

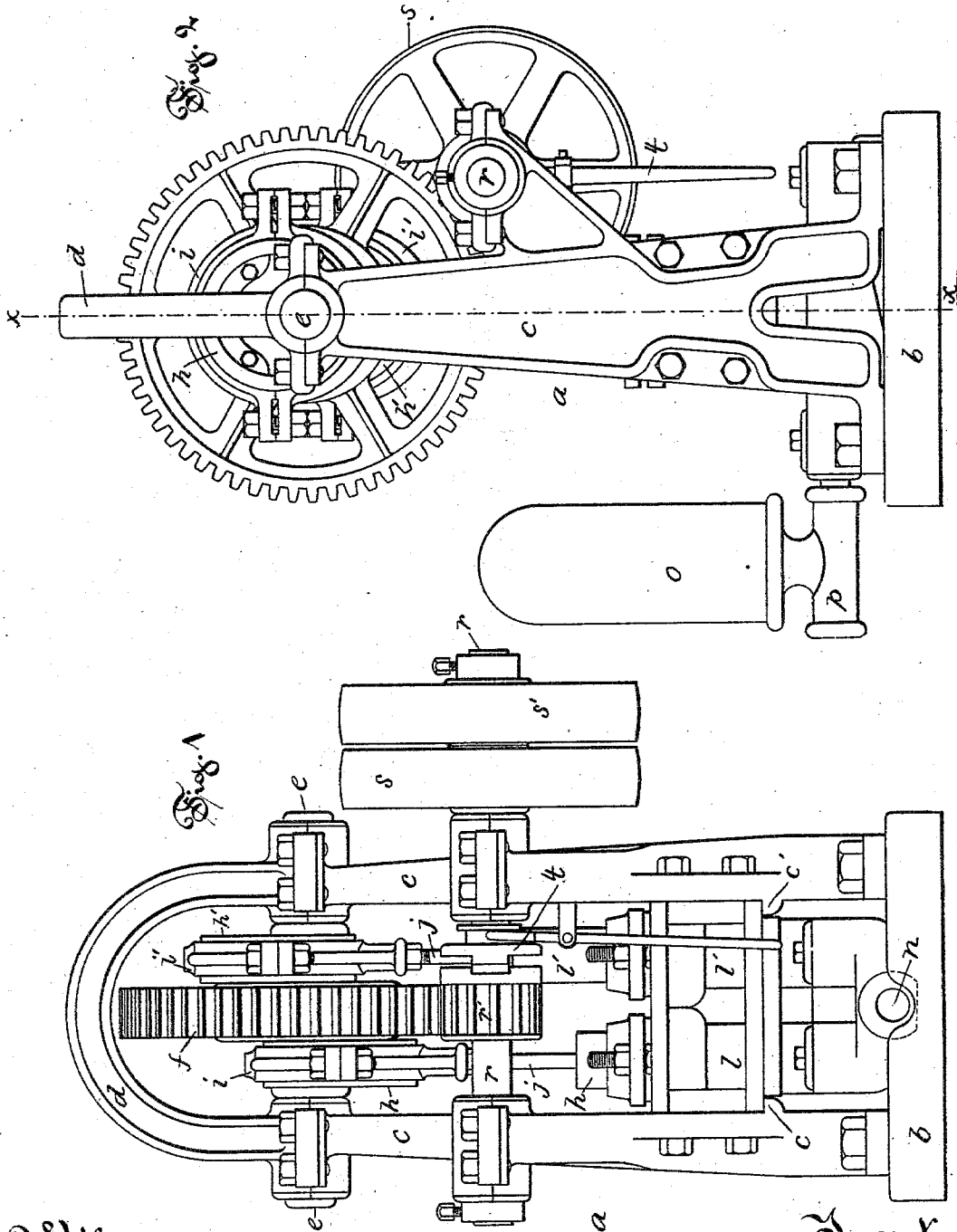
(No Model.)

3 Sheets—Sheet 1.

A. G. HOLLISTER.
PUMP.

No. 287,935.

Patented Nov. 6, 1883.



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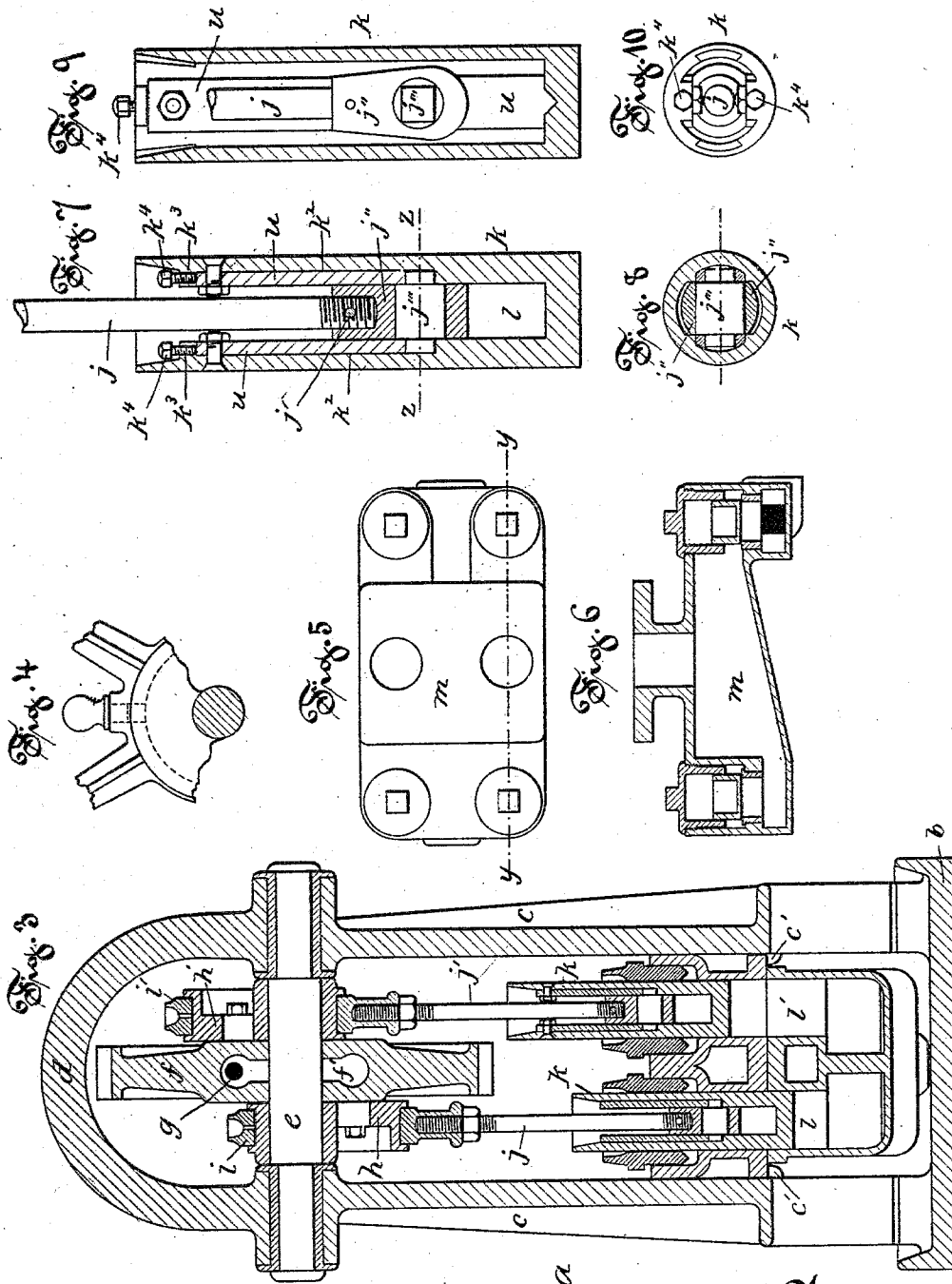
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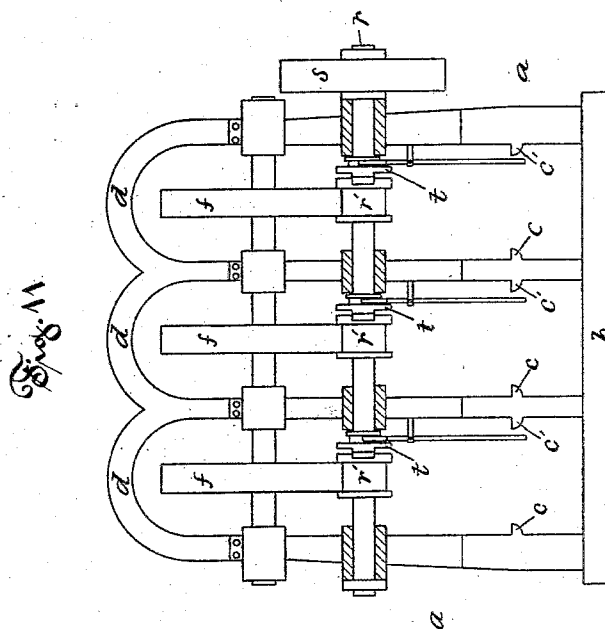
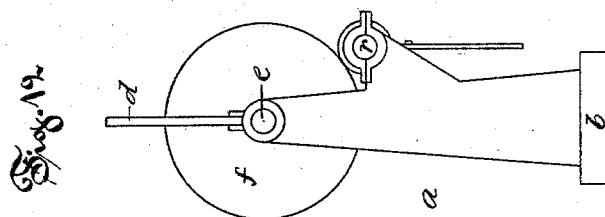
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UNITED STATES PATENT OFFICE.

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PUMP.

SPECIFICATION forming part of Letters Patent No. 287,935, dated November 6, 1883.

Application filed May 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, ALBERT G. HOLLISTER, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

Figure 1 is a front view of my improved device, showing a single double-acting pump. Fig. 2 is a side view of the same. Fig. 3 is a view in longitudinal vertical section on plane denoted by line *xx* of Fig. 2. Fig. 4 is a detail side view of the hub of the main gear-wheel, showing a portion of the oil-recess. Fig. 5 is a top view of the valve-chest. Fig. 6 is a view in vertical section through the valve-chest on line *yy* of Fig. 5. Fig. 7 is a detail view in vertical section, on enlarged scale, of my improved plunger and method of connecting the piston to the plunger. Fig. 8 is a view of the plunger in cross-section on line *zz* of Fig. 7. Fig. 9 is a side view, in vertical section, of an alternate form of the plunger and means of securing it to the piston-rod. Fig. 10 is a top view of the device shown in Fig. 9. Fig. 11 is a diagram view, showing method of uniting several independent pumps in a continuous structure, the frames being of my improved form. In this view the cylinders, pistons, and steam-chests are omitted. Fig. 12 is a side view of the same.

My improvement relates to the class of pumps known as "feed-pumps," which are used for filling boilers and the like; and it consists in the improved form and combination of parts of the frame, in the arrangement of the main gear, so that it turns loosely upon its shaft, and in various other details of the structure, more fully hereinafter described.

In the accompanying drawings, the letter *a* denotes the frame as a whole, made preferably of cast-iron; *b*, the base-plate; *c*, the upright side pieces; *d*, the connecting-brace, of semi-circular form, which spans the place between the side frames, passing over the main gear,

and strengthening and stiffening the structure as a whole. These parts are preferably formed in several pieces, bolted together substantially in the manner shown in the drawings. Near the top of the side frames is the transverse shaft *e*, which bears the main gear-wheel *f*, arranged centrally of the frame and placed upon the shaft so as to rotate freely upon it. In the hub of this gear-wheel a cavity, *f'*, is made, accessible through the opening *g*, for the admission of oil to lubricate the bearings. Eccentrics *h* and *h'* are secured to the opposite faces of the gear-wheel, and attached to them are the eccentric straps *i* and *i'*, fast to which are the piston-rods *j* and *j'*. These rods are attached at the lower ends to plungers *k* *k'*, which operate in cylinders *l* *l'*, below which cylinders is secured the valve-chest *m*. The cylinders are secured to the sides of the frame by bolts, and have a projecting lateral flange, which rests upon the inwardly-projecting lugs *c'* on the inner sides of the frame. The valve-chest bears a double set of valves, which are of any ordinary construction, arranged in such manner that each pair operates in connection with one of the cylinders *l* and *l'*. By the reciprocation of the plungers water is taken in through the induct-pipe *n* and forcibly delivered by way of the air-chamber *o*, through the educt-pipe *p*, to any desired position.

On brackets projecting from the front of the frame-work is arranged the transverse shaft *r*, bearing the gear *r'* in mesh with the gear *f*, and also the driving-pulleys *s* *s'*. Upon a fulcrum fast to a portion of the frame is arranged an ordinary clutch device, *t*, in such manner as to engage with or disengage from the gear *r'*, which is arranged to turn loosely upon the shaft *r*.

The plunger *k* is a hollow cylinder, closed at the bottom, having in opposite sides mortises *k²*, terminating at their upper extremities in a lug, *k³*, through which work the clamp-screws *k⁴* in a vertical direction. The piston-rod *j* is fastened at its lower end, as by a screw-thread, to the block *j''*, through which passes the pivot-pin *j'''*, the opposite ends of which are square in section and fit into the bottom of the mortises *k²*.

The parts are assembled by sliding the block and pivot into the plunger until the pivot ends

are seated in the mortises, and then fixing in place the stops *u*, which are bolted at their upper ends to the sides of the plunger, the clamp-screws *k*⁴ being turned forcibly down upon their upper ends.

In Fig. 11 I illustrate the method of assembling several of these compound pumps in a group, the only change over the ordinary construction of a single pair being in providing the intermediate uprights of the frame with lugs projecting on each side, to serve as bearings for the inclosed cylinders, and in forming the connecting top brace in one casting.

The special construction of the frame enables me to remove various parts for repair without taking the whole pump to pieces, and the arrangement of the driving-gear loosely upon the shafts enables me to use one or more of the pumps which are arranged in any given group.

In the alternate form of securing the plunger to the piston-rod (shown in Figs. 9 and 10) the stop-pieces bear the sockets for the ends of the pivot, and extend to the bottom of the chamber in the plunger, where a projecting lug fits into a mortise. These parts are assembled by placing the side pieces upon the pivot, thrusting them into the chamber in the plunger, with the axis of the pivot at right angles

to its final position, and then by a quarter-turn of the parts upon the axis of the rod the stops are moved to their place below the inwardly-projecting lug, which bears the clamp-screw on the side of the plunger. The parts are then bolted in position, as before described.

I claim as my invention—

1. In combination, in a pump, the base, the vertical frame, the sides of which bear the inwardly-projecting lugs *c'*, the arched cross-brace *d*, between the sides of the frame and spanning the gears, and the cylinder and valve-chest with operative parts, all substantially as described.

2. In a pump, in combination, the frame *a*, cross-shafts *r* and *e*, the gear-wheels loosely secured to the shaft, and the connected pump-operating mechanism, all substantially as described.

3. In combination, the plunger bearing lateral seats, the piston-rod block bearing the pivot, which rests in the lateral seats, and the strips secured to the inner sides of the plunger by the bolts and clamp-screws, all substantially as described.

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Witnesses:

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