

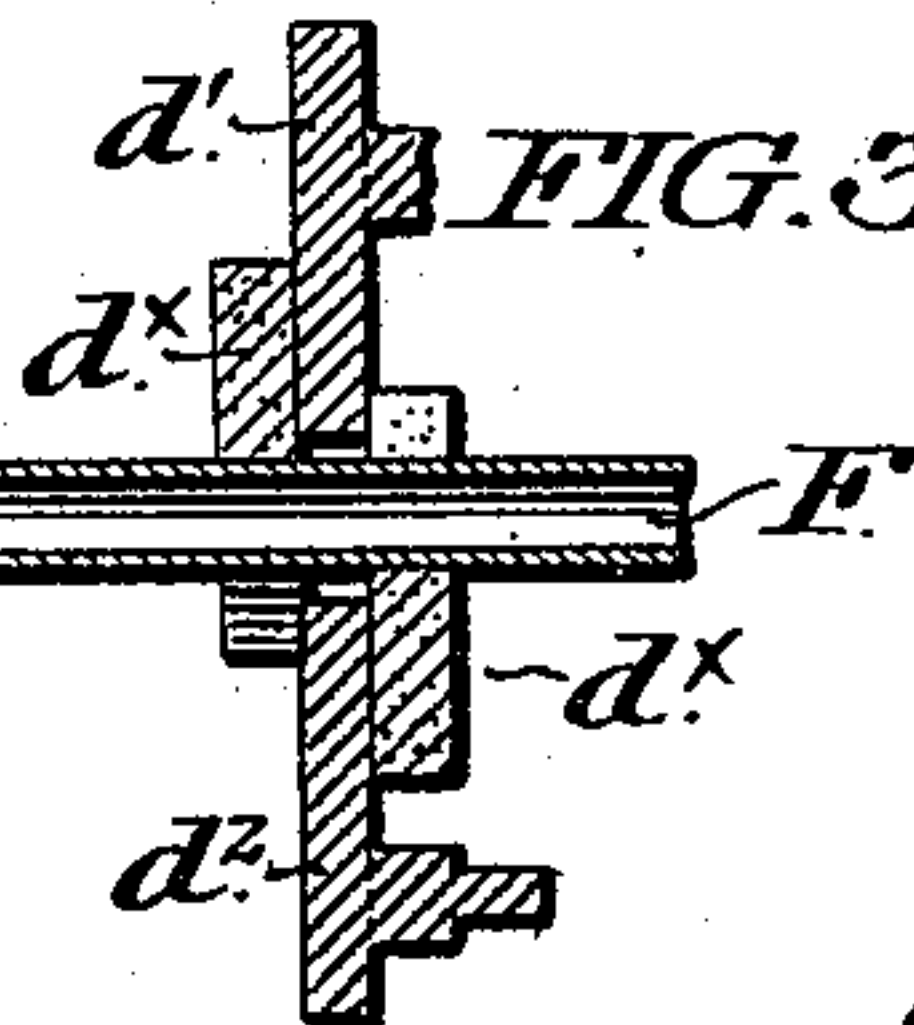
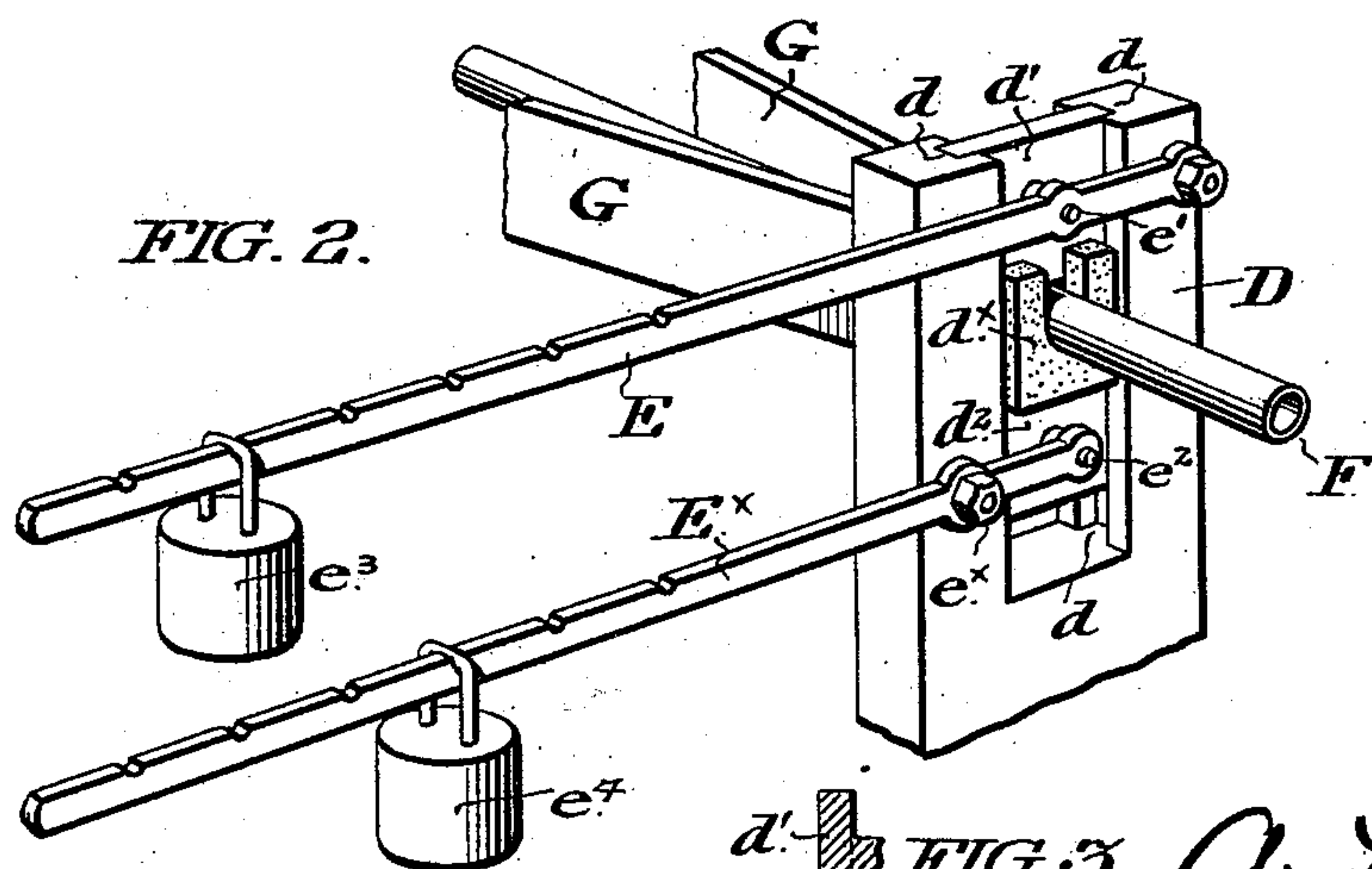
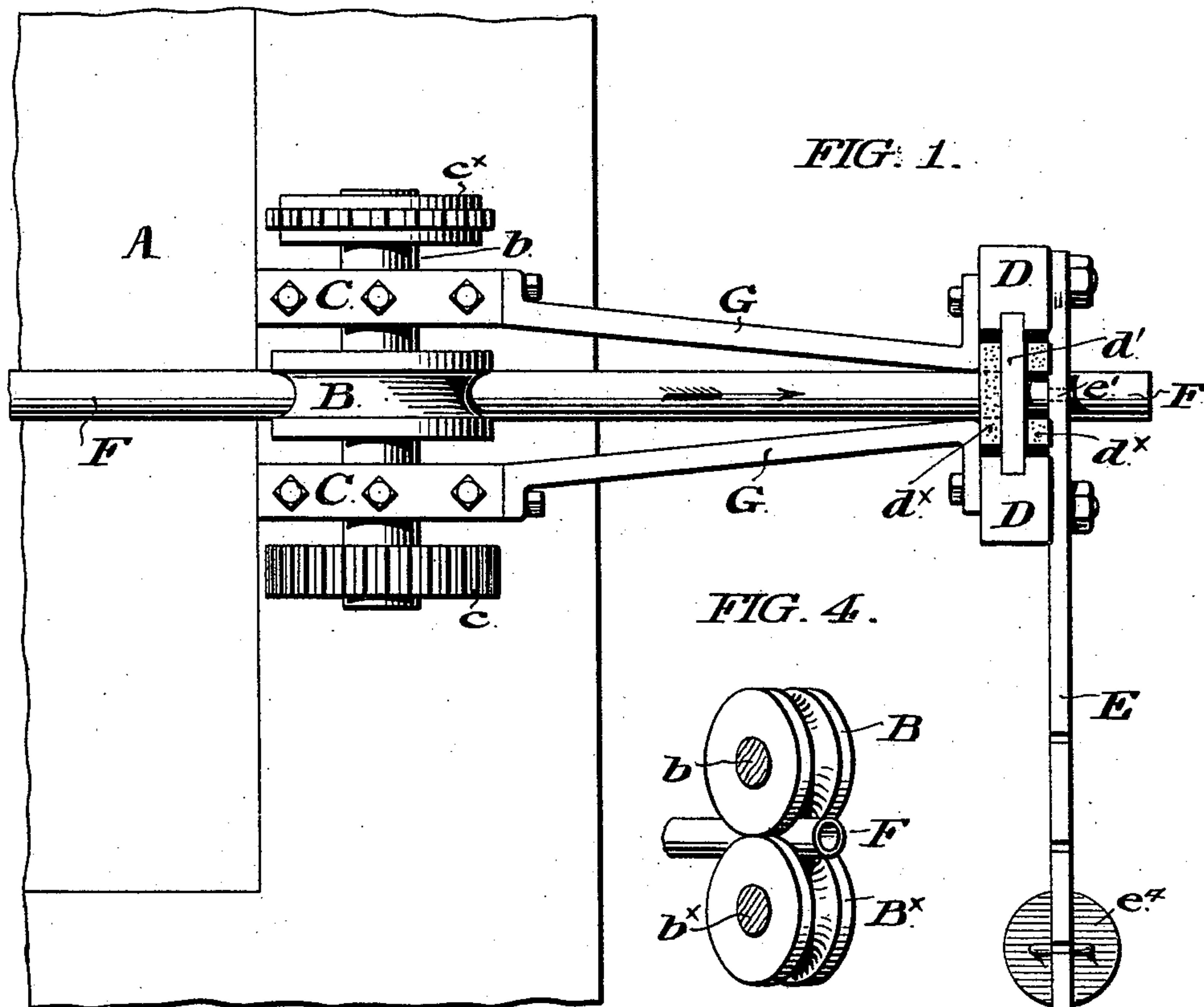
(No Model)

A. L. MURPHY.

APPARATUS FOR GALVANIZING METAL TUBES, BARS, OR SIMILAR ARTICLES.

No. 582,667.

Patented May 18, 1897.



A. L. Murphy.

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# UNITED STATES PATENT OFFICE.

ALBERT L. MURPHY, OF CONSHOHOCKEN, PENNSYLVANIA.

APPARATUS FOR GALVANIZING METAL TUBES, BARS, OR SIMILAR ARTICLES.

SPECIFICATION forming part of Letters Patent No. 582,667, dated May 18, 1897.

Application filed October 21, 1896. Serial No. 609,530. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT L. MURPHY, a citizen of the United States, residing at Conshohocken, in the county of Montgomery, and State of Pennsylvania, have invented certain new and useful Improvements in the Apparatus for Galvanizing Metal Tubes, Bars, and Similar Articles, of which the following is a specification.

10 My invention relates to operations of galvanizing or coating with liquid spelter, pipes, tubes, rods, wire, angle-iron, and other products of iron, steel, or other suitable metals, in which the article to be coated is plunged  
15 into a bath of melted zinc or other molten metal, after its surface has been cleaned by friction with the aid, for instance, of dilute acid.

20 The object of the invention is to provide the article to be treated with a uniformly-applied and thoroughly smooth or evenly-surfaced coating of such liquid spelter or other metallic coating as it is desired to apply.

25 To the foregoing ends my invention comprehends an apparatus for applying, compressing, condensing, wiping, and smoothing, a liquid metallic coating upon a pipe, bar, rod, or kindred product of metal,—a good form of a preferred embodiment of which is represented in the accompanying drawings, and  
30 hereinafter described,—the particular subject-matter which I claim as novel being hereinafter definitely specified.

In the accompanying drawings,

35 Figure 1 is a top plan view of an apparatus embodying my improvements.

Figure 2 is a view in perspective of the smoothing and wiping dies, which form an element of my apparatus.

40 Figure 3 is a fragmentary transverse sectional detail of the die plates and dies shown in Figure 2.

Figure 4 is a perspective view of the compressing rolls which form another element of  
45 my apparatus, removed from their housing.

Similar letters of reference indicate corresponding parts.

In the drawings,

50 A represents a tank for containing the liquid spelter, or other molten metallic surfacing liquid, in which the tube or article to be coated is immersed.

This tank may be of any preferred character.

B B<sup>x</sup> are a two-high set of peripherally-grooved compressing rolls, mounted upon  
55 journals *b b<sup>x</sup>* in a suitable housing C.

These rolls may be driven in unison in opposite directions by any suitable gearing, as, for instance, by intermeshing spur wheels, of which the wheel *c* shown in Figure 1 as  
60 applied to the journal of the upper roll B, is a type; and the train may be driven by a sprocket chain, not shown, applied to a sprocket wheel *c<sup>x</sup>* shown in Figure 1 as  
65 applied to the journal *b* of the upper roll B.

The means for driving the rolls is immaterial.

The housing of the compressing rolls may be erected upon any preferred foundation in adjacency to the tank,—or upon a wall of the  
70 tank, as shown in Figure 1.

D is a die housing, Figures 1 and 2,—the same being, conveniently, a vertically-slotted plate or frame, the facing margins of the slot of which are provided with a die-way *d*, within  
75 which are applied and fitted for longitudinal movement toward or away from each other, a pair of die plates *d' d<sup>2</sup>*, which are preferably opposite counterparts, and each of which  
80 embodies a recessed die, or die proper *d<sup>x</sup>*, respectively conformed each to the sectional outline of one half of the article to be acted upon.

These dies which are the wiping, and polishing, so to speak, instrumentalities proper,  
85 are preferably made of asbestos, soap-stone, magnesium, paperia, or analogous material; and they may be either directly conformed to the die way of the housing, or be as shown,  
90 connected with die plates or slides applied to said way, as convenience of construction may dictate.

The dies are oppositely disposed, that is to say, their respective recesses are in opposite registry, so that when the dies are caused to  
95 approach the two recesses form a single pass which is conformed to the sectional outline of the article to be acted upon by the dies.

It is proper here to remark that although I have illustrated the pass of the compressing  
100 rolls, and also that of the wiping dies, as each circular so as to adapt the apparatus to be operative upon a cylindric tube,—yet that both the conformation of the periphery



of the rolls and the transverse sectional outline of the recesses of the die plates, are of any desired cross sectional outline, and therefore adapted to operate upon products of  
5 manufacture not externally cylindric, but possessing circular, triangular, elliptical, polygonal, or other, so to speak, irregular, form.

It being necessary that the dies should be capable of mutual approach and separation,  
10 means to that end must be provided,—and I have found it convenient to apply to each die plate a counter-weighted lever, E, E<sup>x</sup>, respectively fulcrumed at  $e$   $e^x$  to the die housing, and respectively pivotally connected at  
15  $e'$   $e^2$  with the respective die plates.

The counter-weights  $e^3$   $e^4$  are adjustable longitudinally of the levers in the usual manner.

Obviously the arrangement above described  
20 will effect the maintaining of the die plates under constant pressure toward each other.

In order to effectuate the separation of the dies for the introduction of a tube, the tension of the counter-weights must be overcome  
25 by the elevation of the free ends of the levers in any preferred manner.

Although the die housing as a whole may be erected upon any suitable bed or foundation, I find it convenient to support it upon  
30 brackets G, springing from the roll housing, because such relationship insures alinement of the respective passes of the rolls and dies.

Having now described an apparatus conveniently effectuating my invention, the operation will be easily understood.  
35

The tube F, or other article to be coated, after having been immersed in a bath in the tank for a sufficient length of time, is as to its forward extremity elevated into the pass  
40 of the compressing rolls, the nip of which draws the tube forward from the tank, and forces it into and through the pass of the wiping dies,—with the result that the rolls compress and condense the spelter upon the tube,  
45 consolidating it, so to speak, upon the surface of the tube, and incidentally rolling down all irregularities,—while the dies, under their constant pressure, serve to wipe off of the surface of the tube any surplus metal and  
50 any remaining lumps or irregularities, so that the resultant product is a tube rod or other article possessing a hard smooth uniform and highly finished surface coating of a charac-

ter superior to any heretofore produced by any apparatus or operation of which I have  
55 knowledge.

I am aware that galvanizing tanks have been provided with submerged and partly-submerged handling rolls, for occasioning the passage through and delivery from the bath  
60 of spelter within the tank of a sheet of metal to be galvanized,—and that there have also been combined with tanks containing submerged handling rolls, sets of rotary brushes, and also sets of finishing brushes,—and I am  
65 also aware that wiping dies *per se* have been employed in galvanizing apparatus,—and to none of these instrumentalities or combinations of instrumentalities do I, however, lay  
70 claim.

But what I do claim as my invention, and desire to secure by Letters Patent is:—

1. An apparatus for galvanizing tubes and kindred articles, in which are combined the following instrumentalities:—first, a tank for  
75 containing a bath of liquid spelter;—second, compressing rolls exterior to the tank, which operate upon the article to be coated after it has received its coating within the bath;—  
80 and, third, wiping dies which operate upon the article to be coated after its coating has been subjected to the action of the compressing rolls,—substantially as and for the purpose specified.

2. An apparatus for galvanizing tubes and  
85 kindred articles, in which are combined the following instrumentalities:—first, a tank for containing a bath of liquid spelter;—second, compressing rolls exterior to the tank, which operate upon the article to be coated after  
90 it has received its coating within the bath;—third, two-member wiping dies which operate upon the article to be coated after its coating has been subjected to the action of the compressing rolls;—and, fourth, means for occasioning the constant mutual approach of the  
95 members which respectively compose the wiping dies as an entirety;—substantially as and for the purposes specified.

In testimony that I claim the foregoing as  
100 my invention I have hereunto signed my name this 19th day of October, A. D. 1896.

ALBERT L. MURPHY.

In presence of—

J. BONNALL TAYLOR,  
WALTER C. PUSEY.