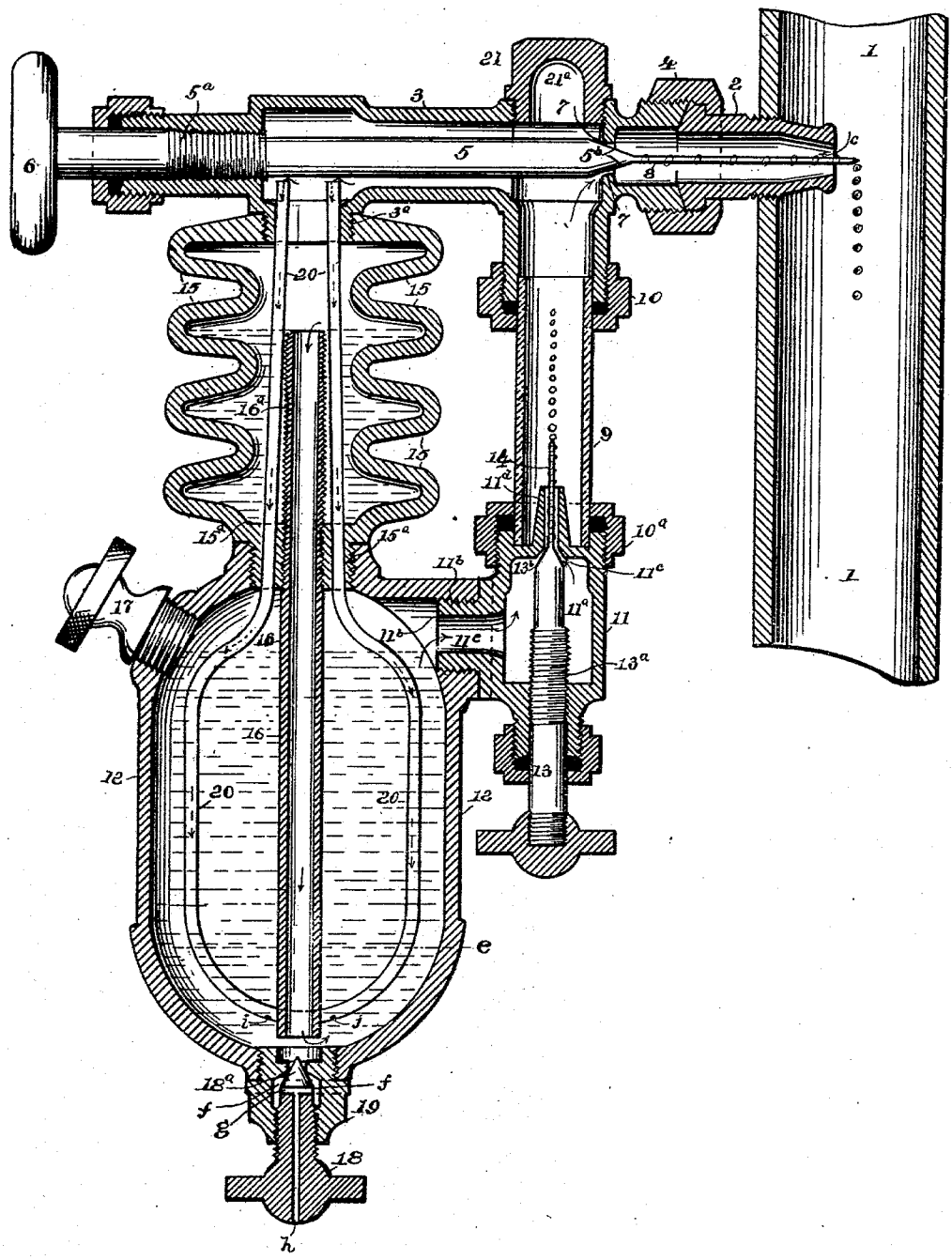
(No Model.)

H. R. FRISBIE.

OIL FEED INJECTOR.

No. 548,609. Patented Oct. 22, 1895.



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OIL-FEED INJECTOR.

SPECIFICATION forming part of Letters Patent No. 548,609, dated October 22, 1895.

Application filed July 8, 1895. Serial No. 555,301. (No model.)

To all whom it may concern:

Be it known that I, HENRY R. FRISBIE, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Oil-Feed Injectors, of which the following is a specification.

My invention relates to oil-injectors, the improvements of which will be more fully described in the following specification, and such features as I believe to be new and novel particularly set forth in the claims to follow.

To enable others to fully understand my invention reference is had to the accompanying drawing, in which is shown a side elevation and sectional view of the injector attached to a broken sectional view of the steam-pipe leading from the boiler to the engine-cylinder. Its construction and operation are as follows:

1 represents the steam-feed pipe. 2 is a screw-plug attached to a threaded hole in such pipe and projecting therein, to which plug is attached the injector-body 3 by means of the threaded union-nut 5.

5 is a valve-stem controlled by the handle 6, and whose threaded portion 5^a engages with a threaded portion of the body 3. The pointed end 5^b of such stem is adapted to cover and uncover the valve-seat 7 for the admission of steam and also for the oil-feed along the needle-point or wire 8, presently to be more fully described.

9 is a glass connected by the screw-caps 10 10^a to the injector-body 3 and the feed-plug connection 11, the latter having the oil-chamber 11^a therein and the hollow threaded end 11^b, by which it is connected with the oil-reservoir 12.

13 is an oil-feed stem whose threaded portion 13^a engages with a threaded hole in the feed-plug connection 11. Said stem has the tapered valve-point 13^b to engage with the taper-seat 11^c of the feed-plug connection 11. 11^d is a hollow cone rising from said plug and within the glass tube 9, whose interior passage-way is larger than the needle or wire 14, projecting from the end of the stem 13.

Intermediate between the injector-body 3 and the oil-tank 12 is the corrugated steam-condenser 15, which is attached thereto by means of the threaded connections shown. This condenser, by means of the large amount of surface which is presented to the atmosphere by means of such corrugations, condenses steam much faster than if such outer surface were plain or unbroken.

16 is a tube whose upper end 16^a is screwed into the lower portion 15^a of the condenser, and which upper end projects about two-thirds through the same, while the lower end of such tube extends nearly to the bottom of the oil-reservoir 12. This tube operates as an overflow for the condensation which takes place in the condenser 15, carrying the water therefrom to the bottom of the oil-reservoir. The oil is admitted to the oil-reservoir by removing the plug 17 in the upper part, such oil floating on the surface of the water, the height of the latter being regulated to about the dotted line *e* by means of the drip-cock 18, which is set so that the pointed end 18^a will be raised from the seat sufficient to let the water pass into the chamber *f* of the screw-plug 19, thence through the channels *g* and *h* of the cock 18.

20 is a steam oil-heating pipe whose free ends open into the interior of the injector-body 3, the two branches passing through the solid portion 15^a of the condenser and into the oil-reservoir. One or more holes, as *i j*, are provided in such pipe to let out the water which may be lodged therein from condensation of the steam. The object of this pipe is to carry the live steam into the oil so as to thin it. The pipe 16 serves in a measure this same purpose; but it is not sufficient where crude or heavy oil is used.

The operation of the device is as follows: Steam is admitted from the pipe 1, thence through the valve-seat 7 into the condenser 15, and also into the tube 16 and pipe 20 for thinning the oil. The condensation taking place in such condenser soon fills the same to the height of the tube 16, which tube, as before mentioned, carries the overflow to the bottom of the oil-reservoir. When, therefore, the feed-stem 13 is opened, circulation is instantly started, the oil from the reservoir passing through the port 11^e into the chamber 11^a, and from thence it passes off the needle or wire point 14 in drops, as shown, or in a solid stream, if desired, the flow being regulated by the opening of such feed-stem, the oil-drops passing through the water in the glass tube 9 and through the valve 7, and from

thence they will drop off from the needle or wire point 8 down into the steam-pipe 1, as shown.

The injector above described presents many features that are both new and novel. The corrugated condenser affords a much better facility for condensation than the constructions usually employed and the facility with which the oil is heated by the direct steam, so that the crudest and heaviest oils can be used.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein described improvement in oil injectors, comprising in combination, the body 3 having the valve stem 5 therein, a drip wire at its free end, an oil reservoir having a drip plug at the bottom thereof; a corrugated condenser depending from the injector body and connected with the oil reservoir; a central overflow tube in such reservoir and condenser, as shown, plug connection 11 and oil-feed stem 13, said stem having a taper face thereon to engage with a taper seat in such plug connection; a feed wire on the inner free end of said stem 13; a sight glass connecting said plug connection with the injector body, for the purpose set forth.

2. The improvement in oil injectors, of the character described, comprising in combination, injector body 3; means for attaching said body to the steam pipe; a corrugated condenser and oil reservoir depending from said injector body, as shown, means for producing the necessary circulation for feeding the oil from the reservoir; a central overflow tube extending within said reservoir and condenser; an auxiliary oil heating pipe passing through the condenser into the reservoir, as shown, the free ends of said pipe projecting into the injector body, as set forth.

Signed at Newark, in the county of Essex and State of New Jersey, this 14th day of June, A. D. 1895.

HENRY R. FRISBIE.

Witnesses:
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