(No Model.)

P. T. PERKINS.

PUMP.

No. 287,461. Patented Oct. 30, 1883.

FIG-1-

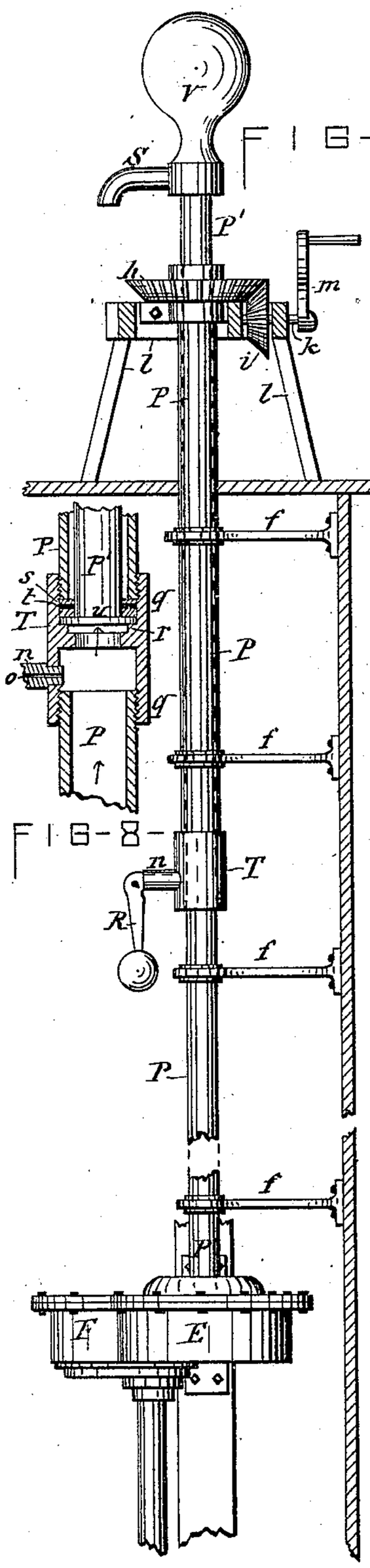


FIG-2-

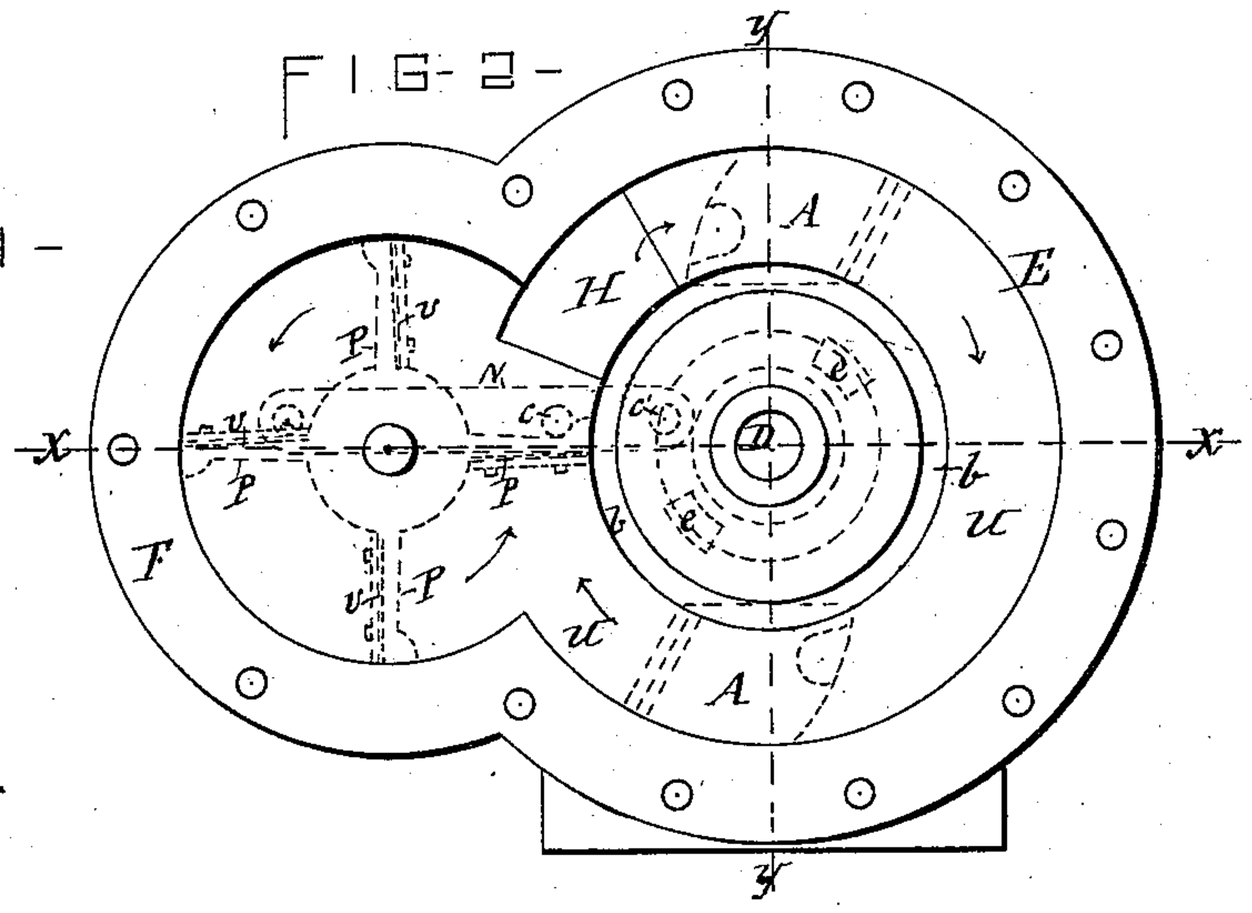


FIG-3-

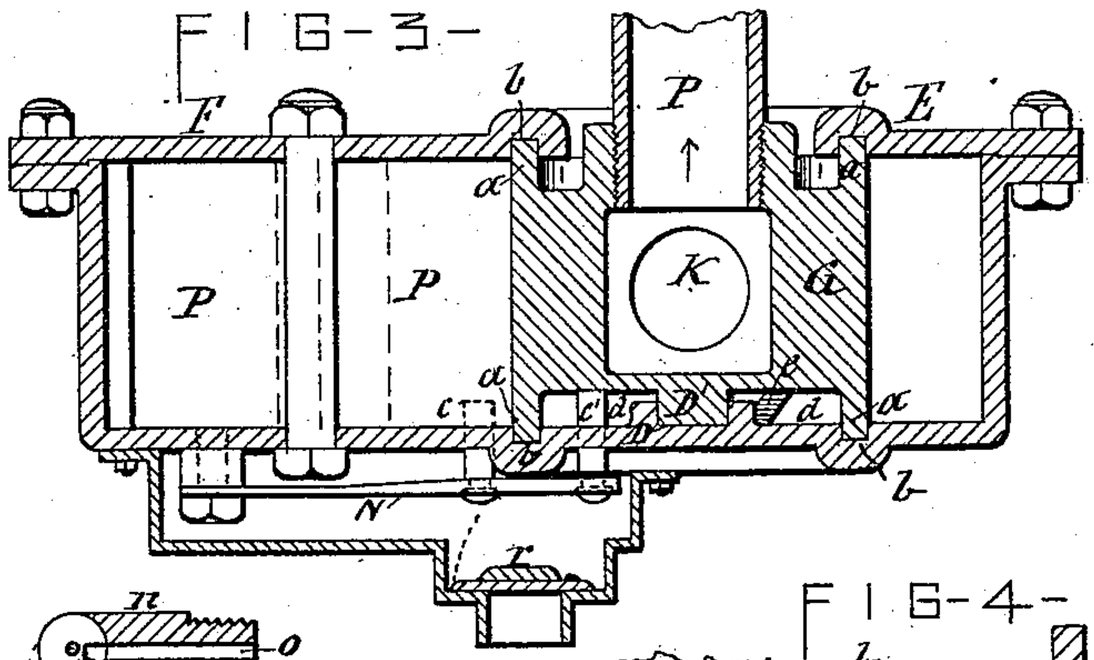


FIG-8-

FIG-7-

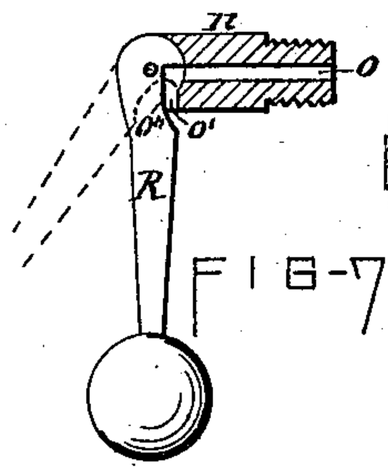


FIG-4-

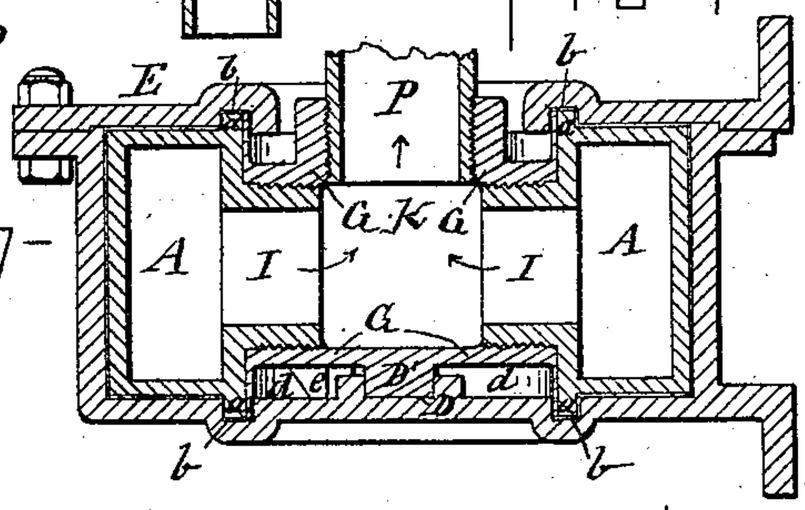


FIG-5-

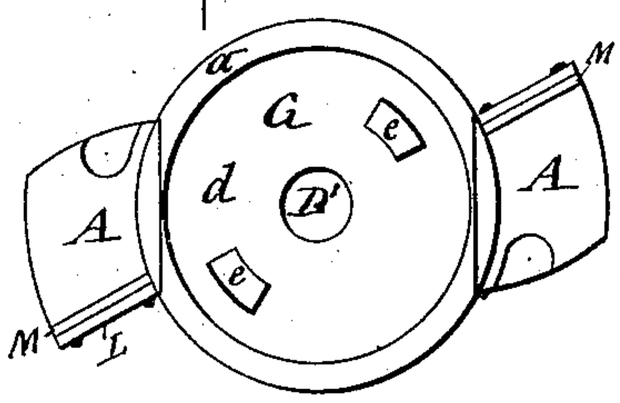
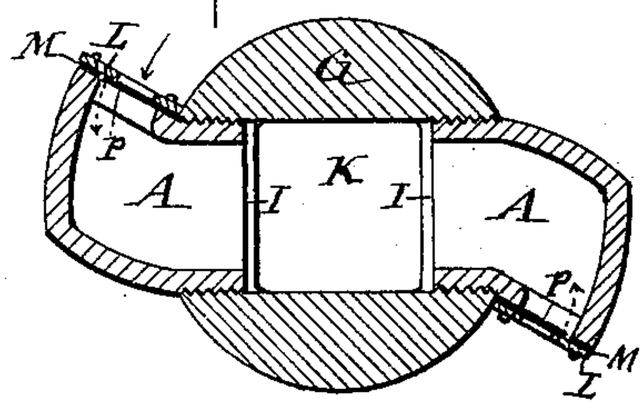


FIG-6-



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UNITED STATES PATENT OFFICE.

PARDON T. PERKINS, OF OSWEGO, NEW YORK.

PUMP.

SPECIFICATION forming part of Letters Patent No. 287,461, dated October 30, 1883.

Application filed January 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, PARDON T. PERKINS, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful Improvements in Pumps, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel construction of a rotary pump exerting a centripetal force on the water to be drawn or propelled; and it also consists in certain auxiliary devices connected with said pump for transmitting thereto the requisite power, and for protecting it against frost, all as hereinafter more fully described, and set forth in the claims.

In the annexed drawings, Figure 1 is an elevation of my improved pump, with portions broken away to better illustrate the connections of the stationary discharge-pipe with the rotary pipe. Fig. 2 is a plan view of the pump-case with the cover thereof removed and the pump mechanism shown by dotted lines, to illustrate the construction of the interior bottom of the case. Figs. 3 and 4 are transverse sections taken on lines *x x* and *y y*, respectively, in Fig. 2. Fig. 5 is an inverted plan view of the rotary hub and its buckets. Fig. 6 is a horizontal transverse section of the same. Fig. 7 is a detail view of the automatic vent, and Fig. 8 is a detail view of the coupling of the stationary discharge-pipe with the rotary eduction-pipe.

Similar letters of reference indicate corresponding parts.

E represents a circular metallic case joined with another smaller circular metallic case, F, which is on the same plane, and has its periphery intersecting that of the case E, so that the interiors of the two cases communicate with each other. These cases are placed horizontally, either submerged in the water to be pumped or in an elevated position, as illustrated in Fig. 1 of the drawings, to which latter position the following description will be chiefly confined. The interior of the case E, which constitutes the main case or shell of the pump, is provided in the center of the bottom with a socket or step, D, in which is journaled a gudgeon, D′, fixed to the under side of a rotary hub, G, the diameter of which is considerably smaller than that of the case, so as to leave around said hub an annular channel, U. The two ends or top and bottom faces of the hub G are each provided with a circumferential rim or flange, *a*, which is fitted water-tight in a corresponding annular groove, *b*, in the adjacent face of the case E. In the vicinity of the junction of the two cases E and F the bottom of the case E is provided with the induction-port H, arranged in the annular water-passage U, formed around the hub G, as before described. Said induction-port is to be provided with a suitable valve, *r*, in case the pump-chamber is arranged above the surface of the water. The hub G is formed with radial or diametrical channels I I, and with an axial channel, K, extending from the radial channels through the top of the hub. The radial channels I communicate with hollow arms or buckets A A, which are fitted closely in the annular water-channel U, and are firmly secured to the periphery of the hub, either by casting them thereon or by providing the buckets with a screw-threaded nipple and screwing them into the channels I of the hub, screw-threaded correspondingly for that purpose, as illustrated in Figs. 4 and 6 of the drawings.

In order to insure a perfectly water-tight fit of the buckets on the interior of the case E, I face the mouth or open end of the bucket with a rubber or leather packing-disk, M, secured thereto by a brass plate, L, placed over the said disk and fastened by bolts tapped in the face of the bucket, said plate having a central opening for the entrance of water into the bucket. An inwardly-opening valve, *p*, is placed over the mouth of the bucket—said valve may be formed in the usual manner—by making in the packing-disk M incisions extending around three sides of the mouth of the buckets, and in such a manner as to allow the released portion of the disk to lap onto the outer plate, L, which projects somewhat over the edge of said mouth.

In the supplemental case F is a rotary gate, B, consisting of wings or plates extending radially from a hub pivoted in the center of the case. Said gate-plates are fitted closely to the interior of the case, and have secured to their back a packing-disk, *v*, by means of a plate placed over said disk and bolted to the gate

plates or wings, as illustrated by dotted lines in Fig. 2 of the drawings. The packing-disks projecting at the edges of the wings insure a water-tight joint around the same.

To the under side of the case F is attached one end of a spring-bar, N, the free end of which reaches under the main case E, and is provided thereat with two pins, *c c'*, which project through the bottom of the case E, so as to bring one of said pins, *c*, in the path of the gate-plates B in the vicinity of the induction-port H. The other pin, *c'*, comes into an annular cavity, *d*, which is formed on the under side of the hub G, between the peripheral flange *a* and central gudgeon, D', thereof. In the aforesaid annular cavity *d* the hub G is provided with cams or beveled bosses *e*, arranged in such positions in relation to the bucket A that when the hub G is rotated the cam *e* will encounter the protruding pin *c'*, and thereby push both pins *c c'* out of the case in time to liberate the gate-wing B, and allow the same and the bucket A to freely advance in their respective cases. The operation of the pump is as follows: The hub G being rotated in the direction toward which the mouth of the bucket faces, and as indicated by arrows in the annexed drawings, creates a vacuum at the rear of the bucket, and thus draws the water through the induction-port H. The succeeding bucket A drives the water around the annular channel U of the case E, and the pressure of the propelled water throws one of the gate-wings B against the protruding pin *c*, which holds said wing, and thereby presents a barrier to the passage of the water directly back of the induction-port H. The water thus arrested is forced into the bucket or hollow arm of the hub G, and through the radial channel I and axial channel K thereof, from which latter it enters the exit or discharge pipe P, connected therewith, as hereinafter described. In the close approach of the bucket to the gate the cam *e* encounters the pin *c'*, and thereby releases the gate B, and allows the bucket to proceed and repeat its operation on the water, which has in the meantime entered through the induction-port H. As one gate-wing is released, another is swung around and arrested by the protruding pin *c* in time to stop the flow of water propelled by the bucket following the one aforesaid.

It will be observed that in the operation of the pump the supplemental chamber or case F becomes filled with water, and the gate-wings are thus relieved of the shock incident to collision with the stop-pin *c*.

The described pump mechanism receives its motion by the following instrumentalities: The discharge-pipe P is made to serve as the driving-shaft, and is therefore firmly secured to the hub G by screwing the end of said pipe into the axial channel K of the hub, which is screw-threaded for that purpose. When the pump is applied to a well, as illustrated in Fig. 1 of the drawings, the pipe P is extended up above the top of the well, where it is journaled in a suitable box secured to a suitable frame, *l*. A miter-gear, *h*, attached to the end of the pipe P, meshes in a miter-pinion, *i*, attached to a horizontal shaft, *k*, which is mounted in suitable bearings on the frame *l*, and is provided either with a crank, *m*, or other suitable means for turning said shaft *k*. By means of bearings *f f*, attached to a post or other support fastened on the side of the well, the pipe P is steadied at different points of its length. To protect the pipe P from frost, said pipe is provided at a proper distance below the top of the well with a coupling, T, in the form of a sleeve, having intermediately screw-threaded ends *q q*, in which are screwed the ends of the lower and upper sections, respectively, of the pipe P. Between the ends of said pipe-sections the interior of the coupling is provided with a shoulder, *r*, and upon this rests the stationary discharge-pipe P', which is provided with a collar or flange, *u*, on its lower end. Upon the collar is placed a packing-ring, *t*, and over the latter is applied an anti-friction metal ring, *s*. The upper section of the rotary pipe P being screwed down to bear with its end on the ring *s* effectually prevents the water from passing upward between the two pipes P P', and compels the water to ascend in the inclosed stationary pipe, which projects above the upper part of the rotary pipe P, and is provided with the spout S, and, if desired, with an air-chamber, V.

In order to guard against frost in the discharge-pipe P, I employ an automatic vent consisting of a tubular arm or nipple, *n*, screwed into the coupling T at a point at or above the end of the lower section of the pipe P and below the lower end of the stationary pipe P'. On the outer end of said nipple *n* is hinged a gravitating arm, R, which has its hinged end across the channel *o* of the nipple, and has on the side facing said channel an excision, *o''*, extending downward from the channel *o* of the nipple, and thus forming a vertical outlet, *o'*, for the water from the channel *o* when the arm R is at rest or in its normal pendent position, as illustrated by full lines in Fig. 7 of the drawings. When the pump is set in motion, the centrifugal force exerted on the arm R by its rotation with the pipe P swings said arm from its perpendicular position toward a horizontal position, as indicated by dotted lines in Fig. 7 of the drawings, and this movement of the arm R carries the solid upper end of said arm across the channel *o* of the nipple, and thus closes the same. So soon as the motion of the pump is stopped, the arm R drops down into its normal perpendicular position, and thereby brings the excision *o''* in coincidence with the channel *o*, and allows water to escape from that portion of the discharge-pipe which is above the nipple.

Having described my invention, what I claim

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

1. A centripetal pump consisting of an annular chamber provided with the induction-port at or near its periphery, a hub pivoted in the center of the case and provided with an axial eduction-port, radial hollow arms or buckets projecting from the hub and communicating with the eduction-port thereof, and a barrier arranged to intermittently fall in the path of the buckets, all combined and operating as specified.

2. The combination of the case E, provided near its periphery with the induction-port H, and valve *r*, with the hub G, pivoted in the center of the case, and provided with the radial channels I and axial channel K, the hollow arms or buckets A, communicating with the channels I, and provided at their mouth or outer end with the valves *p*, and the discharge-pipe P, connected with the channel K, substantially as described and shown.

3. In combination with the case E, provided with the induction-port H, the pivoted hub G, provided with the radial channels I and axial channel K, buckets A, connected with channels I, a movable partition or gate, B, arranged to fall across the path of the buckets, and mechanism for locking and unlocking said gate automatically with the movement of the buckets, substantially as set forth.

4. In combination with the pump-case E, hub G, pivoted therein and provided with the channels I I K and buckets A, the supplemental case F, rotary gate B, pivoted in the case F, a stopping device arranged to arrest the movement of the gate, and mechanism for throwing the stop off the gate automatically with the rotation of the hub G, substantially as described and shown.

5. In combination with the cases E and F, the pivoted hub G, provided with the channels I I and K, and with the cams *e*, the buckets A, the rotary gate B, and the spring N, provided with the lugs or pins *c c'*, as and for the purpose set forth.

6. The combination of the case E, provided internally with the central socket, D, and concentric grooves *b b*, with the hub G, having the gudgeon D' stepped in said socket, and concentric flanges *a a*, fitted to the aforesaid grooves, substantially as described and shown.

7. In combination with the case F, the rotary gate B, consisting of radial wings projecting from the pivoted hub, and packing-disks *v*, secured to the back of said wings, substantially as described and shown.

8. In combination with the rotary pipe P, the automatic vent consisting of the nipple *n*, provided with the channel *o*, and the gravitating arm R, pivoted on the end of the nipple and provided with the opening *o'*, substantially in the manner described and shown, for the purpose set forth.

9. The combination, with the rotary pipe P, of the coupling T, having internally-screw-threaded ends *q q* and shoulder *r*, the stationary pipe P', provided with the collar *u*, the anti-friction metal rings *s*, intermediate packing-ring, *t*, and the upper section of the pipe P, screwed into the end of the thimble and bearing on the anti-friction rings *s*, all constructed and combined substantially in the manner described and shown.

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 19th day of December, 1882.

PARDON T. PERKINS. [L. S.]

Witnesses:
FREDERICK H. GIBBS,
WM. C. RAYMOND.