J. SOSS.

CASTING MACHINE.

APPLICATION FILED NOV. 22, 1910.

1,009,107.

Patented Nov. 21, 1911.

2 SHEETS—SHEET 1.

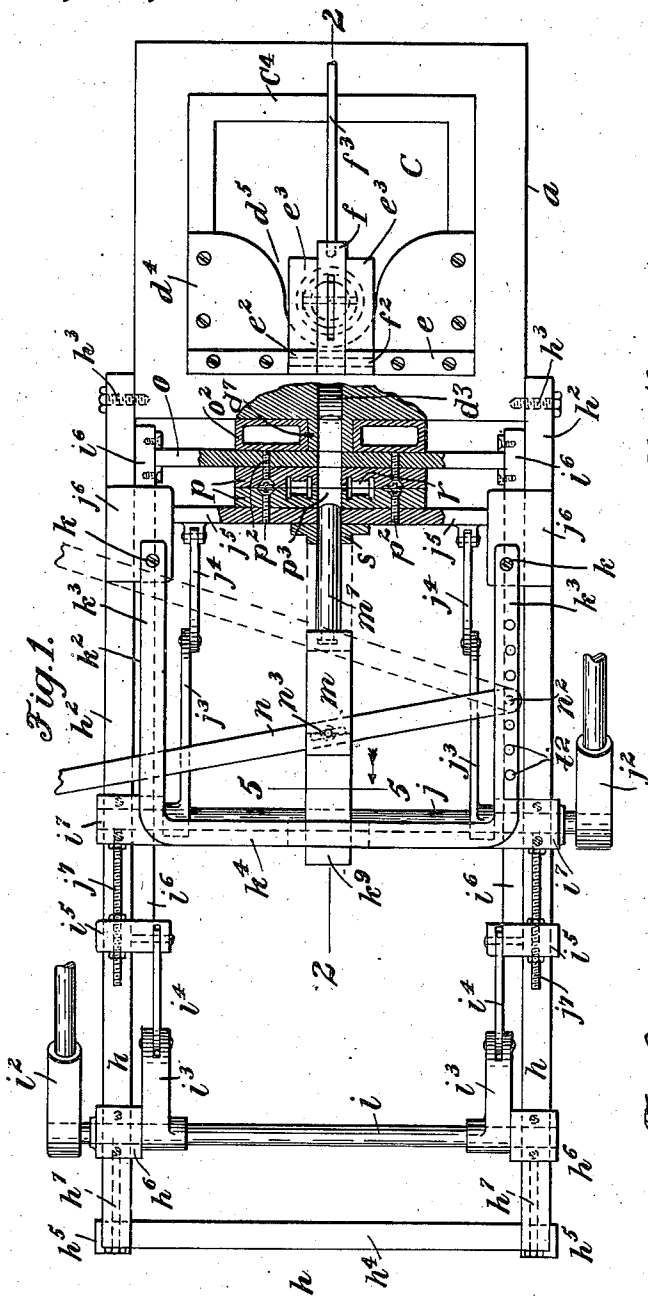

Fig. 1.

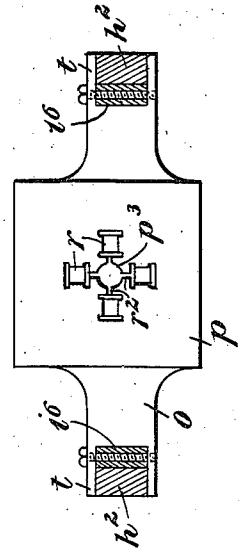

Fig. 7.

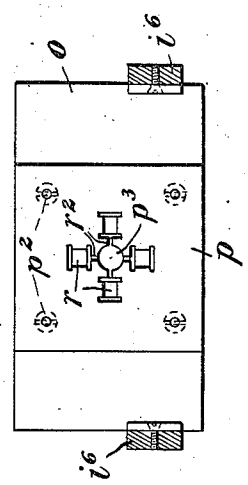

Fig. 6.

WITNESSES

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2 SHEETS—SHEET 2.

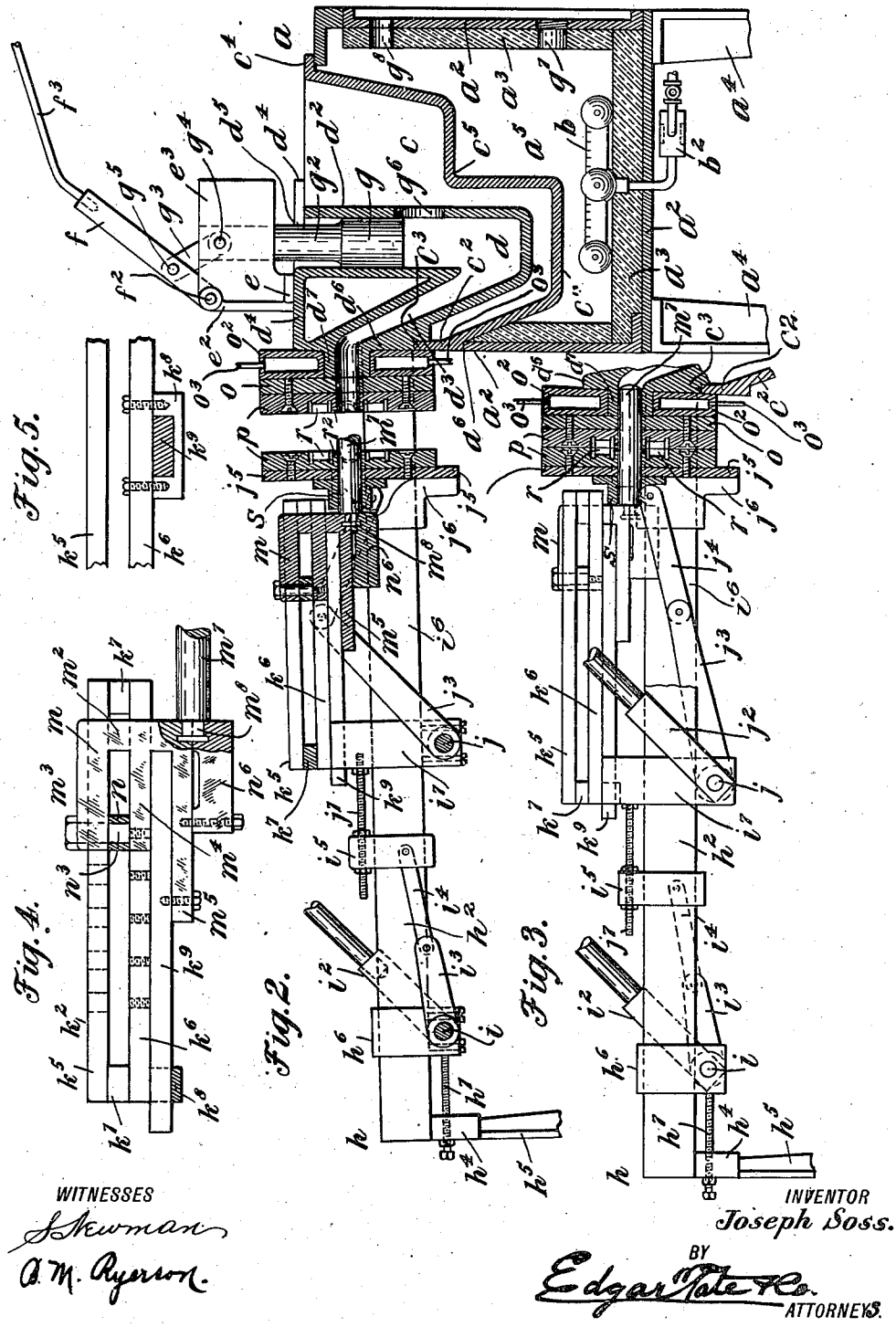

Fig. 5.

Fig. 4.

Fig. 2.

Fig. 3.

WITNESSES

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JOSEPH SOSS, OF BROOKLYN, NEW YORK.

CASTING-MACHINE.

1,009,107. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed November 22, 1910. Serial No. 593,618.

To all whom it may concern:

Be it known that I, JOSEPH SOSS, a citizen of the United States, and residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Casting-Machines, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to machines for casting small articles of various kinds and classes, of metal, and the object thereof is to provide an improved machine of this class which is simple in construction and efficient in operation, and which may be conveniently manipulated; a further object being to provide a furnace for casting machines having a melting pot construction consisting of inner and outer members, the inner member being provided with a discharge passage for the molten metal, and being also provided with a cylinder and piston for forcing said molten metal through said passage, the bottom of the inner member of the melting pot and the bottom portion of the said discharge passage being always, when the machine is in operation, inclosed by as well as filled with molten metal whereby the metal discharged in the operation of forming castings is always retained at a proper temperature, and with these and other objects in view the invention consists in a machine of the class specified constructed as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, in which the separate parts of my improvement are designated by suitable reference characters in each of the views, and in which;—

Figure 1 is a plan view partly in section of my improved casting machine; Fig. 2 a central longitudinal section on the line 2—2 of Fig. 1; Fig. 3 a side view of a part of the machine as shown in Figs. 1 and 2, but showing the parts in a different position and showing a portion of said parts in section; Fig. 4 a side view of the details of the construction shown in Figs. 1, 2 and 3, said details being detached and on an enlarged scale and partly in section; Fig. 5 a partial section on the line 5—5 of Fig. 1; Fig. 6 a face view of one of two mold jaws which I employ, and showing the method of connecting the same with the framework of the machine, and; Fig. 7 a view similar to Fig. 6 but showing a modification.

In the practice of my invention I provide a furnace a composed in the form of construction shown of an outer metallic wall or casing a^2, having an inner lining a^3 of fire brick or other suitable material, and the furnace a is supported on legs a^4. Within and resting on the bottom of the furnace chamber a^5 is a gas and air burner b, with which is connected a Bunsen burner device b^2 for supplying gas and air to said burner, and it will be understood that the burner b may be of any desired construction and any suitable means may be provided for supplying the same with gas and air or other combustion medium.

The front wall of the furnace casing a^2 extends upwardly only to the point a^6, and said furnace is open at the top, and set thereinto is a main melting pot c, the front wall c^2 of which rests on the front wall of the furnace casing a^2 at a^6 and extends upwardly only to the point c^3. The main melting pot c is provided at the top with a flange c^4 which rests on a corresponding flange at the top of the furnace casing and the back wall of the main melting pot c is preferably set inwardly as shown at c^5, and this forms a downwardly directed extension c^6 of said main melting pot.

Set into the main melting pot c is a supplemental melting pot d provided with a vertically arranged cylinder d^2 and an upwardly and forwardly directed tubular discharge d^3. The supplemental melting pot d is provided with a top plate d^4 which rests on the main melting pot c, and the front of the top plate d^4 of the supplemental melting pot d is cut out to form a recess d^5 through which the cylinder d^2 opens upwardly. The supplemental melting pot d is provided with a front wall d^6 which extends from the point c^3 to the top of the furnace and through which the discharge d^3 of the supplemental melting pot d opens, and said discharge d^3 is tubular in form and provided with a projecting nozzle d^7.

Placed transversely on and secured to the top plate d^4 of the supplemental melting pot d and rearwardly of the cylinder d^2 is a transverse plate e having a raised bracket consisting of a front member e^2, and backwardly directed parallel jaws e^3, and a lever f is pivoted in the member e^2 at f^2 and which is free to swing vertically between the jaws

e^3, and said arm is provided with a handle f^3.

Mounted in the cylinder d^2 is a piston g having a plunger rod g^2, and a link member g^3 is pivoted to the plunger rod g^2 at g^4 and in the lever f at g^5, and by means of the lever f which is manipulated by the handle f^3 the piston g may be raised or lowered as will be readily understood.

In the back side of the cylinder d^2 and preferably midway thereof is a large port or passage g^6 through which, in the operation of the apparatus as hereinafter described, the liquid or molten metal flows from the main melting pot c into the cylinder d^2 and supplemental melting pot d.

One wall of the furnace, preferably the back wall is provided with an opening g^7 through which the burner b, or the condition of the furnace chamber may be examined, and by means of which or through which the burner may be ignited, and this opening may be closed in any desired manner when necessary or desirable; and at the top portion of said wall of the furnace is an escape flue or passage g^8 through which the hot gases of combustion may pass.

At the front of the furnace is a frame h consisting of parallel side bars h^2, the front ends of which are secured to the sides of the furnace at h^3, and the rear ends of which are connected by a cross bar h^4, and said frame is provided with legs h^5 which correspond with the legs a^4, and the frame h in the form of construction shown is slightly inclined downwardly and forwardly from the furnace.

Mounted on the front end portions of the side bars h^2 of the frame h, are slides h^6 which are made adjustable on said side bars h^2 by means of screws h^7 passed therethrough and through the cross bar h^4 of the frame h, and in the bottom of said slides below the side bars h^2 is a transverse shaft i, one end of which is provided with an arm i^2 by which said shaft may be rotated, and said shaft is also provided between the side bars h^2 with forwardly directed arms i^3 which are secured thereto and with which are connected links i^4 which are also connected with slides i^5 mounted on the side bars h^2 and to which are connected or secured supplemental side bars i^6 which extend forwardly flush with the side bars h^2 and to or approximately to the furnace a.

Mounted on the side bars h^2 of the frame h, and between the frame and the furnace a, are other slides i^7 through which the supplemental side bars i^6 are movable, and in the bottom portions of the slides i^7 is mounted a transverse shaft j provided at one end with an arm j^2 by which it may be rotated. The shaft j is provided between the bars i^6 with arms j^3 which are rigidly secured thereto and with which are connected links j^4, and the links j^4 are pivoted to a cross head j^5 provided at its ends with keepers j^6 which are movable on the side bars h^2 and i^6 and through which the side bars i^6 are movable. The slides i^5 are connected with the slides i^7 by screws j^7 and said screws are provided with set nuts, by means of which the distance between the slides i^5 and i^7 may be adjusted. Secured to the slides j^6 at k is a yoke-shaped frame k^2 consisting of parallel side members k^3, and a transverse portion k^4, and in the position of the parts shown in Fig. 1, the transverse portion k^4 of the yoke-shaped frame k^2 is directly over the shaft j and the front end of said frame rests on the slides i^7.

The yoke-shaped frame k^2 is shown detached in Fig. 4 and preferably consists of top and bottom members k^5 and k^6 separated by blocks as shown at k^7 or in any desired manner, and the transverse part k^4 of said frame is provided on the bottom thereof with a keeper k^8 through which is passed a movable plate k^9, to the front end of which is secured a block m. The block m consists of a vertically arranged rear member m^2 and forwardly directed arms m^3, m^4 and m^5, and the plate k^9 is secured between the arms m^4 and m^5 of said block, and a lever n is pivoted in one side of the yoke-shaped frame k at n^2 and passes transversely across the frame h, and between the top and bottom parts k^5 and k^6 of the yoke-shaped frame k^2 and is pivoted between the arms m^3 and m^4 of the block m by means of a pin or bolt passed through a longitudinal slot formed therein as shown or indicated at n^3; and a supplemental block n^6 is secured to the bottom of the block m, and by means thereof a cut-off plunger m^7 is rotatably secured to the block m at and in the manner shown at m^8 in Figs. 1, 2, 3 and 4.

A cross head o is secured to the rear ends of the supplemental side bars i^6, and two similar mold jaws p are provided, one of which is secured to the cross head o and the other to the cross head j^5, this connection being preferably made by screws as shown at p^2, and said mold jaws p and the cross heads j^5 and o are provided with a central transverse passage p^3, and when these parts are in the position shown in Figs. 1 and 3, the passage p^3 through the mold jaws p and cross heads j^5 and o communicate with the nozzle d^7 of the discharge d^3 of the supplemental melting pot d, and the cut-off plunger m^7 operates through the passage p^3 and through the cross heads j^5 and o and mold jaws p as hereinafter described.

The mold jaws p are provided in their adjacent faces with casting chambers r, one half of said chambers being in one mold jaw and the other half in the other mold jaw and

these chambers which, as shown in the drawing, are spool-shaped in form are placed in communication with the passage p^3 by small radial passages r^2 as clearly shown in Figs. 1, 2 and 3.

An annular water jacket o^2 is mounted on the nozzle d^7 of the discharge d^3 of the supplemental melting pot d, and this water jacket is provided with tubular connections o^3 which serve as inlets and outlets for water, and in practice, or in the use of the machine as hereinafter described water may be constantly circulated through the water jacket o^2 in order to cool the nozzle d^7 and the adjacent parts.

The cross head j^5 is provided centrally with a hub s in the form of construction shown, and through which the cut-off plunger m^7 operates. In practice the water jacket o^2 may be made detachable or it may be secured in position in any desired manner, or it may be secured to the cross head o, and thus be made removable from the nozzle d^7 when said cross head is moved forwardly, this operation being performed, when desired by turning the shaft i.

From the foregoing description it will be seen by moving the arm i^2 of the shaft i forwardly the slides i^5 and i^7 and the supplemental side bars i^6 connected with said slides, together with the cross head o, the shaft j and cross head j^5 together with the mold jaws p, the yoke-shaped frame k^2, and the parts m and n by which the plunger cut-off m^7 is operated may all be moved forwardly, and this will separate the cross head o and the mold jaw p connected therewith from the nozzle d^7, and if the water jacket o^2 be connected with the cross head o it will be separated from said nozzle, but in the ordinary operation of the machine the above parts are moved, the cross head o with its mold jaw p remaining stationary or in the position shown in Figs. 1, 2 and 3. It will also be seen that with the parts in the position shown in Figs. 1 and 3 the shaft j may be rotated by turning the arm j^2 forwardly so as to move the slides j^6 together with the cross head j^5, and the mold jaw p connected therewith into the position shown in Fig. 2 so as to separate the mold jaws p, and with the parts in the position shown in Figs. 1 and 3 the arm n may be operated so as to move the cut-off plunger m^7 into the position shown in either of said figures.

This machine is particularly designed for casting various articles from what are known as soft or comparatively soft metal which will melt quicker than steel or cast iron, and in practice the metal or metals to be molded and from which the castings are to be made are placed in the main melting pot c and the burner b is ignited. The molten metal, as will be understood passes into the cylinder d^2 through the opening g^6 and fills the supplemental pot d, and said cylinder and the discharge, or discharge tube d^3, up to the bottom of the opening g^6. At this stage of the procedure the cross head o and mold jaw p connected therewith being in the position shown in Figs 1, 2 and 3, the cross head j^5 and mold jaw p are also moved in the position shown in said figures by means of the arm j^2, and there is a continuous passage from the discharge d^3 of the pot d into the casting chamber or chambers r. The piston g is then forced downwardly by means of the arm f and the pressure of said piston on the molten metal in the pot d forces said metal up through the discharge d^3 and through the nozzle d^7, and into the casting chambers r in the jaws p, and the said molten metal fills said chambers. The lever n is then moved backwardly and the cut-off plunger m^7 is forced backwardly through the mold jaws p, and into and through the nozzle d^7, and all surplus molten metal is cut off and forced back through said parts, and into the discharge d^3 of the pot d and flows downwardly into said pot and this keeps all the molten metal in proper condition for a re-operation of the plunger g and the making of new castings. At the end of the above described operation the arm j^2 of the shaft j is moved forwardly and the cross head j^5 and its mold jaw p are moved into the position shown in Fig. 2, and the castings drop out of the casting chambers r and fall into a suitable receptacle provided therefor, and this operation may be continued as long as desired or until it becomes necessary to again fill the main melting pot c with metal.

It will be observed that the supplemental pot d is entirely within the main pot c as is also the discharge tube or passage d^3, and with this construction the molten metal in said parts is kept in proper condition for casting at all times and by reason of the operation of the cut-off plunger m^7 as herein shown and described, all surplusage of metal at each casting operation is forced into the said discharge d^3 and flows back down into the pot d and mingles with the body of molten metal therein.

In Fig. 7 I have shown a modified form of the cross head o and a modified means for connecting it with the side bars i^6 consisting of yoke-shaped keepers t formed on or connected with said cross head and in which the bars i^6 are secured, and the bars h^2 also pass through said keepers. Although I have shown and described the cross heads o and j^5, and the mold jaws p as formed separately and connected, it will be apparent that this method of connecting said parts is not absolutely essential, and said parts may be formed integrally if desired; and although I have shown and described the main melting pot c and supplemental pot d as

formed separately it will also be apparent that this method of constructing said parts is not absolutely essential and said parts may be formed integrally if desired. The casting chambers r in the mold jaws p may also be made of any desired shape or form according to the design or configuration of the articles to be cast, and any desired number of said casting chambers may be employed as will be readily understood.

The side of the yoke-shaped frame k^2 to which the lever n is pivoted as shown at n^2 is provided with a plurality of apertures t^2 whereby the pivotal point of said lever may be adjusted forwardly or backwardly as may be desired so as to regulate the operation of the plunger cut-off m^7. It will also be understood that the adjustment of the shafts i and j forwardly and backwardly on the frame h facilitates the operation of the apparatus and the movement of the cross heads o and j^5 may be regulated as may be desired. My invention is also not limited to the particular means herein shown and described for supporting the cross head o and its mold jaw p, and these parts may be supported in connection with the nozzle d^7 in any desired manner and I prefer to support the said cross head and its mold jaw p in connection with the nozzle d^7 so that said parts can be moved toward and from said nozzle.

The movable mold jaws, the devices for operating said jaws, the plunger, and means for operating said plunger, and the framework in which said devices and means are supported, are not claimed herein but are made the subject of a divisional application filed January 3, 1911, Serial No. 600,390.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

1. In a casting machine, a furnace having a main melting pot set thereinto and open at the top, and a supplemental pot suspended within the main melting pot, said supplemental pot being provided with a vertically arranged cylinder which opens upwardly and in one side of which is an opening, said supplemental pot being also provided with a cover by which it is suspended in the main melting pot and which closes the top thereof except the top of said cylinder and which partially closes the top of the main melting pot; the cover of the supplemental pot being also provided with a raised support which extends over said cylinder, a piston movable in said cylinder and provided with a stem, and a handle lever pivoted in said support and connected with the stem of said piston; said supplemental pot being also provided with an upwardly and forwardly directed discharge passage which communicates with the lower end of said cylinder and which is provided with a nozzle which extends through the front wall of the furnace.

2. In a casting machine, a furnace having a main melting pot which is suspended therein and open at the top, a supplemental pot suspended in the main melting pot and provided with a vertically arranged cylinder which opens upwardly and in one side of which is an opening, the top of said supplemental pot being also provided with a raised support, a piston movable vertically in said cylinder and provided with a stem and a hand lever pivoted into said support and in operative connection with the stem of said piston, said supplemental pot being also provided with an upwardly and forwardly directed passage way which communicates with the bottom of said cylinder and which is provided with a nozzle which extends through the front wall of the furnace.

3. In a casting machine, a furnace open at the top, a main melting pot suspended in said furnace from the top thereof and open at the top, a supplemental pot suspended in the main melting pot and provided with a vertically arranged cylinder which opens upwardly and in one side of which is an opening, the said supplemental pot being also provided with a cover by which it is suspended in the main melting pot and which closes the top of the same except for said cylinder, a piston movable vertically in said cylinder and provided with a stem, and a hand lever in operative connection with the cover of the supplemental pot, and in operative connection with the stem of said piston; said supplemental pot being also provided with an upwardly and forwardly directed passage which communicates with the bottom of said cylinder at its lower end and which is provided with a discharge nozzle which extends through the front wall of the furnace.

In testimony that I claim the foregoing as my invention I have signed my name in presence of the subscribing witnesses this 21st day of November 1910.

JOSEPH SOSS.

Witnesses:
B. M. RYERSON,
C. E. MULREANY.