A. B. SEYMOUR.

SECTIONAL ROLLS.

No. 192,392. Patented June 26, 1877.

FIG. 1.

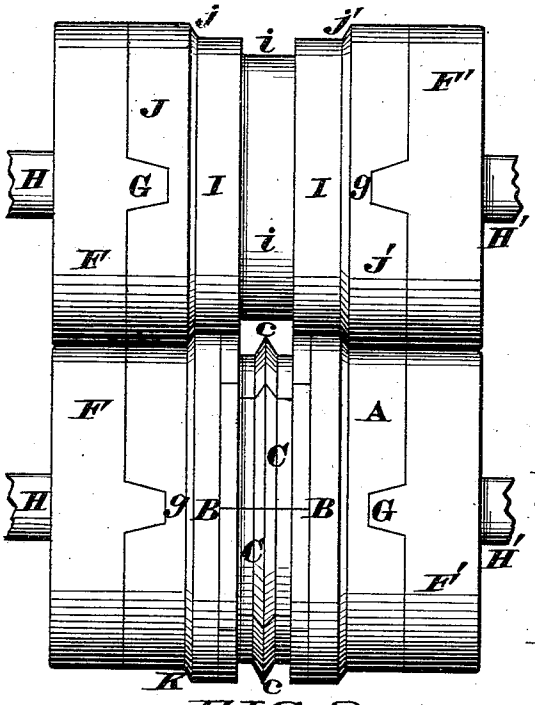


FIG. 2.

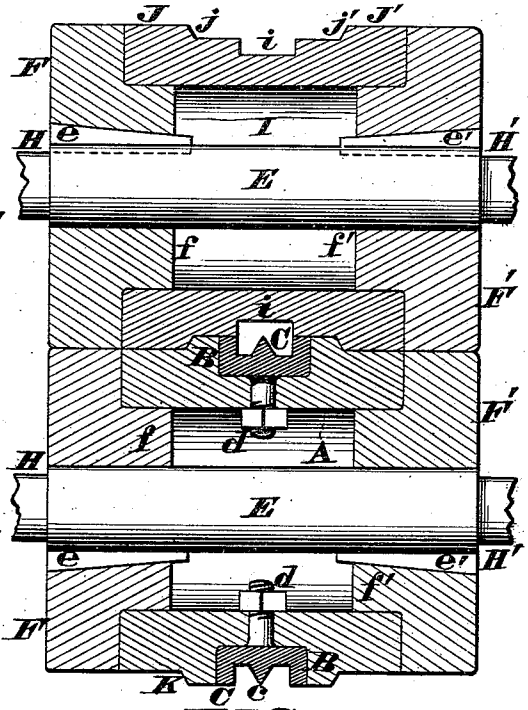


FIG. 3.

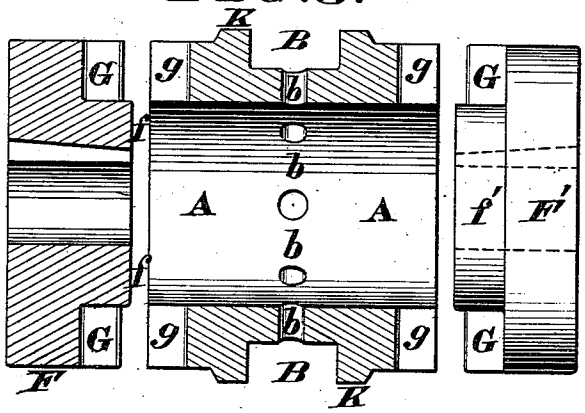


FIG. 4.

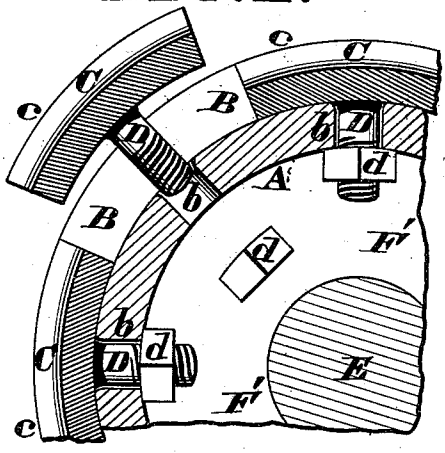


FIG. 5.

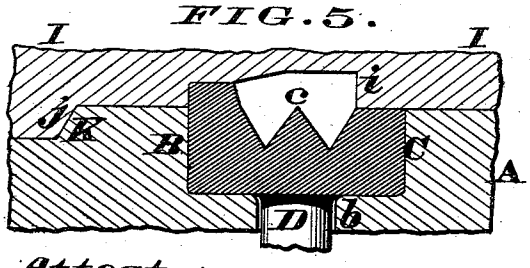
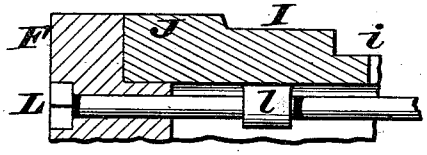


FIG. 6.



Attest:
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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN SECTIONAL ROLLS.

Specification forming part of Letters Patent No. **192,392**, dated June 26, 1877; application filed November 16, 1876.

To all whom it may concern:

Be it known that I, ALFRED B. SEYMOUR, of Portsmouth, Scioto county, Ohio, have invented a new and useful Sectional Roll, of which the following is a specification:

This invention relates to that class of devices commonly known as sectional rolls, or, in other words, rolls whose shaping-dies or cutters are capable of being readily applied to or detached from the cylinders within which they are fitted; and my improvement comprises a novel method of securing said dies, so as to prevent them slipping or twisting around within the circumferential groove of the supporting-cylinders, and at the same time said shaping-members constitute a practically continuous or uninterrupted die for the rolls.

These dies are composed of two or more segments or sections, each section being furnished with one or more screw-threaded stems or shanks, that pass through suitable radial apertures in the tube, after which nuts are applied to the inner ends of said shanks, thereby securing the dies immovably within the circumferential groove, previously alluded to. The aforesaid cylinder is open at both ends, and has fitted within it heads or disks that are keyed fast to the driving-shaft, which latter occupies an axial position with reference to the sectional roll, said shaft being rotated by any suitable appliance, such as gearing or otherwise.

This cylinder and its two heads are locked together, in order that they may rotate in unison with the driving-shaft or axle of the roll, the connection between the cylinder and its attached heads being effected in any approved manner.

Having thus indicated the leading features of my sectional roll, I will now give a detailed description of the same, by referring to the accompanying drawings, in which—

Figure 1 is a front elevation of my improved sectional roll, the housings and gears of the same being omitted. Fig. 2 is a vertical section thereof. Fig. 3 is a vertical section of the various parts of the sectional roll detached from each other, the driving-shaft being omitted. Fig. 4 is an enlarged transverse section of a portion of the cylinder and its accessories, the section being taken in the plane of the circumferential groove, and one of the dies being shown detached from said groove. Figs. 5 and 6 represent modifications of the invention.

The principal member of my sectional roll is a hollow cylinder or tube, A, of any suitable length, diameter, and thickness of material. This cylinder may be composed of iron or steel, or any other suitable metal, and it is furnished with an annular or circumferential groove or channel, B, and a number of radial apertures *b*, whose office will presently appear. This groove may be of any desired shape in its tranverse section. Seated within this annular groove are sectional or segmental dies C, whose outer peripheries are so shaped as to impart the desired form to the heated bar, blank, or plate when such bar or blank is passed through the rolls.

In the drawings these dies are shown as provided with a central and V-shaped ridge, *c*, for the purpose of forming a V-shaped groove or depression longitudinally of the heated bar, blank, or plate, but it is evident said dies may be cut so as to impart any desired shape or combinations of forms to the blank, such, for example, as a series of alternate transverse ridges and valleys, or otherwise. Each segment, or individual die, is furnished with one or more stems or shanks D, screw-threaded at their inner ends, and capable of being passed through the radial apertures *b*, after which nuts *d* are engaged with said screw-threaded stems, as seen in Figs. 2 and 4.

Two or more of such segments may be applied to the groove B, care being taken to have their contiguous ends in close contact, so as to constitute practically a continuous or uninterrupted die around the cylinder or roll A.

The preferred method of attaching this cylinder to the driving-shaft E is as follows: Said shaft is preferably a steel bar of any suitable diameter, and has firmly secured to it, with keys *e e'* or other equivalent devices,

two heads or disks, F F′, provided, respectively, with short inwardly-projecting flanges or hubs *f f′*, capable of entering the opposite ends of cylinder A, as seen in Fig. 2. In order that these heads may drive the cylinder, the former are provided with tongues or projections G, that fit snugly within sockets or grooves *g* in the ends of said cylinder, although any other secure method may be employed for coupling these three members of the sectional roll together. Two tongues will suffice for each head, but a greater number of them may be employed, if preferred.

The projecting ends H H′ of shaft E constitute the necks or journals of the roll, and it is preferred to reduce the diameter of said necks a distance equal to the depth of the key-seats in said shaft. This arrangement obviates the cutting of grooves or channels in said necks.

It is preferred to make the upper roll I in the previously-described sectional manner; but, as said roll is not generally furnished with dies, it may be solid.

In the drawings, however, it is represented as composed of a cylinder, I, and two heads, F *f* F′ *f′*, which are coupled to said cylinder or roll in the same manner as are the cylinder A and its heads.

This upper roll is represented as having a rectangular pass, *i*, cut in it, as said roll acts only on the back of the blank, which back is generally flat or nearly flat.

But this cylinder I may be provided with the segmental dies, and the lower one, A, may have the pass in it.

Or both cylinders may be furnished with dies, according to the kind of bar or blank or plate that is to be rolled in the mill.

The upper cylinder has two collars, J J′, with inclined shoulders *j j′*, thereby affording guides for the enlarged diameter K of the lower roll A. By this means the two cylinders or rolls A and I are maintained in close contact with each other, and neither of them can shift longitudinally with reference to the other in case the keys *e e′* should work loose.

To illustrate the advantages incidental to this sectional construction of rolls, I will suppose that either one of the dies C has become injured by the passage through the train of some foreign substance—such, for example, as a pair of tongs or other implements. As soon as such an accident occurs, the train of rolls is at once thrown out of gear, and one of the keys *e* is dislodged so as to permit the head F or F′ to be shifted, after which the appropriate nut is unscrewed from the shank of the injured segment or die. The die C is then withdrawn from groove B, a new one inserted in its place, the nut screwed onto the stem, the head keyed up, and the roll is again ready for service.

As these operations can be performed in a few minutes, it is evident a great saving of time is effected over the old plan of plugging the solid roll, and then chipping it out to the desired shape.

Another objection to the old-fashioned solid roll is, that the necks are cast onto it, and if but one of the necks breaks from any cause whatever, the entire roll is thereby rendered useless. Now, my necks, on the contrary, are composed of heavy steel bars, and, therefore, a fracture of either one of them is almost impossible; but if such a contingency should occur, a new shaft can be fitted in the heads in a few minutes. Furthermore, the dies being cut in detachable pieces, enables me to produce shapes that could not possibly be cut in the solid-cast rolls.

In addition to these advantages my roll is much lighter than solid ones, and, consequently, it is capable of being transported in separate sections or pieces, and handled in the mill with the utmost facility.

In the drawings, the housings and gears are omitted from the rolls; but as said housings and gears are the same as in general use in all rolling-mills, further description of them is unnecessary in this specification.

Each roll has been shown as provided with but one groove, armed with a practically continuous die; but two or more of such grooves and dies may be applied to a single roll, which grooves and dies can be so shaped as to gradually reduce the bar to the desired form.

In the modification shown in Fig. 5, the die C is represented as entering some distance into the upper roll I, which arrangement is necessitated by the peculiar shape of the bar or blank to be rolled.

This blank is similar in shape to the one patented by me September 26, 1876, the dies being adapted to produce such an arrangement of heel, toe, and side calks as seen in said Patent No. 182,535.

In Fig. 6, a tie-rod, L, is shown for clamping the two heads of the roll together, said rod being passed through a perforated lug or lugs, *l*, on the inner side of the cylinder. This rod is used in conjunction with the tongues G and sockets *g*, previously described.

The shanks D *d* may be omitted, and the dies furnished with laterally-projecting lugs or ears to receive screws or bolts, wherewith said segments C can be secured in the groove B; or the dies may be retained in position with keys or other devices.

I claim as my invention—

1. A sectional roll, consisting essentially of two heads secured to a driving-shaft, and a cylinder or tube fitted to said heads, the cylinder being armed with two or more removable dies or formers, whose contiguous ends abut, substantially as herein described and set forth.

2. The combination of shaft E, detachable heads F F′, grooved cylinder A B, and re-

taining devices *e e'* G *g*, or their equivalents, substantially as herein described and set forth.

3. The combination of driving-shaft E, detachable heads F *f* F' *f'*, grooved cylinder A B *b*, removable dies or formers C D *d*, and retaining devices *e e'* and G *g*, substantially as herein described and set forth.

4. In combination with driving-shaft E *e e'*, detachable heads F *f* F' *f'*, lower cylinder A, and upper cylinder I, the collars J J', shoulders *j j'*, and enlargement K, to prevent either of said cylinders shifting longitudinally in case the head F or F' should become loose, substantially as herein described and set forth.

In testimony of which invention I hereunto set my hand.

ALFRED B. SEYMOUR.

Witnesses:
JAMES H. LAYMAN,
L. H. BOND.