

No. 712,300.

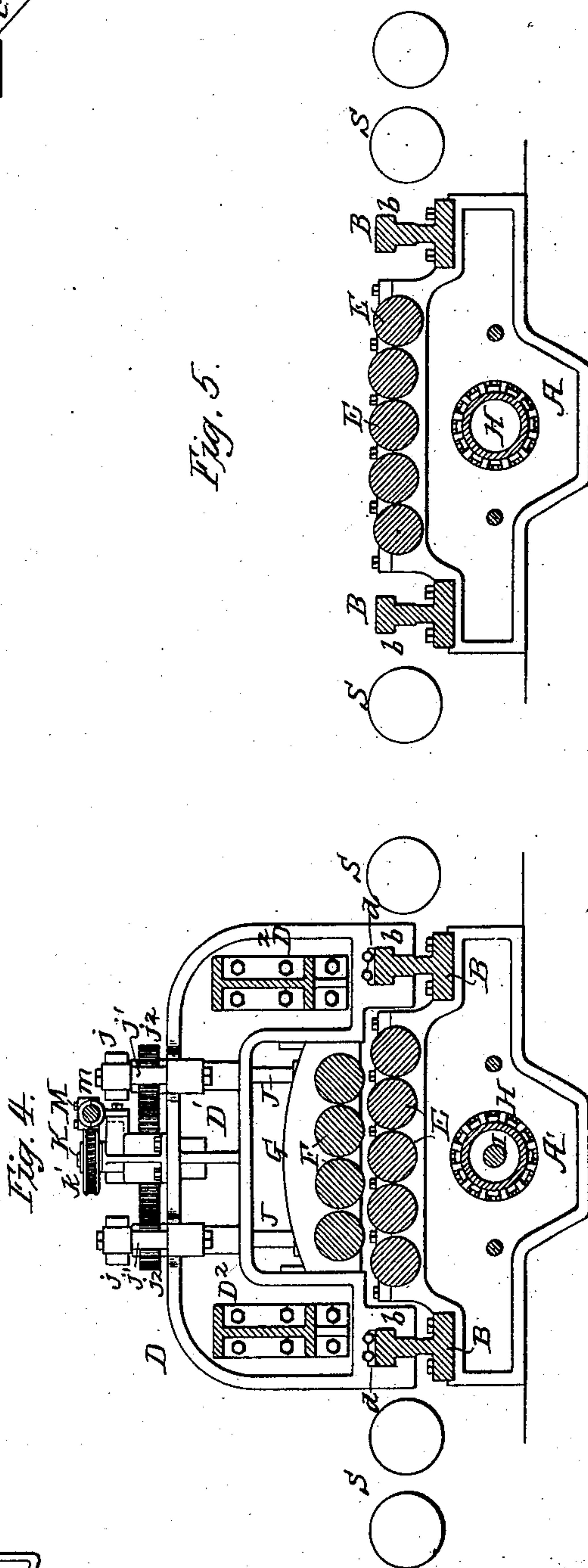
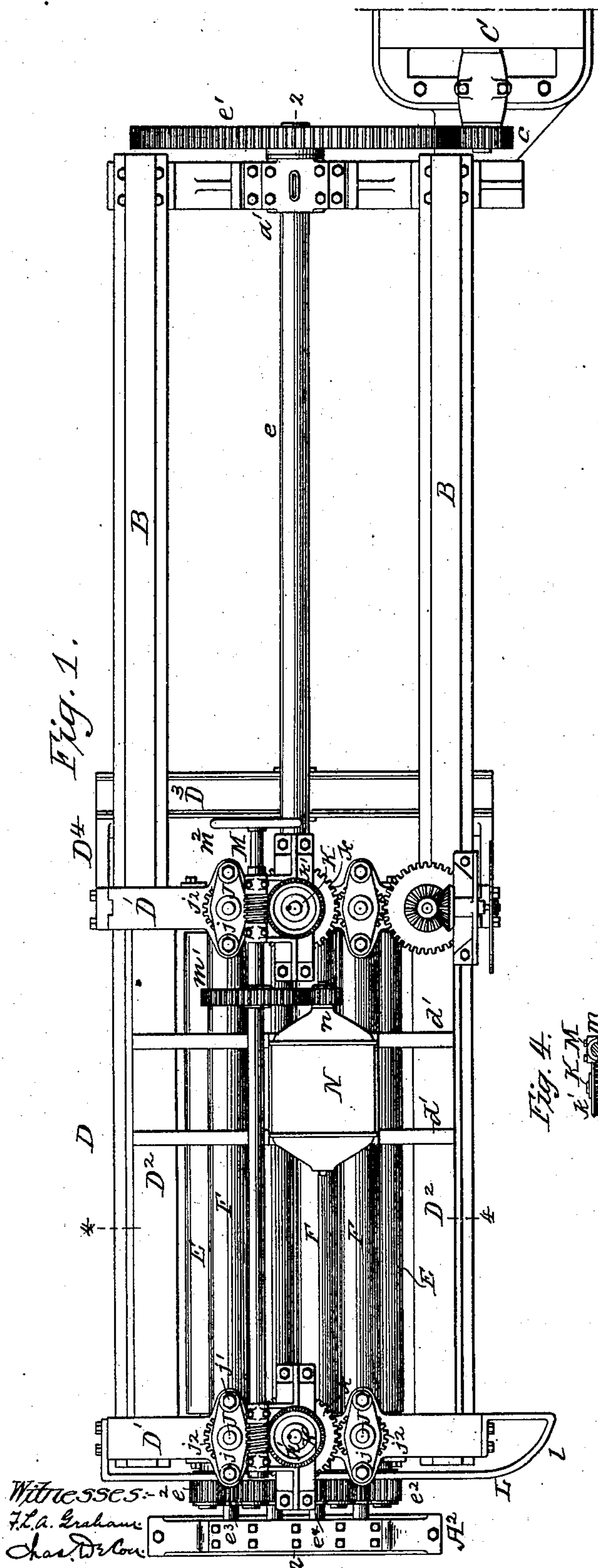
Patented Oct. 28, 1902.

C. L. HUSTON.
PLATE STRAIGHTENING MACHINE.

(Application filed Mar. 22, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
F.L.A. Graham
Chas W. Cow

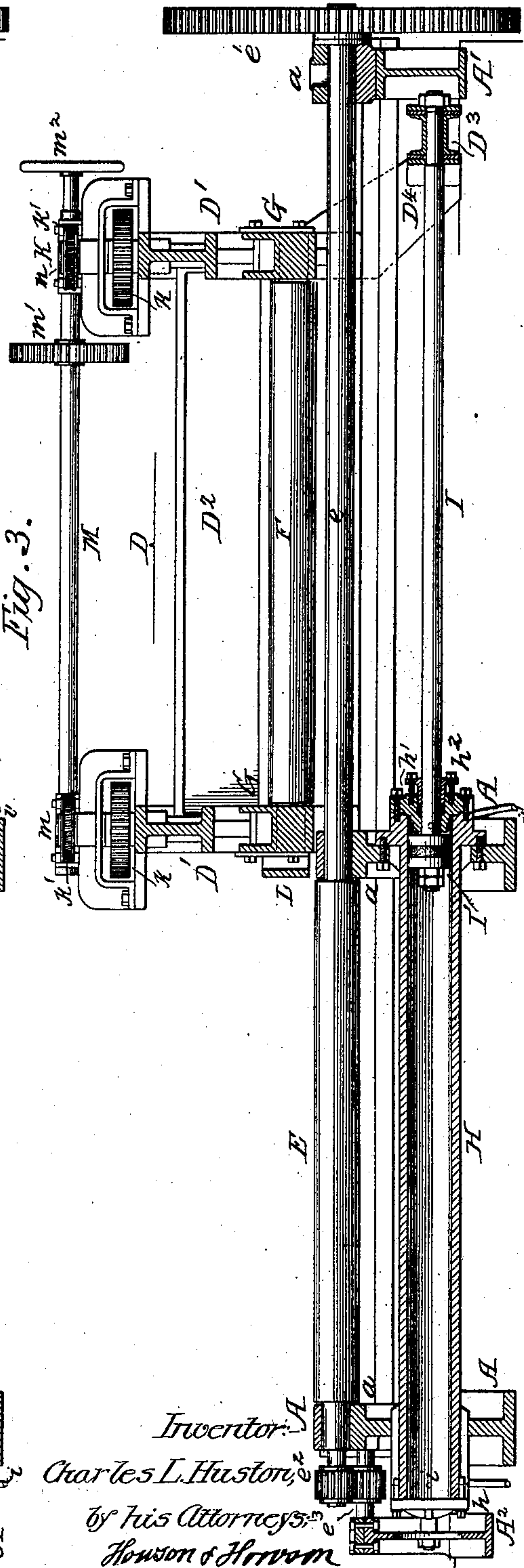
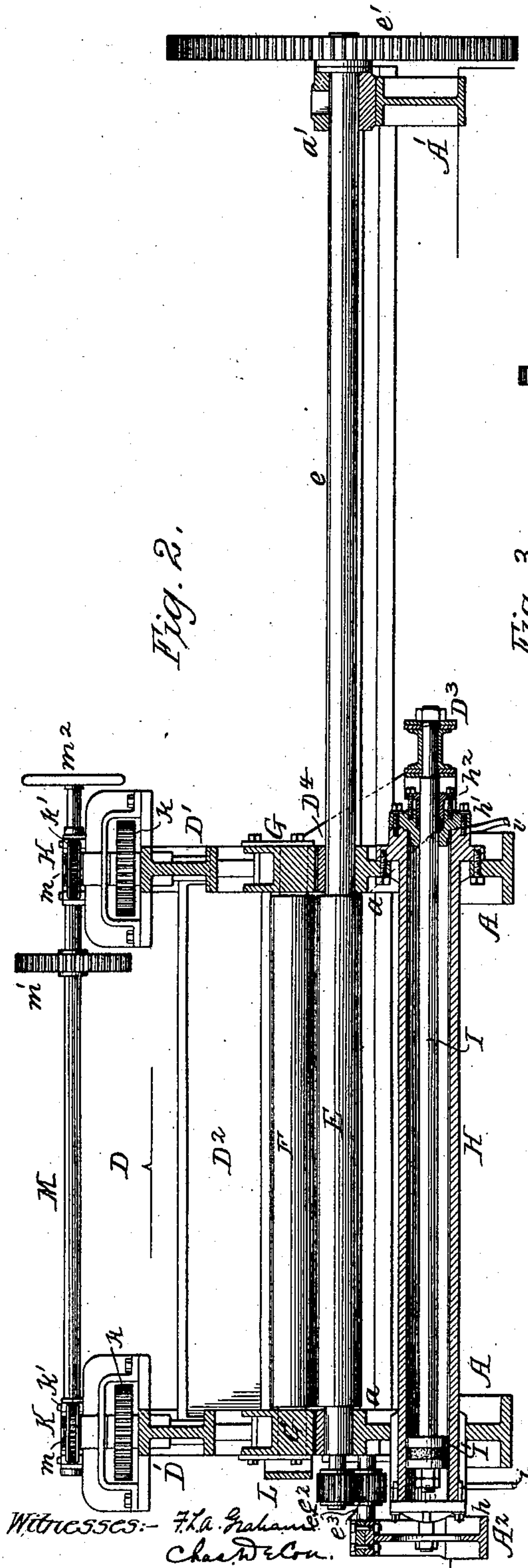
Inventor.
Charles L. Huston.
by his Attorneys;
Hornum & Harrison

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(No Model.)

2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

CHARLES L. HUSTON, OF COATESVILLE, PENNSYLVANIA.

PLATE-STRAIGHTENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 712,300, dated October 28, 1902.

Application filed March 22, 1901. Serial No. 52,379. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. HUSTON, a citizen of the United States, and a resident of Coatesville, Pennsylvania, have invented certain Improvements in Plate-Straightening Machines, of which the following is a specification.

My invention relates to certain improvements in plate-straightening machines.

The main object of my invention is to so construct the machine that the upper rolls can be moved away from the lower rolls to leave an unobstructed passage for the plates in the process of rolling, so that the machine can be placed in line with the rolling-mill and the lower rolls can be used as a part or continuation of the roller-table of the mill and after the last pass the upper rolls can be shifted into position and the plate passed between the upper and lower rolls for the purpose of straightening the same.

My invention also relates to details, which will be fully described hereinafter.

In the accompanying drawings, Figure 1 is a plan view of my improved plate-straightening machine, showing the upper rolls directly above the lower rolls. Fig. 2 is a longitudinal sectional view on the line 2 2, Fig. 1. Fig. 3 is a longitudinal sectional view, similar to Fig. 2, with the upper rolls shifted. Fig. 4 is a sectional view on the line 4 4, Fig. 1; and Fig. 5 is a view similar to Fig. 4 with the upper rolls removed.

A A are the housings of the machine.

B B are the longitudinal rails, extending from end to end of the machine and acting not only as braces for the frames and housings, but also as guides upon which the movable frame D slides.

A' is a pedestal or support for the outer ends of the rails B B and driving-shaft.

E E are the lower rolls of the plate-straightening machine, and F F are the upper rolls. It will be noticed that the trunnions of the lower rolls E are mounted in boxes *a a* in the fixed frames or housings A, and the trunnion *e* of the center roll in the present instance extends in the form of a shaft to the pedestal A', in which is a bearing *a'* for said shaft. On this shaft is a gear-wheel *e'*, which meshes with a pinion *c* on the shaft of an electric

motor C. It will be understood, however, that in place of the electric motor a power-shaft may be geared or belted to a driving-shaft driven in any suitable manner.

The lower rolls E are geared together by a train of gears $e^2 e^3$, the gears e^2 being on the trunnions of the rolls E, while the gears e^3 are on shafts e^4 , mounted in bearings in one of the housings A and a pedestal A², as clearly shown in the drawings.

The trunnions of the rolls F are mounted in vertically-adjustable slides G G, arranged to travel in the side members D' of the frame D. These side members are connected together by longitudinal members D² in the form of I-beams in the present instance, so that the frame D² is perfectly rigid. The side members D' extend down to and rest upon the rails B, as clearly shown in Fig. 4, and have slide-blocks *d d*. The side members D' underlap the head *b* of each rail, so that the frame is held rigidly to the rails B B and when adjusted above the rolls E is fixed, so that there will be no lost motion when the plate is passed between the upper and lower rolls.

The frame D may be moved from the position shown in Fig. 2 to the position shown in Fig. 3 by any suitable mechanism. In the present instance I provide hydraulic mechanism for this purpose, and mounted on the housings A A under the rolls E is a hydraulic cylinder H, closed at one end by a head *h* and at the other end by a head *h'*, provided with a stuffing-box *h²*. Passing through the stuffing-box is a piston-rod I, having a piston I' at its opposite end. This piston may be made in any manner common to hydraulic mechanism.

The rod I is connected to a cross-bar D³, secured by brackets D⁴ to one of the side members D' of the frame D, as clearly shown in Figs. 1 and 2, so that if, for instance, the frame D is in the position shown in Fig. 2, directly above the rolls E, and it is wished to shift the frame to the position shown in Fig. 3, then fluid under pressure is admitted to the cylinder H through a pipe *i*, and the piston will be forced to the opposite end of the cylinder, carrying with it the frame D and shifting the frame to the position shown in

Fig. 3. If it is wished to shift the frame from the position shown in Fig. 3 to that shown in Fig. 2, then the fluid is admitted to the opposite end of the cylinder through the pipe v' .

5 I have shown in the drawings means for raising and lowering the slides G to adjust the rolls F in respect to the rolls E. Projecting upward from the slides G are fixed screws J J, which extend through bearings in the
10 side members D' of the frame D and through a cross-bar j , supported by studs j' , and on each screw is a threaded pinion j^2 , which engages the thread of the screw. The teeth of each pinion mesh with the gear-wheel k on a
15 stud K. On this stud is a worm-wheel k' , which meshes with a worm m on a shaft M, extending from one set of adjusting means to the other. On the shaft M is a gear-wheel m' , which meshes with a pinion n on the shaft
20 of an electric motor N, mounted on cross-bars d' on the frame D. The shaft M is also provided with a hand-wheel m^2 , by which it can be turned independently of the motor when it is desired to adjust the slides G by hand.

25 It will be noticed that on one side of the frame D' is a guard L, which is rounded at l . This guard is for the purpose of protecting the frame and guiding a plate should it by accident be moved out of its usual course.

30 In the present instance on each side of the straightening-machine are the rolls SS, forming part of the table of the rolling-mill, as my invention can be used in connection with a rolling-mill and the machine can be set in the
35 table at one side of the mill, so that during the process of rolling the frame D and its rolls can be shifted clear of the lower rolls, as in Fig. 3, and the lower rolls will then act with the rolls S of the table of the universal mill
40 to support the plate as it is moved back and forth between the rolls of the mill, and after the last pass the frame D can be moved in position directly over the lower rolls, so that the plate can be immediately passed through the
45 straightening-machine and straightened on its way to the shears.

In some instances the lower rolls may be driven by the same mechanism that drives the rollers of the table of the rolling-mill, and
50 other means may be used for moving the upper rolls away from the lower rolls without departing from my invention.

While I have shown the shaft e as a continuation of one of the trunnions of the central lower roll E, it may be an independent
55 shaft coupled thereto or to any of the lower rolls.

I claim as my invention—

1. The combination in a plate-straightening
60 machine, of the housings, a series of lower horizontal rolls mounted in said housings, a movable frame, upper horizontal rolls carried by said frame and mounted above the spaces between the lower rolls, with means for shift-
65 ing said frame either to a position above the

lower rolls or to one side of the same, substantially as described.

2. The combination in a plate-straightening machine, of the housings, a series of lower horizontal rolls mounted in said housings, 70 means for driving said rolls, a frame mounted above said rolls, a series of upper horizontal rolls carried by said frame, and means for moving said frame so as to shift the upper rolls either to a position above the lower rolls 75 or to one side of the same, substantially as described.

3. The combination in a plate-straightening machine, of the housings, a series of lower horizontal rolls mounted in said housings, 80 means for driving said lower rolls, rails, a frame mounted on said rails, upper rolls carried by said frame, a hydraulic cylinder, a piston therein, a piston-rod, said piston-rod being connected to the upper frame so that 85 the said frame with the upper rolls can be moved horizontally on the rails either to a position above the lower rolls or to one side thereof, substantially as described.

4. The combination in a plate-straightening 90 machine, of the housings, fixed rails, lower rolls mounted in said housings, a shaft connected to the central roll of the series, means for driving said shaft, said central roll being geared to the other rolls, a frame mounted 95 on the rails, means for shifting said frame, and upper rolls carried by the frame, substantially as described.

5. The combination in a plate-straightening machine, of the housings, lower rolls mounted 100 in said housings, means for driving said rolls, rails, the housings supporting one end of said rails, a pedestal for the outer ends of the said rails, a driving-shaft for the lower rolls extending from said pedestal to the housings, 105 a frame mounted on the rails, means for shifting said frame, slides therein, means for adjusting said slides, and upper rolls having their bearings in the slides, substantially as described. 110

6. The combination in a plate-straightening machine, of a series of lower rolls, housings therefor, rails, a frame arranged to slide on said rails, upper rolls carried by said frame, 115 brackets on the frame, a cross-bar secured to the brackets, a fixed cylinder, a piston, and a piston-rod, said rod being attached to the cross-bar of the frame, substantially as described.

7. The combination in a plate-straightening machine, of a series of lower rolls, housings 120 therefor, means for driving said rolls, a frame, upper rolls carried thereby, means for shifting said frame with its rolls in respect to the lower rolls, gearing for adjusting the upper rolls in said frame, and an electric motor on 125 said frame coupled to the said gearing, substantially as described.

8. The combination in a plate-straightening machine, of lower rolls, housings therefor, 130 rails, a frame mounted on said rails, upper

rolls carried by said frame, means for shifting said frame to one side of the lower rolls, and a guard-plate attached to one end of said frame, substantially as and for the purpose
5 set forth.

9. The combination in a plate-straightening machine, of a series of lower horizontal rolls, housings therefor, a movable frame, a series of upper horizontal rolls carried thereby, with
10 means for shifting said frame and the upper rolls clear of the lower rolls so as to leave an

unobstructed passage for plates during the process of rolling, and driving means geared only to the lower rolls, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES L. HUSTON.

Witnesses:

WILL. A. BARR,
JOS. H. KLEIN.

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