

H. SCHMITZ.
Three High Rolls.

No. 150,895.

Patented May 12, 1874.

Fig. 1.

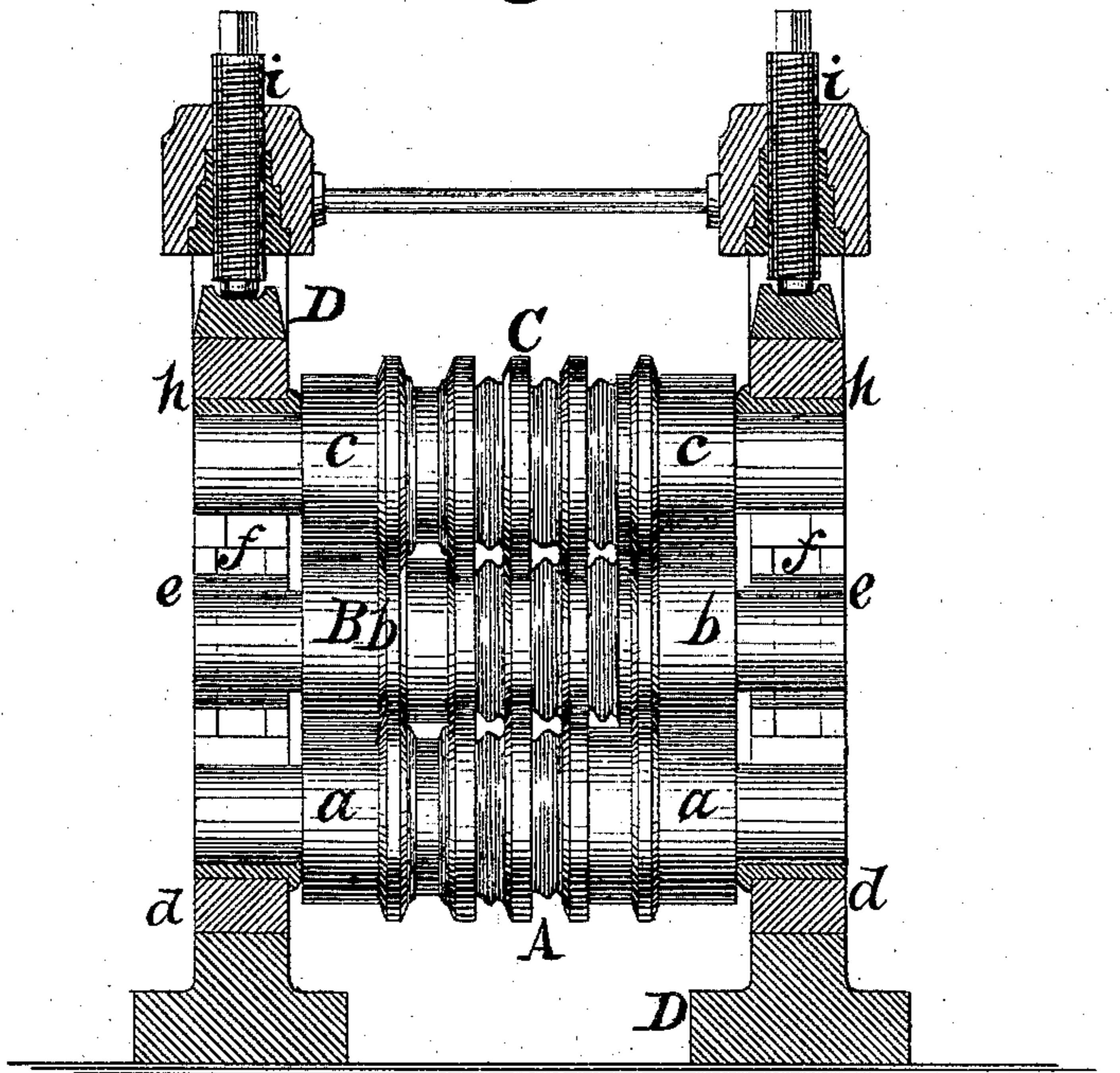


Fig. 2.

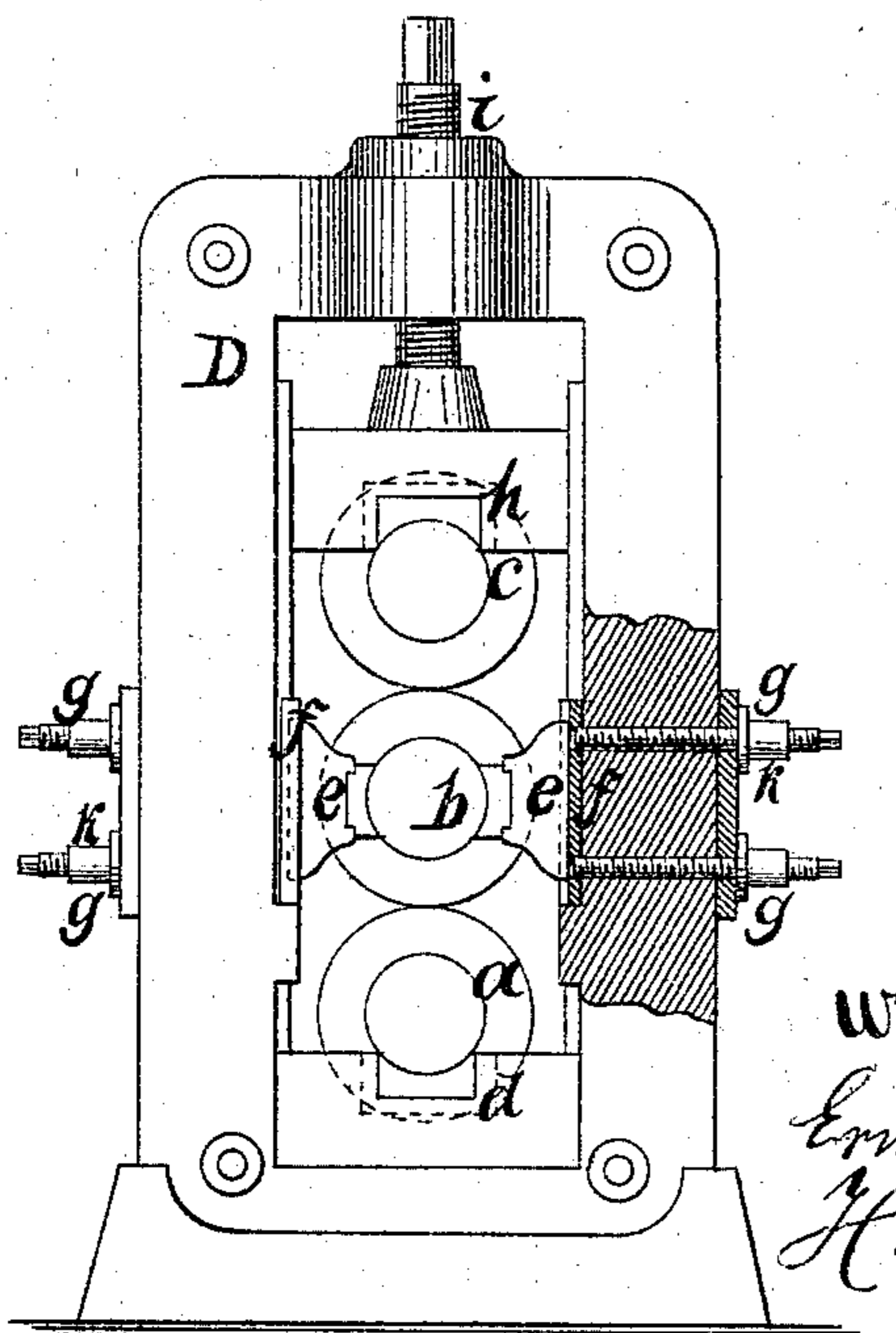
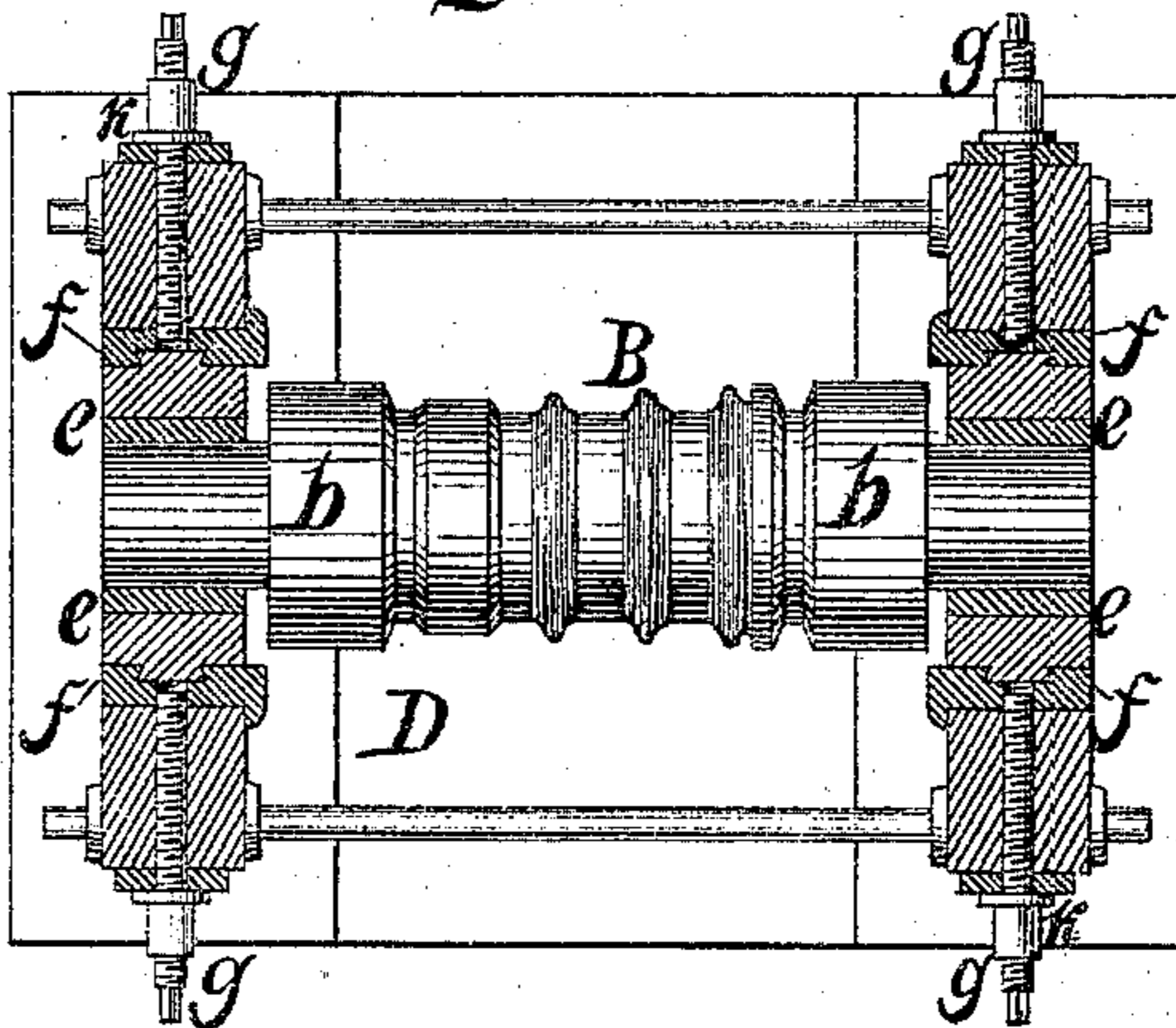


Fig. 3.



Inventor.

Heinrich Schmitz

per

Van Santvoord & Hauff
attys

Witnesses.

Ernst Bilhuber.

Henry Gentner.

UNITED STATES PATENT OFFICE.

HEINRICH SCHMITZ, OF HOERDE, PRUSSIA, ASSIGNOR TO GEORGE ASMUS,
OF NEW YORK.

IMPROVEMENT IN THREE-HIGH ROLLS.

Specification forming part of Letters Patent No. **150,895**, dated May 12, 1874; application filed
April 20, 1874.

To all whom it may concern:

Be it known that I, HEINRICH SCHMITZ, of Hoerde, in the Kingdom of Prussia, Empire of Germany, have invented a new and useful Improvement in Rolling-Mills; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a sectional side view of my invention. Fig. 2 is a sectional front view of the same. Fig. 3 is a horizontal section of the same in the plane $x x$, Fig. 1.

Similar letters indicate corresponding parts.

This invention consists in three-high grooved rolls with cylindrical bearing ends, in combination with sliding bearings for the middle roll, in such a manner that the correct position of the rolls in relation to each other is rendered independent of the wear of the journal-boxes, and that the operation of rolling iron or other metals in a great variety of shapes is materially facilitated.

In the drawing, the letters A B C designate three grooved rolls, which are mounted in a frame, D, one above the other, and which are provided with cylindrical ends $a b c$ of equal diameters. When the rolls are in operation these cylindrical ends bear and roll upon each other. The lower roll A rests in fixed bearings d , while the middle roll B has its bearings in boxes $e e$, which are fitted in grooved plates $f f$, and which are pressed up from opposite sides against the journals of the roll B by means of set-screws $g g$ passing through the frame or housing D and acting on the grooved plates $f f$. The boxes $e e$ are free to adjust themselves up or down in the grooves of the plates $f f$. By this arrangement I am enabled to adjust the axis of the middle roll in the same vertical plane with the axis of the upper and of the lower roll. The upper roll C has its bearings in boxes $h h$ which slide up and down between the uprights of the frame D, and which are subjected to the action of set-screws $i i$, by means of which the rolls can be compressed so that their cylindrical ends will bear upon each other.

In three-high rolls for forming shaped iron, as formerly arranged, the proper distance between the lower and middle rolls was sometimes regulated by wedges between the bearings, which is sufficient for roughing-rolls and for rolling ordinary flat bars. When, however, it was desired to manufacture railroad-iron with three-high rolls it was found necessary to have large screws acting on the bearings of the lower roll the same as on those of the upper roll, so that the position of the lower as well as that of the upper roll could be adjusted while the middle bearings of the roll were fixed. But even with this arrangement it is very difficult to properly adjust the rolls, owing to the uneven wear of the brasses. Iron bars of a shape more difficult than ordinary railroad-bars cannot be produced successfully with three-high rolls of this last-mentioned arrangement.

If the rolls are constructed and mounted according to my invention they are kept invariably at the proper distance by their cylindrical bearing ends $a b c$, and if the grooves in the rolls are properly constructed the iron will leave the last groove with the proper profile, and without faults or defects. Should the pressure-screws $i i$ not be screwed far enough to prevent motion of the rolls in a vertical direction, the jumping or spreading apart of the rolls will be exactly the same between the top and middle rolls as between the middle and bottom rolls. Owing to the perfection in the setting of my rolls I am enabled to roll the most difficult shapes on the three-high rolls, the use of which is much more economical than that of two rolls. The wear of the brasses or journal-boxes has no influence on the proper position of the rolls, and all the workman has to do is to see that the centers of the rolls are in a vertical plane, and that he keeps the pressure-screws moderately tight. The cylindrical ends $a b c$ prevent the touching of the conical collars and grooves, the surfaces of which have different velocities, and through sliding friction cause a great waste of power if they revolve in contact with each other. The wear of the three-high rolls arranged according to my invention is so much reduced, as compared with three-high rolls of former constructions, that at least twice the quantity

of iron may be rolled before it becomes necessary to turn off the rolls. The side bearings of the middle roll may be arranged in various ways so as to retain a motion in a vertical direction and an adjustment in a horizontal direction. The plates *ff* are fastened to the housings by screws, and have female threads for the set-screws *gg*, which are provided with lock-nuts *kk*. If the set-screws *gg* are screwed out sufficiently far the entire bearing may be taken out. The length of the cylindrical bearings varies with the depth of the grooves. The bearings for the upper rolls may be secured in any desirable manner.

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

The combination of three-high rolls having cylindrical bearing ends with sliding side bearings for the middle roll, substantially as and for the purpose shown and described.

This specification signed by me this 18th day of August, 1873.

H. SCHMITZ.

Witnesses:

HERMANN REITZ,
LOUIS SCHROEDER.