

No. 652,392.

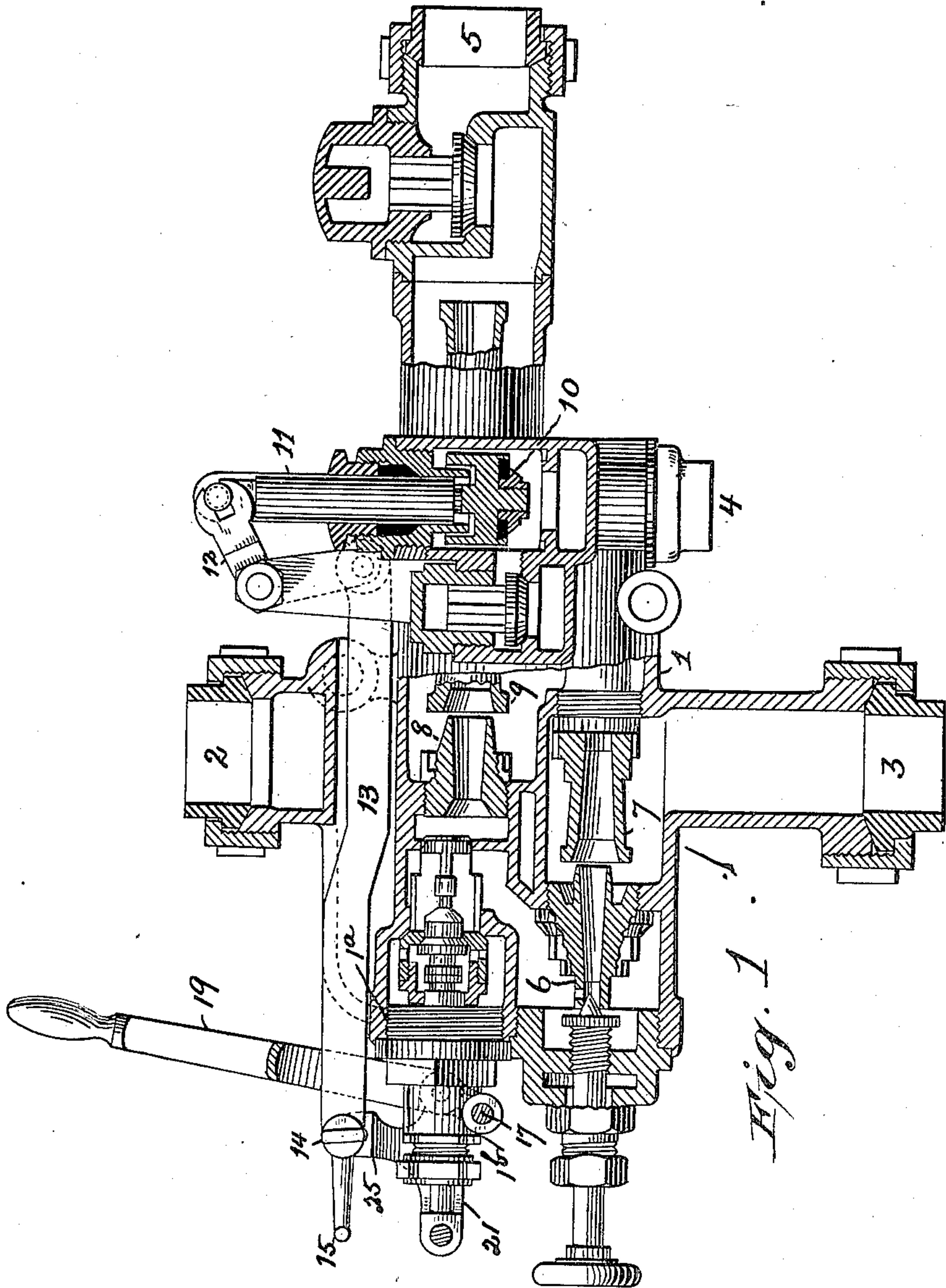
Patented June 26, 1900.

J. HUBER.
INJECTOR.

(Application filed May 17, 1899.)

(Model.)

2 Sheets—Sheet 1.



Witnesses,
C. W. Benjamin
Herman Meyer

Inventor,
Jacob Huber
by William R. Baird
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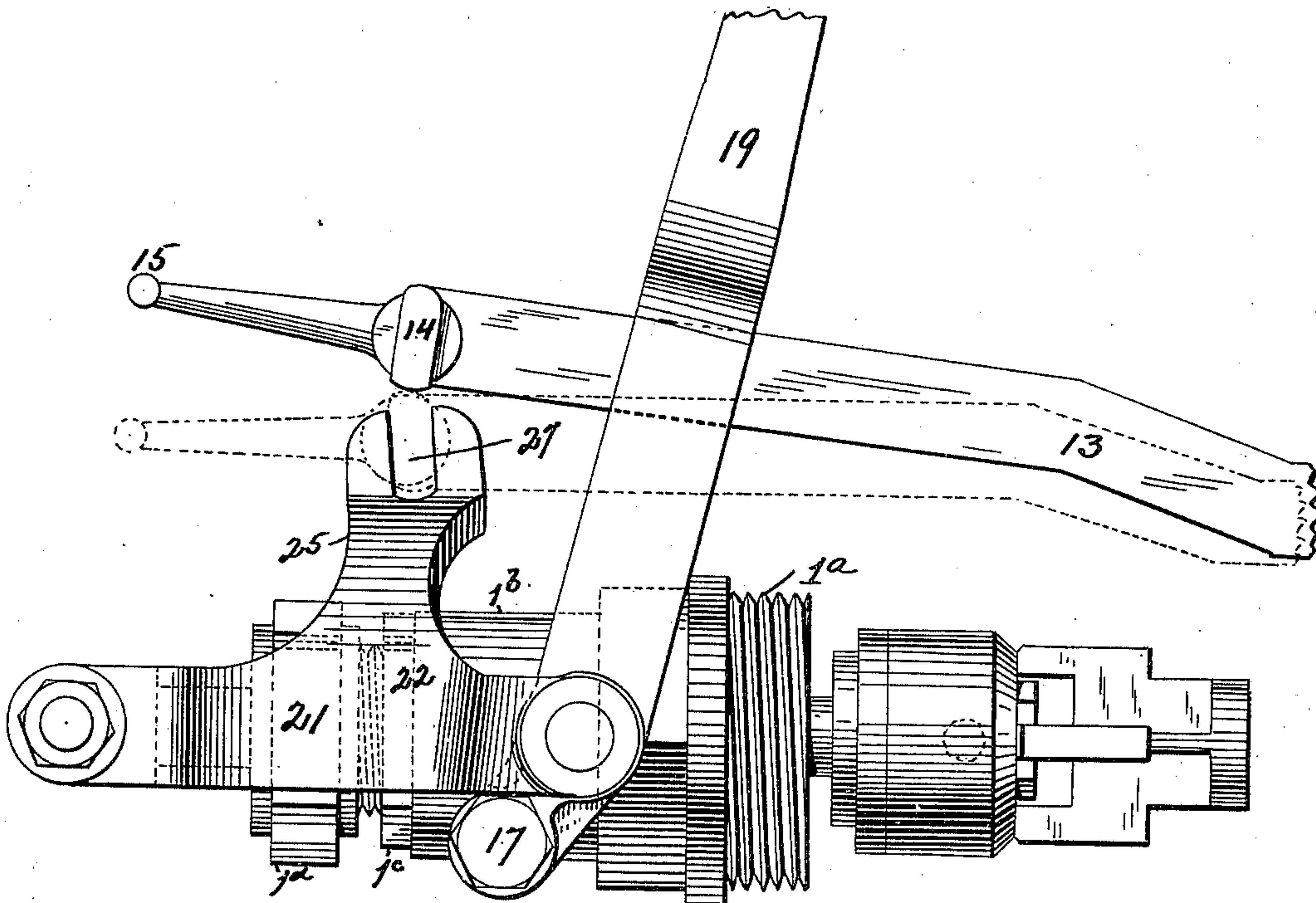


Fig. 2

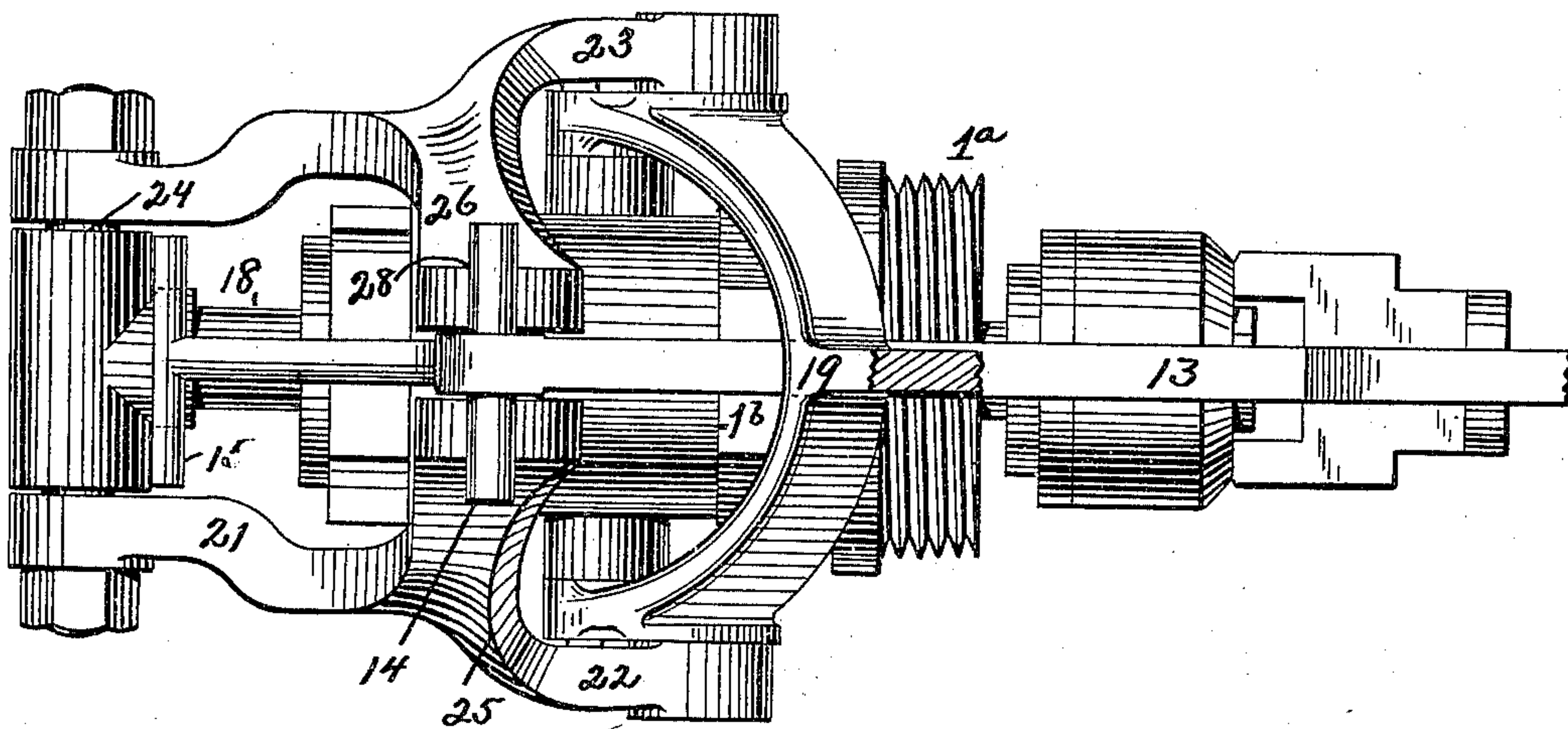


Fig. 3

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UNITED STATES PATENT OFFICE.

JACOB HUBER, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE HAYDEN & DERBY MANUFACTURING COMPANY, OF NEW YORK.

INJECTOR.

SPECIFICATION forming part of Letters Patent No. 652,392, dated June 26, 1900.

Application filed May 17, 1899. Serial No. 717,128. (Model.)

To all whom it may concern:

Be it known that I, JACOB HUBER, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a certain new and useful Improvement in Injectors, of which the following is a specification.

My invention relates to the class of injectors known as "double-tube" injectors; and its novelty consists in the construction and adaptation of the parts, more particular reference being had to the means employed to couple the final-overflow-valve rod to the main-steam-valve stem.

The main features of the injector to which my invention is applied are shown and described in Letters Patent of the United States No. 604,233, issued to the Hayden & Derby Manufacturing Company as my assignee May 17, 1898, and I refer to such patent for a full detailed description of the operative parts of said injector, although it will be understood that my invention may be applied to and used with any other double-tube injector having the essential operative parts shown in the patented device.

In the drawings, Figure 1 is a vertical medial section of an injector displaying my invention. Fig. 2 is an enlarged side elevation; and Fig. 3 is an enlarged plan view of the main steam-valve and its operative connections, the final-overflow valve, and the means for coupling the same to the main-steam-valve stem.

In the drawings, 1 represents the casing; 2, the steam-inlet; 3, the water-inlet; 4, the final-overflow port; 5, the discharge-outlet to the boiler; 6, the lifting steam-nozzle; 7, the lifting combining-tube; 8, the forcing steam-nozzle, and 9 the forcing combining-tube.

10 is the final-overflow valve. 11 is its stem. 12 is the bell-crank lever by which it is reciprocated and which is pivoted upon the casing in the usual manner, and 13 is its connecting or actuating rod. This connecting-rod 13 is adapted to pass through a central aperture in the casing and is provided near its extremity with one or more laterally-projecting lugs 14 and at its extremity with a handle 15.

1^a is a center piece over which is placed a

cylindrical sleeve 1^b, which in turn is held in place by a jam-nut 1^c.

1^d is a packing-nut.

The main-steam-valve stem 18 passes through the center piece. A forked lever 19 is fulcrumed in suitable bearings 17 beneath the sleeve 1^b. Secured to the lever 19 is a coupling 21, consisting of two horizontally-disposed pieces 22 and 23, adapted to be secured to the main valve-stem 18 by the cross-head 24 or by similar suitable means. The coupling 21 is also provided with two upwardly-extending curved arms 25 and 26, which do not meet at the center, but are separated sufficiently to permit the overflow-valve rod 13 to pass between them. Each of these curved arms is slotted or recessed, as at 27 and 28, to receive the lugs 14 on the overflow-valve rod 13.

The other parts of the injector will be understood by those skilled in the art to which it appertains and need no special description.

The operation of the injector is also easily understood. The lever 19 being slightly moved, the auxiliary inlet-valve of the main steam-valve is opened. The steam then passes to the lifting-nozzle and lifting combining-tube, thence to the inlet-chamber of the forcing combining-tube, and thence passes in the usual way to the overflow-port. The passage of the steam through the lifting combining-tube produces a vacuum in the suction-chamber above the source of the water supply. This causes the water to rise and join the steam, whereby the latter is condensed, and the water then follows the usual route to the overflow-port. Now if the lever 19 is again slightly moved the valve-rod 13, being coupled to the lever 19, through the arms 25 and 26, the overflow-valve 10 is moved toward its seat. This retards the flow of the water and forces a portion of it into and through the forcing combining-tube. The lever 19 being again moved allows the steam to flow through the forcing steam-nozzle and being condensed in the forcing combining-tube drives it through this latter tube at a high velocity. This causes a high pressure to be exerted upon the valve controlling the port leading from the discharge-chamber of the lifting apparatus and forces it to its seat. A

yet further movement of the lever 19 causes the final-overflow valve finally to be closed against its seat. This therefore forces the water through the check-valve into the boiler.

5 It will be observed that during this operation the overflow-valve rod 13 has been coupled to the lever 19, as the lugs 14 have been placed within the slots 27 and 28 on the arms 25 and 26, and that therefore the main steam-valve
10 and the final-overflow valve have been operated by the same lever 19. It is at times desirable, however, that the main steam-valve and the final-overflow valve can be operated independently of each other, especially when
15 it is intended to use the steam to heat the water in the feed-water tank. This may be accomplished by lifting the overflow-valve rod 13 out of engagement with the coupling 21 by means of the handle 15 and pulling the
20 same until the overflow-valve is closed. If now the lever 19 is moved slightly to admit the steam, the latter will pass into the injector through its various passages and into the feed-water tank. When such action has
25 taken place as long as desired and it is wished to restore the parts to their connected position, the valve-rod 13 is lifted and pushed forward until its lugs 14 coincide with the slots 27 and 28, when they are pushed into
30 engagement therewith and the overflow-valve rod and the main steam-valve stem are in a position to be conjointly operated by the lever 19.

What I claim as new is—

35 1. In an injector, the combination with the

main steam-valve and its stem, and the final-overflow valve and its rod, of a coupling secured to the main-steam-valve stem and provided with means for engaging with the final-overflow-valve rod, consisting of two up-
40 wardly-projecting arms, each connected to a cross-head upon the main-steam-valve stem, and each slotted transversely and adapted to receive and engage with lugs upon the overflow-valve rod.

45 2. In an injector, the combination with the main-steam-valve stem and the overflow-valve connecting-rod, of a lever adapted simultaneously to operate the valve-stem and rod, through a coupling hinged to the lever and
50 the valve-stem and provided with a slotted bearing adapted to receive and engage with lugs on the rod.

3. In an injector, the combination with the main-steam-valve stem, the final-overflow con-
55 necting-rod and the lever 19, of a coupling consisting of two pieces, each piece being hinged to the lever and the valve-stem, and each provided with an upwardly-projecting slotted arm, the arms being separated to per-
60 mit of the passage of the connecting-rod between them.

In witness whereof I have hereunto set my hand, this 16th day of May, 1899, in the presence of two subscribing witnesses.

JACOB HUBER.

Witnesses:

HERMAN MEYER,
JOHN D. DERBY.