

No. 754,350.

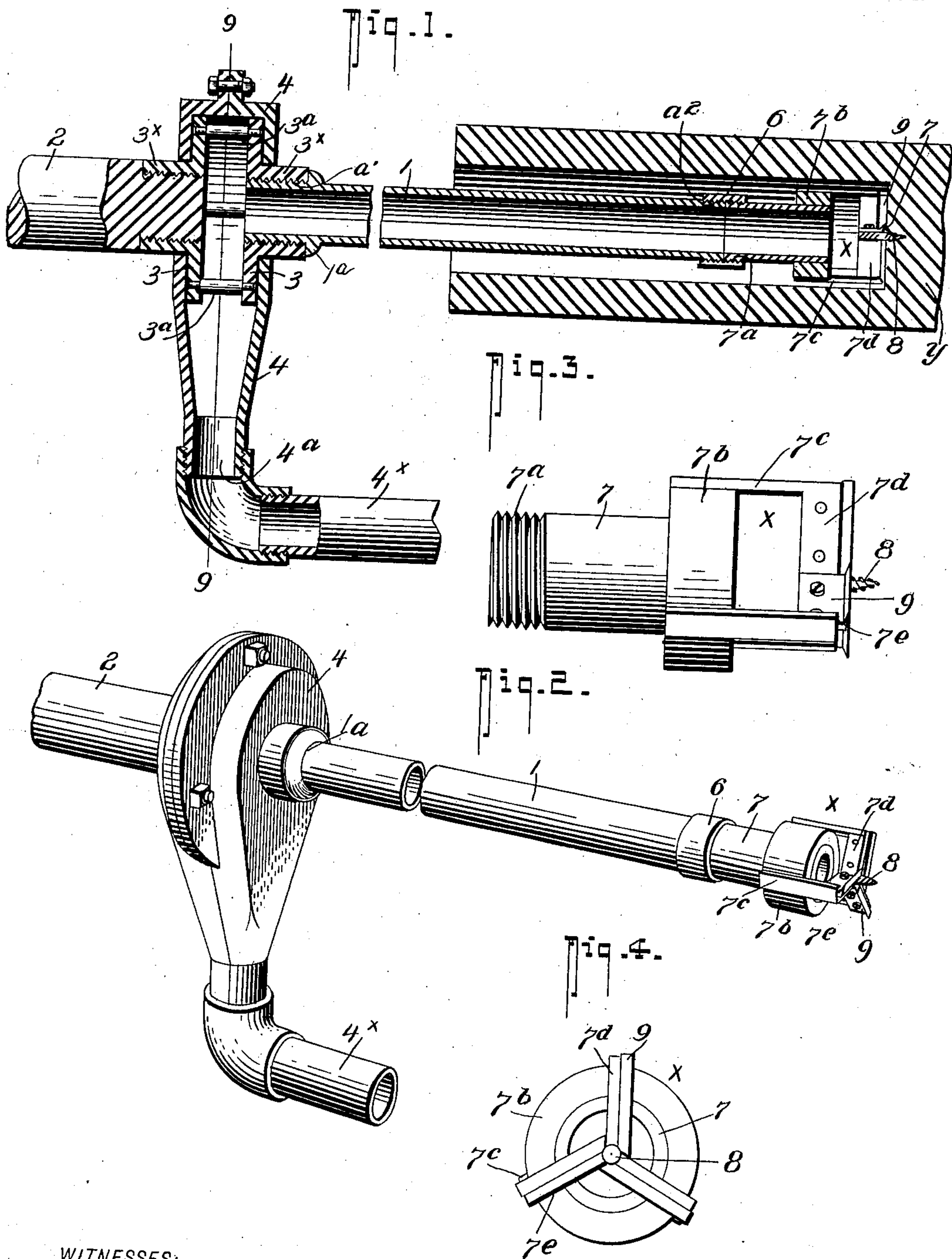
PATENTED MAR. 8, 1904.

G. D. & J. H. SHAULL.
TUBULAR AUGER.

APPLICATION FILED JULY 22, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

F. C. Gibson.
John T. Schrott

INVENTORS:
James Henry Shaull.
Grove David Shaull.

BY

Fred G. Dietrich
ATTORNEYS

No. 754,350.

PATENTED MAR. 8, 1904.

G. D. & J. H. SHAULL.
TUBULAR AUGER.

APPLICATION FILED JULY 22, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 9.

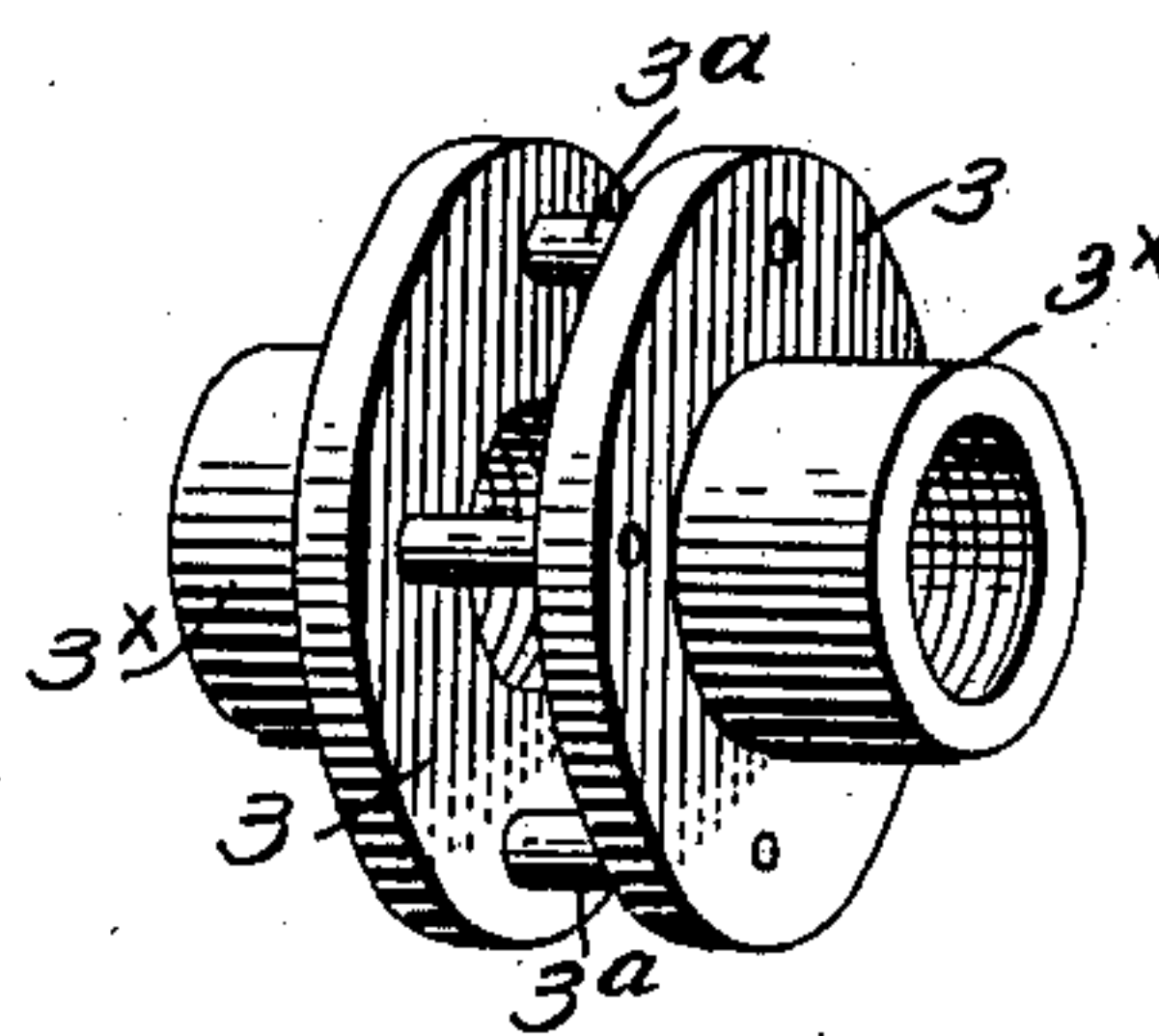
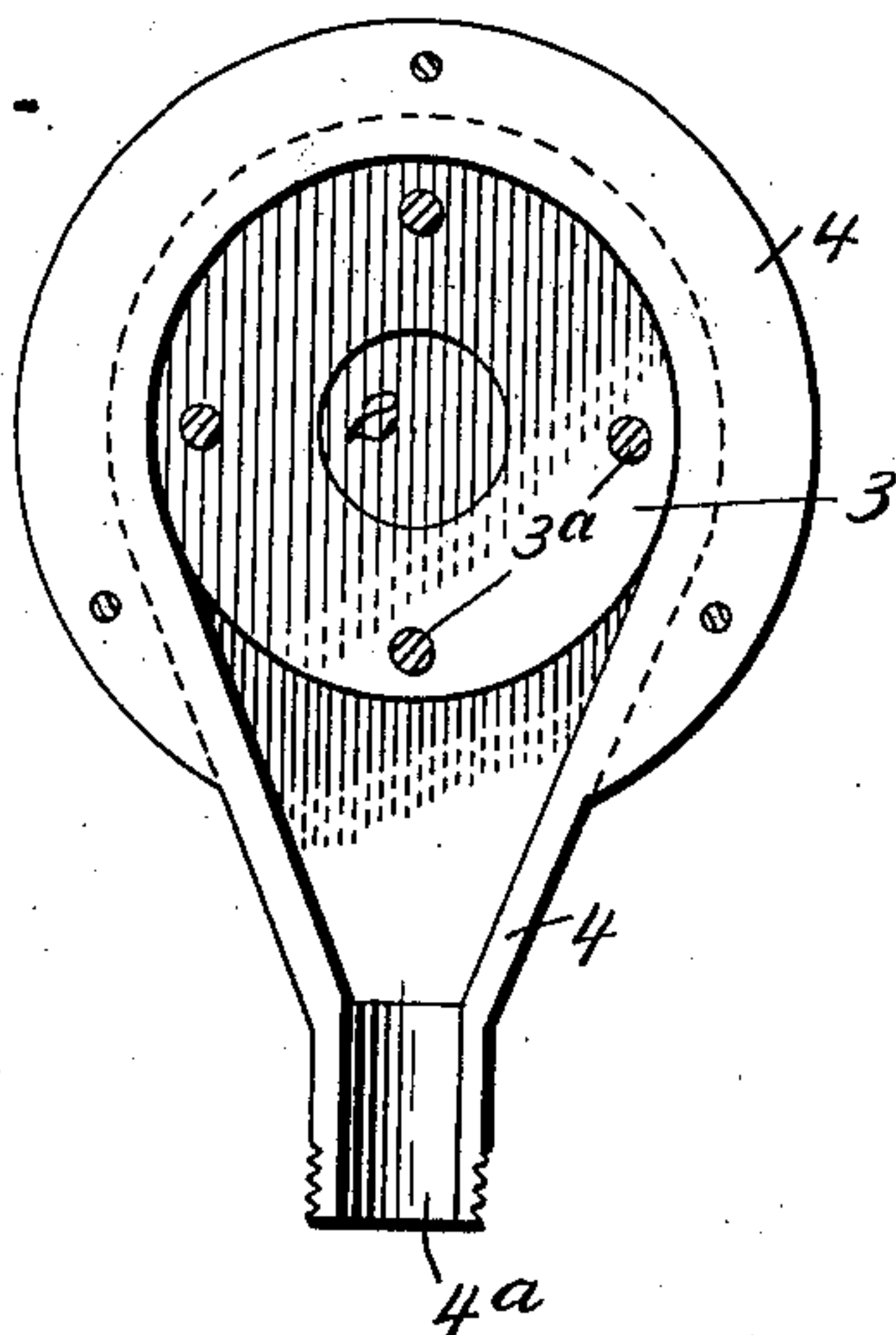


Fig. 10.

Fig. 7.

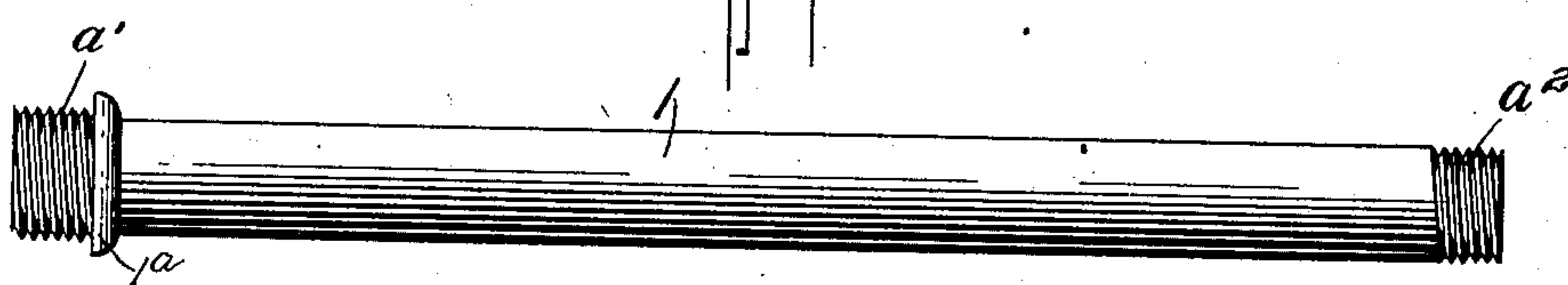


Fig. 8.

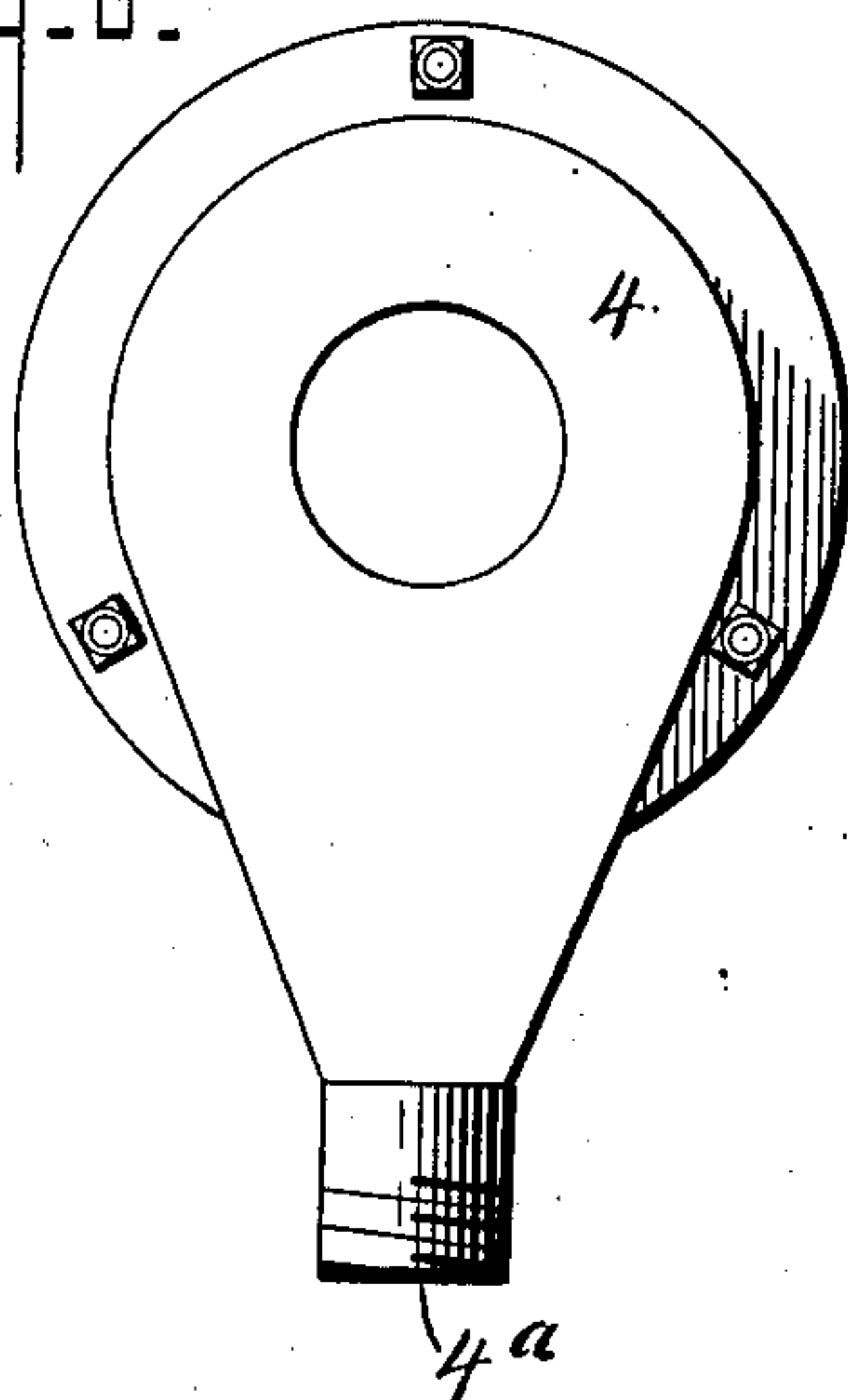


Fig. 5.

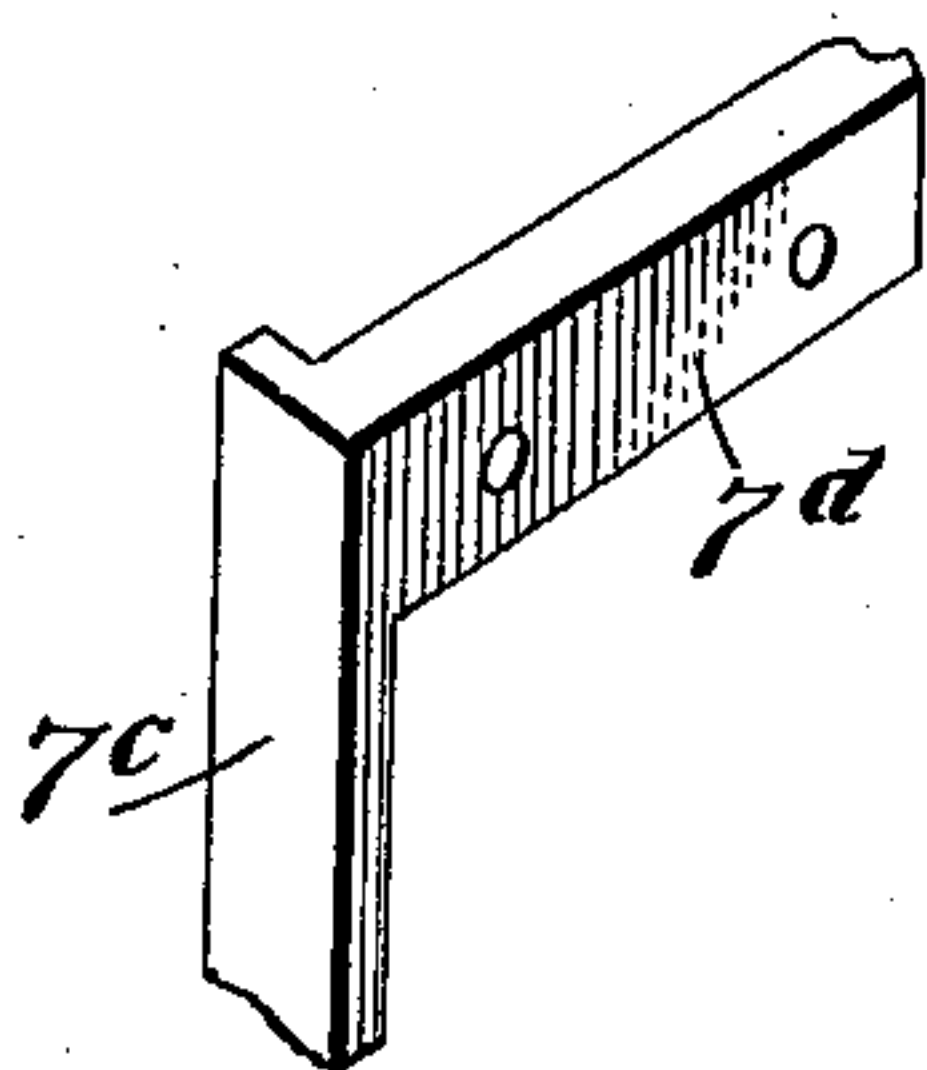
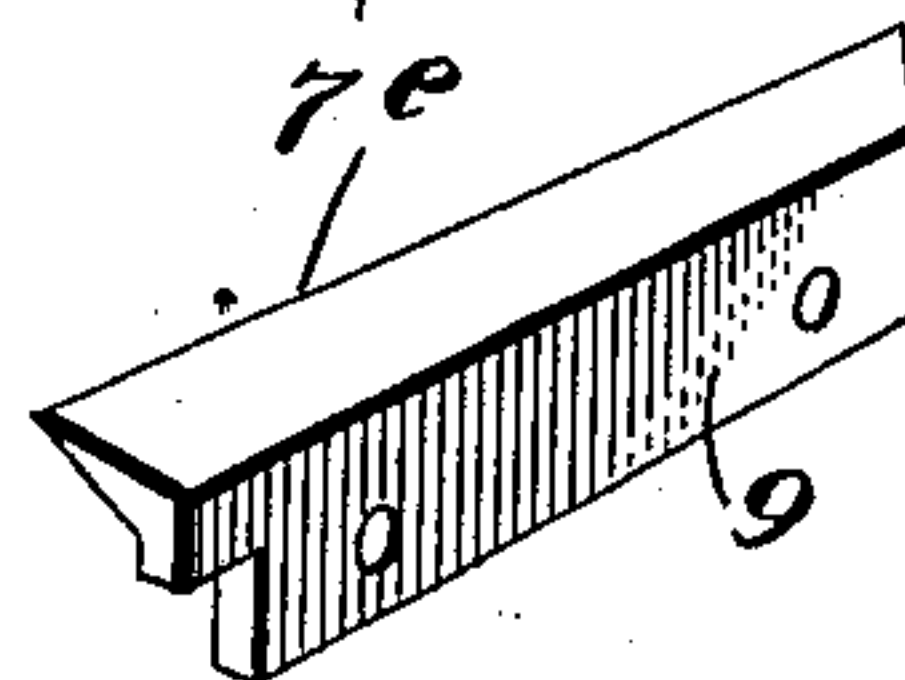


Fig. 6.



WITNESSES:

F. C. Gibson.
John T. Schrott

INVENTORS:

James Henry Shaul.
Grove David Shaul.

BY

Fred G. Dietrich & Co.
ATTORNEYS.

UNITED STATES PATENT OFFICE.

GROVE DAVID SHAULL AND JAMES HENRY SHAULL, OF CHARLOTTE,
MICHIGAN.

TUBULAR AUGER.

SPECIFICATION forming part of Letters Patent No. 754,350, dated March 8, 1904.

Application filed July 22, 1903. Serial No. 166,644. (No model.)

To all whom it may concern:

Be it known that we, GROVE DAVID SHAULL and JAMES HENRY SHAULL, residing at Charlotte, in the county of Eaton and State of Michigan, have invented a new and Improved Tubular Auger, of which the following is a specification.

Our invention relates to improvements in that type of hollow augers or boring-tools especially described to provide for drawing out and discharging the chips and cuttings from the bore being cut and from the tool under pneumatically-controlled means, and primarily our invention seeks to produce an improved tool of this character of a simple and inexpensive construction, easily manipulated, and which will effectively serve for boring logs of large diameters, wooden pipes and pipe-stocks, porch-columns, and the like.

Our invention consists in certain details of construction and combination of parts, all of which will be hereinafter explained, and specifically pointed out in the appended claims, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of our improved boring-tool in the operative position. Fig. 2 is a perspective view of the tool or apparatus. Fig. 3 is an enlarged side elevation of the cutter-head. Fig. 4 is an end view of the same. Fig. 5 is a detail view of one of the bit-holders. Fig. 6 is a detail view of one of the bits. Fig. 7 is a view of the barrel or mandrel, and Fig. 8 is a detail view of the jacket or chip and air collector hereinafter referred to. Fig. 9 is a vertical section of the two-part coupling and collector and jacket portion of our improved auger, taken practically on the line 9-9 of Fig. 1. Fig. 10 is a detail view of the collector device or coupling hereinafter referred to.

In the practical construction our invention embodies a straight barrel or hollow mandrel of suitable length and diameter provided at one end with a collar 1^a and a threaded portion *a'* for detachably joining with the coupling and collecting member presently referred to and which in turn connects with the spindle 2 for joining the complete tool to any of

the ordinary boring-machines or lathes now in use.

The hollow mandrel 1 is joined with the spindle in a manner to permit its outer end being coupled with a powerful suction-fan, and for such purpose we prefer to use a connecting device, (illustrated in the drawings,) which consists of a spider-frame formed of a pair of disks 3 3, held spaced apart by shouldered studs or rods 3^a, whose ends extend through apertures in the disk and are riveted, as shown. Each disk has an apertured hub 3^x, internally threaded, whereby to detachably receive at one side the threaded end of the spindle 2 and at the other side the threaded portion *a'* of the hollow mandrel.

4 designates a jacket or collector which fits air-tight over the spider-frame and has a discharge-throat 4^a, adapted to join with the suction-tube 4^x, in practice connected with a powerful suction-fan. (Not shown.)

In the practical application of our invention we use the same-sized hollow mandrel or barrel 1 for all sizes of cutter-heads, usually from four to twelve inches in diameter, and for such purpose the outer or free end of the barrel is threaded, as at *a'*, to receive a union-coupling 6, which joins with and firmly secures the cutter-head *x* to the mandrel 1. The cutter-head may be of any approved type in which the hollow chamber or space is provided at the rear of the bits, into which is received the chips or cuttings.

In the drawings we have illustrated a preferred construction of cutter-head of the type mentioned and which consists of a hollow shank 7, of a diameter equal that of the mandrel and provided with a threaded portion 7^a to engage the union-coupling 6 and end with an annular flange or hub 7^b to receive a member of equal-distance-spaced holders 7^c, and projected therefrom in the longitudinal plane of the mandrel and whose outer ends terminate in right-angle projections 7^d, radially disposed with respect to each other and with their inner ends in close relation to provide for conveniently securing the central auger-point 8 thereto.

The bit-holders may be made of soft steel, as they do not receive any wear.

9 designates the flat bits, having the cutting edge turned down at right angles to form shaving-blades 7° for smooth cutting, one of the said bits being provided for each holder 7°, and to which holders the bits are secured by screws, as shown.

By connecting the bits to the holders in the manner stated the auger-head is made substantially everlasting and inexpensive to manufacture. The diameter of the cutter-head, it will be noticed, is greater than that of the mandrel, and hence the bore being made is of greater diameter than the said mandrel, and by reason thereof a space between the mandrel and the wall of the bore being made is produced, from which air is constantly drawn into the space back of the cutters in the inner end of the mandrel, and on account of such relation of parts it follows the chips and shavings as they are made are drawn back with the air into the mandrel, out at the rear end thereof into the collector and back into the suction-duct and the fan. Furthermore, by reason of the radial disposition of the cutters and the holding-arms a powerful air suction or blast is permitted to collect behind the cutters, the solid head of the bore, and the entrant end of the mandrel and sufficient to thoroughly disintegrate the chips and prevent them from choking the entrance of the mandrel and to provide for positively carrying them off as quickly as made.

Among the advantages obtained in the application of our invention is the providing of a simple, durable, and easily-manipulated means for getting rid of the chips with absolutely no clogging and in which the mandrel and connection that joins it with the suction-fan can be used with different cutter-heads, and the said barrel or mandrel connects to any of the ordinary types of boring-machines with-

out requiring any changes in the construction thereof.

It is understood that the spider-frame rotates with the hollow mandrel and the spindle that connects it with the boring-machine or lathes, and the collector or jacket 4 remains stationary to receive and deflect the chips that are drawn from the mandrel and from between the disks 3 3 of the spider-frame.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. A boring apparatus as described, comprising a spindle, a hollow mandrel, a combined collector and coupling adapted to join the adjacent ends of the spindle to the outlet end of the mandrel and arranged to receive the cuttings that are drawn through the hollow mandrel, a cutter-head on the inlet end of the mandrel of greater diameter than the said mandrel and a suction-blast connected with the combined collector or coupling.

2. In a boring-tool as described, the combination with the hollow mandrel having a threaded end and a suction-fan; of a cutter-head comprising a hollow spindle, an annular flange or head on the spindle, a series of longitudinally-projected holders secured to the annular head, said holders including radially inwardly bent portions, bits having angle-blades, and an auger-point detachably secured to the said inwardly-bent portions, means for detachably connecting the cutter-head to the hollow mandrel and means connected with the discharge end of the mandrel for joining the said mandrel with the lathe and with the suction-fan as set forth.

GROVE DAVID SHAULL.
JAMES HENRY SHAULL.

Witnesses:

GUY M. ROWLEY,
ESTELLA KLAISS.