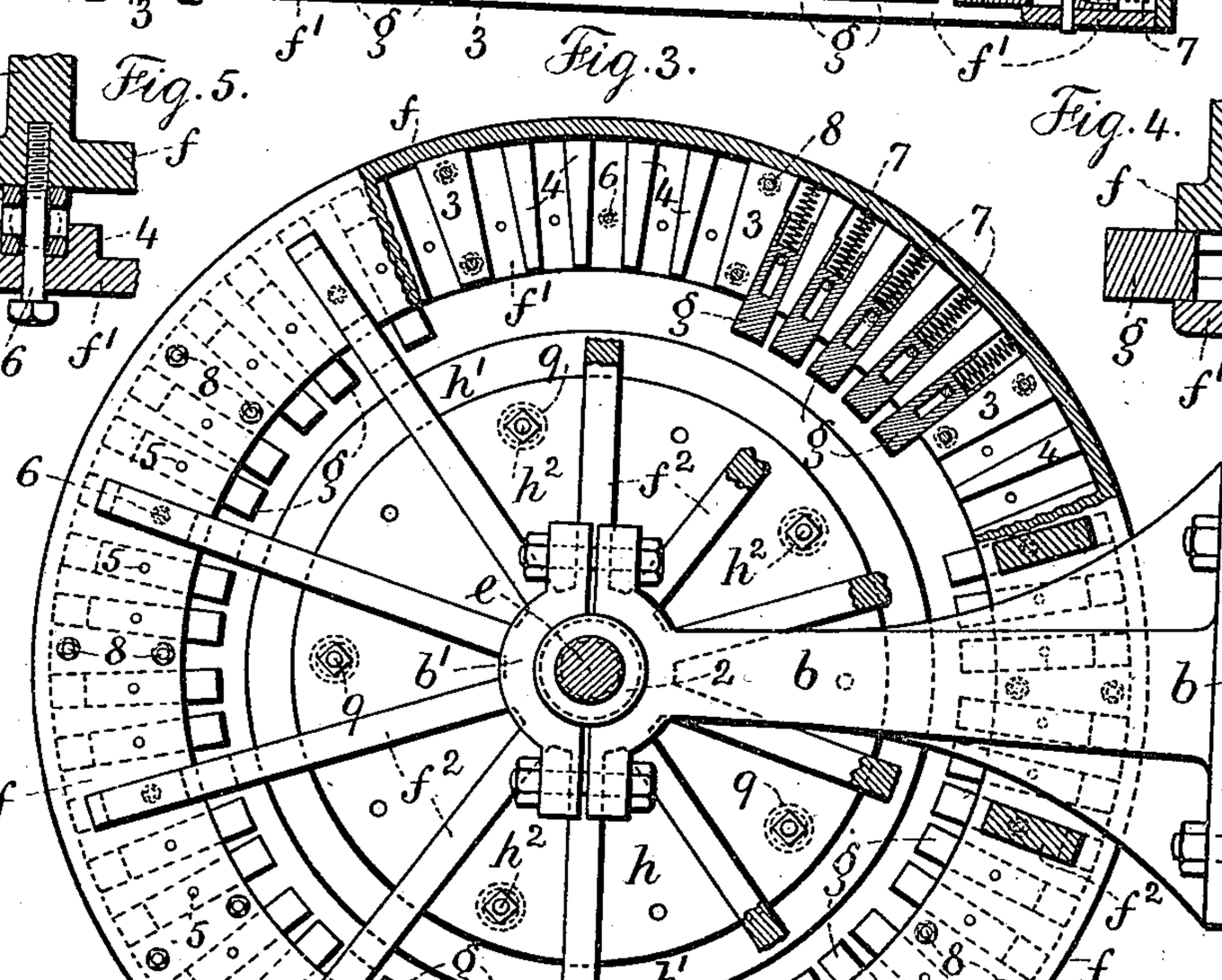
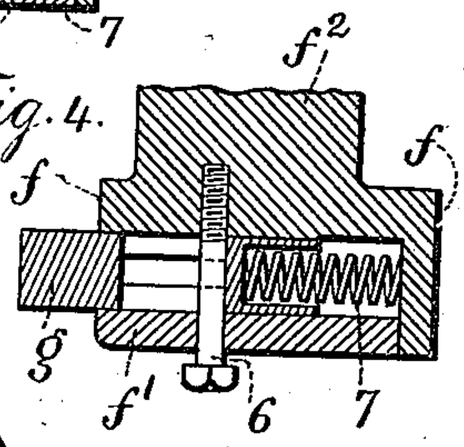


Fig. 5.

Fig. 4.



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No. 753,014.

Patented February 23, 1904.

UNITED STATES PATENT OFFICE.

ERNEST C. THORSCHMIDT, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF, AND ERASTUS H. BARNES, OF BROOKLYN, NEW YORK.

MACHINE FOR APPLYING BILGE-HOOPS TO CASKS OR BARRELS.

SPECIFICATION forming part of Letters Patent No. 753,014, dated February 23, 1904.

Application filed August 31, 1903. Serial No. 171,339. (No model.)

To all whom it may concern:

Be it known that I, ERNEST C. THORSCHMIDT, a citizen of the United States of America, residing in the borough of Brooklyn, county of Kings, city and State of New York, have invented a new and useful Improvement in Machines for Applying Bilge-Hoops to Casks and Barrels, of which the following is a specification.

My invention relates to a device for readily and quickly applying bilge-hoops to casks and barrels, especially bilge-hoops of heavy wire, which are first forced on one end and then on the other end of the cask or barrel.

In carrying out my invention I employ a suspended annulus, within which and in a horizontal plane is a circularly-arranged series of radially-placed spring-projected dogs extending within the inner diameter of the annulus. Pneumatic or other suitable power devices are employed for lowering said annulus over the cask or barrel into contact with the surface of the cask or barrel and into connection with the bilge-hoop and for then forcing the annulus and the said hoop down to place. These same power devices thereafter raise the said annulus, and other devices are preferably employed within the supports of the annulus and bearing upon the cask or barrel which yield as the annulus is forcing the bilge-hoop down to place and which hold down the cask or barrel as the annulus is raised, said devices having a spring construction for the performance of this function.

In the drawings, Figure 1 is an elevation representing my improvement with a cask or barrel and the bilge-hoop thereon. Fig. 2 is an elevation and vertical section through the suspended annulus and the devices adjacent thereto. Fig. 3 is a plan, partly in section, of the parts shown in Fig. 2, the section passing through the annulus so as to show the construction of the same with some of the dogs in position. Fig. 4 is a cross-section through the annulus, through one of the dogs, and one of the supporting-arms thereof. Fig. 5 is a partial vertical section at right angles to Fig. 4 and of the same parts. Fig. 6 is a vertical section and elevation of the pneumatic device shown in the upper part of Fig. 1 and at right angles to said parts. Fig. 7 is a plan of the parts shown in Fig. 6. Fig. 8 is a sectional plan at $x\ x$ of Fig. 6, the valve-case being removed. Fig. 9 is a vertical section through the valve-case at right angles to the position Fig. 6, and Fig. 10 is a plan of the valve-case shown in Fig. 9 with the cover removed. The parts shown in Figs. 2 to 4, inclusive, as a group and the parts shown in Figs. 6 to 10 as a second group are of exaggerated size in relation to the general elevation of the parts shown in Fig. 1.

An upright or standard a is provided and also a suitable base a', upon which the cask or barrel d is adapted to rest. The standard a is provided with brackets b c. The lower bracket b has a yoke b' and holds a sleeve-bearing 2 for the piston rod or plunger e, which is movable vertically therein. The suspended annulus includes a plate f, L-shaped in cross-section and preferably formed integral with the downturned arms f^2, at the union or center of which arms there is an aperture for the lower end of the piston-rod or plunger e, which is provided with a nut 11 for securing the same in position. The plate f' is also a part of the suspended annulus. The same fits within the L-shaped plate f, and upon its upper surface are radial ribs 3 4, the ribs 3 being deeper than the ribs 4, so that between said ribs are formed slideways for dogs g. The upper surface of the ribs 3 comes in contact with the under surface of the plate f when the annulus-plates are together, and said plates are secured together by bolts 8. The ribs 4, which are shallower than the ribs 3, do not come up to the under surface of the plate f. The dogs g, which are received in the recesses formed between said radial ribs, are preferably square in cross-section with longitudinal intersecting slots, the inner ends of said dogs being recessed for springs 7, the ends of which come in contact with the plate f and the dogs at the bases of

the recesses. Pins 5 and tap-bolts 6 pass through the slots of the dogs and occupy vertical positions, the pins 5 being employed solely through the plates $f\,f'$, while the tap-bolts 6 pass through the slots of such dogs as come directly beneath the downturned arms f^2. (See Figs. 4 and 5.) Said pins 5 and bolts 6 limit the projected position of the dogs g. This is the position shown in Figs. 2 to 5, inclusive, and from this position the dogs may move outward or away from the vertical center of the annulus and come more entirely within the spaces between the plates f and f'.

A plate h and a washer 10 come directly beneath the horizontal portions of the arms f^2, and they are held in position by the nut 11, which holds the annulus to the piston-rod or plunger e. A plate h', in a plane parallel with the plane of the plate h, comes beneath the plate h and within the area embraced by the arms f^2. These plates are connected by vertical rods h^2, the upper ends of which are shouldered and secured by nuts to the plate h, the lower ends of said vertical rods h^2 passing freely through the plate h', and there being springs 9 between said plates h and h', so as to maintain the plates normally distant from one another and to yield when pressure is applied to the under side of the plate h'. There are nuts on the lower ends of the vertical rods h^2 to retain the plates h' and springs 9.

The upper bracket c is provided with a head c', having in its under surface a central aperture and an annular groove concentric therewith. A sheet-metal cylinder i at its upper end is received in the annular groove of said head c' and at its lower end in a corresponding annular groove in the cylinder-head i'', the heads c' and i'' being connected into a firm structure with the cylinder i by the tie-rods i^2. The upper end of the piston-rod or plunger e passes through the cylinder-head i'', and the said head is provided with a stuffing-box 12 for said piston-rod. The piston proper, which is secured upon the upper end of the piston-rod e within the cylinder, is composed of two disks 13 and 14, between which are cup-leathers 15, preferably extending in opposite directions, so as to form a tight joint. A disk n is also secured at the inner reduced end of the piston-rod e adjacent to the disk 13 and by the same screw stem and nut, and there are buffers 23, preferably of rubber, which pass through the disk n and are adapted to come into contact with the inner surface of the bracket-head c', so as to reduce to a minimum any concussion that may arise from the upward movement of the piston-rod and piston striking the said bracket-head.

At one side of the cylinder i the cylinder-head i'' is extended so as to receive a valve-case k and valve k' therein and which moves over the surface of the cylinder-head. In this cylinder-head at this place there are ports 20 21 22. The port 20 connects with the pipe m, which pipe extends upward and opens into the central aperture in the under surface of the bracket-head c'. The port 21 communicates with the valve-case at one end and with the interior of the cylinder i at its lower end, and the port 22 is an exhaust-port, simply passing through the cylinder-head i''. The valve-rod 16, passing through the valve-case, is preferably guided at its respective ends and connected to the valve k', and to its outer end is connected a hand-lever 18, pivoted to the end of a stay-rod 17 and passing through the slot of a plate 19, adapted to limit the movements thereof.

I provide a pipe l for fluid under pressure from any source of supply and a valve l' for regulating the same. The pipe l opens into the valve-case for the admission of fluid under pressure, preferably compressed air, which in the position Figs. 6 and 9 passes by the port 20, the pipe m, to the upper end of the cylinder i against the upper end of the piston to force the same and the piston-rod e downward, carrying with them the suspended annulus for the operation of the same. In this position the valve k' opens communications between the port 21 and the exhaust-port 22 for the exit of air in the lower portion of the cylinder i. When the hand-lever 18 is shifted to its opposite position, the valve k' is moved so as to connect the port 20 and the exhaust-port 22 and open up communication between the valve-case and the port 21, so that the fluid under pressure then passes through the port 21 into the lower end of the cylinder i to raise the piston, the piston-rod e, and the suspended annulus structure above the cask or barrel in the position shown in Fig. 1.

With the downward movement of the suspended annulus, as hereinbefore described, the plate h' comes into contact with the top of the cask or barrel. The dogs of the annulus come into contact with the sides of the barrel as the annulus passes down over the cask or barrel. These dogs yield with the tapering surface of the barrel with their downward movement until they come into contact with the bilge-hoop o, that has been placed by hand over the cask or barrel. The further movement causes the dogs to push the bilge-hoop down over the surface of the barrel, compressing together the staves of the cask or barrel and holding the same under strong pressure and tension, and so forcing the bilge-hoop down to the desired position, a position which is preferably predetermined. In this movement the springs 9 yield and the rods h^2 pass through the plate h' down into the barrel. As the suspended annulus is raised with the movement of the parts in the

opposite direction the springs 9 expand and still hold the plate h' in contact with the upper end of the cask or barrel, and so hold the barrel to its seat upon the base a', and in so doing overcome any liability that there may be in the suspended annulus to raise the cask or barrel off said base a', this holding function being progressively maintained by said structure until the suspended annulus is clear of the cask or barrel and the springs 9 have fully expanded, so as to impart to the plate h' the limit of its downward movement.

The cask or barrel is to be reversed so as to place the second bilge-hoop o in position, the movements hereinbefore described being repeated.

The advantage of making the dogs g square and providing them with intersecting slots is so that they may be turned over or given a quarter-rotation when so worn by use that they have become loose, as then new surfaces of the original dimensions are brought into play.

I claim as my invention—

1. In a machine for applying bilge-hoops to casks or barrels, the combination with a standard, a vertically-moving piston-rod or plunger and means for actuating the same, of an annulus structure comprising adjacent ring plates with downturned arms integral with one of said plates, and said plates connected to and suspended from the lower end of the piston-rod or plunger, and a circularly-arranged series of outwardly-yielding devices located between said plates.

2. In a machine for applying bilge-hoops to casks or barrels, the combination with a standard, a vertically-moving piston-rod or plunger and means for actuating the same, of an annulus structure comprising adjacent ring plates with downturned arms integral with one of said plates, and said plates connected to and suspended from the lower end of the piston-rod or plunger, a circularly-arranged series of outwardly-yielding devices located between the said plates, and other yielding devices within the downturned arms of the annular structure adapted to engage the uppermost end of the cask or barrel and hold the same in position against the return and disengaging movement of the annular structure.

3. In a machine for applying bilge-hoops to casks or barrels, the combination with a standard, a vertically-movable piston-rod or plunger and means for actuating the same, of an annulus structure comprising adjacent ring plates with downturned arms integral with one of said plates and said plates connected to and suspended from the lower end of the piston-rod or plunger, a circularly-arranged series of radially-placed spring-projected dogs extending within the inner diameter of the annulus and located between said plates, substantially as set forth.

4. In a machine for applying bilge-hoops to casks or barrels, the combination with a standard, a vertically-movable piston-rod or plunger and means for actuating the same, of an annulus structure comprising adjacent ring plates with downturned arms integral with one of said plates and said plates connected to and suspended from the lower end of the piston-rod or plunger, a circularly-arranged series of radially-placed spring-projected dogs extending within the inner diameter of the annulus and located between said plates, and a yielding structure secured within the area of the arms of the annulus structure and connected thereto at the lower end of the piston-rod or plunger and comprising two parallel plates with a series of vertically-placed rods connecting the same and interposed springs about said rods, substantially as set forth.

5. In a machine for applying bilge-hoops to casks or barrels, the combination with a standard, a vertically-movable piston-rod or plunger and means for actuating the same, a series of downturned arms f^2 centrally connected to and suspended from the lower end of the piston-rod or plunger, an L-shaped annulus-plate preferably formed integral with said arms and occupying a horizontal plane, an annulus-plate received within the aforesaid L-shaped plate and having in its upper surface a series of radial ribs between which are radial grooves, the ribs being tapering and the grooves parallel-sided and a circularly-arranged series of dogs received within said grooves, springs for projecting said dogs and means for limiting the extent of said projection.

6. In a machine for applying bilge-hoops to casks or barrels, the combination with an L-shaped annulus-plate f and a series of arms f^2, of an annulus-plate f' received within the plate f, bolts for removably connecting the said parts, a series of tapering radial ribs 3 rising from the surface of the plate f' to contact with the under side of the plate f, a series of intermediate shallow tapering ribs 4 between the ribs 3 so that between the several ribs there are parallel-sided grooves forming slideways, dogs g adapted to be received in said grooves and which are preferably square in cross-section and provided with longitudinal intersecting slots and recessed inner ends, pins passing through the slots of said dogs to limit their projected position and springs between the parts of the plates $f\,f'$ and at one end bearing in the recesses of the dogs for projecting the dogs, substantially as set forth.

7. In a machine for applying bilge-hoops to casks or barrels, the combination with a series of downturned arms and annulus-plates connected thereto, of a plate h and washer 10 having central apertures, a piston-rod or plunger

passing through said apertures and through an aperture in the center of the downturned arms and a nut 11 for securing said parts together, a plate h' parallel with the plate h, a series of rods h^2 passing freely through the plate h' and having shoulders and reduced portions that respectively come against and pass through the plate h, clamping-nuts on the respective ends of the rods h^2 and springs surrounding the rods h^2 and applying tension to normally keep the plates h h' separate, substantially as set forth.

Signed by me this 25th day of August, 1903.

ERNEST C. THORSCHMIDT.

Witnesses:
A. H. BERRELL,
S. T. HAVILAND.