

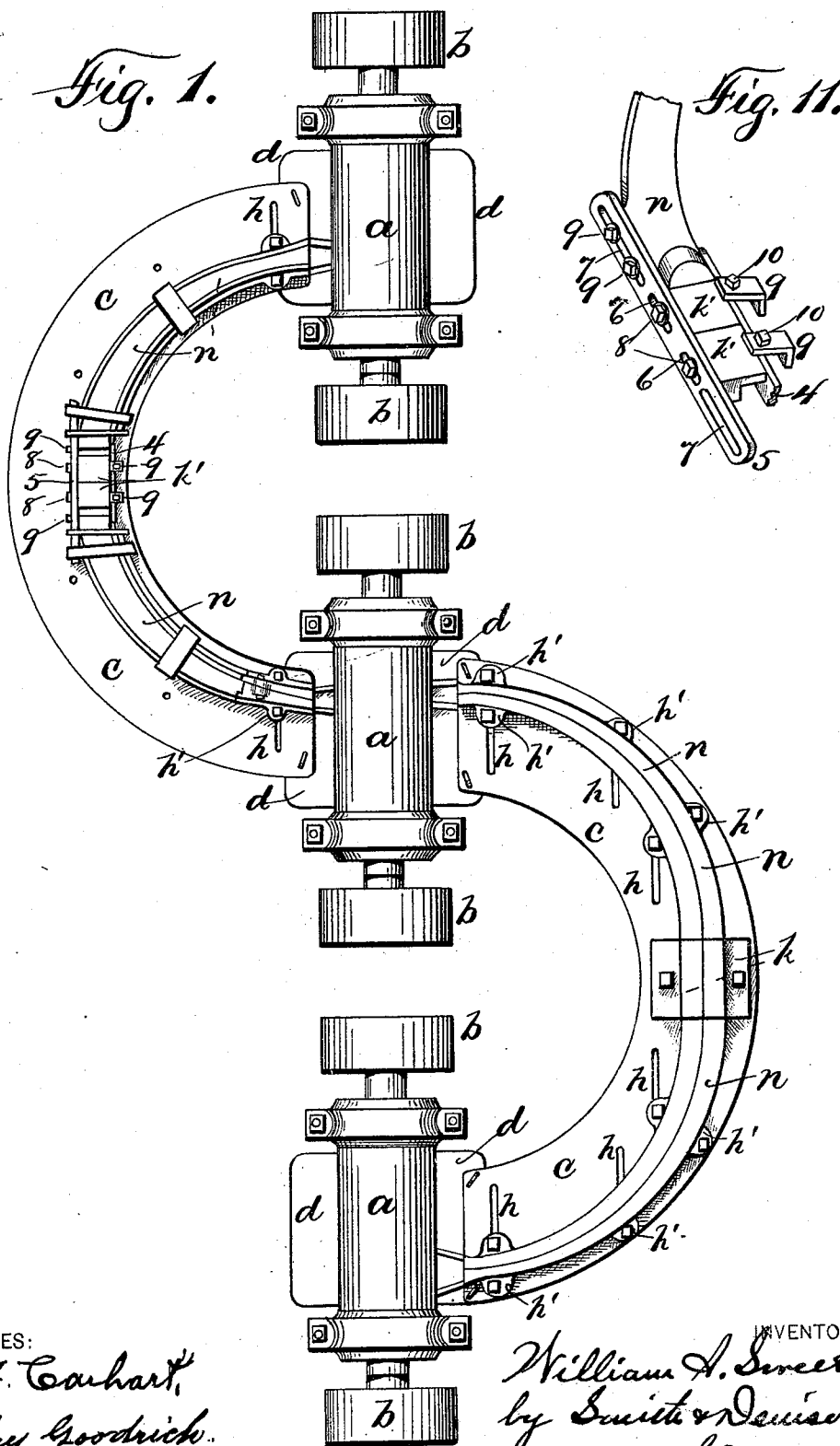
(No Model.)

3 Sheets—Sheet 1.

W. A. SWEET.
PASS CONDUIT.

No. 510,450.

Patented Dec. 12, 1893.



WITNESSES:

H. A. Carhart,
T. May Goodrich.

INVENTOR

William A. Sweet
by Smith & Denison
his ATTORNEYS.

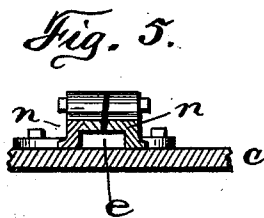
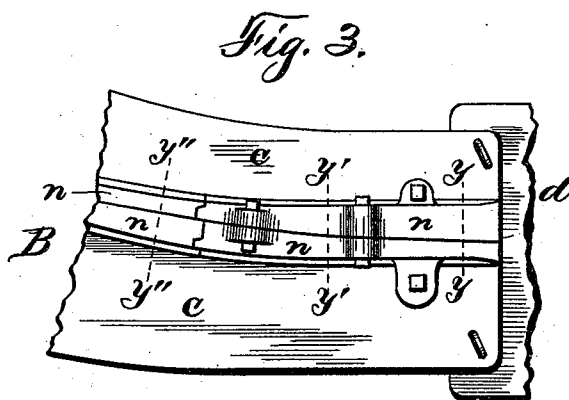
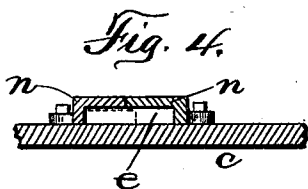
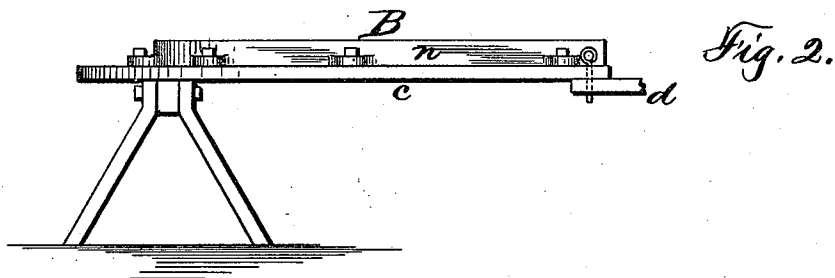
(No Model.)

3 Sheets—Sheet 2.

W. A. SWEET.
PASS CONDUIT.

No. 510,450.

Patented Dec. 12, 1893.



WITNESSES:

H. A. Carhart
Geo. M. Blowers

W. A. Sweet,
INVENTOR.

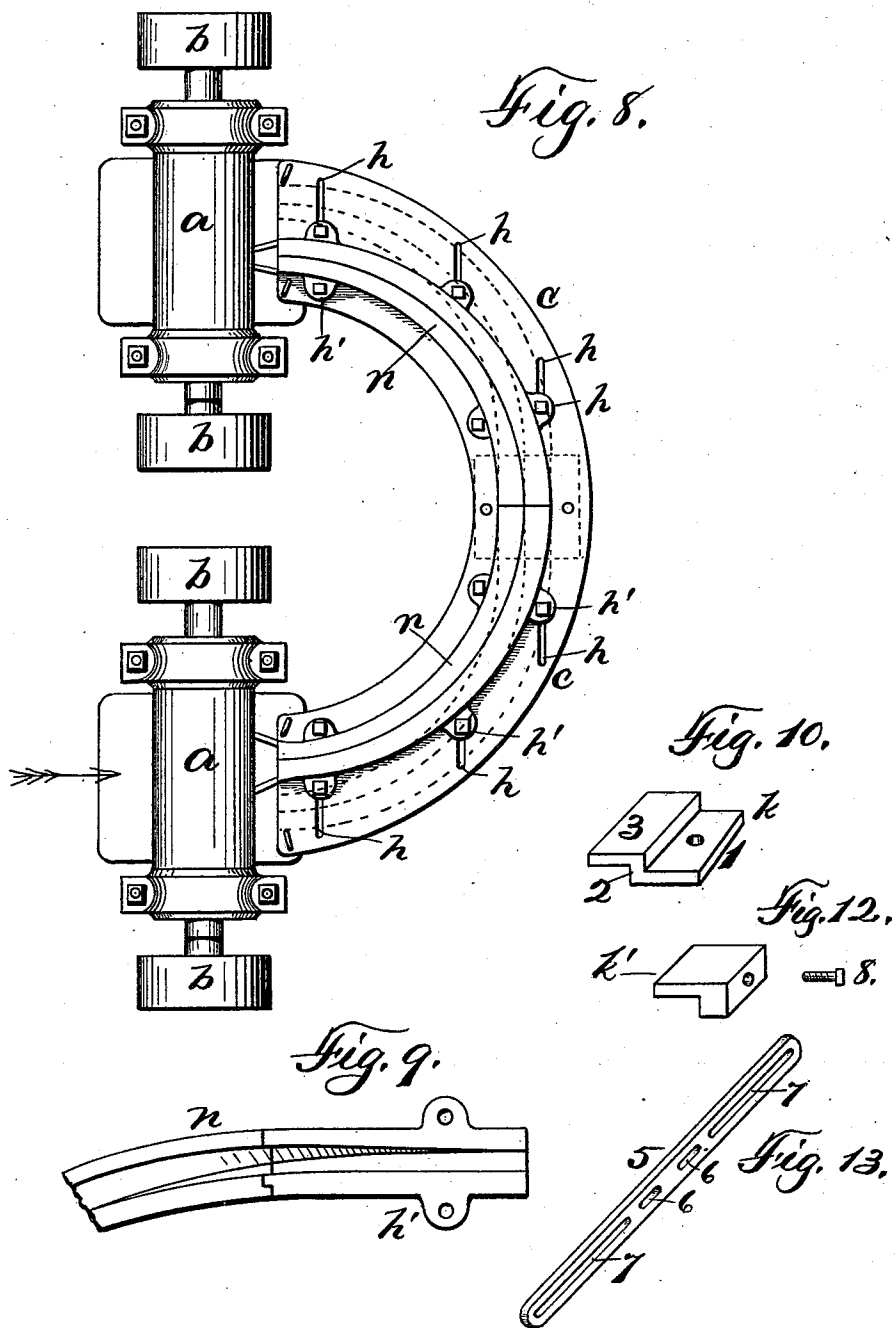
(No Model.)

3 Sheets—Sheet 3.

W. A. SWEET.
PASS CONDUIT.

No. 510,450.

Patented Dec. 12, 1893.



WITNESSES:

H. A. Carhart,
D. May Goodrich.

INVENTOR

William A. Sweet
By Smith & Devison
his ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM A. SWEET, OF SYRACUSE, NEW YORK.

PASS-CONDUIT.

SPECIFICATION forming part of Letters Patent No. 510,450, dated December 12, 1893.

Application filed August 13, 1892. Serial No. 443,019. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. SWEET, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Pass-Conduits, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to mechanism for automatically passing a metal bar, during the process of rolling, from one set of rolls to another, either with or without shifting or turning said bar on edge; or passing said bar automatically from the first set of rolls, into the second set, and from that into the third set, and so on, all without any manual labor except feeding the billet to make the first pass into and through the first set of rolls, or the first two passes through the rolls.

My object is to provide a train of rolls with means whereby part of all of the passes or repasses are automatically made from one set of rolls into and through the succeeding set or sets, without any manual handling, until the bar is partially or wholly rolled; by providing a curved conduit adapted to receive the partially rolled bar and guide and conduct it to, and pass it into the succeeding set of rolls, and another like conduit to pass it to the next set of rolls and so on, until the bar is finished, or the final pass may be made by hand, and whereby the movement of the bar through the rolls and conduits is continuous, and not intermittent, and so that, in fact, in rolling, a long bar can be passing through two or even three sets of rolls, and the intermediate conduits all at the same time; and in which the conduits are provided with means whereby the bar can be automatically turned on edge for edge rolling in one set of rolls and then turned flatwise for passage through the next set of rolls.

My invention consists in the several novel features of construction and operation hereinafter described and which are specifically set forth in the claims hereunto annexed. It is constructed as follows, reference being had to the accompanying drawings, in which—

Figure 1, is a top plan of part of a train of rolls, and two conduits connecting one set of rolls to the succeeding set. Fig. 2, is a side elevation of a conduit. Fig. 3, is an enlarged

top plan of part of a conduit. Fig. 4, is a transverse section on line xx , in Fig. 1. Fig. 5, is a like view on line yy , Fig. 3. Fig. 6, is a like view on line $y'y'$, Fig. 3. Fig. 7, is a like view on line $y''y''$, Fig. 3. Fig. 8, is a top plan view of the first pass-conduit in Fig. 1, showing the conduit shifted, the dotted lines indicating its position in Fig. 1. Fig. 9, is a plan view of the bottom part of the conduit, showing the bar twisting incline. Fig. 10, is a perspective of one of the filling blocks, used between the ends of the conduit sections to fill the space between their ends, when expanded in Fig. 1, and omitted in Fig. 2. Fig. 11, is a perspective of the central portion of the second conduit, detached from the base or body. Fig. 12, is a like view of one of the closures or filling blocks and bolt used in the second conduit between the ends of the conduit sections. Fig. 13, is a like view of the slotted side rails, secured adjustably to the conduit sections and to which the closures are fastened.

A, is a train of rolls, shown here as consisting of separate sets of rolls— a —independently driven by a line of shafting carrying the drive-pulleys (not shown) and belting therefrom passing around the driven pulleys— b —upon the drive shaft of each set of rolls. The rolls and their mountings are all of ordinary construction, for single pass rolls, said rolls being provided with passes of any ordinary construction and of any desired form for flat rolling and edgewise rolling arranged alternately, or in any usual manner.

B—, is a conduit, consisting of a curved or semi-circular bed— c —, the ends of which are detachably secured to the tables— d —of two adjoining sets of rolls, upon which bed the conduit proper is detachably mounted. This conduit consists of curved and flanged segments secured to the bed either rigidly or detachably, in proper alignment, constituting a curved channel— e —on top of the bed, leading from the exit side of one set of rolls to the feed side of the next set in succession, which receives the bar from one set and guides and conducts it to and into the next set, such feed through the conduit being entirely automatic and the pass of the bar therefrom into the rolls being self feeding. As is shown in Figs. 5, 6 and 7, the bar is received flatwise by the conduit, from one set of the rolls, and then

the walls of said conduit being twisted a quarter turn so that the channel is converted from a horizontal one to a vertical one, the bar in its passage is turned on edge by the spiral of the channel, and in that position passes into the next set of rolls, for an edge pass through them; and then, leaving them on its edge, the spiral in the channel, either reverse to that in the preceding conduit, or not, turns the bar flatwise again for its pass through the next set of rolls. In this manner the bar is alternately rolled flatwise and on edge.

The conduit sections —*n*— each consists of a metallic casting (or forging) curved upon the radius desired, substantially as shown in Figs. 4, 5, 6 and 7 in cross section and placed upon the bed —*c*— in the position desired by means of bolts inserted through the slots —*h*— in the bed, and the ears —*h'*— upon the conduit sections; and by varying the position of the securing bolts in the slotways, the conduit sections are adjusted to any position desired so as to receive the bar from any pair of grooves in the pair of rolls and pass it to the next pair of rolls; and also to reduce the length of the conduit for passing small bars, or increase its length for rolling larger ones. In Fig. 1, the first conduit is shown as extended or lengthened; and the space thus created between the sections —*n*— is filled by a pair of closures —*k*— each comprising a base —1—, a vertical wall —2— and a flange —3— substantially as shown in Fig. 10, said flanges being usually about one-half the width of the passage through the conduit sections at that point, and when inserted, the closure walls and flanges coincide with the side walls and top flanges of said sections. In Fig. 8, the conduit sections are drawn in so that their ends meet, thus shortening the passage through them and changing the presentation of the sections to the rolls, and the closures are omitted. In Fig. 1 the second conduit is shown as provided with a closure between the ends of the sections when set in to shorten the length of the passage as aforesaid; consisting of flanged closure blocks —*k'*— engaging on one side with a vertical plate —4— overlapping the inner corners of the sections, and on the other side detachably and adjustably secured to the bar —5— provided with slots —6— and —7— of any number desired, and

screw bolts —8— inserted through the slots —6— into the closures, and bolts —9— inserted through the slots —7— into the outer sides of the sections. In this conduit the sections are adjustable in the same manner as in the first conduit; or by any equivalent manner. When expanded or set out to lengthen the conduit passage sufficient closures are used to fill wholly, or substantially, the opening created between the sections and maintain the continuity of the passage.

As a means of holding down the inner ends of the closures angular straps —9— are shown secured detachably upon the bed by the bolts —10— and having their outer ends bearing upon the tops of said closures. The central portion of said channel may also be widened at or near the center of the curve of each conduit, in order to afford more free passage of the bar through the channel. By the use of these conduits, not only is all manual labor dispensed with for making the shifts from one set of rolls to another, and for feeding and making the passes; but the rolls can be run at very high speeds, such as would be very dangerous if no conduits were used; and consequently a train of rolls will roll a very much larger number of bars in a given time, than where the passing is done by hand, and with little or no damage at all to the operators.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A pass conduit connecting one set of rolls to another set, and in combination therewith, consisting of a bed, and conduit sections mounted thereon, and adjustable to vary the length of the conduit, and means to close the opening between the ends of said sections and preserve the continuity of said conduit.

2. A pass conduit connecting one set of rolls to another set, and in combination therewith, consisting of a bed, and conduit sections having a continuous channel therethrough partly flat, partly spiral, and partly vertical, and adjustably mounted upon the bed and means to preserve the continuity of the channel when the sections are separated.

In witness whereof I have hereunto set my hand this 15th day of June, 1892.

WM. A. SWEET.

In presence of—
C. W. SMITH,
C. B. KINNE.