

No. 682,146.

Patented Sept. 3, 1901.

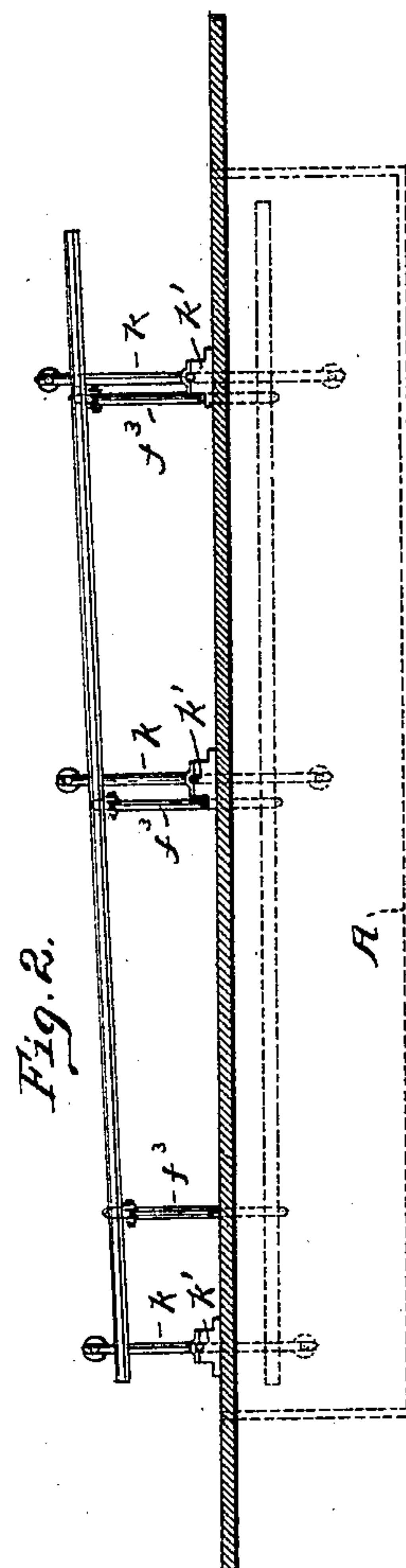
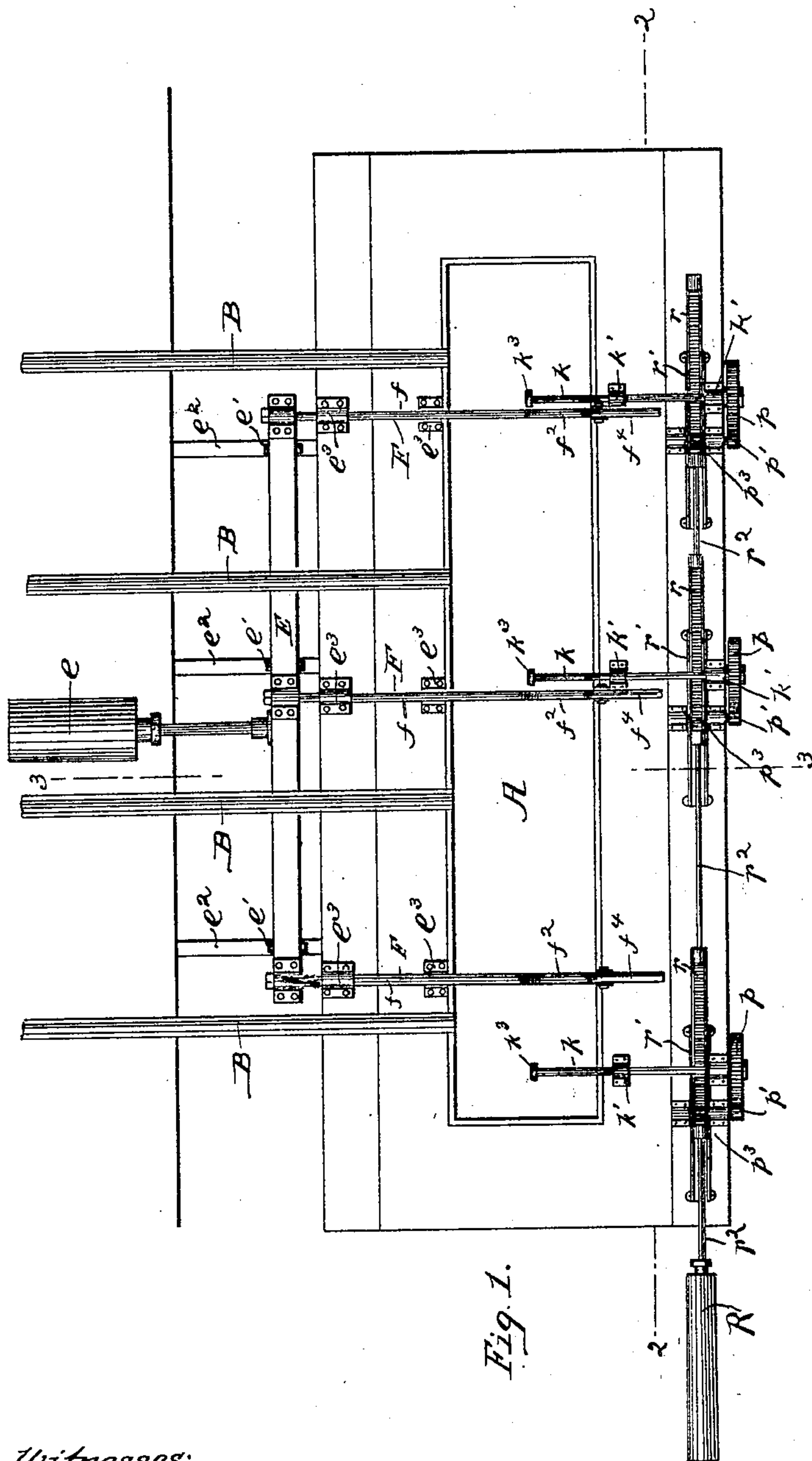
H. B. LYNCH.

APPARATUS FOR COATING PIPES OR BARS.

(Application filed June 2, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

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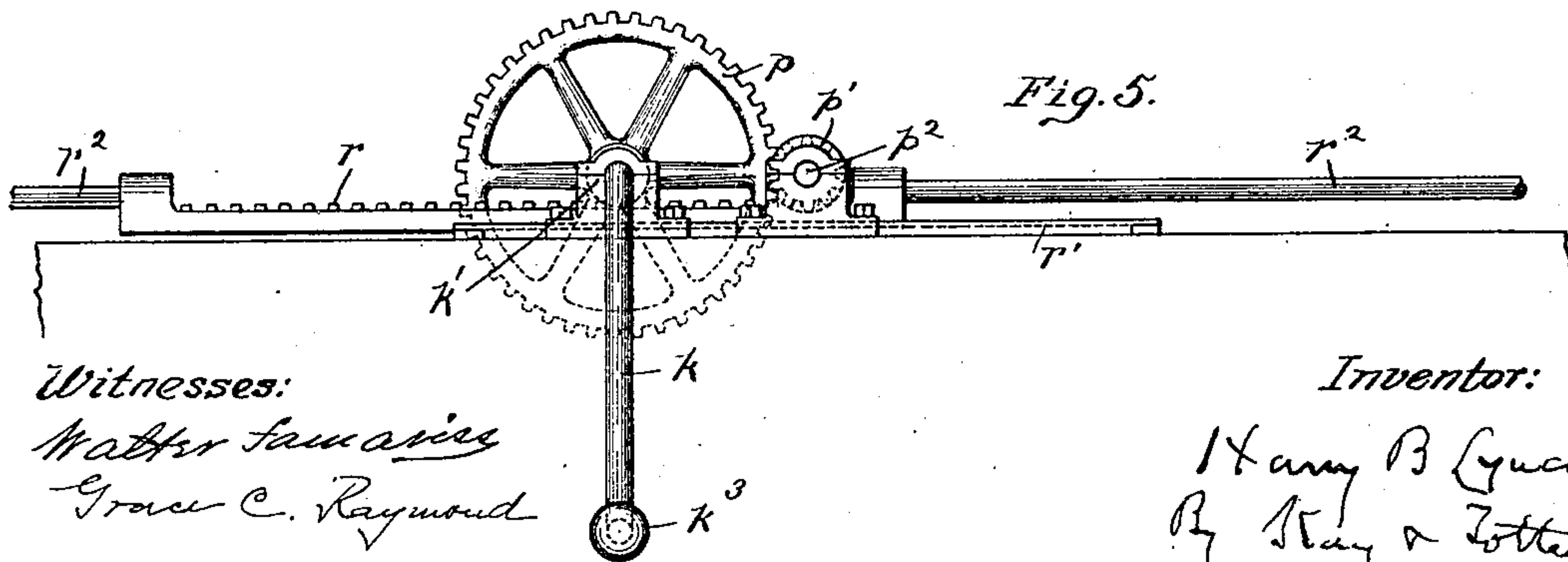
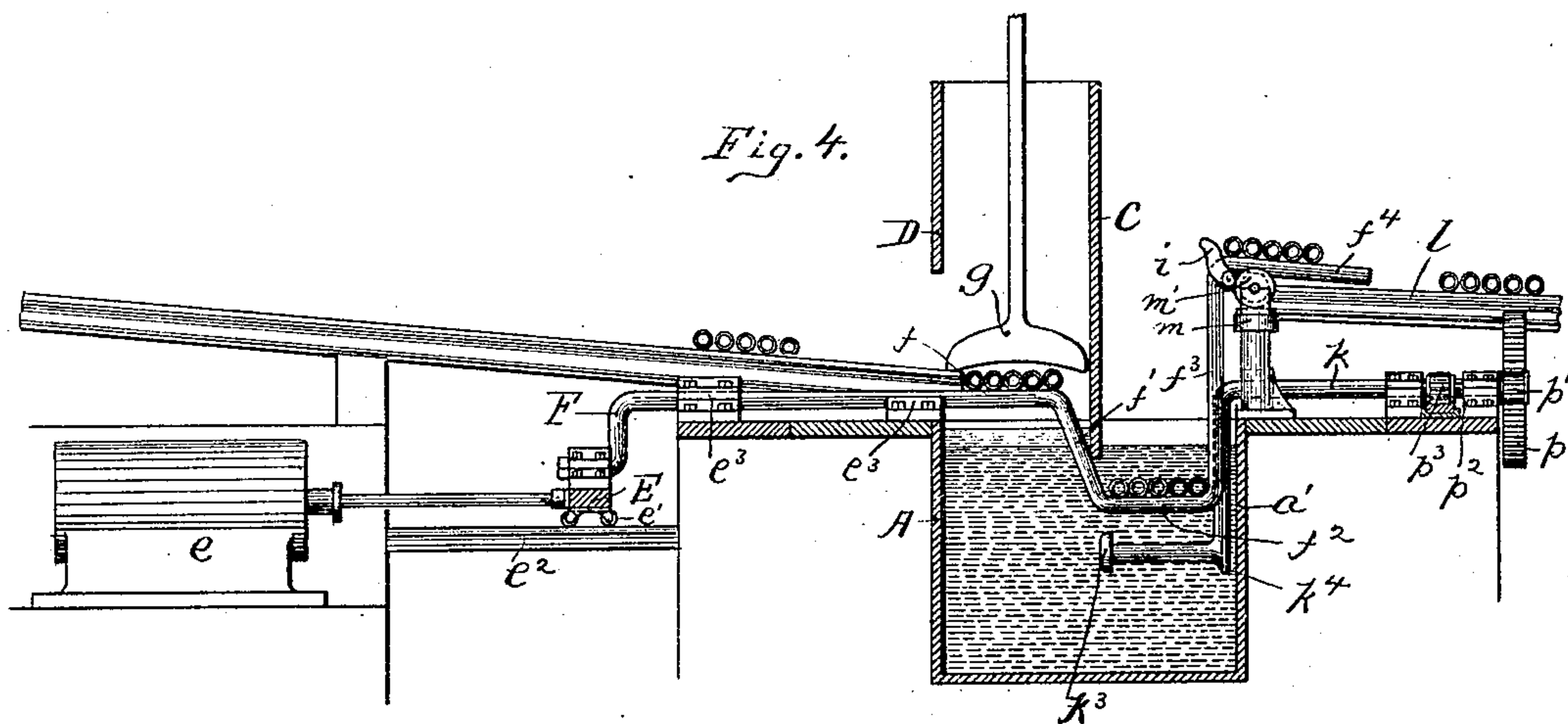
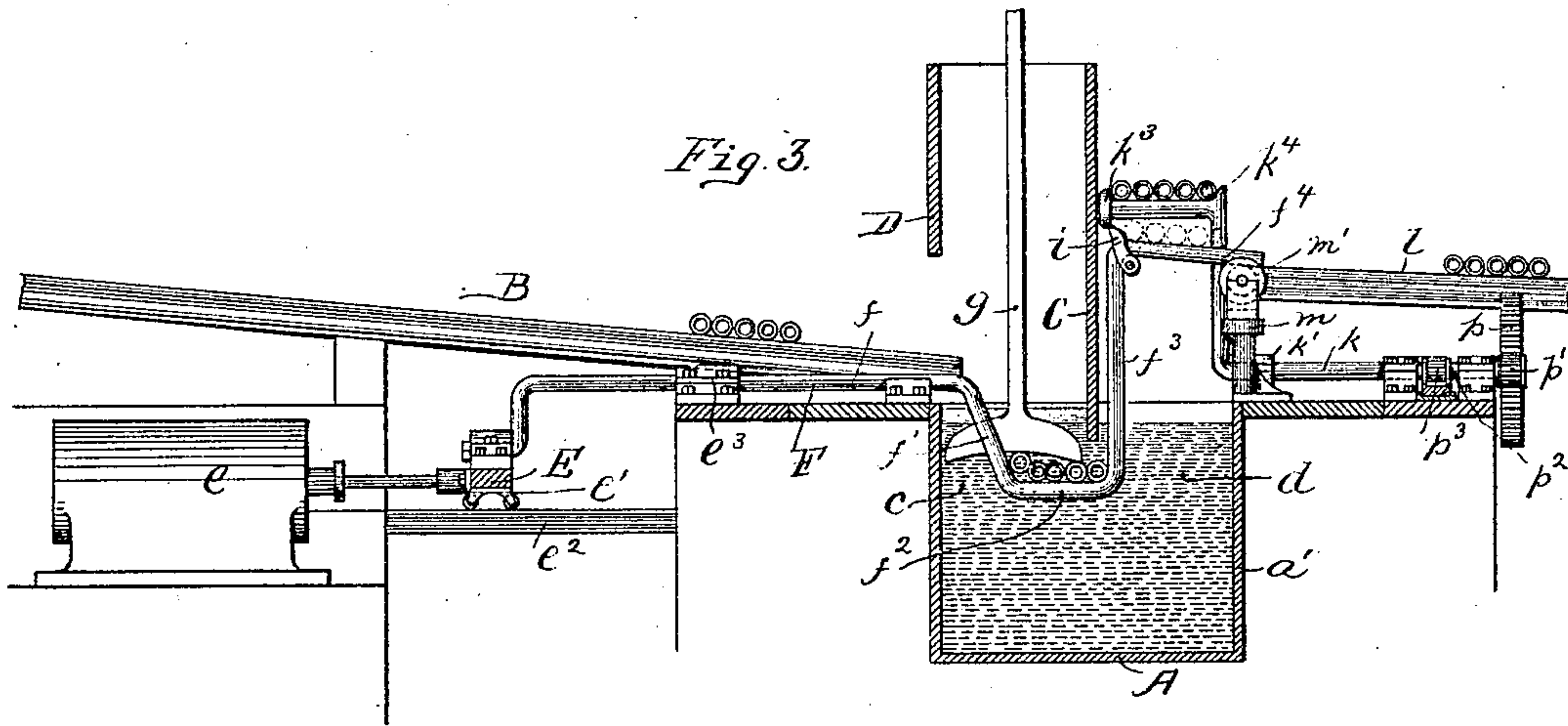
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(No Model.)

2 Sheets—Sheet 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

HARRY B. LYNCH, OF VERSAILLES, PENNSYLVANIA.

APPARATUS FOR COATING PIPES OR BARS.

SPECIFICATION forming part of Letters Patent No. 682,146, dated September 3, 1901.

Application filed June 2, 1899. Serial No. 719,057. (No model.)

To all whom it may concern:

Be it known that I, HARRY B. LYNCH, a resident of Versailles, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Coating Pipes or Bars; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to apparatus for coating pipes or bars with soft metal—such as galvanizing, tinning, or calaminizing—or applying like liquid coating to the same.

Its object is to provide apparatus for the automatic coating of the pipes, hand-labor, such as in the withdrawing of the pipes, being entirely done away with.

The invention consists, generally stated, in apparatus for bringing the pipes or bars entirely over the bath, immersing them transversely of their length in the coating-bath, and lifting them horizontally and transversely of their length out of the bath, thereby providing for the handling of the same in bulk in such way that a comparatively short pot or tank may be employed, and that after bringing the pipe into position for immersion no hand labor whatever is required further than the directing of the same in proper course through the bath.

It also consists in certain mechanism for accomplishing this result, the principal part of which might be stated to be peculiar bar constructions reciprocating transversely of the pot or tank, part thereof being in and part above the tank, which receive the pipes above the bath and as they are drawn back leave the pipes free to descend transversely into the bath onto another part of the bars on which they are supported during the immersion, while beyond the submerged portion of such bars are parts thereof extending above the pot, the pot also containing rotating cranks which lift the pipes from the submerged portion of the bars when they move forward and raise them above these latter exposed portions of the bars, which when they are drawn back pass under the pipes as supported on these rotating cranks and receive the pipes therefrom and deliver them from the coating apparatus.

The particular points of invention desired

to be covered will be hereinafter more fully described and claimed.

To enable others skilled in the art to practice my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a plan view of the apparatus employed in carrying out the invention. Fig. 2 is a longitudinal section on line 2 2, Fig. 1. Fig. 3 is a cross-section on the line 3 3, Fig. 1. Fig. 4 is a similar view showing a different position of the mechanism, and Fig. 5 is an enlarged detail view illustrating the power mechanism for raising the rotating cranks from the tank.

Like letters of reference indicate like parts in each.

The coating-pot A illustrated in the drawings is the ordinary coating-pot employed for galvanizing, and may be considered as illustrating any such coating pot or tank either heated or unheated, according to the coating material employed, it of course being unnecessary to use a heated tank with asphalt, tar, or like coating materials. Extending down to the same are a series of inclined tracks B, over which the pipes or bars pass to the pot or tank, the easiest way to feed the same being by rolling or sliding along such inclined guide-ways. The upper part of the pot is preferably divided into two sections, the immersing-section c and the withdrawing-section d, this being accomplished by means of the vertical partition C, which preferably extends for the full length of the pot, especially with a heated pot, this partition C, as well as the partition D, serving also to protect the workmen to some extent from the heat of the pot.

On one side of the pot is located any suitable reciprocating power mechanism, such as the power-cylinder e, the piston of which connects with the reciprocating frame E, which is mounted on trucks e', running on tracks e² and to which are rigidly connected the reciprocating bars F, such bars extending horizontally through guideways e³ and having horizontal supporting portions f, and thence being bent as illustrated particularly in Figs. 2 and 3, having the downwardly-inclined portions f', horizontal portions f², vertical portions f³, and inclined portions f⁴, the

horizontal portions f^2 being submerged within the coating metal or liquid. When the bars are advanced, as shown in Fig. 4, the ends of the horizontal portions f nearest the pot travel over the same and form rests beyond the inclined guides B to receive the pipes from the same in position to be submerged. The downwardly-inclined portions f' preferably strike against the partition C when advanced to prevent the pipes from sliding down into the bath before it is desired to immerse them. When in this position, also, the submerged portions f^2 are under the withdrawing-section d of the pot, the vertical portions f^3 being brought close to the outer side wall a' of the pot. When it is desired to immerse the pipes, the frame E and the bars F are drawn back into the position shown in Fig. 3, the horizontal portions f of the bars being drawn from under the pipes, so that they can be immersed within the metal, and to insure their immersion reciprocating pushers g , operated by any suitable mechanism within the immersing-section of the pot, may be utilized to force the pipes downwardly into the bath, when they rest upon the submerged portion f^2 of the bars. As the bars are again advanced the submerged portions f^2 carry the pipes over into the withdrawing-section d of the pot in position to be withdrawn therefrom. For the withdrawal of the same I employ the rotating cranks k , two or more, as necessary, which are mounted in suitable bearings k' beyond the withdrawing-section of the pot and extend down into the same in their lowest position, extending below the submerged portion f^2 of the bars F, so that by the rotation of these cranks they may lift the pipes from the submerged portion f^2 of the bars through the withdrawing-section d of the pot, the pipes being lifted transversely of the pot and to a position higher than the inclined portion f^4 of the bars f , as shown in Fig. 3, and when the bars are again drawn back, as shown in Fig. 3, these inclined portions f^4 are drawn under the pipe supported upon the rotating cranks k into position to receive the pipes from the rotating cranks, so that when said cranks are lowered slightly the pipes are delivered onto the inclined portions f^4 , down which they roll onto the receiving-guides l , being thus delivered from the pot.

As shown in the drawings, it is desirable to support the outer ends of the bars F, such as the inclined portions f^4 thereof, so as to relieve the other parts of the arms from heavy strain, especially in view of the fact that portions thereof are submerged in the hot coating metal. For this purpose I provide the spring-jacks m , provided with guide-rolls m' , over which the inclined portions f^4 travel and which give proper support thereto while permitting the horizontal reciprocation of the bars. At the elbow between the vertical portions f^3 and inclined portions f^4 of the bars I also place the shoulders i , which serve to guide

the coated pipes from the rotating cranks onto the inclined guideways f^4 of the bars.

Any suitable mechanism for rotating the cranks k may be employed. It is preferable that they move in unison, so that a single movement will operate to lift all the rotating cranks, and so lift the pipes transversely from the bath. The mechanism illustrated is considered well adapted for the purpose, and it consists in large gear-wheels p on the ends of the cranks k , which mesh with pinions p' on shafts p^2 , mounted on the frame and carrying pinions p^3 above the sliding racks r . The sliding racks r move in suitable guides r' and are connected by the bars r^2 , so that they move simultaneously, while at one end of the machine is the power-cylinder R, with which the end bar r^2 connects and serves as a piston, so that by the power imparted from the cylinder R in moving the sliding racks in either direction the rotating cranks are turned simultaneously, being either lowered into the coating-bath or raised therefrom in position to deliver the pipes onto the inclined guide portions f^4 of the crank-bars. It is evident that in order to maintain the pipes upon the crank portions k^2 of the cranks k when being raised from the bath and supported thereon for draining and delivery from the apparatus it is necessary to form an enlarged head k^3 on the free end of the crank portion k^2 and also a shoulder k^4 at the elbow portion thereof, these parts serving to confine the pipes upon the crank portions k^2 as they are raised from the bath. It is desirable after the pipes are raised from the bath to provide for their draining, and for this purpose the cranks k are made of different lengths from one end of the tank to the other, so that when supporting the pipes above the bath they will be held at such incline that the metal or other coating material can easily drain therefrom. This is fairly shown in Fig. 2, in which the cranks for this purpose are turned so as to show the different lengths thereof.

In coating pipes or bars with the apparatus above described the operation is practically as follows: Through the power-cylinder e the frame E is advanced to bring the crank-bars into the position shown in Fig. 4, when the pipes roll from the inclined guideways B onto the horizontal portions f of the bars, a sufficient number being received upon the same for a single immersion. The crank-bars are then drawn back, dropping the pipes gradually along the inclined portions f' into the bath, and the pipes either then descend by their own weight or are pushed by the pusher g down into the bath and onto the submerged portions f^2 of the bars. The bars are then advanced into the position shown in Fig. 4, carrying these pipes from under the immersing-section into the withdrawing-section d , and when properly heated, so that the metal will adhere thereto, by means of the power-cylinder R the cranks k are rotated to lift the

pipes from the submerged portions f^2 , raising them up into the position shown in Fig. 3. Meanwhile another charge of pipes has been received from the inclined guideways B and the bars are again drawn back, providing for the immersion of the same and bringing the inclined guide portions f^4 under the cranks, as shown in Fig. 3, when the cranks k are rotated, delivering the coated pipes supported thereby onto such inclined guide portions f^4 , from which they roll down upon the receiving-table l . In this way the pipes can be carried rapidly through the coating-tank and without requiring any mechanical handling whatever, and several charges can be operated upon, the one charge being brought in position for immersion while the other is being heated within the pot, and as soon as that charge is withdrawn from the pot and while it is draining the next charge is immersed, the only hand-labor being the feeding of the charge into position to be immersed, a very rapid and economical way of coating the pipes or bars being thus provided.

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

1. The combination with a coating pot or tank, of means for raising a charge of coated pipes therefrom, and independently-movable means for simultaneously supporting a second charge in position to be immersed in the tank but preventing their entrance therein.

2. The combination with a coating pot or tank, of means for raising a charge of coated pipes therefrom, means for simultaneously supporting a second charge in position to be immersed in the tank but preventing their entrance therein, and means for thereafter moving said last-named means to allow the immersion of the pipes supported thereon and carry the same over the raising means.

3. The combination with a coating pot or tank, of movable bars for supporting pipes in position to be immersed and for receiving the same after being lifted from the tank, means for raising the pipes out of the tank, and means for preventing a second charge of pipes being immersed in the tank while the preceding charge is being raised therefrom.

4. The combination with a coating pot or tank, of bars extending transversely thereof and serving to support the pipes above and in the tank and to deliver the same from the tank, means for raising the pipes from the tank, and means for moving the bars into position alternately to receive a fresh charge and simultaneously carry a preceding charge transversely over the lifting means, and then to immerse the first charge and simultaneously receive the preceding charge from the lifting means and deliver the same from the tank.

5. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and having portions extending down into the tank and forming supports for the pipes therein, substantially as set forth.

6. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and having portions extending down into the tank and forming supports for the pipes therein, and rotating cranks adapted to swing into the tank and raise the pipes from said bars, substantially as set forth.

7. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof, and extending part way above the same, and thence extending down into the same, and thence extending upwardly from the same, substantially as set forth.

8. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof, and extending part way over the tank, thence extending at an incline downwardly into the tank, thence extending horizontally therein, and thence extending upwardly out of the tank, substantially as set forth.

9. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and extending part way above the same, and thence extending down into the same and thence extending upwardly from the same, and thence extending outwardly beyond that side of the tank, substantially as set forth.

10. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof, and extending part way above the same, and thence extending down into the same and thence extending upwardly from the same, and rotating cranks adapted to swing down into the tank below the said bars and raise the pipes from the tank, substantially as set forth.

11. The combination with a coating pot or tank, of a frame located at the side thereof and having a series of bars extending out therefrom first above the tank and thence downwardly into the same, and thence extending above the tank, and means for reciprocating said frame.

12. The combination with a coating pot or tank, of a frame traveling on a track at the side thereof transversely of the tank, and a series of bars extending out from the frame through guideways and across the tank, parts of said bars being depressed within the tank, substantially as set forth.

13. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and extending part way above the tank, and thence downwardly into the same, and a reciprocating pusher adapted to enter the tank so as to force the pipes downwardly into the same, substantially as set forth.

14. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and extending part way above the same, thence extending down into the same, thence extending upwardly from the tank and thence outwardly beyond the oppo-

site side thereof, and guides located on the opposite side of the tank for supporting said bars, substantially as set forth.

15. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and extending part way above the same, thence extending down into the same, thence extending upwardly from the tank and thence outwardly beyond the opposite side thereof, and spring-jacks located on the opposite side of the tank for supporting said bars.

16. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and extending part way above the same, thence extending down into the same, thence extending upwardly from the same, and thence extending outwardly beyond the opposite side of the tank, and shoulders at the elbow uniting the upwardly and outwardly extending portions of said crank-bars.

17. The combination with a coating pot or tank, of bars supported to reciprocate transversely thereof and extending part way above the same, thence extending down into the same, thence extending upwardly from the same, and thence extending outwardly beyond the opposite side of the tank, and rotating cranks adapted to swing down into the tank below the said bars and raise the pipes from the tank, substantially as set forth.

18. The combination with a coating pot or tank, of a series of cranks mounted at one side thereof and adapted to swing down into the tank, said cranks being located at different points in the length of the tank and having crank-arms of different lengths, substantially as set forth.

19. The combination with a coating pot or tank divided by a longitudinal partition into two sections, of bars supported to reciprocate

transversely of the tank and having portions extending down into the tank and forming supports for the pipes therein, a reciprocating pusher located in one tank-section and a series of rotating cranks located in the other tank-section, substantially as set forth.

20. The combination with a coating pot or tank divided longitudinally into two sections, of bars supported to reciprocate transversely of the tank and adapted to extend over one section thereof, and having portions extending down into the tank to form supports for the pipes to be coated, and a series of cranks adapted to swing down into the other section of the tank, substantially as set forth.

21. The combination with a coating pot or tank, of a series of cranks located at different distances along the same and adapted to swing down into the tank, said cranks each having crank-shafts carrying gear-wheels, and a bar supported to reciprocate longitudinally of the tank and carrying rack-faces, and gearing between said rack-faces and the gear-wheels carried by said rotating cranks, substantially as set forth.

22. The combination with a coating pot or tank, of a series of rotating cranks mounted at one side thereof and adapted to swing down into the tank, said cranks each having crank-shafts carrying gear-wheels p , shafts p^2 carrying pinions p' meshing with the gear-wheels p and pinions p^3 , the racks r connected together, each meshing with a pinion p^3 and means for reciprocating said racks, substantially as set forth.

In testimony whereof I, the said HARRY B. LYNCH, have hereunto set my hand.

HARRY B. LYNCH.

Witnesses:

FRANCES D. SCOTT,
ROBERT C. TOTTEN.