(No Model.) 2 Sheets—Sheet 1.

G. CONKLING.

MACHINE FOR SEPARATING IRON FROM ORES.

No. 403,575. Patented May 21, 1889.

Fig. 1.

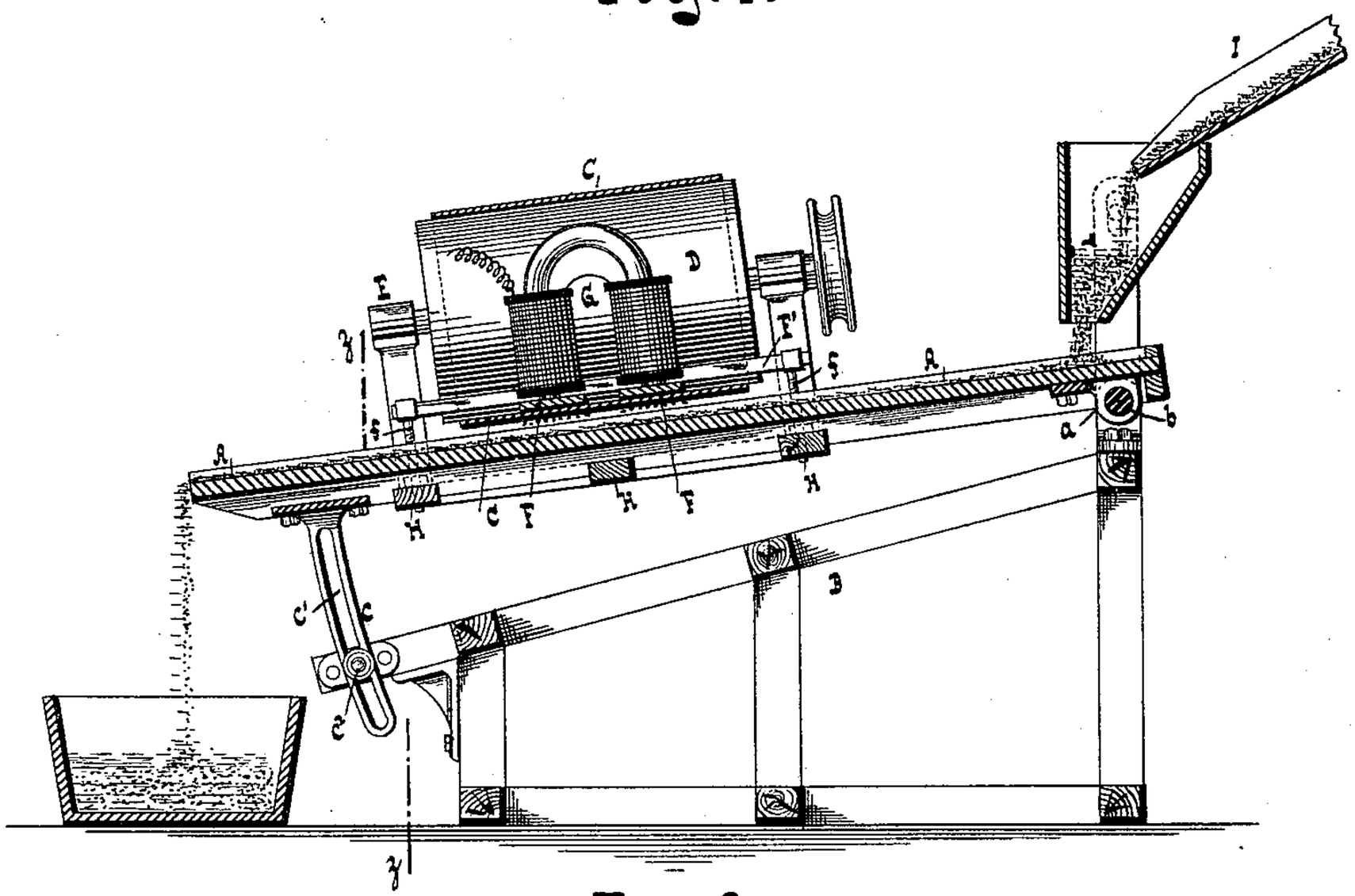
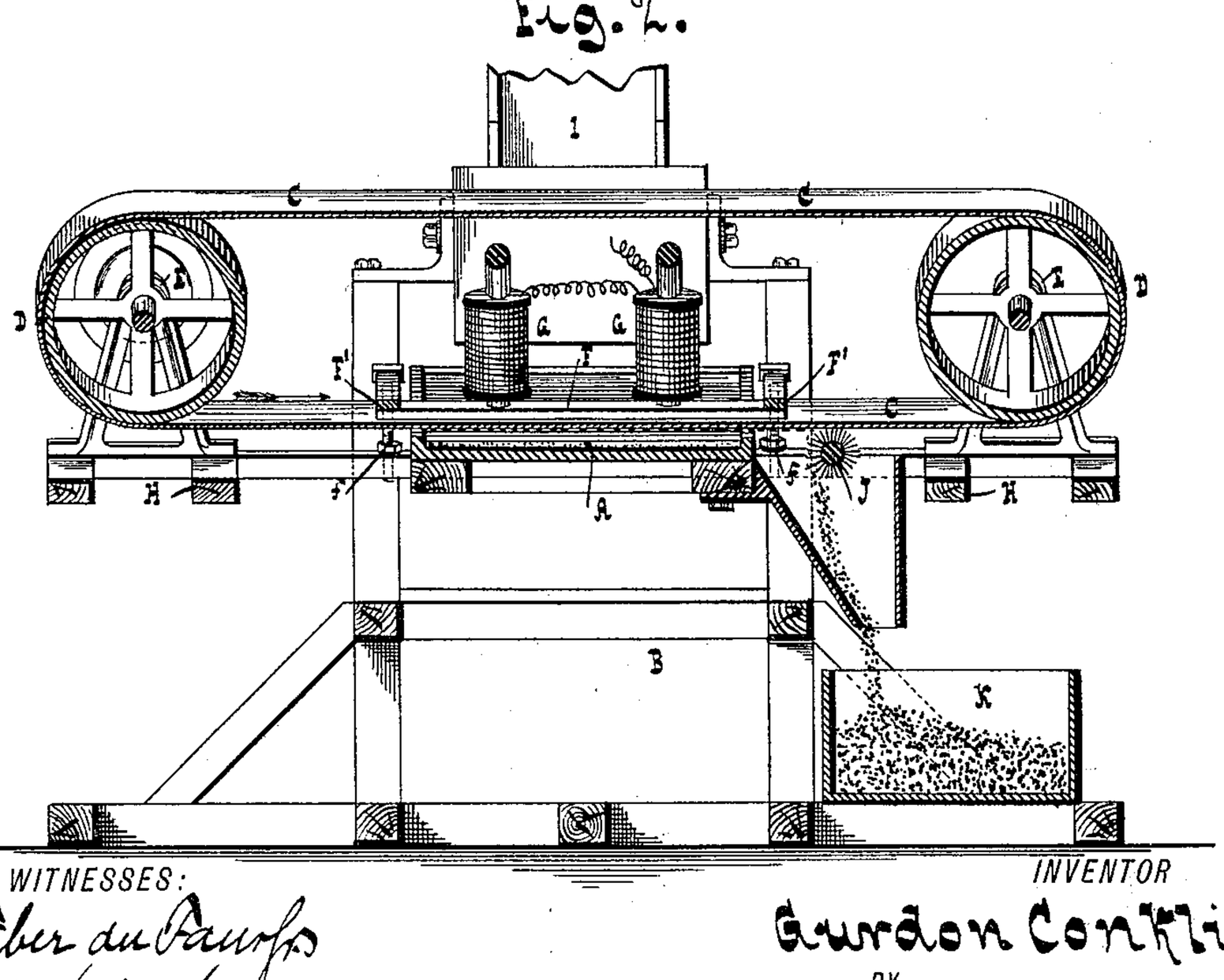


Fig. 2.



WITNESSES:

Alber du Bois

William Miller

INVENTOR

Gurdon Conkling

BY

Van Santvoord & Hauff

his ATTORNEYS

N. PETERS, Photo-Lithographer, Washington, D. C.

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Fig. 3.

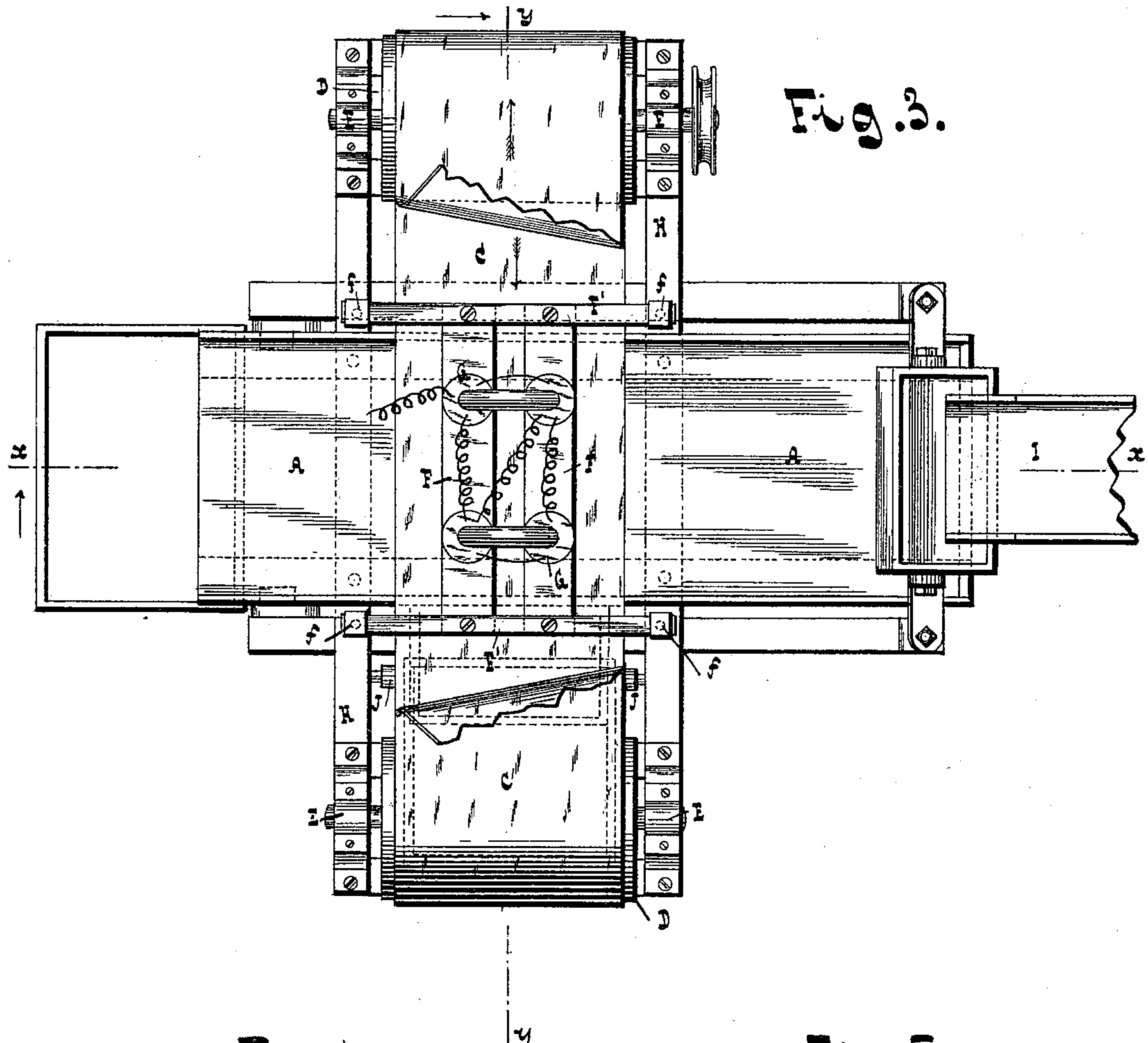


Fig. 4.

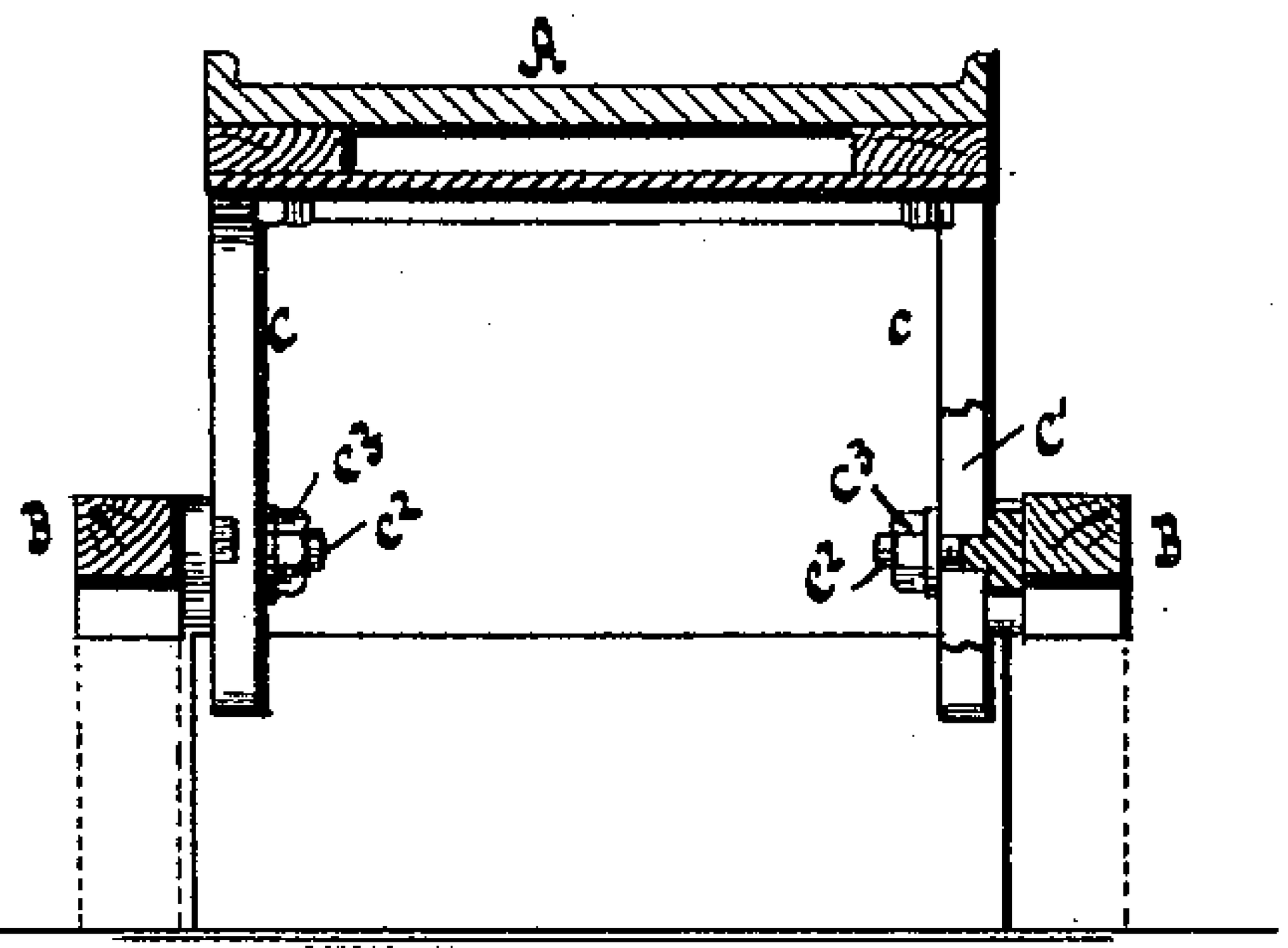


Fig. 6

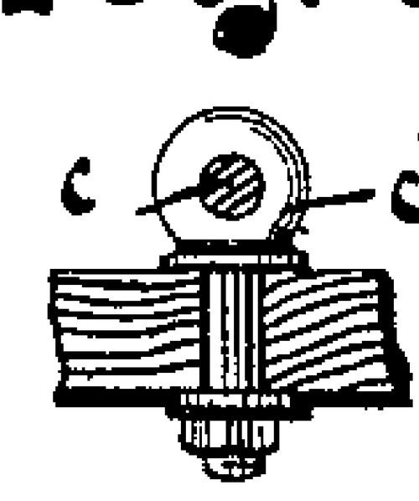
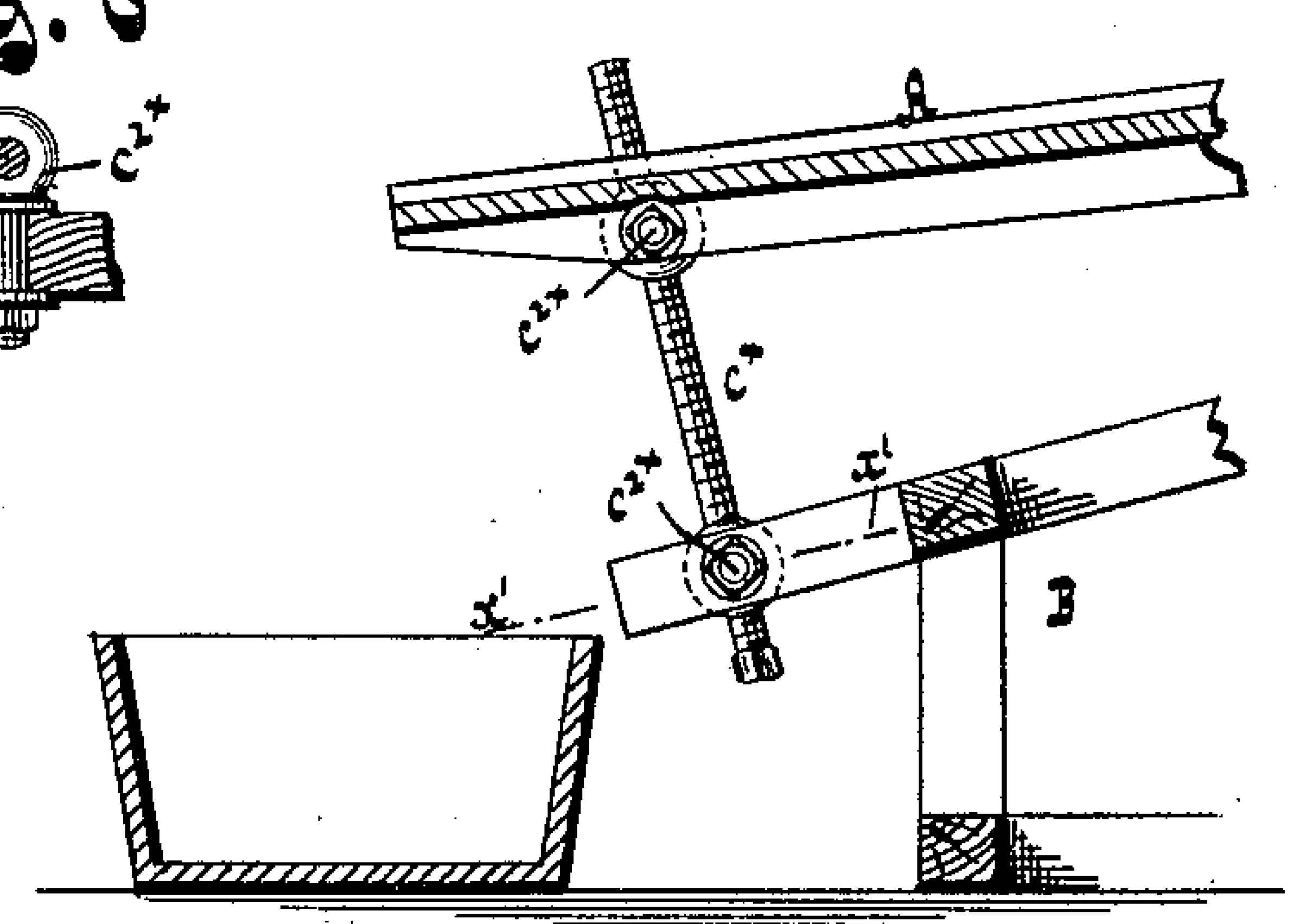


Fig. 5.



WITNESSES:

A. Faber du Faur, Jr.

William Miller

INVENTOR.

Gurdon Conkling

BY

Van Santvoord & Hauff

his ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GURDON CONKLING, OF GLENS FALLS, NEW YORK.

MACHINE FOR SEPARATING IRON FROM ORES.

SPECIFICATION forming part of Letters Patent No. 403,575, dated May 21, 1889.

Application filed March 29, 1888. Serial No. 268,875. (No model.)

To all whom it may concern:

Be it known that I, GURDON CONKLING, a citizen of the United States, residing at Glens Falls, in the county of Warren and State of New York, have invented new and useful Improvements in Machines for Separating Iron from Ores and other Materials, of which the following is a specification.

This invention relates to a machine which is intended, principally, for separating iron from the tailings of wet-ore separators in an economical manner, but which can also be used for separating particles of iron from non-magnetic matter.

The peculiar and novel construction of my machine is pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section in the plane *x x*, Fig. 3. Fig. 2 is a similar section in the plane *y y*, Fig. 3. Fig. 3 is a plan or top view. Fig. 4 is a vertical section in the plane *z z*, Fig. 1. Fig. 5 is a modification of the means for adjusting the working parts of my machine. Fig. 6 is a section in the plane *x' x'*, Fig. 5.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a trough, which is supported by the frame B, and which is placed in an inclined position. (Best seen in Fig. 1.) For the purpose of adjusting the inclination of the trough the following means may be used: To the under surface of said trough, near one of its ends, are firmly secured two eyes, *a*, one near each side, and through these eyes extends a rod, *b*, which has its bearings in the frame B. The opposite end of said trough is supported by two arms, *c c*, Figs. 1 and 4, which are firmly secured to its under surface, and which are provided with slots *c'*. Through these slots extend studs c^2, the outer ends of which are provided with screw-threads to engage with nuts c^3, so that the trough can be turned on the rod *b* and secured at the required inclination by means of the nuts c^3. In place of the slotted arms *c c* screw-rods c^* may be used, Fig. 5, which extend into swivel-bolts c^{2*}, Fig. 6.

Above the trough A is situated an endless belt, C, which runs over two drums, D D, the shafts of which have their bearings in standards E E, and to one of which is imparted a revolving motion by suitable means, such as a belt and pulley. In proximity to the endless belt C are placed one or more magnetized plates, F, which are preferably made of metal—such as soft iron—which will be magnetized by placing them upon magnets, as at G. The magnets G may be permanent magnets or electro-magnets. The plates F are secured to traverses F', which are supported by screw-studs *f f*, so that the plates F can be raised or lowered.

The magnetized plates F are so arranged that they extend or run in the direction of the length or travel of the apron C. I have found this arrangement advantageous, in that it insures the movement of the iron particles away on the belt and avoids clogging. Where magnets are located across the apron at right angles to the direction in which the apron travels, the iron particles attracted by the magnets are not moved away by the apron, but remain stationary, while the apron moves between the attracted particles and the magnets, thereby clogging the apparatus.

By referring to the drawings, particularly Fig. 1, it will be seen that the belt C is placed in an inclined position to correspond to the inclination of the trough A. If the inclination of the trough A is changed, that of the belt C must also be changed to correspond, and in order to accomplish this object in the simplest possible manner I place the standards E E, which form the bearings for the shafts of the drums D D, upon a frame, H, which is firmly connected to the trough A, and the screw-studs *f f*, which support the traverses F' and magnetic plates F, are also secured to this same frame, so that if the inclination of the trough A is changed the belt C and the plates F must follow, and the required relation between the trough and the belt is preserved at all times.

The material to be acted upon is mixed with water and conducted in a thin stream upon the trough A. When my apparatus is to be used for separating the iron particles contained in the tailings of a wet-ore separator—such as a jigger—such tailings may be conducted to the trough A directly from the

jigger through a trough, I. As the stream containing the tailings passes beneath the belt C the particles of iron contained therein are attracted by the magnetized plates F F, so that they adhere to the under surface of the belt C, and by this belt they are carried away in the direction of the arrow marked on said belt in Fig. 2 until they reach the scraper J, by the action of which they are swept off from the belt and caused to drop down into the receptacle K. The scraper may be made in the form of a revolving brush.

By increasing or decreasing the inclination of the trough A the speed of the stream of tailings running down over said trough will be increased or decreased, and the action of the magnetized plates F F can thereby be regulated.

If the trough A is adjusted at a sufficiently steep inclination, the materials to be separated can be made to slide down over said trough in a dry state.

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

1. The combination, with the trough A, transverse belt C, and means for moving the latter, of the magnetized plates F, extending or running in the direction of the length and travel of the belt to attract particles to the belt, substantially as described.

2. The combination, with the trough A, transverse belt C, and means for moving the latter, of the traverses F′, extending across the belt, and the magnetized plates F, suspended from the traverses and extending or running in the direction of the length and travel of the belt, substantially as described.

3. The combination, with the trough A, the endless belt C, and the magnetized plate or plates F, of suitable means, substantially such as herein described, for adjusting the inclination of the trough.

4. The combination, with the trough A, the endless belt C, and the magnetized plate or plates F, of the frame H, which is attached to the trough and supports the endless belt, and the magnetized plate or plates, and means, substantially such as described, for adjusting the inclination of the trough, substantially as set forth.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

GURDON CONKLING. [L. S.]

Witnesses:
W. C. HAUFF,
E. F. KASTENHUBER.