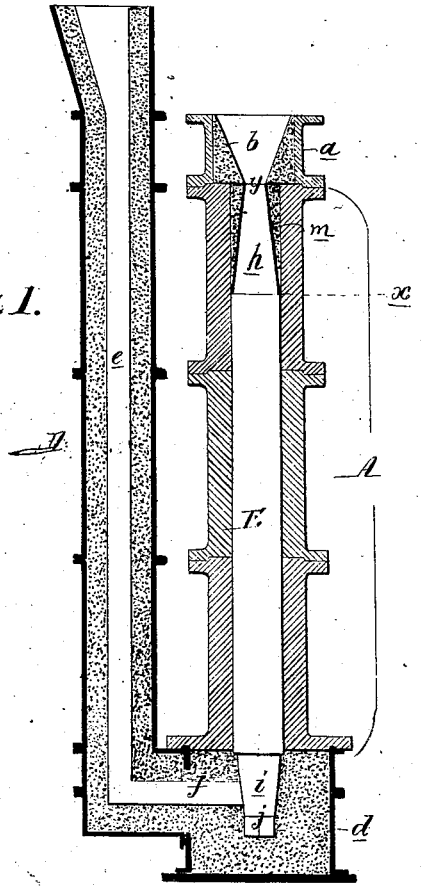
G. G. Lobdell & Wm. Stuart,
Improvement in Casting Chilled Rolls.

110378

PATENTED DEC 20 1870

Fig. 1.



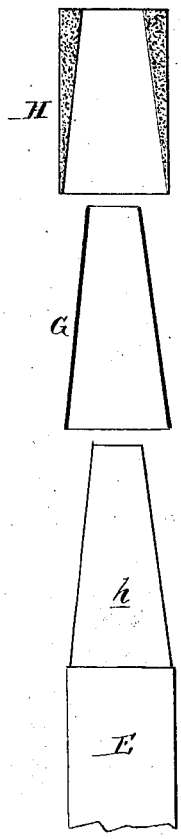
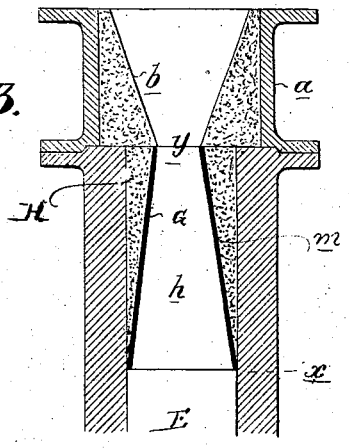


Fig. 2.

Fig. 3.



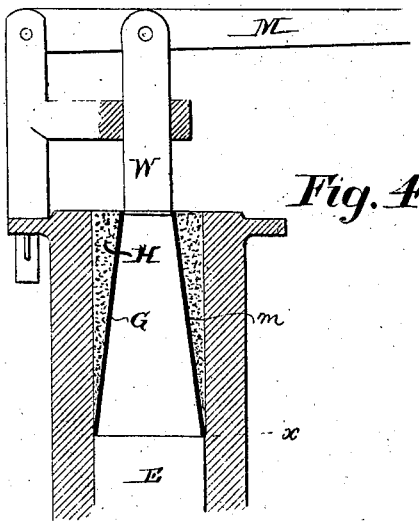


Fig. 4.

Witnesses { Jno. B. Harding
John Parker

G. G. Lobdell and
Wm. Stuart
by their Attys
Howson and

United States Patent Office.

GEORGE G. LOBDELL AND WILLIAM STUART, OF WILMINGTON, DELAWARE.

Letters Patent No. 110,378, dated December 20, 1870.

IMPROVEMENT IN CASTING CHILLED ROLLS.

The Schedule referred to in these Letters Patent and making part of the same.

We, GEORGE G. LOBDELL and WILLIAM STUART, both of Wilmington, county of Newcastle, State of Delaware, have invented an Improvement in Casting Chilled Rolls, of which the following is a specification.

Nature and Object of the Invention.

Our invention, which is too fully described hereafter to need preliminary explanation, has for its object the casting of chilled rolls having soft ends, without incurring the common danger of the said ends being separated from the chilled body during the cooling and shrinking of the roll.

Description of the Accompanying Drawing.

Figure 1 is a vertical section of a mold for casting a chilled roll.

Figures 2 and 3, detached views of part of fig. 1, drawn to an enlarged scale, and illustrating a feature of our improvement; and

Figure 4 a vertical section of part of the mold, showing another feature of our invention.

General Description.

Any desired number of hollow cylindrical cast-iron chills of appropriate thickness is fitted and secured together, as shown in fig 1, so as to form a tubular mold for the chilled body of the roll, and on the top of this mold is a box, *a*, within which is formed in sand the rising gate *b*.

The lower portion of the mold is formed in sand contained in a box, *d*, with which is connected the vertical box D, the latter being so packed with sand as to leave a central running-gate *c*, which communicates through a horizontal passage, *f*, with the interior of the mold.

The chilled roll E, cast in the mold, has the ordinary tapering ends *h* and *i*.

In casting chilled rolls, it is important that these tapering ends should be of comparatively soft metal, for, on finishing the rolls, these ends are first turned in a lathe, so as to be converted into the required journals, adapted to bearings in which the roll revolves while its chilled portion is being turned and ground.

Chilled rolls have been heretofore cast in molds similar to that described in reference to fig. 1, and, in order to insure the softness of the tapering ends, the latter are cast in contact with sand; thus, the lower tapering end *i* of the roll is cast in that portion of the mold formed in sand in the box *d*, while the upper tapering end *h* of the roll is surrounded by sand *m* packed in the upper portion of the cylindrical chill A.

There is, however, in this, the ordinary process of casting chilled rolls, a serious defect, which may be explained as follows:

After the metal has been poured through the gate *c* into the mold until it reaches the rising-gate *b*, a sudden cooling, and a correspondingly sudden shrinkage of that portion of the roll which is in contact with the chill takes place; no evil result of this would ensue if the tapering portion *h* of the roll followed the contracting chilled body of the same; but it adheres to the sand *m*, while the latter adheres to the interior of the chill A; hence, in very many instances, the tapering end is separated from the body of the roll at *x*, and the casting is useless.

In order to obviate this evil, we use a tapering sleeve, G, of thin metal, bent to the form of the tapering end *h* of the roll; this we generally coat inside and out with black-lead, clay, or other non-conducting refractory material, the inner coating preventing the melting of the sleeve, and the outer coating insuring the ready separation of the sleeve from the body of sand when the latter is used. This sleeve is fitted into the chill at the point shown in fig. 1, and in the space between the sleeve and the interior of the chill may be inserted the hollow cylinder *m*, of baked sand or loam, which has also been suitably black-washed, after which the mold is surmounted with the box *a*, and the rising-gate *b* formed therein with sand.

After the metal has been poured into the mold, the box *a* is at once removed, and whatever metal may have risen into the gate *b* is separated from the roll at the point *y* by simply knocking it off.

Owing to the presence of the metal sleeve G, which prevents the contact of the molten metal with and its adhesion to the body of sand, the tapering end *h* will accommodate itself to the shrinkage of the chilled portion of the roll, the sleeve separating from the sand and moving with the roll when the latter shrinks; hence the tapering end remains an integral part of the roll, and is as soft as desirable.

In some instances the coated sleeve may be employed alone, as it will prevent the chilling of the metal; or the sleeve of baked sand may be employed alone, if so arranged as to slide in the mold and to move and remain in contact with the metal as the roll shrinks; in either case the object of my invention is accomplished; that is, the mold which receives the metal forming the soft end of the cylinder is carried with the latter when it shrinks, so as to prevent the fracture of the roll.

To facilitate the descent of the tapering end of the roll as the chilled body shrinks, we sometimes apply pressure to the end of the newly-cast roll immediately after the removal of the box *a* and the knocking off the metal on the rising-gate

This pressure may be applied in a variety of ways, for instance, a plunger, W, and a weighted lever, M,

may be applied, in the manner too clearly illustrated in fig. 4 to need enplanation.

The sleeve will be united or partially united to the metal of the roll, but can be readily removed by tearing or chipping it off, or removing it in the lathe when the journal is turned.

Claims.

1. The employment, in casting chilled rolls, of a sleeve, or its equivalent, receiving the metal which forms the soft end of the roll, and moving with the latter when the metal contracts, substantially as described.

2. The application, to the top of the newly-cast roll, of pressure, as set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE G. LOBDELL.
WILLIAM STUART.

Witnesses:
JARRETT MEGAW,
JAMES H. CAMERON.