

S. STUTZ.
Coal-Washing Machinery.

No. 226,940.

Patented April 27, 1880.

Fig: 1.

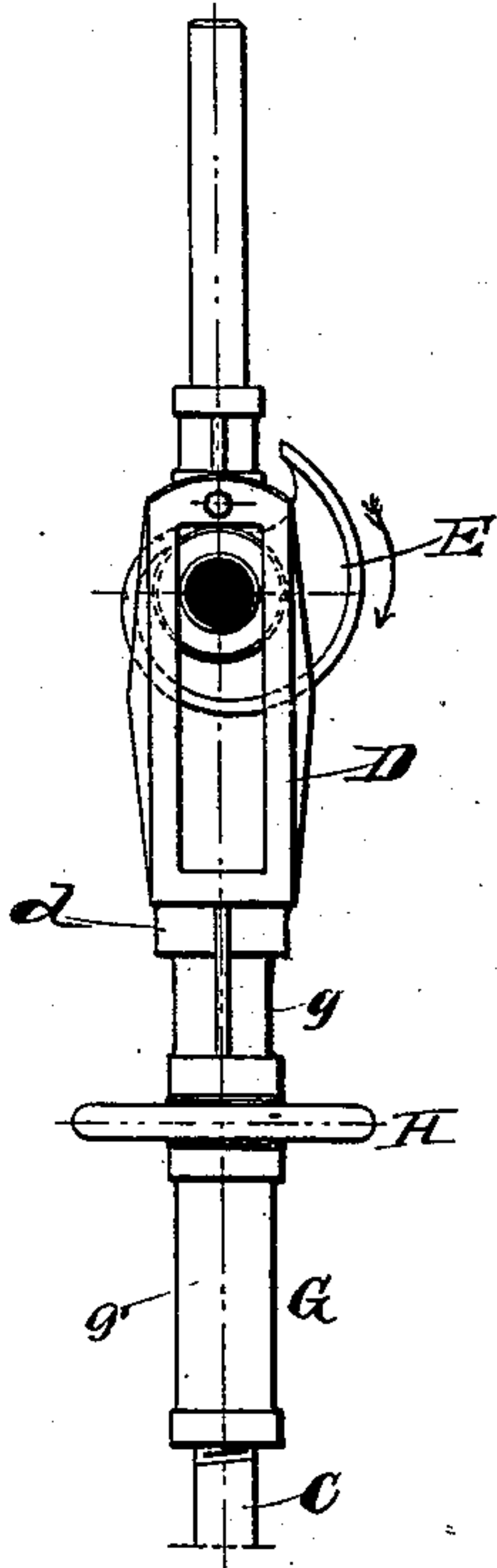


Fig. 2.

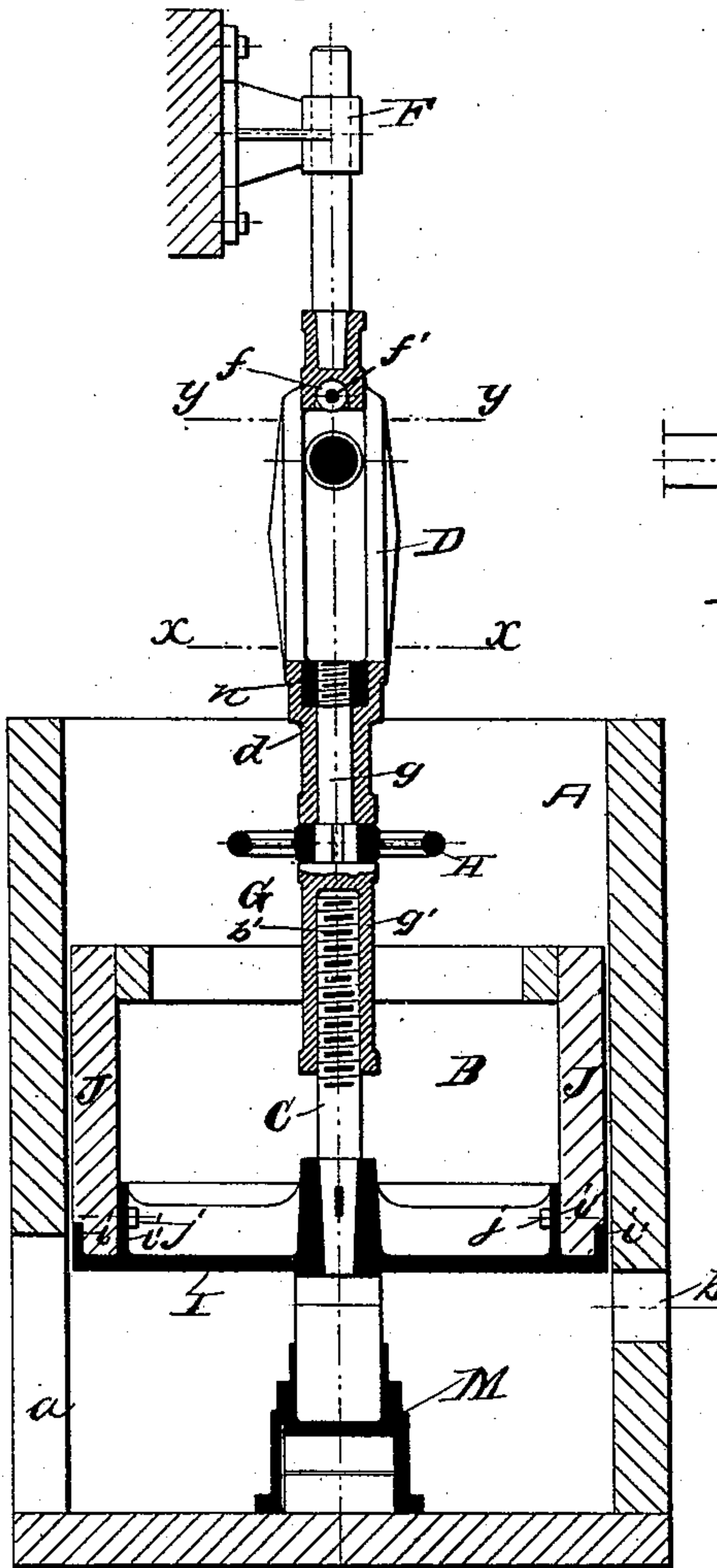


Fig: 3.

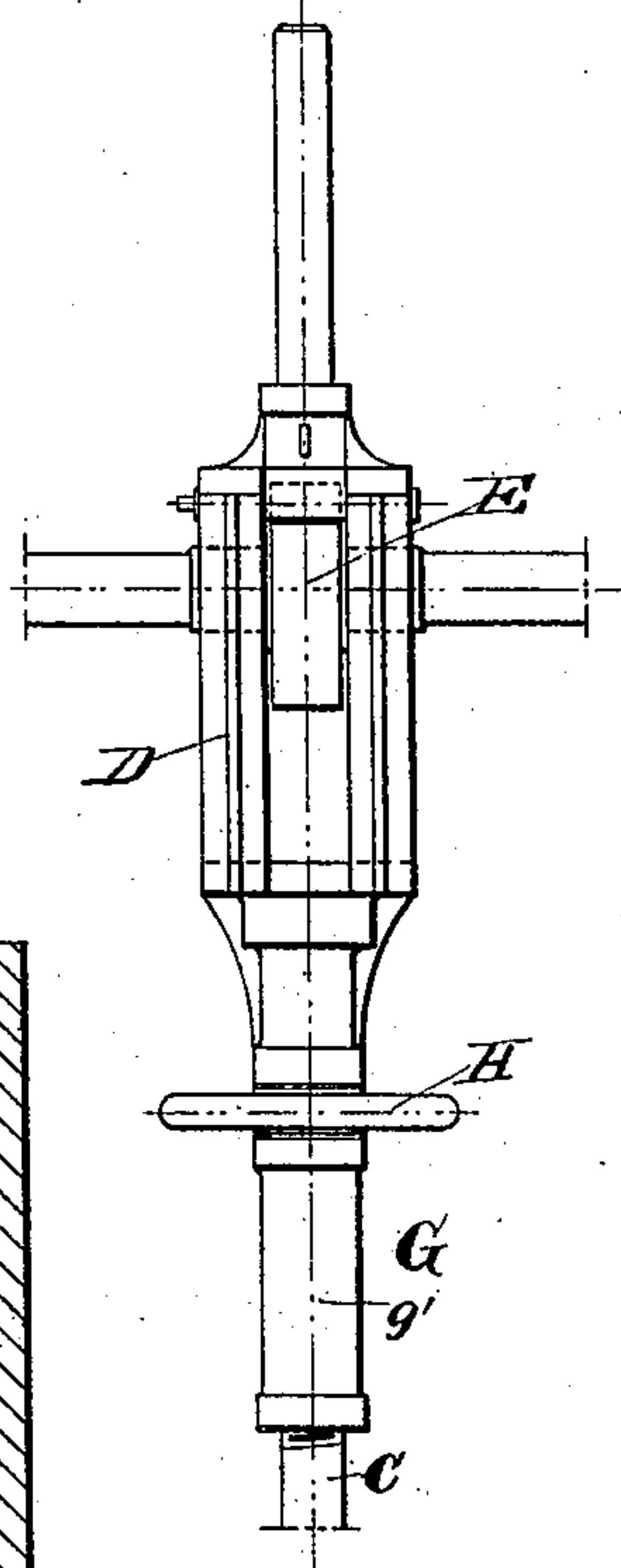


Fig: 4.

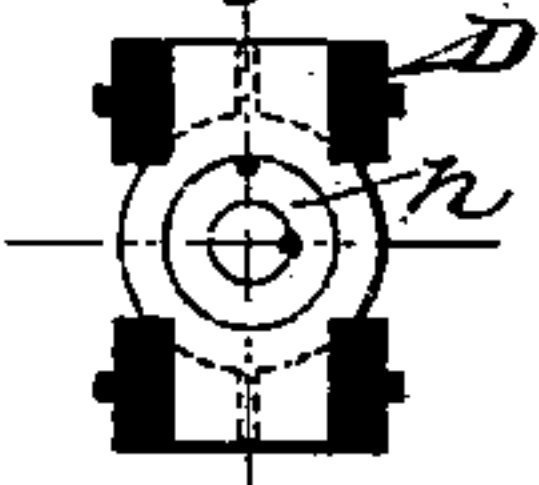
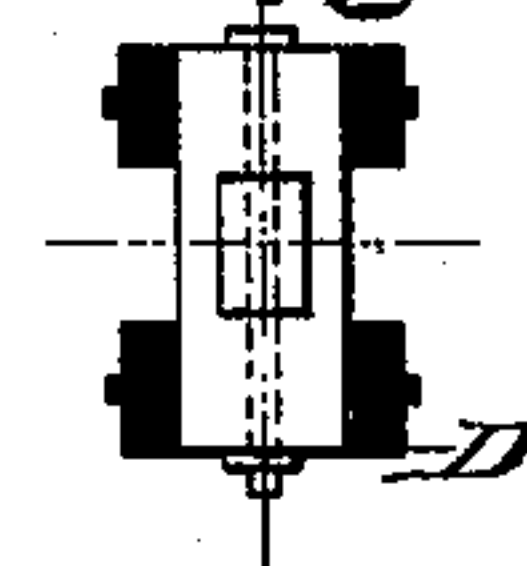


Fig:5.



WITNESSES:

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SEBASTIAN STUTZ, OF PITTSBURG, PENNSYLVANIA.

COAL-WASHING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 226,940, dated April 27, 1880.

Application filed February 3, 1880.

To all whom it may concern:

Be it known that I, SEBASTIAN STUTZ, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Coal-Washing Machinery; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, and Fig. 3 a front elevation, showing the yoke, a portion of the piston-rod, the connecting-coupling, and the rotating lifting-cam. Fig. 2 is a vertical sectional view, showing the construction and arrangement of the piston and the co-operating parts. Fig. 4 is a transverse sectional view taken on the line *x x*, Fig. 2; and Fig. 5 is a similar view taken on the line *y y* of the same figure.

Similar letters of reference in the several figures denote the same parts.

This invention relates to that class of coal-washing machines for which Letters Patent of the United States No. 188,691 were granted and issued to me March 20, 1877; and it consists, primarily, in the combination of a lifting-cam with a lifting-yoke and a piston-rod, adjustably connected to each other, and with a buffer or stop for limiting the downward stroke of the piston, whereby the length of the stroke of the piston may be regulated.

It further consists in effecting the adjustable connection between the above-mentioned lifting-yoke and piston-rod by means of a coupling swiveled to the said yoke and connected to the piston-rod by an adjustable screw-connection; and it consists, finally, in the employment of a hand-wheel attached to the shank of the said coupling for facilitating the adjustment of the coupling.

In the drawings, A represents the piston-box of a coal-washing machine such as is shown in my patent referred to; B, the piston which works in said box; C, the piston-rod; D, the yoke connected to the piston-rod; E, the rotating differential cam which co-operates with the yoke to lift the piston; F, the upper guide for the piston-rod; *a*, the opening through which the water beneath the piston is forced by the descent of the latter into the separating-chamber of the machine, and *b* the opening through which a supply of clean water is

admitted below the piston while the latter is ascending.

The yoke D is adjustably connected to the piston-rod by means of a coupling, G, consisting of an upper shank, *g*, and a lower tubular screw-threaded portion, *g'*. The shank *g* is made square or polygonally shaped in cross-section at its base to accommodate and hold a hand-wheel, H, and it extends up through the lower tubular portion, *d*, of the yoke, and is confined therein by a nut, *n*, thus making a swivel-connection, which prevents the withdrawal of the shank but does not interfere with its rotation. The lower tubular screw-threaded portion, *g'*, is adapted to receive the screw-threaded end *b'* of the piston-rod. By turning the hand-wheel H the piston and yoke can be adjusted nearer to or farther from each other, to make the stroke of the piston on the water beneath shorter or longer, as desired.

I preferably locate a buffer, M, at the bottom of the piston chamber or box for the purpose of arresting the descent of the piston, and thereby relieving the cam-shaft from the shock or strain to which it would otherwise be subjected. As the buffer limits the downward stroke of the piston, it is evident that by turning the hand-wheel H the yoke D can be adjusted so that the whole or but a portion of the surface of the cam will operate to raise the yoke and the connected piston. When the yoke is adjusted down near to the cam-shaft the whole of the cam-surface will operate to raise the yoke and the stroke of the piston will be of the maximum length. As the yoke is adjusted farther away from the cam-shaft, a portion only of the cam will come in contact with it, and the stroke will be correspondingly shortened. The yoke may, in fact, be adjusted so far away that the cam will not strike it at all. This regulation of the stroke of the piston is a marked improvement and adds materially to the effectiveness of the machine.

Instead of permitting the lifting-cam to work against the smooth inner surface of the upper part of the yoke, as heretofore, I now employ a friction roller or sleeve, *f*, mounted upon a cross-pin, *f'*, and thereby avoid a great deal of friction and reduce the wear.

The piston proper is constructed of a metal plate, I, preferably formed in one piece, and having two vertical parallel flanges, *i i'*, ex-

tending way around its four sides. Between the flanges are inserted boards J, which constitute the sides of the piston, and screws or bolts *j* are applied through the inner flange, *i'*,
5 to hold such boards securely in position.

When the machine is in operation the piston is lifted by the rotating cam, and suddenly descends of its own weight, falling sharply on the water beneath and forcing the latter or a
10 portion of it into the separating-chamber of the machine through the opening *a*. The extent of the stroke is limited by the buffer M. As the piston again rises fresh water is supplied through the opening *b*, and the operation
15 is repeated, as before.

I claim as my invention—

1. In a coal-washing machine, the combination of a lifting-cam with a lifting-yoke and a piston-rod, adjustably connected to each other,
20 and with a buffer or stop for limiting the downward stroke of the piston, whereby the length of the stroke of the piston may be regulated,

substantially as described, for the purpose specified.

2. In a coal-washing machine, the combination of a lifting-cam, a lifting-yoke, and a piston-rod with a coupling swiveled to the yoke and connected to the piston-rod by an adjustable screw-connection, and with a buffer for limiting the downward stroke of the piston,
25 30 whereby the length of the latter's stroke is regulated, substantially as described.

3. In a coal-washing machine, the combination, with the lifting-cam, the piston-rod, and the yoke, of the coupling G, having the shank
35 *g*, carrying the hand-wheel H, and connected to the yoke, as described, and having the screw-threaded lower portion, *g'*, for the accommodation of the screw-threaded piston-rod, substantially as described.

S. STUTZ.

Witnesses:

M. CHURCH,
W. BLACKSTOCK.