

No. 619,496.

Patented Feb. 14, 1899.

H. W. MUNSEY.
COMPOUND ROLL.

(Application filed Sept. 29, 1897.)

(No Model.)

Fig. 1.

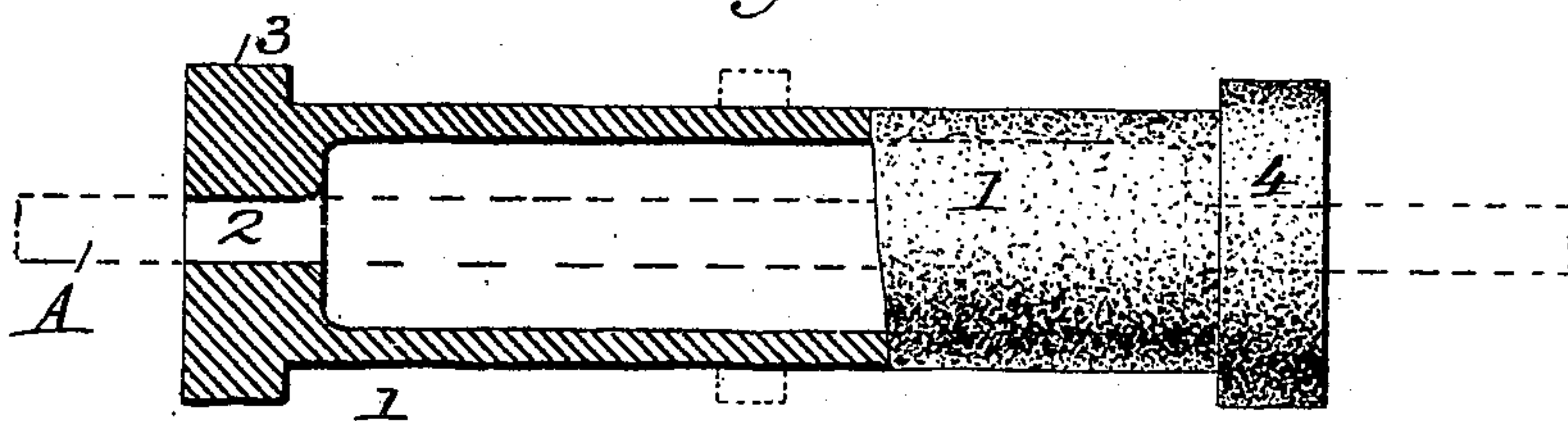


Fig. 2.

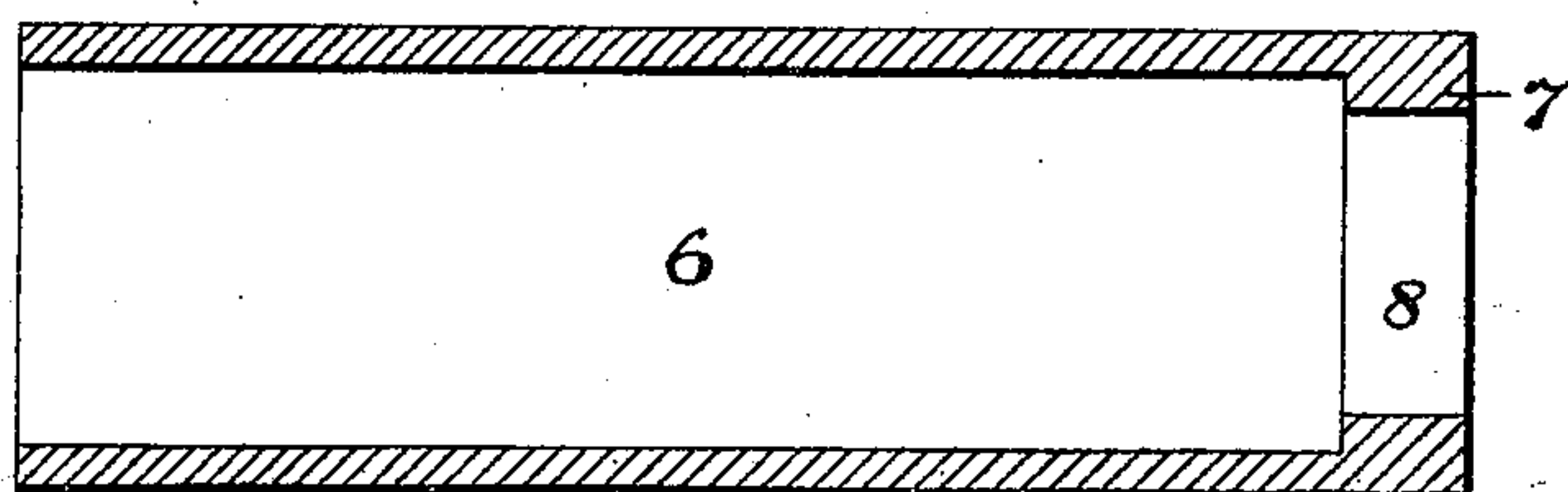


Fig. 3.

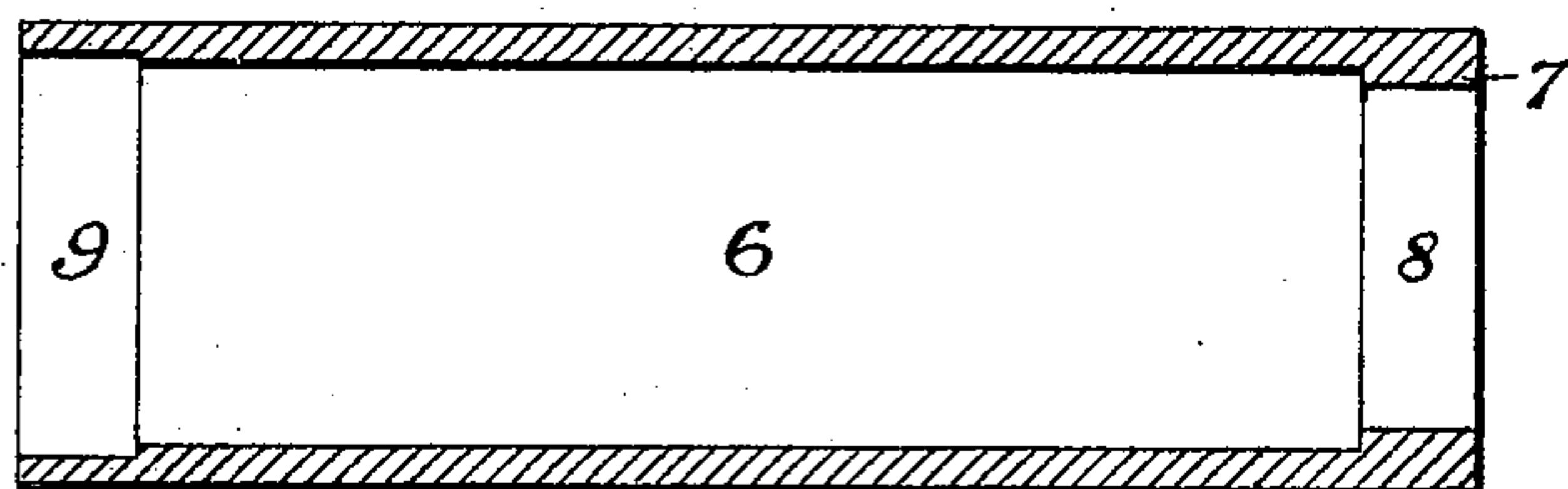


Fig. 4.

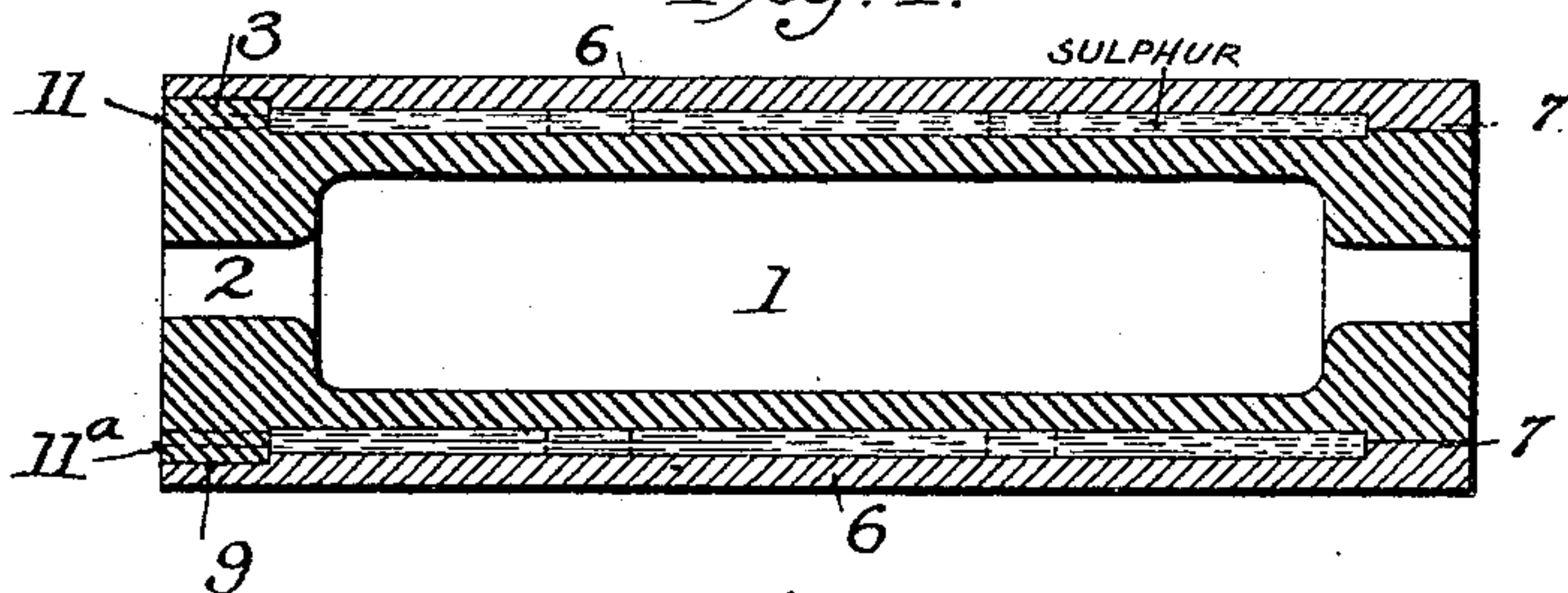
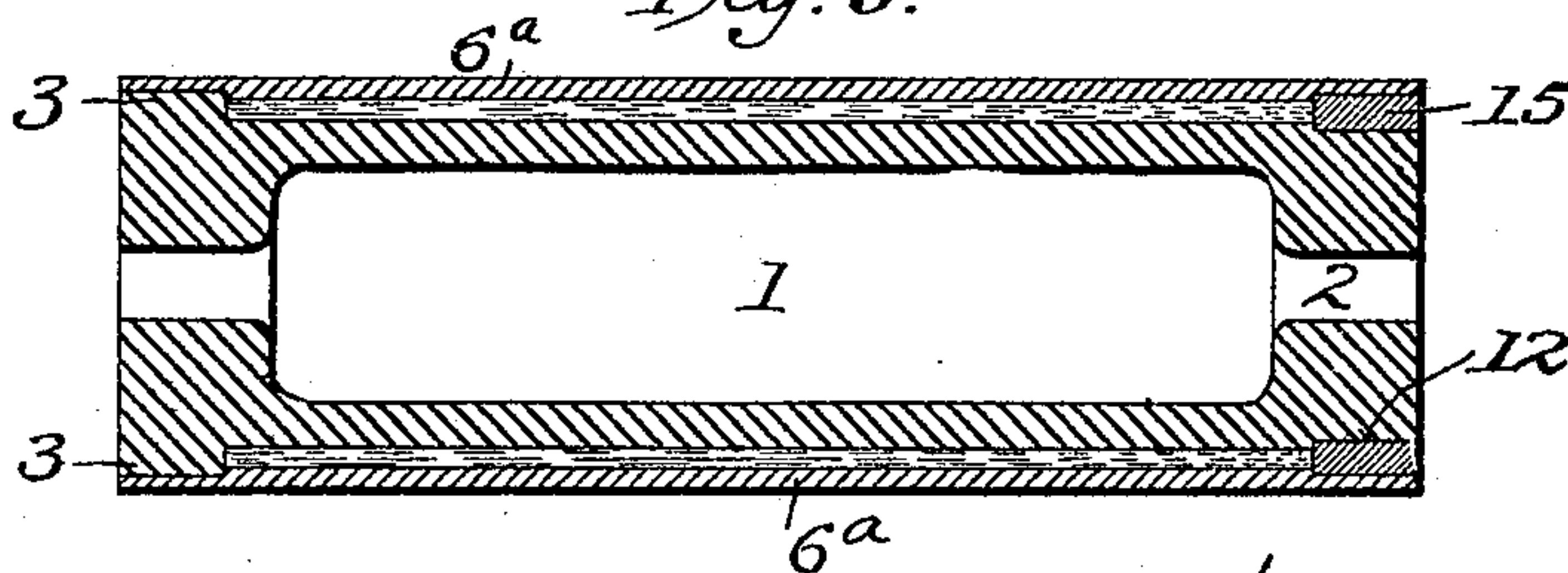


Fig. 5.



Witnesses
Sidney P. Heringworth
Halbert Smith.

Inventor
Horace W. Munsey
by *H. W. Munsey*
Attorney

UNITED STATES PATENT OFFICE.

HORACE W. MUNSEY, OF CHESTER, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO WILLIAM H. BERRY, OF SAME PLACE.

COMPOUND ROLL.

SPECIFICATION forming part of Letters Patent No. 619,496, dated February 14, 1899.

Application filed September 29, 1897. Serial No. 653,492. (No model.)

To all whom it may concern:

Be it known that I, HORACE W. MUNSEY, of Chester, in the county of Delaware and State of Pennsylvania, have invented certain
5 new and useful Improvements in Compound Rolls and Methods of Making the Same, of which the following is a specification, reference being had to the accompanying drawings and to the numerals of reference marked
10 thereon.

My invention relates to an improved compound roll and the method of making the same, the object being to produce a roll composed of two or more parts which can be
15 united in a cheap, strong, rapid, and accurate manner.

In certain classes of machinery used in the arts—such, for instance, as paper-making and cloth-finishing machines—a roll is used which
20 requires a surface of brass or copper, the salts of which will not stain or affect in any way the material operated upon. These rolls when in use are subjected to severe strains and must necessarily be made strong enough
25 to resist them. Several methods of construction are now in use, none of which are entirely satisfactory, the cost of manufacturing being too great. One method is to cast the rolls entirely of brass. This is objectionable,
30 as the metal, besides being expensive, is somewhat soft, and rolls made of it consequently must be heavy in order to withstand the pressure and strain to which they are subjected. Another method of making such rolls is to
35 cast a core of iron and a shell of brass, after which the whole of the outer surface of the iron core and the inner surface of the brass shell are turned until the shell very nearly fits the core. The shell is then heated until
40 it expands sufficiently to pass easily over the core, to which on cooling it tightly shrinks. This method is expensive because of the skilled work called for in fitting the parts together, as great accuracy is required in turning the two pieces in order that the shrinkage
45 may be the same throughout the entire shell.

My method, which is somewhat similar to that just described, is, however, much simpler and cheaper, very little turning being re-
50 quired, and a superior article being produced

thereby. Instead of turning the whole of the contacting surfaces of the core and the shell I turn only the ends thereof, after which the shell is placed over the core and forced in
place by pressure. Space is left between the
55 turned ends of the core and shell, which I fill with some cheap substance, such as sulfur.

In order to attain a fuller understanding of my invention, attention is called to the drawings annexed, in which—
60

Figure 1 is a view of the core of my improved roll, partly broken away. Fig. 2 is a longitudinal section through the shell as it comes from the mold. Fig. 3 is a similar view
65 of the shell in a finished condition. Fig. 4 is a section of the completed roll, and Fig. 5 shows a modified form thereof.

Similar numerals of reference indicate similar parts in the respective figures.

In carrying out my invention I first cast a
70 core 1, which may be of iron or steel and preferably hollow, as indicated, the core having an opening 2 at each end, through which passes the shaft A, on which the roll is mounted. An external flange of suitable width is
75 formed on each end of the core, as seen at 3 4, the flanges being of greater diameter than that of the core between them. These flanged ends 3 4 are turned, the flange 4 being of less diameter than the flange 3, while that portion
80 of the core between the flanges is left rough or in the condition in which it comes from the mold.

The shell 6, which is cast from brass or copper, is hollow throughout its length, one end
85 being cast with an internal flange 7 of a width equal to that of the flange 4 on the core and having an opening 8 left therethrough. The shell 6, which is in the rough, must now be turned or bored to fit the iron core, for which
90 purpose it is secured to a suitable machine and the opening 8 in the flange 7 is turned until the diameter thereof will make a tight fit with the flange 4 on the core 1. The opposite end of the shell is also turned, as at 9,
95 for a length equal to the width of the flange 3 on the core and makes a tight fit with the said flange, the intermediate portion of the shell being left rough. The two portions—that is to say, the core and the shell—being
100

now ready for uniting, the shell 6 is placed over the core and the finished portions 8 9 of the shell are forced over the flanges 3 4 of the core. As thus constructed the shell and core 5 are firmly united at the ends, leaving the space between the two parts at the middle to be filled with some suitable material.

The surface of the roll may be turned smooth or given any other finish desired, 10 either at the time the ends are being bored or after the core and shell have been assembled.

Through an opening 11 in the flange 3 melted sulfur or other cheap substance is poured, 15 filling the space between the flange and the shell, thus forming a cheap, strong, and useful roll. A second opening 11^a through the flange 3 permits the escape of air from the space between the core and the shell while 20 the sulfur is being poured in.

A modified form of constructing my roll is shown in Fig. 5. It is sometimes desired to cover the core with seamless tubing 6^a, which is both light in weight and of even thickness 25 throughout, in which case, instead of casting the core 1 with a flange 4 on one end, this end is turned down, as indicated at 12, the opposite end having the flange 3 finished as before, the ends of the seamless tubing being 30 each turned or bored out, as shown. In assembling the parts one end of the seamless tubing is forced over the flange 3. The opposite end is filled in by a collar 15, whose external and internal diameters form a close fit 35 with the turned portions of the core and seamless tubing. The space between the shell and core is filled with suitable material.

When long rolls are made, it may sometimes be desirable to support the shell by one or 40 more flanges intermediate of the ends, such construction being shown by dotted lines in Figs. 1 and 4.

While I have described the core as being

made of iron or steel and the shell of brass or copper, it is to be understood that I do not 45 confine myself to these metals or to metals at all, as any suitable material or materials may be used for either the core or the shell.

Having thus described my invention, I claim—

1. In a roll, a core having flanged ends turned or finished to different diameters, in combination with a shell shrunk over the core and having an internal flange at one end, which, with the other end, is finished to fit 55 tightly the flanges of the core, a space being left between the core and the shell, and a filling material within this space, substantially as set forth.

2. In a roll, a core having flanged ends, the said flanged ends being ground or finished to different diameters, in combination with a shell surrounding the core and having an internal flange on one end, which flange and the opposite end of the shell are ground or 65 finished to fit tightly the ends of the core, a space having a roughened surface being formed between the core and the shell, and a filling material within the space, substantially as set forth. 70

3. In a roll, the combination, with a core having a flange at each end, one of which is of less diameter than the other, of a sleeve having an internal flange at one end adapted to fit tightly over the lesser flange at one end 75 of the core, the other end of the said shell being recessed and adapted to fit tightly the larger flange, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal this 11th day of 80 September, 1897.

HORACE W. MUNSEY. [L. S.]

Witnesses:

GEO. E. SMALL,

GEO. R. FULTON.