No. 880,205. PATENTED FEB. 25, 1908.

J. J. EVANS & R. LEWIS.

ROLL.

APPLICATION FILED APR. 12, 1907.

Fig. 1.

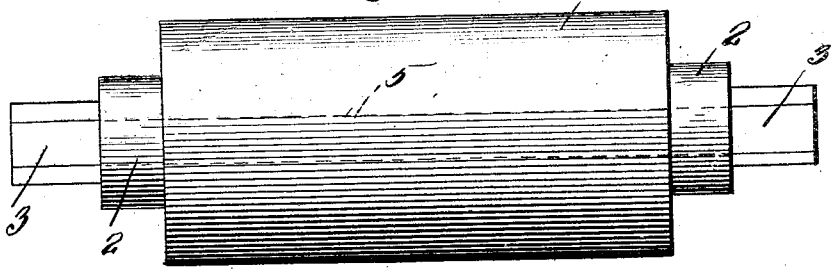


Fig. 2.

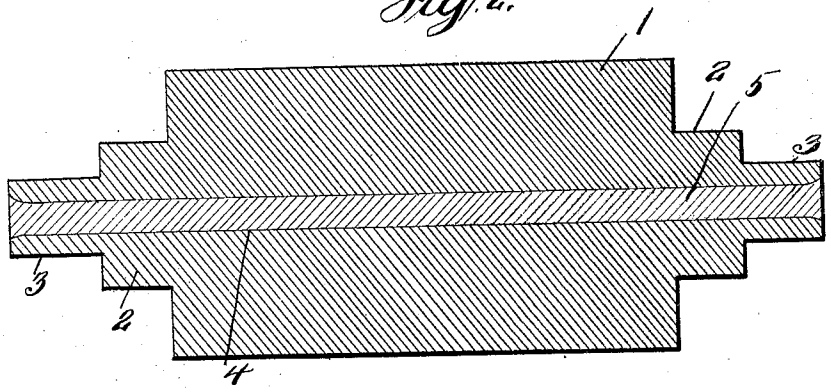
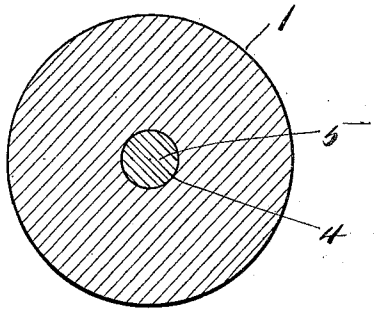


Fig. 3.



WITNESSES:

Samuel Payne

R. N. Parker.

INVENTORS

J. J. Evans and R. Lewis

BY H. C. Evert & Co.

Attorneys

UNITED STATES PATENT OFFICE.

JOHN J. EVANS AND REES LEWIS, OF NEW CASTLE, PENNSYLVANIA.

ROLL.

No. 880,205. Specification of Letters Patent. Patented Feb. 25, 1908.

Application filed April 12, 1907. Serial No. 367,880.

To all whom it may concern:

Be it known that we, JOHN J. EVANS, a citizen of the United States of America, and REES LEWIS, subject of the King of Great Britain, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Rolls, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in rolls, and the invention has for its object to provide a roll with positive and reliable means for strengthening and preventing the same from breaking or cracking due to the expansion and contraction of the roll.

Another object of this invention is to provide a roll with a soft metal core, which will sustain the roll when expanded and contracted, the soft metal core having properties susceptible to expansion and contraction similar to the material from which the roll is constructed.

A further object of this invention is to construct a roll whereby it will withstand the rough usage to which it is ordinarily subjected, the roll being comparatively inexpensive to manufacture and highly efficient for the purpose for which it may be used.

With the above and other objects in view, the invention consists in the novel construction, combination and arrangement of parts to be hereinafter more fully described and then specifically pointed out in the appended claims, and referring to the drawing forming part of this specification, like numerals of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a side elevation of the roll constructed in accordance with our invention, Fig. 2 is a longitudinal sectional view of the same, Fig. 3 is a cross sectional view of the same.

For the purpose of illustrating a practical embodiment of our invention, we have shown a roll 1 which in its form is similar to an ordinary sizing roll, and is shown as provided with the usual collars 2 and necks 3.

To practice our invention, we take a roll such as that shown and above described, and provide the same longitudinally with a central bore 4 extending from end to end of the roll, and in this bore 4 we insert a soft metal core 5, the core 5 being of a metal which is considerably softer in its nature than the metal from which the roll 1 is formed, and we prefer to use copper for the core, as we have found the same to be best suited to accomplish the objects of our invention, on account of its susceptibility to expansion and contraction, and other peculiar qualities inherent in copper, as will be more fully explained. This soft core 5 after being inserted in the bore 4 of the roll 1 may be securely held against longitudinal displacement in any desired manner, as by upsetting the ends of the core 5 as clearly seen in Fig. 2 of the drawings.

As preliminarily stated, the object of the invention is to prevent the breaking or cracking of the roll 1 due to the expansion and contraction of the roll. These rolls are generally of steel and the extreme variations in temperature to which they are constantly subjected has a decided tendency to cause them to break or crack thereby rendering the same worthless for further use. With a soft metal core placed within such a steel roll, and, as stated, preferably a copper core, it has been found that the danger of the roll cracking or breaking is reduced to a minimum, due to the fact that when the steel roll contracts, the copper core also contracts, and its susceptibility to contraction being greater than that of the steel roll, the core "gives way" as it were to the steel roll, and very materially reduces the danger of the roll cracking due to contraction thereof. Also, when the steel roll expands the copper core also expands, and the susceptibility of the copper to expansion being greater than that of the steel roll, the copper core expands to a greater extent than the steel roll, though this difference in expansion as has been demonstrated is not sufficient to injure the roll, owing to the different natures of the two metals. The copper core in its expanded form becomes stronger to support the roll and prevent danger of the latter breaking under the strains to which it may be subjected. As stated, we prefer to use the copper, and in practice have used this particular material for the core on account of its being a tougher metal than other soft metal, and also on account of its becoming more indurate and tenacious in its

expanded condition, thereby aiding materially in the strengthening of the roll and reducing the danger of the roll breaking under severe strains. The roll is therefore strengthened under all conditions of temperature to which it is subjected, the copper core in its expanded condition being stronger and adding strength to the roll 1, and in its contracted condition being tough, and having greater susceptibility to contraction than the steel roll, will allow the latter to contract without danger of cracking during contraction.

It is of course understood that while we have shown the core 5 secured in the roll 1 by upsetting the ends of the core, which method is the preferable one owing to the fact that by this means air is excluded from the bore, yet the core may be secured in the roll in any desired or approved manner.

What we claim and desire to secure by Letters Patent, is:—

A roll comprising a body portion formed with a collar and neck at each end thereof, said roll further provided with a centrally-disposed longitudinal bore extending from end to end thereof, and a core of copper tightly disposed in said bore.

In testimony whereof we affix our signatures in the presence of two witneses.

JOHN J. EVANS.
REES LEWIS.

Witnesses:
EVAN EVANS,
L. A. JOHNSTON.