

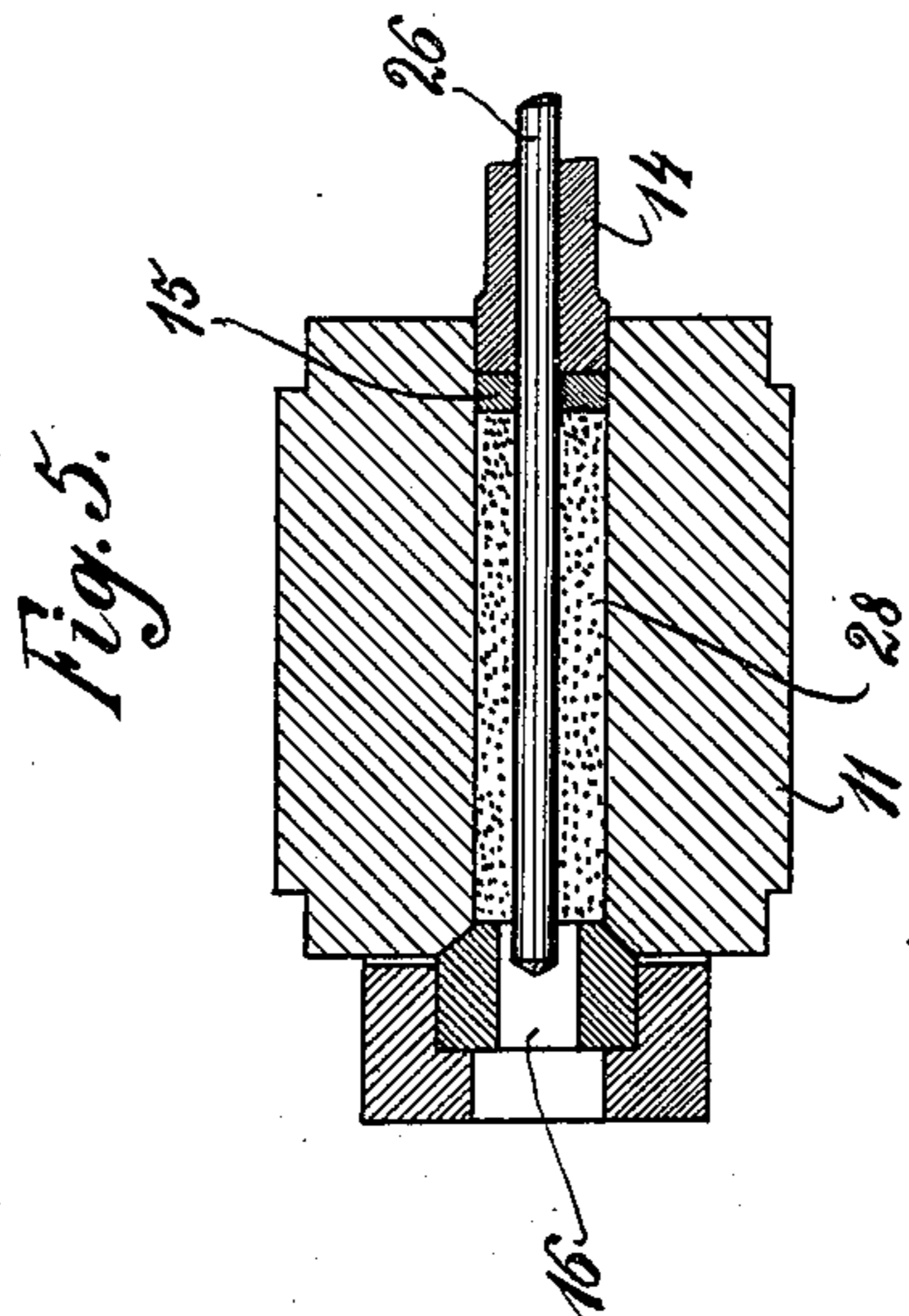
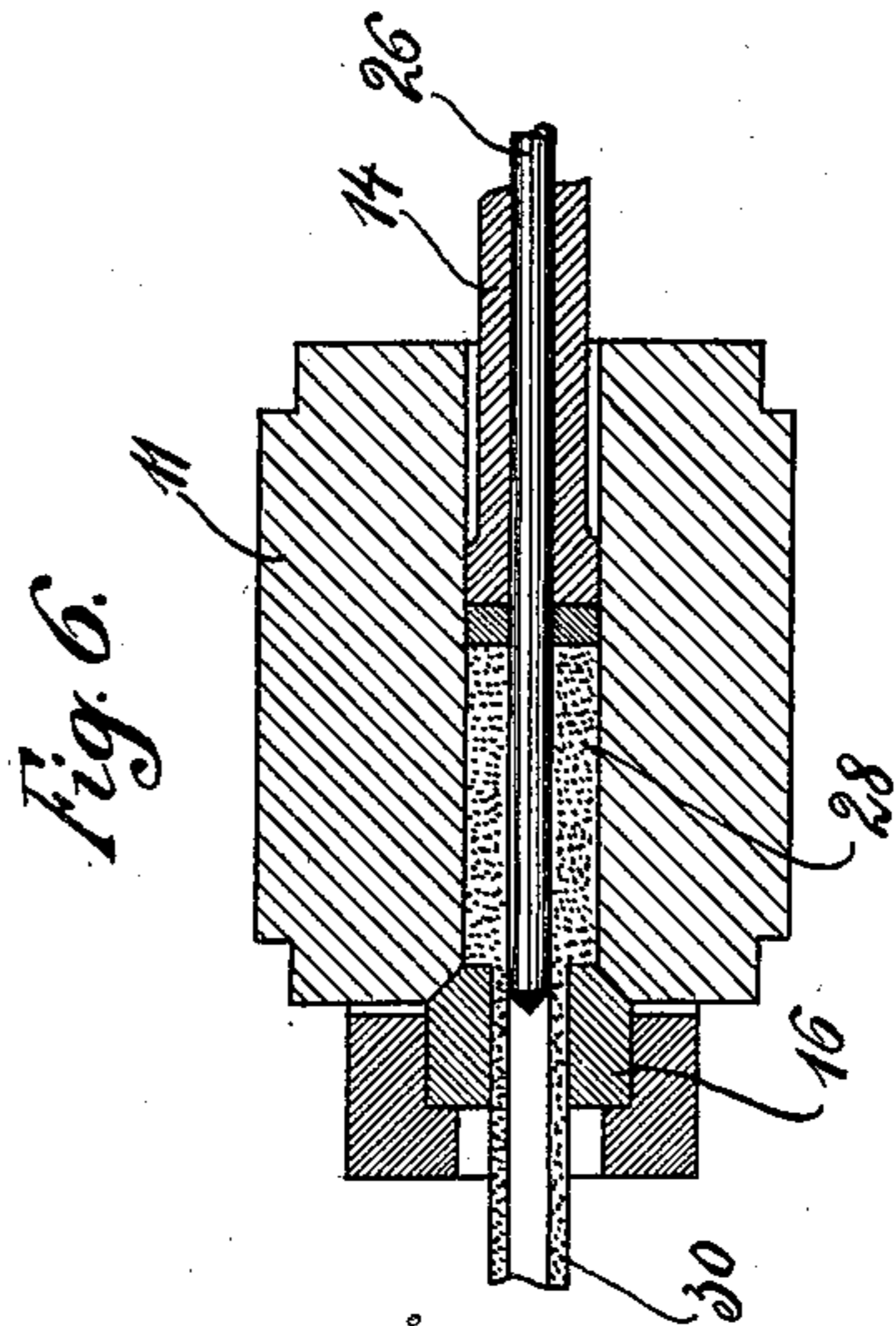
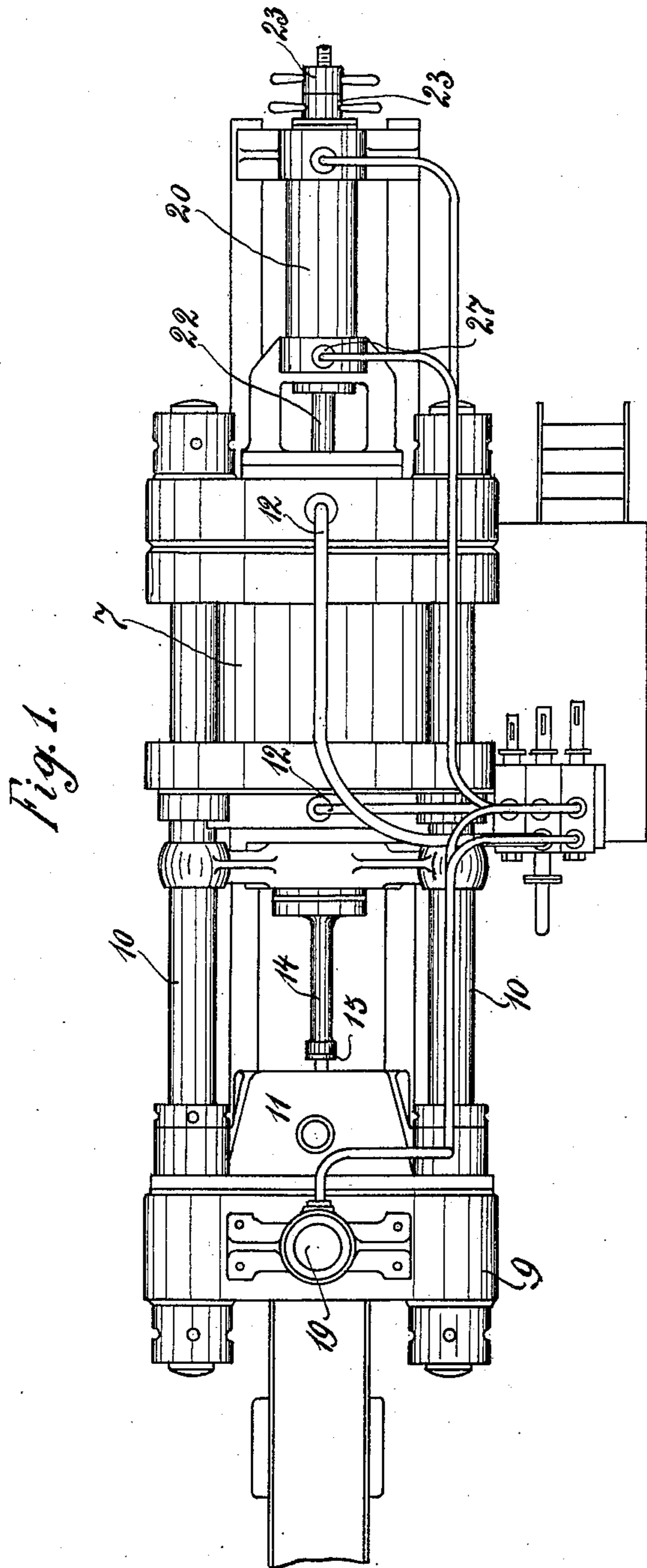
No. 861,194.

PATENTED JULY 23, 1907.

A. SCHWIEGER.
HYDRAULIC PRESS.

APPLICATION FILED JAN. 29, 1904.

2 SHEETS—SHEET 1.



Witnesses.

M. E. Tucker.
L. E. Scott

Inventor:
Arnold Schwieger
By Knight Bros Attys.

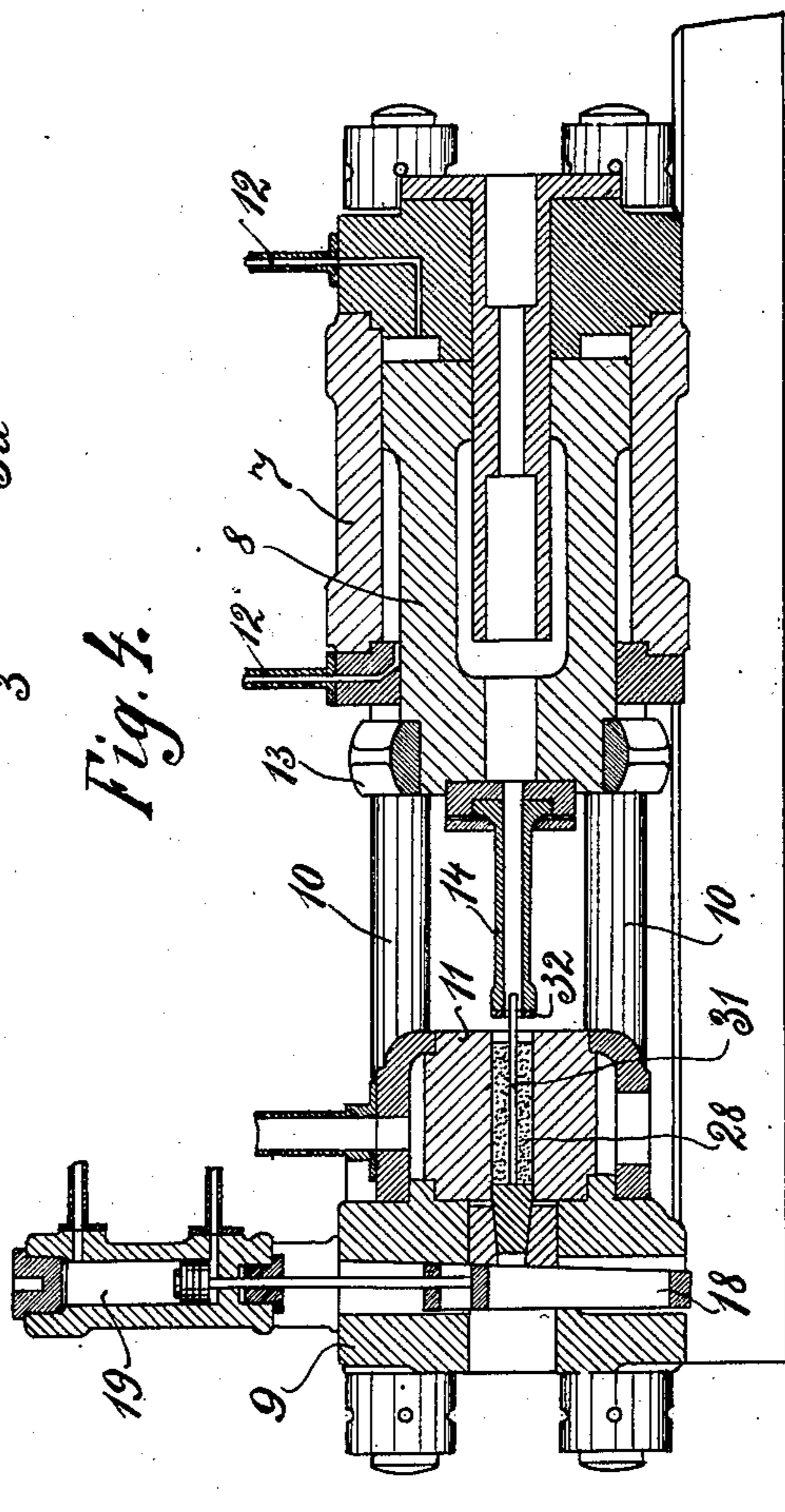
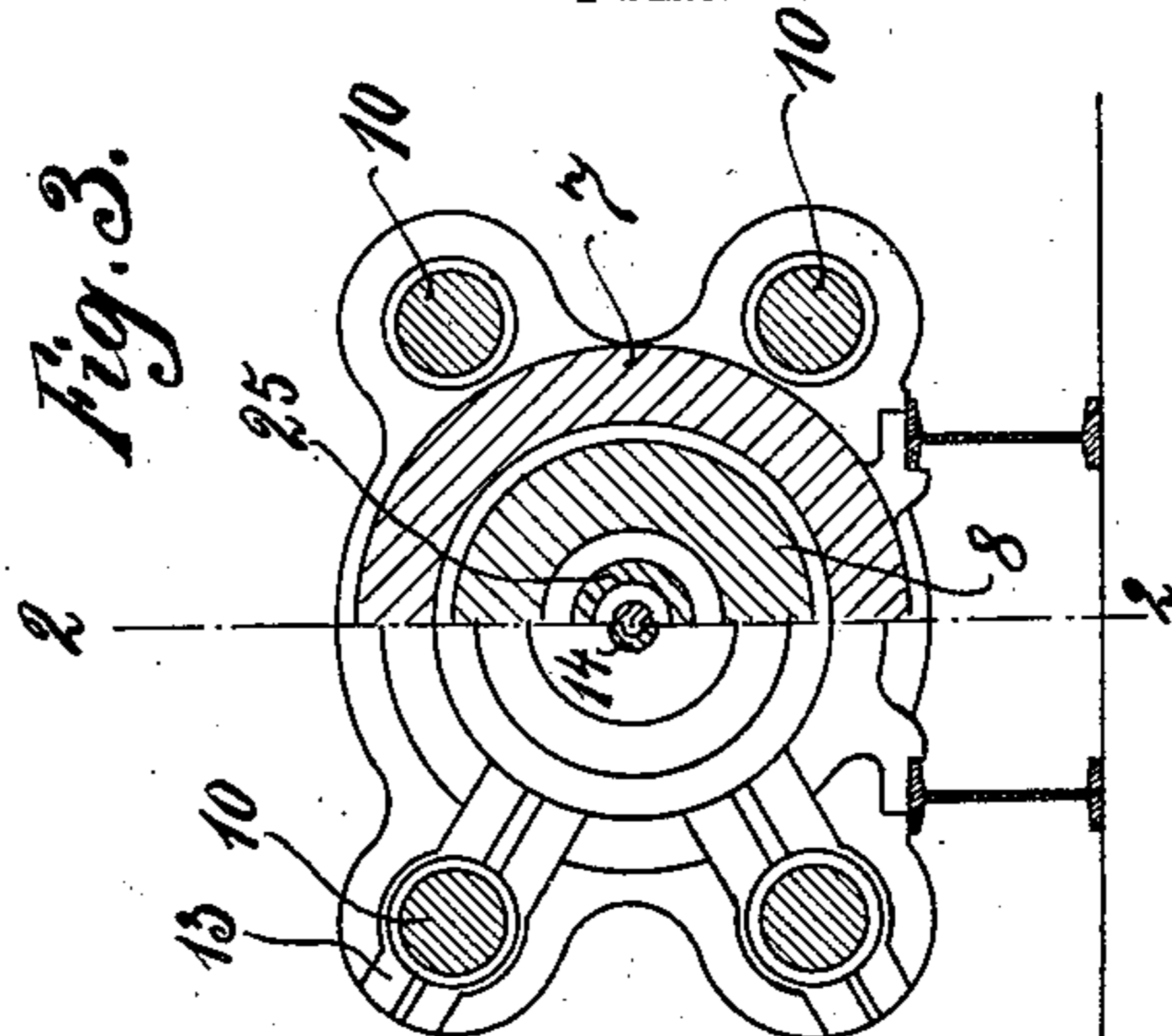
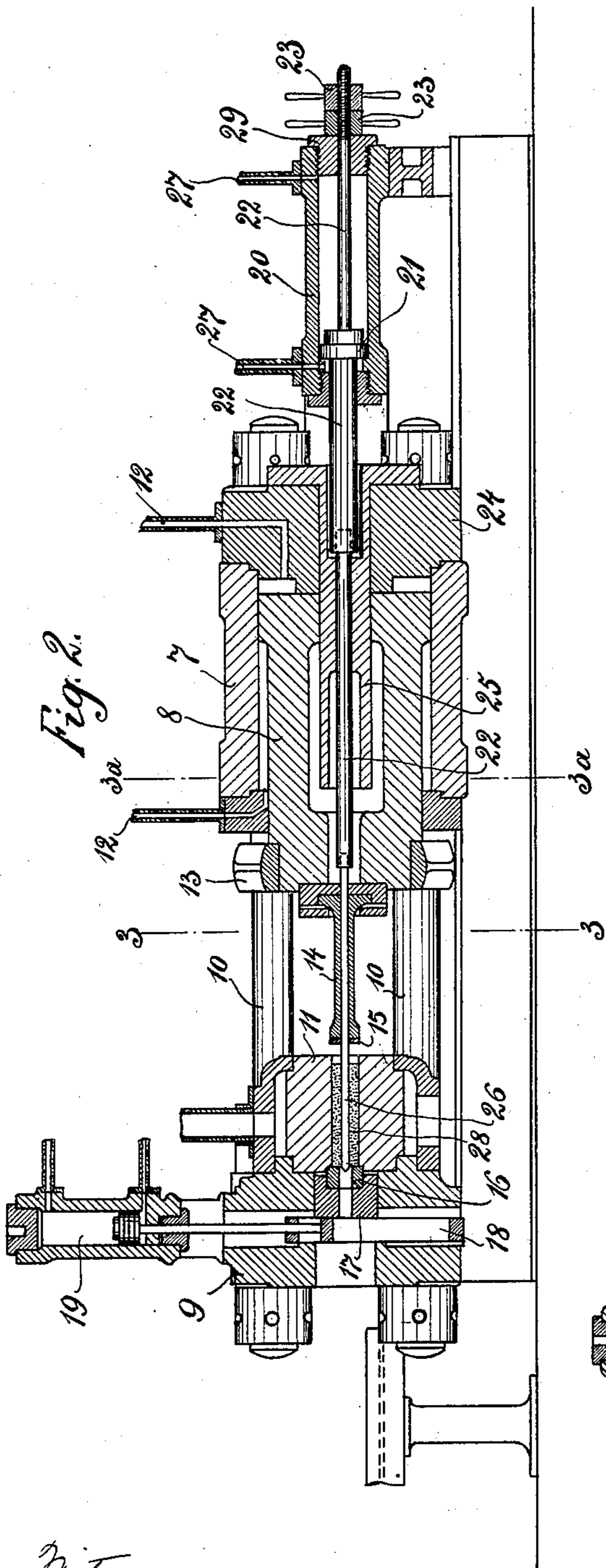
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

ARNOLD SCHWIEGER, OF OBERSCHÖNEWEIDE. NEAR BERLIN, GERMANY.

HYDRAULIC PRESS.

No. 861,194.

Specification of Letters Patent.

Patented July 23, 1907.

Application filed January 29, 1904. Serial No. 191,219.

To all whom it may concern:

Be it known that I, ARNOLD SCHWIEGER, a subject of the German Emperor, and a resident of Oberschöne-
weide, near Berlin, Germany, have invented certain
5 new and useful Improvements in Hydraulic Presses,
of which the following is a specification.

The present invention relates to an improved hy-
draulic press adapted for the manufacture of tubes or
profiled bars, the manufacture being effected by pres-
10 sure on a metal block. In my improved press, I em-
ploy a mandrel for perforating the metal block, which
mandrel also serves as core for the tube to be produced,
and an object of the invention is to so construct and
arrange the mandrel that it can be driven by a driving
15 apparatus independent of the driving piston for the
plunger; that its stroke can be adjusted, and that its
front part which is most subject to wear can be re-
moved and a fresh piece inserted in lieu thereof.

Another object of the invention is to so construct
20 the press that it can also be used for rearward pressing
simply by fixing the mandrel in the matrix-housing,
in which case the product is ejected rearwardly by the
movement of the plunger.

Other and further objects of the invention will ap-
25 pear in the following description and will be more par-
ticularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top
view of my improved press; Fig. 2 is a longitudinal
section on line 2—2, Fig. 3; Fig. 3 is a cross-section on
30 lines 3—3 and 3*—3* Fig. 2; Fig. 4 shows a longitudinal
section of the press adapted for rearward pressing, and
Figs. 5 and 6 are longitudinal sections through the
pressure cylinder on an enlarged scale and showing
two different steps of the operation.

35 7 is the main driving cylinder for the main driving
piston 8. By means of rods 10 the cylinder 7 is con-
nected with a cross-head 9 on which is mounted a pres-
sure cylinder 11 which serves to receive the metal
block which is to be formed into a tube or a profiled
40 bar. The pressure medium for the driving cylinder
7 is introduced to and passes out from the cylinder
through pipes 12 which are provided with a suitable
controlling means. The plunger 14, which preferably
is provided with a removable disk 15, is mounted on
45 the front part of the piston 8 which is hollow and
which, by means of a cross-piece 13 is guided by the
rods 10. The matrix 16 is mounted in a housing 17
which can be secured in position by a slide 18 driven
by a hydraulic driving apparatus 19.

50 In the embodiment shown in Figs. 1 to 3 a supple-
mental driving cylinder 20 is arranged behind the main
driving cylinder 7. The cylinder 20 is provided with
a sliding piston 21 having the rear part of its piston rod
22 projecting outside of the rear head 29 of the cylinder
55 20 and provided with screw-threads with which en-
gage two nuts 23 for adjusting the stroke of the piston

21. The front part of the piston rod 22 projects through
a guide 25 which is secured in the head 24 of the main
cylinder 7 and projects into the hollow piston 8. The
mandrel 26 is detachably connected to the front end 60
of the piston rod 22 and is guided in the plunger 14.
The pressure medium is introduced to and passes out
from the cylinder 20 through pipes 27 which are pro-
vided with suitable controlling means.

The mode of operation of the press is as follows: Let 65
it be assumed that the pistons 21 and 8 are in their ex-
treme positions to the right in which case the plunger
14 and the mandrel 26 are withdrawn from the pressure
cylinder 11. A metal block 28 is then inserted in the
pressure cylinder 11 in the customary manner and pres- 70
sure medium is introduced into the cylinder 20 to cause
the piston 21 to move to the left thereby forcing the
mandrel 28 into the metal block to perforate the same.
The forward movement of the piston 21 with the man-
drel 26 is continued until the front end of the man- 75
drel projects into the opening of the matrix 16. In this
position of the mandrel the nuts 23 abut against the
head 29 of the cylinder thereby preventing further for-
ward movement of the mandrel. Pressure medium is
then introduced to the right side of the piston 8 in the 80
main cylinder 7 and the piston with the plunger 14 is
moved towards the left to the position shown in Fig. 5.
During the further forward movement of the piston 8
the material of the metal block 28 is forced out through
the matrix opening to produce the tube 30 as seen in 85
Fig. 6.

If it is desired to use the press for the manufacture of
profiled bars, the matrix 16 is exchanged for another
one having an opening corresponding to the profile of
the bar. Furthermore, the mandrel 26 with the piston 90
21 is moved all the way to the right and the pressing
disk 15 is replaced by an imperforate disk. If then a
solid block is inserted in the pressure cylinder 11 and
the main piston 8 with the plunger 14 is set in motion,
the desired profile bar emerges from the matrix opening. 95
When the mandrel becomes worn out it is drawn out
from the piston rod 22 and another one is substituted
therefor.

If it is desired to use the press for rearward pressing
the cylinder 20, the piston 21, the piston rod 22 and the 100
mandrel 26 are removed and a mandrel 31 (Fig. 4) is
inserted in the cross-head 9 in lieu of the matrix 16 and
its housing 17, and the front end of the plunger 14 is
provided with a matrix 32. The metal block 28,
which must be previously perforated, is then inserted 105
in the pressure cylinder 11 and the piston 8 and plunger
14 are set in motion so as to cause the metal to pass
through the opening of the matrix 32 and move towards
the right through the bore of the plunger and piston.
If a profiled bar is to be produced by rearward pressing; 110
the mandrel 31 is removed and the cross-head is closed
by a solid plate. It will be seen that the action of the

press remains in the main the same when rearward pressing is employed.

Having described my invention, what I claim as new is:—

- 5 1. In a hydraulic press, the combination with the plunger and its driving piston, of a supplemental piston having a piston rod projecting to both sides thereof, a mandrel connected to one end of the piston rod, and means on the other end of the piston rod for adjusting the stroke
10 of the supplemental piston.
2. In a hydraulic press, the combination with the hollow plunger, the main cylinder and the hollow main piston for driving the plunger, of a supplemental cylinder, a pis-

ton operating in the supplemental cylinder and having a piston rod projecting through both ends of the supple- 15 mental cylinder, a mandrel projecting through the hollow main piston and plunger and detachably connected to one of the projecting ends of the piston rod of the supplemental piston, and adjusting nuts on the other projecting end of said piston rod for adjusting the stroke of the 20 supplemental piston.

In witness whereof I have signed this specification in the presence of two witnesses.

ARNOLD SCHWIEGER.

Witnesses:

WOLDEMAR HÄUPT,
HENRY HASPER.