

(No Model.)

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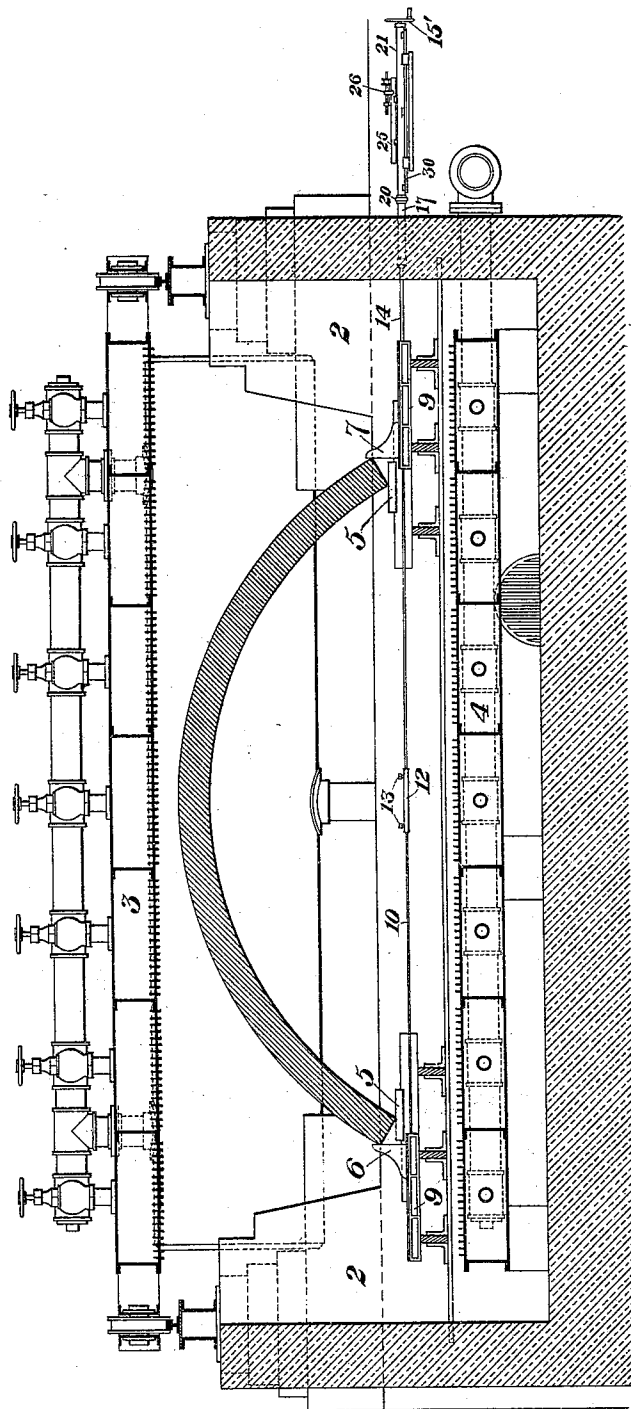
W. WHIGHAM.

REGULATING CHORDS OF CURVED PLATES.

No. 543,917.

Patented Aug. 6, 1895.

Fig. 1.



WITNESSES

M. B. Conner
H. M. Conner

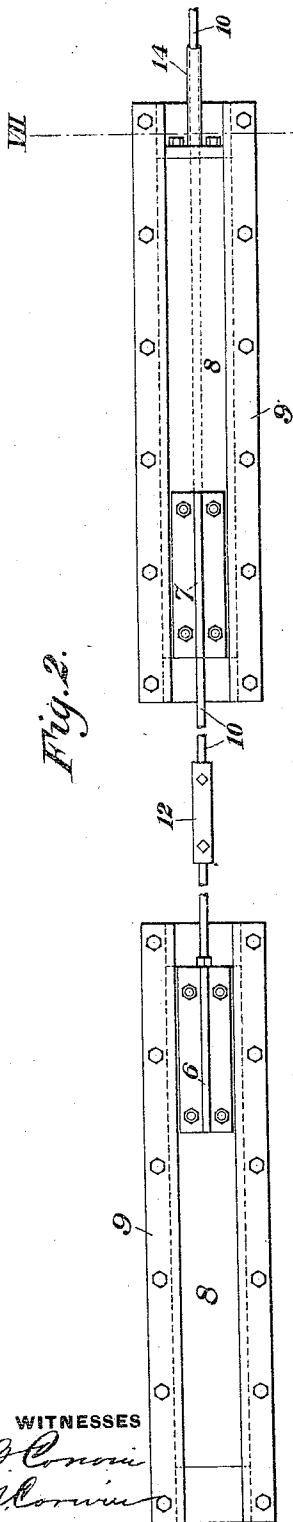
INVENTOR

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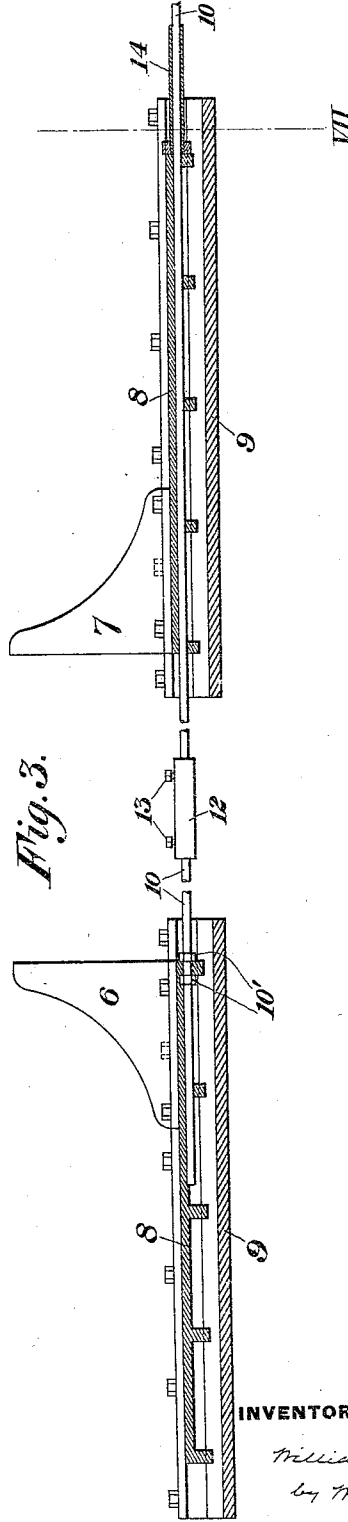
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(No Model.)

4 Sheets—Sheet 3.

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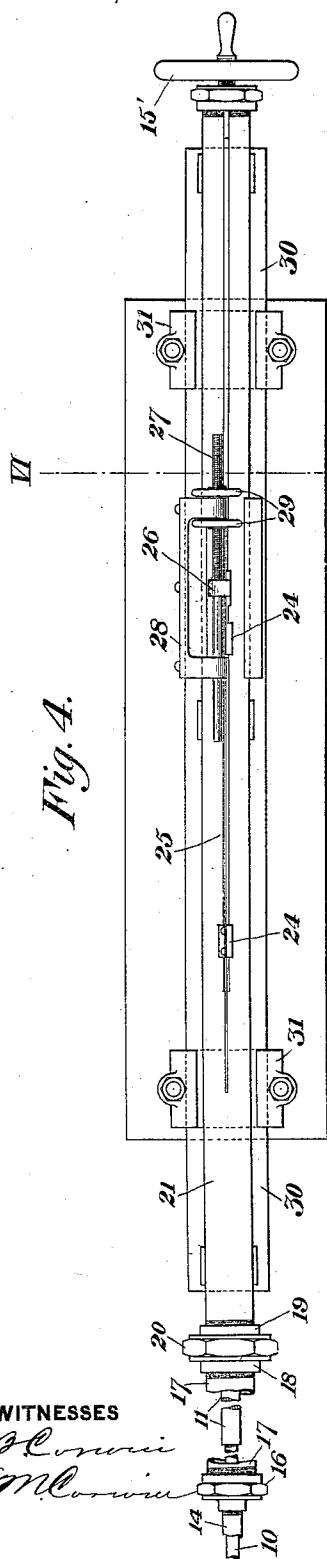


Fig. 4.

WITNESSES

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J. M. Corvici

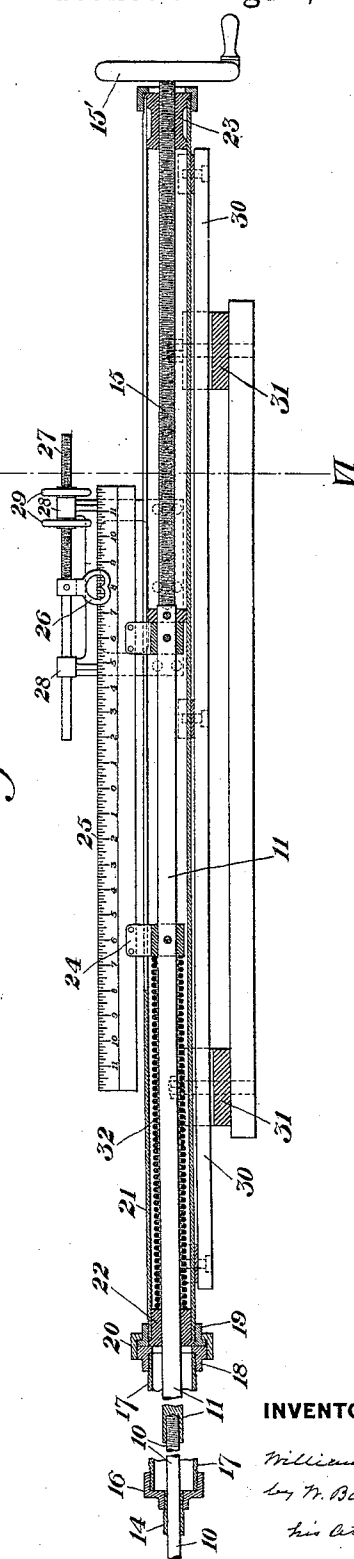


Fig. 5.

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(No Model.)

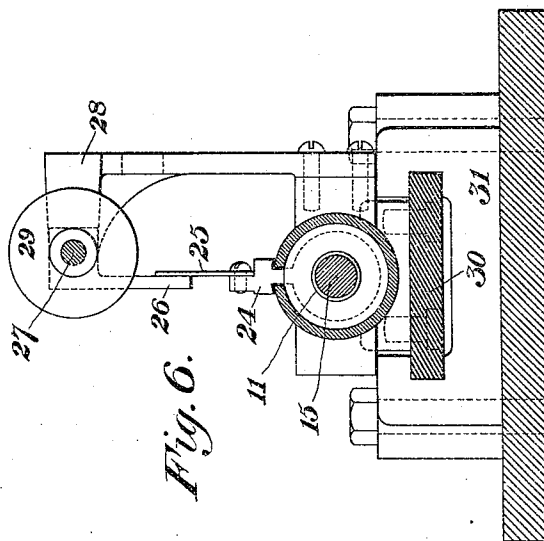
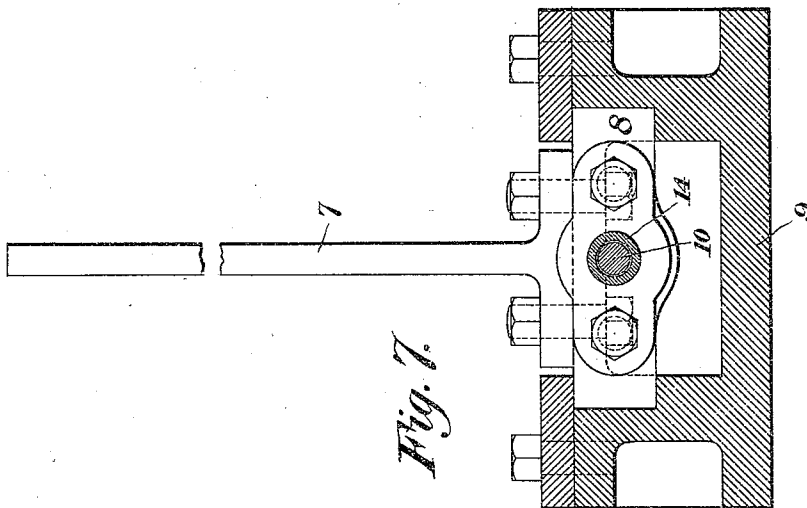
4 Sheets—Sheet 4.

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REGULATING CHORDS OF CURVED PLATES.

No. 543,917.

Patented Aug. 6, 1895.



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UNITED STATES PATENT OFFICE.

WILLIAM WHIGHAM, OF MUNHALL, PENNSYLVANIA.

REGULATING CHORD OF CURVED PLATES.

SPECIFICATION forming part of Letters Patent No. 543,917, dated August 6, 1895.

Application filed November 5, 1894. Serial No. 527,876. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WHIGHAM, of Munhall, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Regulating the Chord of Curved Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view of tempering apparatus provided with my improved chord-indicator. Fig. 2 is an enlarged top plan view of the central portion of the indicating or measuring apparatus, and Fig. 3 is a side elevation, partly in section, of the same. Fig. 4 is an enlarged top plan view of the end portion of the indicator, and Fig. 5 is a side elevation, partly in section, of the same. Fig. 6 is an enlarged cross-section on the line VI VI of Figs. 4 and 5, and Fig. 7 is an enlarged cross-section on the line VII VII of Figs. 2 and 3.

My invention relates to the tempering of curved plates, more especially armor-plates, and is designed to provide a method of and means for continuously indicating changes in the chord of the curved plate.

Heretofore in the spraying and cooling of plates it was impossible to retain the chord of the plate at the desired length, as this chord lengthened or shortened during the spraying, according to which side the water was applied; and as the chord could not be measured during the cooling many plates must be reheated to bring their chords to the right length. To remedy this difficulty and to afford the operator an indicator which will show him at each moment the length of this chord and thus inform him as to which side to apply the water is the object attained by my invention.

In the drawings, in which similar numerals indicate like parts, 2 represents a tempering-pit having upper and lower spraying-tanks 3 and 4. The plate rests between the tanks upon end shoes 5, of which there are preferably two at each end placed near the corners of the plate, which slides thereon as it contracts or elongates in cooling. Against each end of the plate, preferably at its middle line, press the caliper-jaws 6 and 7, which are secured to slides 8, which move in side recesses

of boxes 9. A rod 10 is adjustably secured to the slide of the jaw 6 by the lock-nuts 10' taking about its screw-threaded end portion, this rod extending through the other slide and being made adjustable in length by a collar 12 secured to its ends between the jaws by set-screws 13. Secured to the rear end of the right-hand slide 7 is a tube 14, through which the rod 10 extends. The protruding end of the rod is screwed into a larger rod 11, against the end of which abuts a screw-spindle 15, provided at its outer end with a hand-wheel 15'. Secured to the end of the pipe or tube 14 is a cap 16, secured to a sleeve 17, screwed into a flanged cap 18, which is secured to a second cap 19 by a collar 20. The collar 19 is secured to an enlarged tube 21, having a plug 22 fitting about the rod 11, and at its outer end an innerly screw-threaded plug 23, engaging the spindle 15.

Secured to the rod 11, by supports 24, projecting upwardly through a slot in the upper side of the tube, is a scale 25, over which moves a pointer 26 secured to a rod 27, which passes through bearings 28 and may be held in adjusted position by lock-nuts 29. The bearings 28 are secured to the tube 21, so that as the tube 21 and rod 11 move relatively to each other the pointer moves over the scale. The tube 21 is secured to a sliding plate 30, which moves within stationary guides 31.

To hold the calipers firmly against the ends of the plate I provide the spiral spring 32, which encircles the rod 11 and is held between the plug 22 and the collar of the support 24.

The indicating portion of the apparatus, shown in Figs. 4 and 5, is outside the pit, as shown in Fig. 1.

The operation is as follows: The plate being put in position the caliper-jaws are adjusted to bear upon its ends, as in Fig. 1. The spraying is then begun, and by watching the movements of the pointer over the scale the amount of change of the chord is accurately seen and the spraying regulated accordingly, the top spray lengthening the chord and the lower spray contracting it, the spraying being so gaged that the chord will be maintained uniform or brought back as nearly as possible to its normal length at the end.

The advantages of my invention will be apparent to those skilled in the art, since, in-

stead of haphazard results and a plate being changed so that it cannot be used without the trouble of reheating and tempering, the operator can observe the whole action of the plate and regulate the sprays accordingly.

Many changes in the form and arrangement of my invention may be made by those skilled in the art without departure therefrom; since

What I claim as my invention is—

- 10 The method of adjusting the chord of a curved plate in spraying the same during tempering, consisting in continuously measuring

the same during the spraying operation and regulating the place of application of the cooling fluid to lengthen or shorten the chord according to the readings of the measuring device; substantially as described. 15

In testimony whereof I have hereunto set my hand.

WILLIAM WHIGHAM.

Witnesses:

H. M. CORWIN,
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