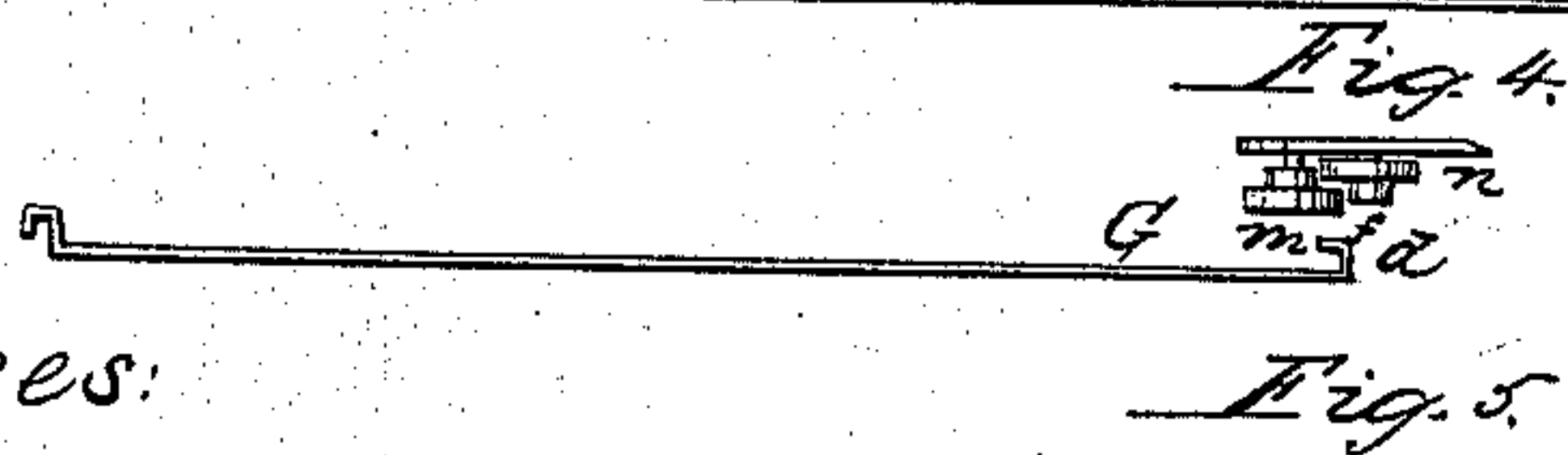
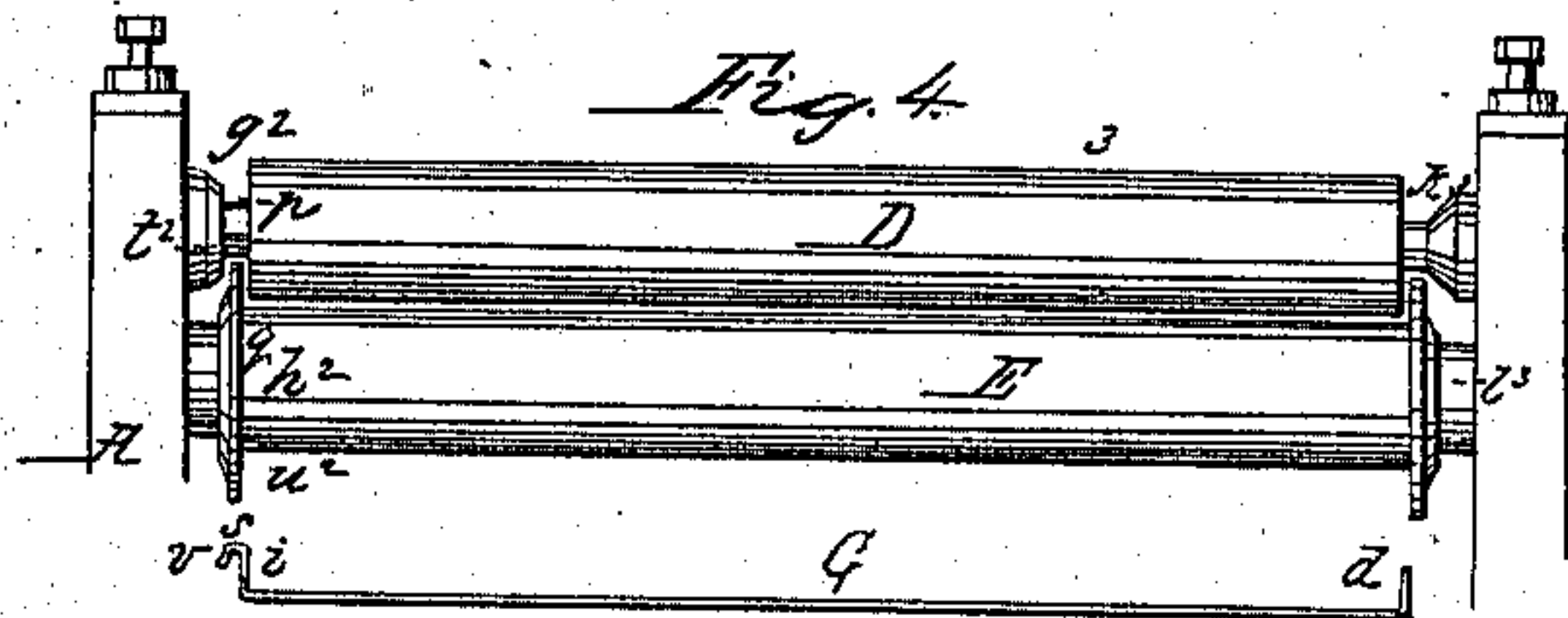
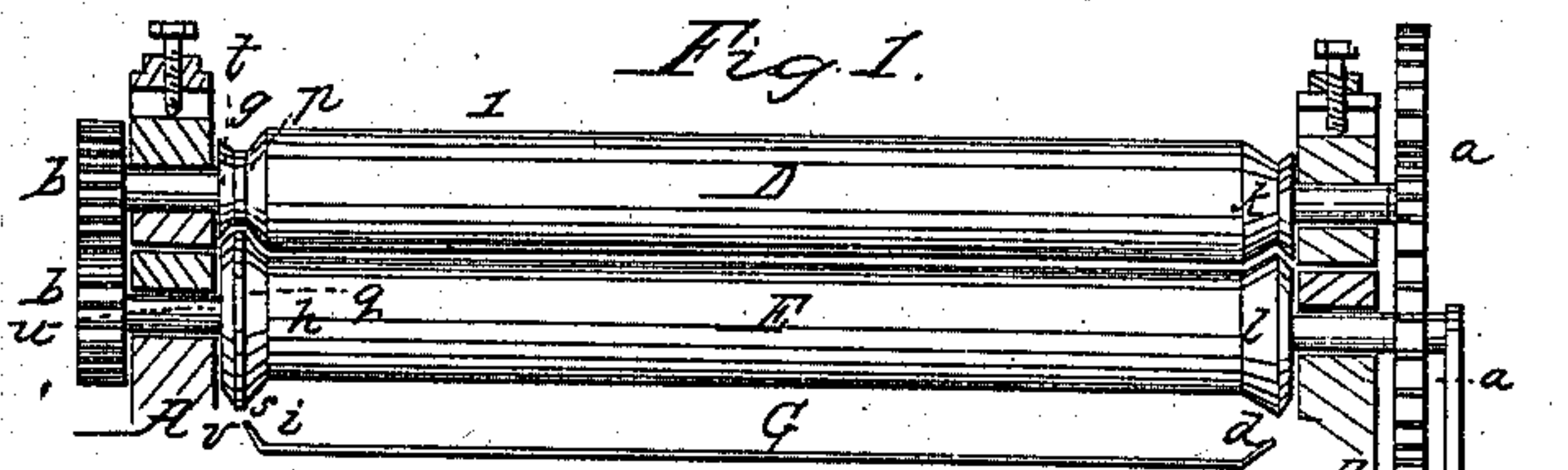
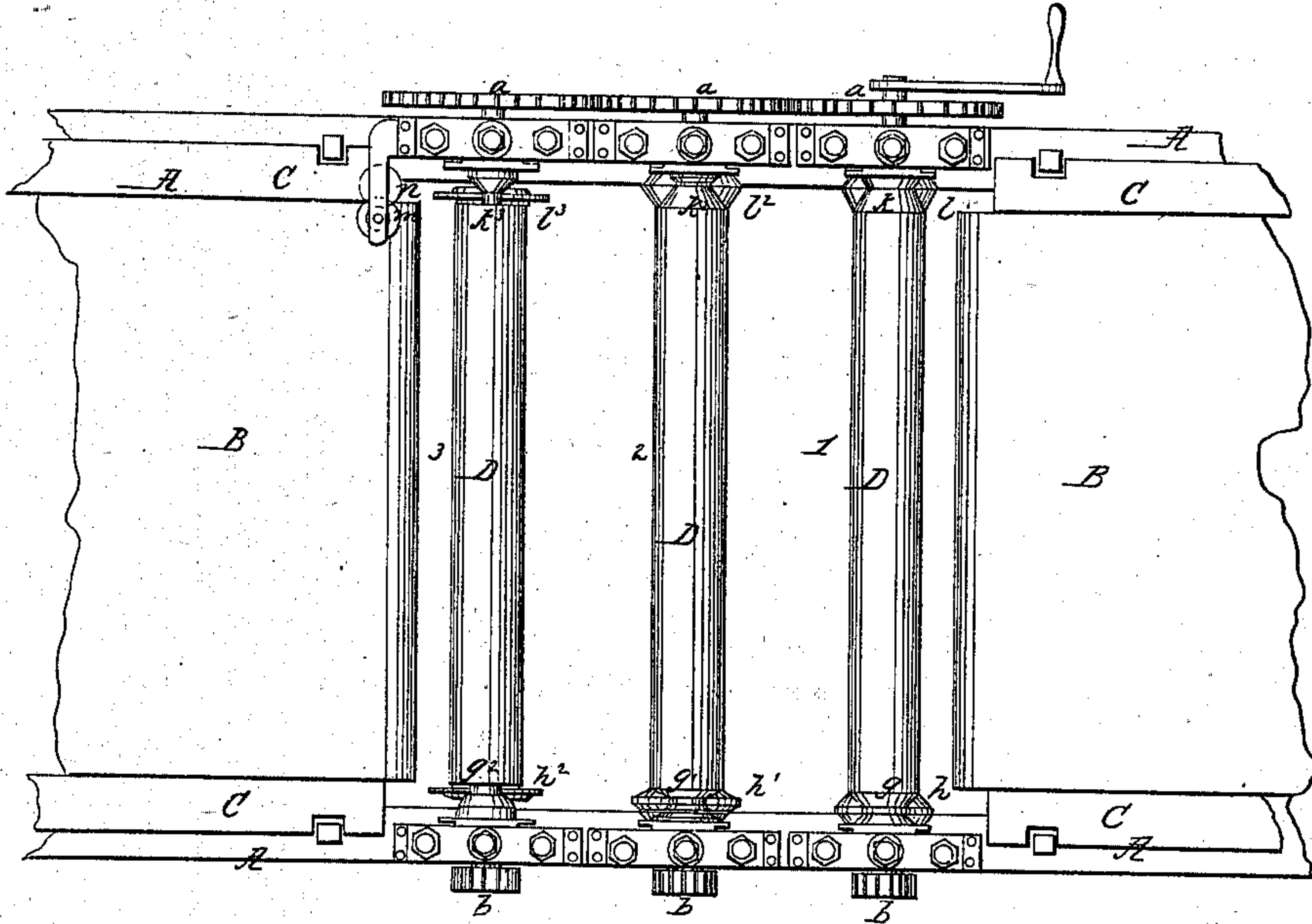


*G. A. Reynolds,*  
*Rolling Metal Roof Plates.*  
*N<sup>o</sup> 104,647. Patented June 21, 1870.*



*Witnesses:*  
*Wm. A. Lender.*  
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# United States Patent Office.

GEORGE A. REYNOLDS, OF ROCHESTER, NEW YORK.

Letters Patent No. 104,647, dated June 21, 1870.

## IMPROVEMENT IN MACHINES FOR ROLLING METALLIC ROOFING-PLATES.

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

To all whom it may concern:

Be it known that I, GEORGE A. REYNOLDS, of the city of Rochester, county of Monroe, and State of New York, have invented a certain new and useful Improvement in Machines for Rolling Metallic Roofing-Plates, of which the following is a specification.

### Nature of the Invention.

This invention consists of a series of rollers for rolling the plates through flatwise, having, at the ends, and forming fixtures thereof, a corresponding series of graduated rolling-dies, for producing the seaming bends of the plates, as hereinafter described.

### General Description.

In the drawing—

Figure 1 is a plan of the machine.

Figures 2, 3, 4, and 5, elevations of the successive rollers and dies, with corresponding views of the form of the rolled plate at successive steps of the rolling process.

A is the frame of the machine, having suitable beds B B, for the entrance and exit of the plate, and having, also, side gauges C C, which are set exactly to the width of the plate, and serve to keep it in position as it is passed through the rollers.

At a suitable distance apart on the frame is mounted a series of rollers, 1 2 3, &c., of any desired number in the series, each set being made up of two rollers, D E, situated one above the other, with just space enough between for the sheet-metal plate to pass through. These rollers are driven by gears *a a a b b b*, arranged in any desired manner, so as to give a constant forward motion to all the rollers.

At one end of the set of rollers 1 are arranged rolling-dies *k l*, which simply consist of angular faces of slight incline, which correspond and intermatch.

The plate G, as it passes through, is formed with a slight bend, *d*, of the edge, as shown at fig. 2.

The next set of rollers, 2, has similar dies, *k<sup>2</sup> l<sup>2</sup>*, but of a greater angle or incline, and they produce a greater bend of the edge *d* of the plate G, as shown in fig. 3; and so on, for any desired number of the sets of roller-dies, gradually bending the edge of the metal up more and more, till the last set is reached, when the dies *k<sup>3</sup> l<sup>3</sup>* are made vertical, thereby turning the edge *d* of the plate to a right-angled position as it runs through, as shown in fig. 4.

After passing these dies, the vertical edge *d* of the plate strikes into the angle of small roller-dies *m n*, which overlies one another, and the extreme edge is bent inward between the vertical faces of the dies, thereby producing the horizontal flange *f*, bent inward from edge *d*, as shown in fig. 5.

The same graduation is employed at the opposite end of the rollers, to produce a gradual bend of the edge of the metal; but, as the form of the bend is different, the dies are of a somewhat different shape.

The dies *g<sup>1</sup> h<sup>1</sup> g<sup>2</sup> h<sup>2</sup>* have the same incline for turning up the vertical edge *i* of the metal plate G, but they have, in addition, narrow horizontal rims *p q*, which intermatch and form the horizontal part *s* of the bend. Furthermore, they have inclined faces *t u t<sup>1</sup> u<sup>1</sup> t<sup>2</sup> u<sup>2</sup>*, which are the reverse of *g h*, &c., and which gradually produce the downward vertical bend *r* of the plate, shown complete in figs. 4 and 5.

I am aware that it is not new to form the seaming-edges of metallic roofing-plates in a shape somewhat similar to that above described; and I am also aware that a machine is already in use in which small graduated roller-dies are employed for the purpose; but, in such case, the dies are not connected with rollers that pass the plate through between them, but are of small size, and situated horizontally at the sides of the machine, and the plate itself is clamped in a bed which moves between the side dies, the edges of the metal only projecting out so as to reach the dies.

The great advantage of my arrangement over that is in the use of the main rollers D E, with the dies forming a part and fixture of the same, in which case the sheet is held steady in place, and is run through only just so fast as the dies can act upon it without straining or injuring the metal.

The dies and rollers themselves feed the plate along, and the plate cannot be moved so fast as to crimp or strain, which is the case where the movement of the bed to which the plate is clamped is independent of the dies which act upon the edges of the plate.

Another great advantage of my invention is, that I can run the plates through of any desired length, even of the roof itself, while in other devices heretofore used only certain and given lengths could be made, not exceeding the bed in which it was clamped.

I also claim an advantage in the use of the rollers D E, which remove all the dents, bends, and irregularities in the metal in passing through, making it correspond with the edges which are bent by the dies, and delivering it in a smooth and unbroken sheet, ready for application upon the roof.

A simple bed clamp cannot do this, as the pressure is insufficient over the whole surface; besides which, the edges, in passing through the dies, become expanded or stretched to a greater degree than the body of the metal, thereby producing bend and irregularity in the plates, and frequently tear.

I contemplate, in some instances, setting the inner set or sets of the rollers higher than the outer ones, so as to produce a convex or rounding outline, in which



case, when the plates are run through, they will be delivered of convex form, suitable for covering car-roofs.

They can also be easily adapted for covering Mansard and other roofs not having a flat surface.

*Claims.*

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

1. In a machine for rolling metallic roofing-plates, a series or train of rollers having the dies forming a part and fixture of the rollers themselves, and gradu-

ated as described, and the whole so arranged as to produce the double effect of rolling the plate and forming the seaming bends at one operation, as specified.

2. The arrangement of the series of rollers D E and dies  $k\ l\ k^2\ l^2\ k^3\ l^3$ , and finishing-dies  $m\ n$  at one end, and the dies  $g\ h\ g^1\ h^1\ g^2\ h^2$  at the other, as described.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE A. REYNOLDS.

Witnesses:

R. F. OSGOOD,

GEO. W. MIATT.