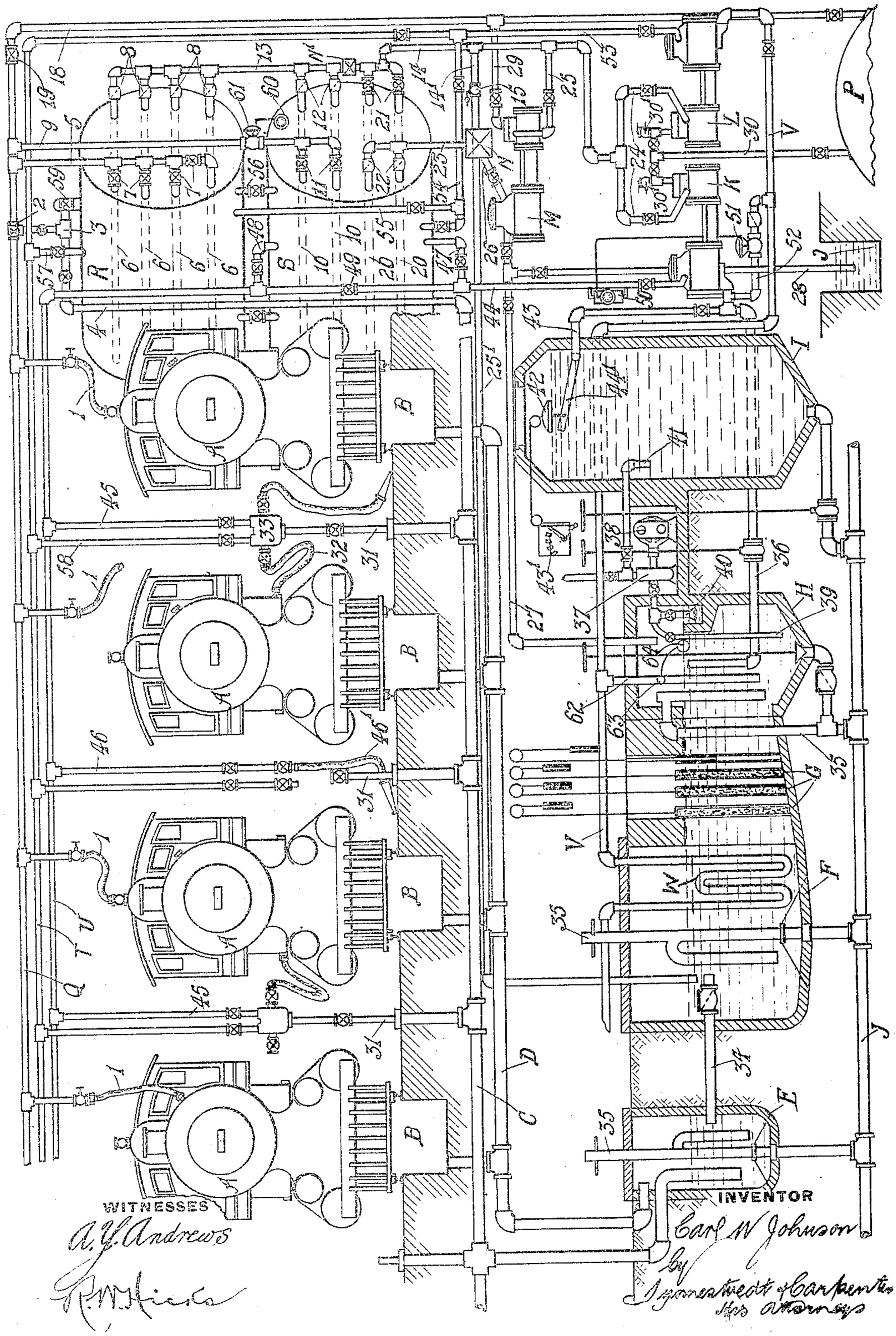
C. W. JOHNSON.

ROUNDHOUSE SYSTEM.

APPLICATION FILED JULY 28, 1908.

929,857. Patented Aug. 3, 1909.



WITNESSES

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ROUNDHOUSE SYSTEM.

No. 929,857. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed July 28, 1908. Serial No. 445,718.

To all whom it may concern:

Be it known that I, CARL W. JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and the State of Illinois, have invented certain Improvements in Roundhouse Systems, of which the following is a specification.

The invention relates to systems for utilizing in roundhouses the steam and hot water of incoming locomotives, and has for its principal objects, the provision of an improved system of this character wherein a high degree of economy is attained; the provision of a system capable of efficient operation under widely varying conditions, and the provision of a system which may be conveniently and easily operated and wherein the water from the locomotive boiler may be properly filtered and treated chemically if necessary.

One embodiment of the invention is illustrated in the accompanying drawing wherein the figure is a section through a roundhouse equipped with my apparatus.

The system is designed to utilize the water and steam from incoming locomotives for supplying locomotives which are to be fired up and sent out. Briefly stated, the apparatus comprises in the main, a series of receptacles for receiving the hot water from incoming locomotives, in which receptacles the water is filtered and chemically treated if necessary, for re-use, a series of tanks for heating the water from the receptacles preliminary to re-supplying it to outgoing locomotives, which tanks are heated by steam from the incoming locomotives, and from the exhaust of the pumps employed, together with piping for supplying water for washing the boilers, piping for carrying the steam from the incoming locomotives to the heating tanks, and piping for carrying the heated watey from the heating tanks to the outgoing locomotives. The system also includes preferably a stationary boiler for supplying any additional steam necessary for heating purposes and for operating the pumps used.

The system is further designed to provide for the discharge of the condensation from a high pressure heater unit through a suitable trap into a low pressure unit with re-expansion therein; to provide means for filling up an engine with water above the 212° and obtaining a pressure in the boiler after filling equal to the temperature of the filling water by superheating such filling water by means of steam blown off from a live engine or by means of steam from an independent boiler; and to provide means for filling up an engine with hot water and developing pressure therein by steam from a live engine or an independent boiler.

Referring to the drawing, the principal parts there shown may be enumerated as follows: A, A, A, A, are locomotives in position over their respective pits B, B, B, B, in the roundhouse. C, and D are return pipes for carrying the hot water from the boilers of the locomotives to the catch basin E. F is a well to which the water from the catch basin is conducted. G are removable filter-plates. H is a filter well to which the water from the well F flows through the filter plates G. I is a purifying tank in which the water from the well H may be chemically or mechanically treated if necessary. J is a main leading to the sewer into which the overflow and drainage from the catch basin, wells and purifying tank is directed. K, and L are pumps for forcing the water through the system to various parts thereof. M is a return pump for carrying the water from the trap N back to the well H and the boiler feed-water well O. P is a stationary boiler for supplying steam for the pump and also any additional steam necessary for heating. Q is the blow-off pipe to which the steam domes of the incoming locomotives may be connected, which pipe leads to the steam coils in the heating tanks R and S. T is the filling-up pipe arranged to supply water to the locomotives from the heating tanks R and S. U is the washout pipe for supplying water for washing the boilers, which pipe may be supplied either from the tanks H and I or from the heating tank S, and V is a supply main connected to the city main, for supplying water to the pump, and having coils W in the well F for preliminarily heating the water in the main.

Over each of the locomotives is a flexible pipe 1 for blowing off steam to the blow-off pipe Q, or for supplying pressure to operate the steam blower in firing up. Pipe Q and tanks R and S are provided with a safety valves 2, and 5ª which have connection 3, which leads to the pipe 4 connected to the return pipe C leading into the catch basin E. By this arrangement any excess amount of pressure in the pipe Q or the

heating tank R and S can be directed into the catch basin. The pipe Q is also provided with a connection 5 leading to the steam coils 6, 6, 6, 6, in the heater R, and said coils each being provided at one end with a valve 7, and at the other end with a check valve 8. The pipe Q is also provided with a connection 9 leading to the steam coils 10, 10 in the tank S, such coils 10 being provided with cutoff valves 11, 11 and check valves 12, 12. The outlet end of these coils have connection with the coils 20, 20 through the trap N′ by means of the pipes 13. The back pressure valve 15 is provided in the pipe 25′. Live steam from the stationary boiler P may be also supplied to the steam coils in the tanks R and S by means of the pipe 18 leading to the pipe Q and provided with a pressure reducing valve 19. The lower heating tank S is also provided with a pair of additional heating coils 20, 20 which coils are provided at their inlet ends with the valves 21, 21, and at their outlet ends with check valves 22, 22. The outlet ends of the coils are connected to the pipe 23 leading to the trap N. The coils 20, 20, are supplied with steam from the exhaust pipes 24 of the pumps K and L, and the exhaust pipe 25 of the pump M, all such exhaust pipes being connected to the pipe 14 leading to the coils 20, 20 in the manner shown. The water of condensation from the trap N, is forced to the wells H and O by means of the pump M, such pump being connected to the trap by means of the pipe 26, and to the wells H and O by the pipes 27 and 28 respectively. Means for operating the pump M is applied thereto from the boiler P by means of the pipes 18 and 29, and steam for operating the pumps K and L is supplied from the boiler, by means of the pipe 30, governors 30′, 30′ being provided adjacent said pumps to insure a constant and even pressure to the lines supplied thereby.

The hot water coming from the locomotives is conducted to the pipe C leading to the catch basin E, by means of the pipes 31 and the flexible connections 32, such pipe members both being connected to the mixer 33, and the connection 32 being connected at its inner end to the blow-off valve of the locomotive. The water from the catch basin E passes through the pipe 34 at the well F, and then through the filter plates G to the filter well H, the overflow from these receptacles being provided for by means of combined overflow pipe and vent 35. The filtered water in the well H may be carried directly to the pump K by means of the pipe 36, or if necessary can be transferred to the treatment tank I. In order to accomplish this latter result, the pump 37 operable from the electric motor 38 is provided. The pump 37 has two suction connections with the well H, viz., the pipe 39 leading to the bottom of the well for use when it is desired to remove all of the water from the well H, and the pipe 40 extending only a slight distance below the surface of the water in the well, and designed to be normally used so that the hottest water is removed from the well to the treatment chamber. The pump discharges to the treatment chamber by means of the pipe 41. The operation of the motor 39 is controlled by means of the float 42 connected to the switch 43′, which switch governs the operation of the motor. When the level of the water in the treatment chamber I falls below a certain level the float operates the switch to start the motor, and when the water in the tank I reaches its proper level weighted means returns the switch to inoperative position. The pump K is supplied from the treatment chamber by means of the connecting pipe 43, such connecting pipe having a hinged end 44′ connected to the float so that the hottest water from the chamber is supplied to the pump. The outflow from the pump K takes place through the pipe 44, which pipe is connected at its upper end to the washout pipe U. This pipe U has a series of connections 45 to the mixers 33, and another connection 46 which is not connected to a mixer, and to which a hose 46′ may be applied direct if desired. The pipe 44 also has branch connections, 47 and 48, leading to the bottom and top of the tank S, so that water can be supplied to this tank, and, if desired, by closing the cock 49 in the pipe 44, and opening the valves in both the pipes 47 and 48, the water for washing out purposes may be supplied from the tank S, thus giving water of a higher temperature. In some cases the water from the pipe 44 may be of too high a temperature and need tempering, and in order to fulfil this requirement and maintain the water at any desired temperature, the thermostat 50 is applied to the pipe 44, which thermostat governs a valve 51 on a pipe 52 leading from the supply main V to the pump. The pump L is also supplied directly from the main V and is provided with a discharge pipe 53 leading to the filling pipe T. The pipe 53 is also supplied with a connection 54 for furnishing water to the tank S, and an additional connection 55 for furnishing water to the upper tank R. The tanks R and S are connected by the pipe 56, so that when an outlet from the upper tank is open and water is forced into the lower tank, the water is first preliminarily heated in the lower tank, and then passes to the upper tank for further heating. When water is supplied the tanks R and S from the pump L and main V, the coils W in the tank F constitute a secondary feed water heating means, whereby hot water from the

main is supplied to the main feed water heater R and S. Water heated to a high degree is supplied to the filling pipe T from the tank R, by means of the connection 57. The pipe T is connected to the blow-off valves of a boiler by means of the downwardly extending pipe 58, the mixer 33, and the flexible connection 32. The upper tank is provided with a safety valve 59, and the lower tank has a thermostat 60 for regulating a valve 61 in the pipe 9, in order that when the temperature in the lower tank reaches a predetermined height the supply of steam through the pipe 9 may be automatically cut off. In order to maintain the level of the water in the filter well H at a fixed height, the water main V is connected to the well by the pipe 62, which pipe is provided with a valve 63 controlled from the float 64.

It will be seen from the foregoing that the heat from the steam and water of incoming locomotives is fully utilized. In case there is more steam to be blown off than is necessary to heat the water in the tanks R and S, the surplus is conducted by the connections 3, 4, and C, to the catch basin E, and assists in maintaining the temperature of the water at this point. The heating possibilities of the steam are also well utilized in the coils 6, 10 and 20, and the hot water of condensation is subsequently returned from the trap N, so that little loss of heat occurs. Furthermore the heat from the exhaust steam of the pump is utilized by conducting it to the lower heating tank S. The boilers of the locomotives may be filled with hot water by the operation of either of the pumps, as will be seen by following the connections as heretofore described, and in case it is desired to fill the boiler with cold water, this may be done by operating the pump L, and supplying water to the filling pipe T through the pipe 53. Water of almost any desired temperature may be also secured by the use of the mixer 33 to which cold water may be supplied from the pipe T in any desired quantity, and by means of the pipe 45 to which hot water may be supplied through the washout pipe U. In the operation of washing out, in case the water from the well H or tank I is not sufficiently hot, water of a higher temperature may be secured by sending the flow through the tank S via the connections 47 and 48. Substantially cold washout water may be supplied to the mixer when desired, through the pipe T, by operating the pump L and sending the flow through the pipe 53 direct to such pipe T. When operating the pump L alone, variations in temperature of the water supplied for filling-up purposes from the tank R may be secured by means of the cocks in the pipes 54 and 55 which may be turned so that the water supplied from the pump to the pipe 53 passes either through the upper tank R only, or through both tanks. Other advantages and uses incident to the construction will be apparent to those skilled in the art.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. In a system of the character described, a receptacle for hot water, a tank provided with two sets of steam heating pipes, a steam pump for supplying the tank from the receptacle, means for supplying one set of the heating pipes from the pump exhaust, means for supplying the other set of heating pipes with high pressure steam, and outlet means leading from the tank.

2. In a system of the character described, a receptacle for waste hot water, a main feed water heater, means for supplying steam for heating the feed water in the heater, secondary feed water heating means located in the receptacle and having connection to a supply main, and means whereby the water from the secondary heating means is supplied to the main feed water heater.

3. In a system of the character described, a receptacle for waste hot water, a pair of communicating tanks, a set of steam heating coils in each tank, means for supplying steam to each set of coils, and means whereby water may be supplied after being forced through both tanks, or may be supplied after being forced through one tank only.

4. In a system of the character described, a receptacle for waste hot water, a pair of communicating tanks, a set of steam heating coils in each tank, means for supplying steam to each set of coils, means controlled by the temperature of the water in one of the tanks for governing the flow of steam to the coils therein, means for supplying water from the receptacle to one of the tanks and outlet means whereby water may be supplied from either of the tanks.

5. In a system of the character described, a receptacle for waste hot water, a low temperature tank, a high temperature tank, a set of steam heating coils in each tank, a steam pump for supplying water to the low temperature tank, means for supplying steam to the set of coils in the high temperature tank, means for supplying steam from the pump exhaust to the coils in the low temperature tank, and means whereby water may be supplied from either of the tanks.

6. In a system of the character described, a receiver for the hot water, a plurality of tanks in series each provided with a set of steam heating pipes, a blow-off pipe adapted to be connected to a source of steam supply, connections from the blow-off pipe to the sets of steam heating pipes whereby

each may be independently supplied with steam, and means provided with cut-offs and connections whereby water from the said receiver may be forced therefrom to a receptacle either directly, through one of the series of tanks, or through the entire series of tanks.

7. In a system of the character described, a receiver for hot water, a pair of communicating tanks for supplying feed water each provided with a set of steam heating pipes, means for forcing water from the receiver through the tanks, a blow-off pipe for supplying one set of heating pipes with high pressure steam, means for supplying the other set of heating pipes with low pressure steam, and means whereby the condensation from the first set of heating pipes is conducted to the second set of heating pipes and permitted to reëxpand and condense.

8. In a system of the character described, a receiver for hot water, a pair of communicating tanks for supplying feed water each provided with a set of steam heating pipes, means for forcing water from the receiver through the tanks, a blow-off pipe for supplying one set of heating pipes with high pressure steam, a trap for receiving the condensation from the set of heating pipes supplied with high pressure steam, and means for conducting such condensation to the second set of heating pipes when it is permitted to vaporize and recondense.

In testimony whereof, I have hereunder set my hand in the presence of the two subscribed witnesses.

CARL W. JOHNSON.

Witnesses:

PAUL CARPENTER,

ALFRED Y. ANDREWS.