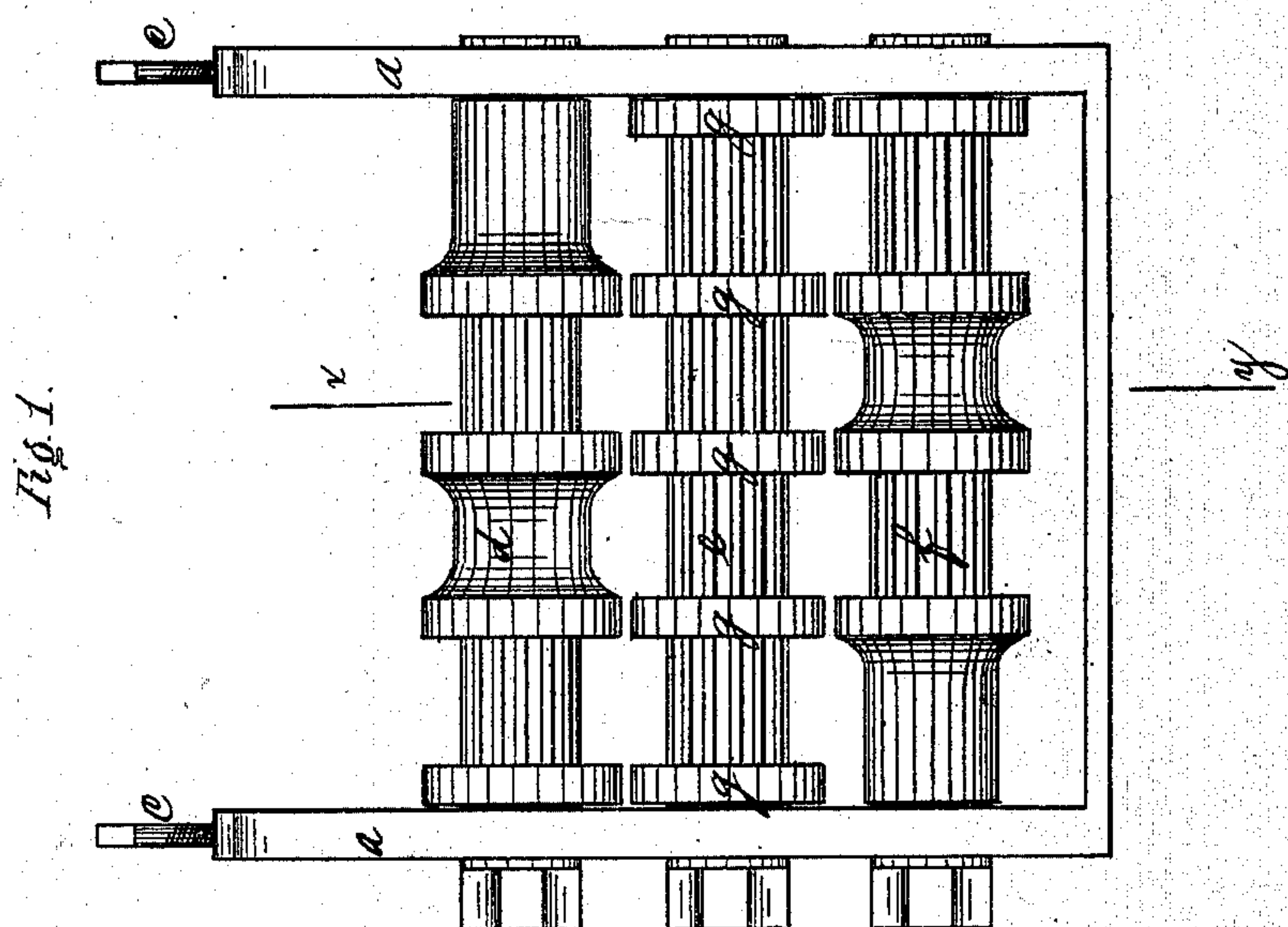
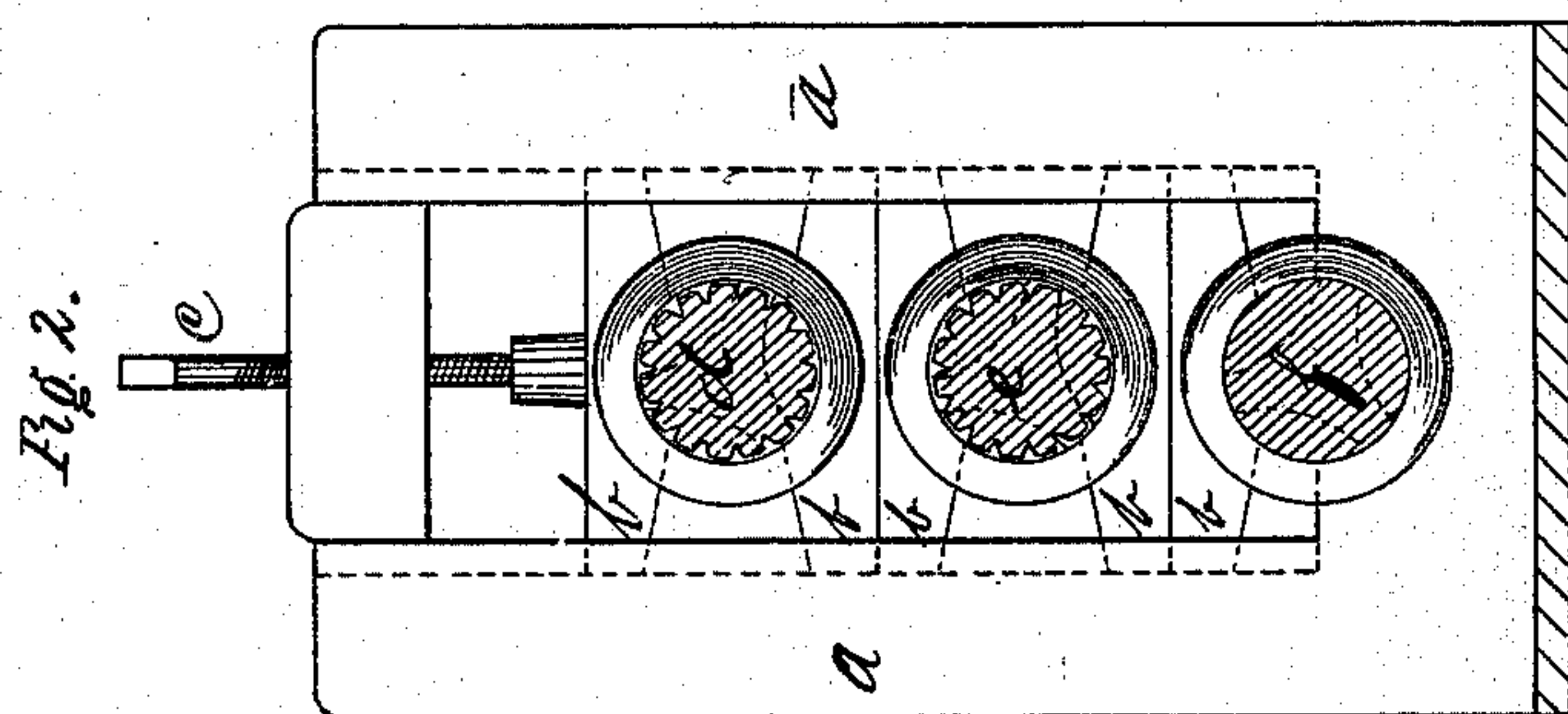


G. W. BILLINGS.
Machines for Rolling Blooms.

No. 139,358.

Patented May 27, 1873.



Witnesses:
 Chas. A. Burrill
 William Moore

Inventor.
 George W. Billings

UNITED STATES PATENT OFFICE.

GEORGE W. BILLINGS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN MACHINES FOR ROLLING BLOOMS.

Specification forming part of Letters Patent No. **139,358**, dated May 27, 1873; application filed June 29, 1872.

To all whom it may concern:

Be it known that I, GEORGE W. BILLINGS, of Chicago, Cook county, Illinois, have invented a Machine for Welding Piles for Railroad Rails, Beams, Bars, and other things of Iron, of which the following is a specification:

In the drawings, Figure 1 represents a side elevation of the rollers, their housings, boxes, and adjusting-screws; Fig. 2, a vertical transverse section of the same taken on the line *x y* of Fig. 1.

a a represent the housings; *b b*, the journal-boxes; *c c*, the screws for holding the rollers together. These several parts are of ordinary construction, and may have the strength and capacity for piles of any size, capable of being heated and handled in a furnace. *d, e, and f* are the welding-rollers which are intended to be geared and driven in the ordinary manner.

The rollers are from twenty to twenty-four inches in diameter, and about five feet in length between the housings, and divided by several transverse collars or bosses, *g*, into several spaces, as follows, viz: The middle roller *e* is divided into four spaces, all of which are cogged, as shown; the upper roller *d* and lower roller *f* are similarly divided, but only two the spaces of these rollers *d* and *f* are provided with cogs, the other two spaces of each being left blank. The middle roller *e* is of a varying diameter, the diameter being different in each of its four cogged spaces. The cogged spaces of the upper and lower rollers *d* and *f*, respectively, are each the same in diameter as the opposite or corresponding spaces, respectively, of the middle roller *e*.

This construction and arrangement of the spaces are necessary in order that when a pile is passed through any one of the spaces, the rollers acting on it above and below shall tend to move it uniformly, or with the same rate of motion.

I give the gears a pitch of about two inches, measuring from center to center of the pitch-line of the meshing cogs. The spaces between

the cogs are about eight (8) per cent. wider than the faces of the cogs respectively. The cogs have a depth of about three-quarters of an inch.

The pile having passed through the corresponding cogged spaces of rollers *e* and *f* is returned between the corresponding cogged spaces of the rollers *d* and *e*, and in this way there is secured an almost continuous pressure and a thorough welding or amalgamation of the metal before it has time to cool.

The action of the cogs in the roller spaces is such that the parts of the pile are pressed together without much, if any, draft of the pile, it being a very little longer after the welding operation than it was before.

Four passes through the rollers are sufficient to thoroughly weld any ordinary pile of iron, and when so welded the pile is returned to the furnace for a second heating, and then by a train of the common draft-rollers is drawn into the shape desired.

The pile may be passed two or three times through the cogged spaces of the rollers, as described, and then at once, without reheating, may be passed through the draft-rollers for final shaping.

I claim—

The combination of the three welding-rollers *d, e, and f*, each of which is divided by bosses *g* into spaces whereof the cogged spaces of the upper roller *d* are the same in diameter as the respective corresponding or opposite spaces of the middle roller *e*, and the cogged spaces of the lower roller *f* are the same in diameter as the respective corresponding cogged spaces of the middle roller *e*, so that the pile can be passed back and forth between the rollers and thoroughly welded without material elongation of the pile, substantially as set forth.

GEORGE W. BILLINGS.

Witnesses:

THOS. A. BURTT,
WM. MOORE.