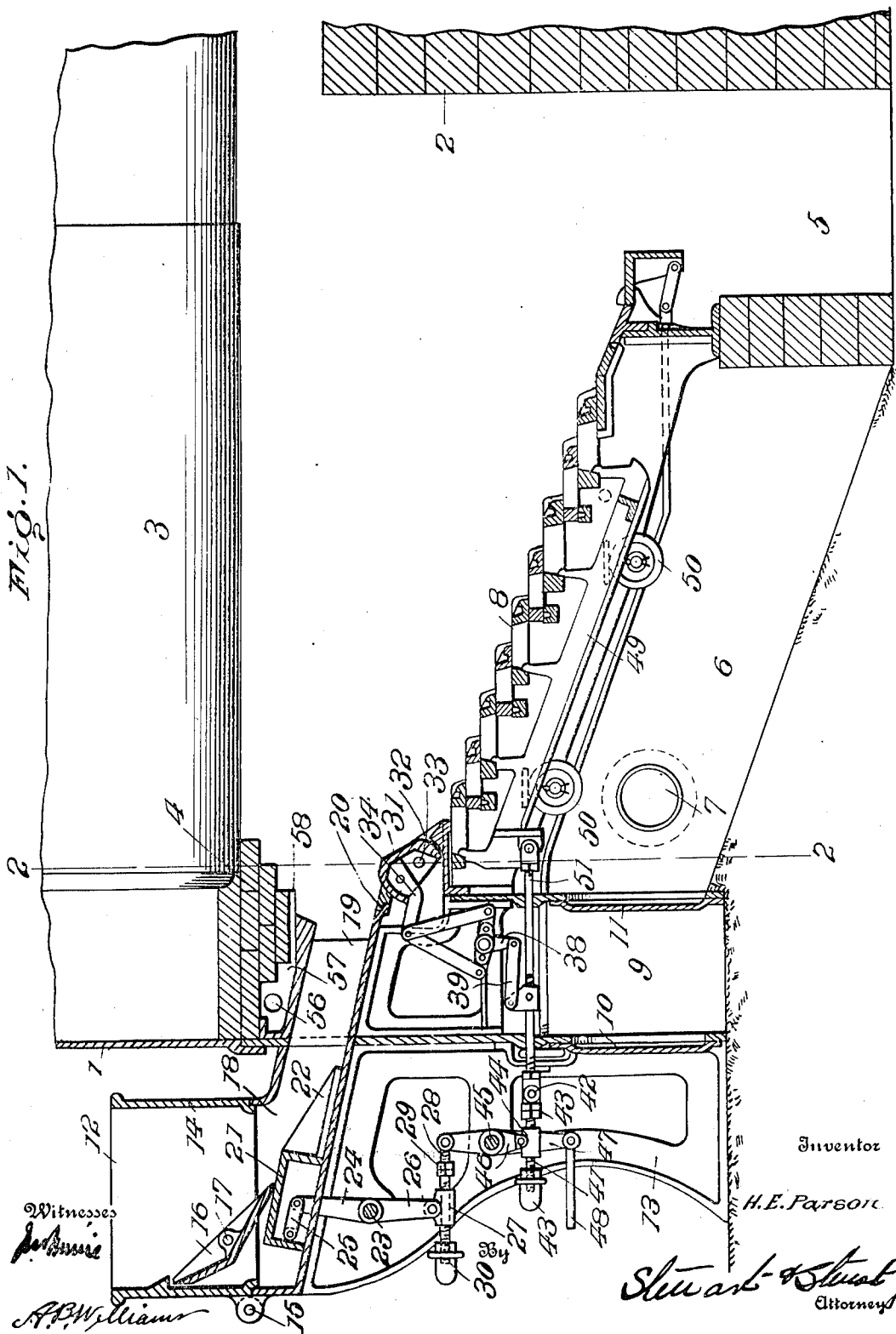


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 APPLICATION FILED OCT. 18, 1905.

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Patented May 16, 1911.

3 SHEETS—SHEET 1.



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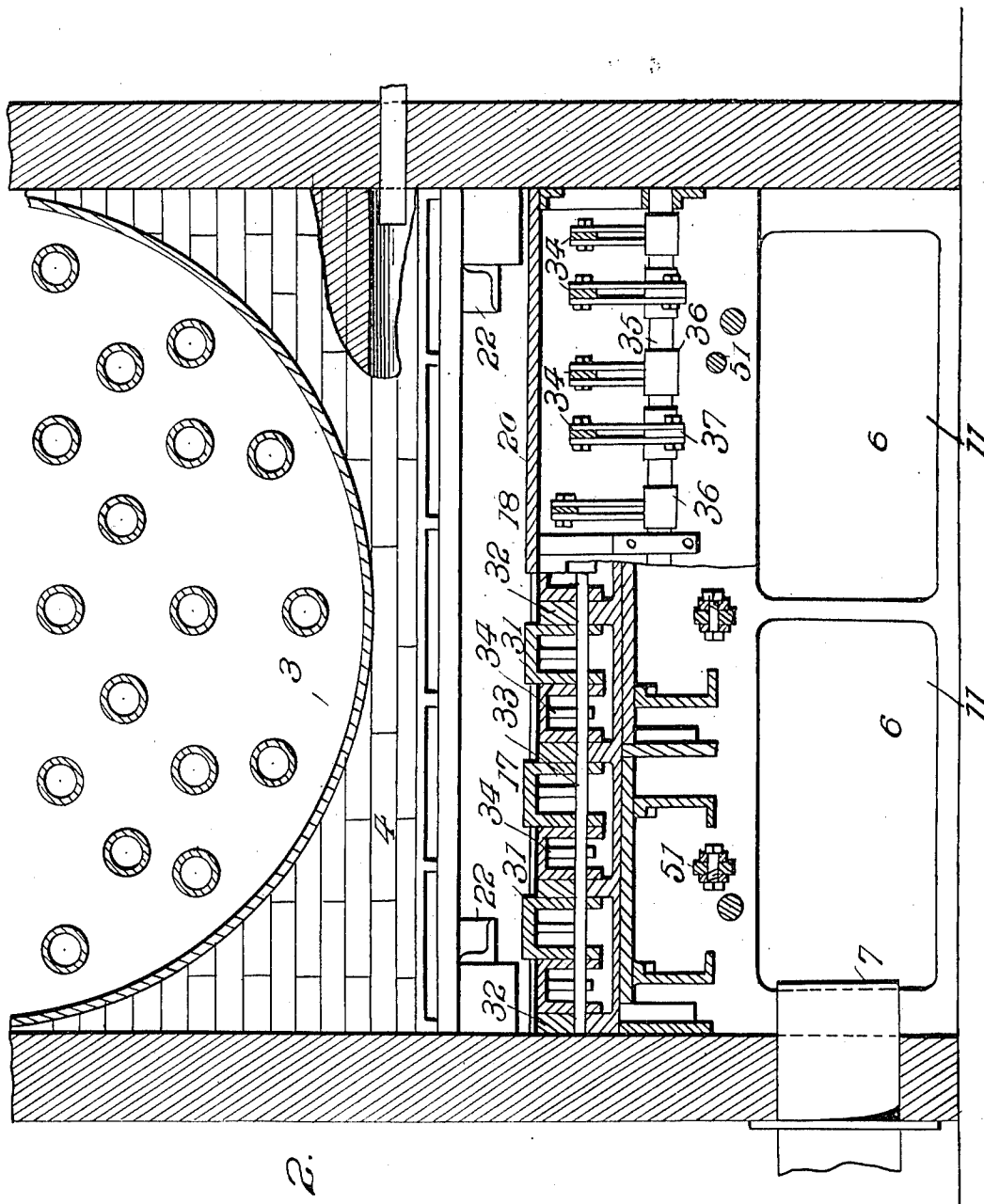


Fig. 2.

Witnesses

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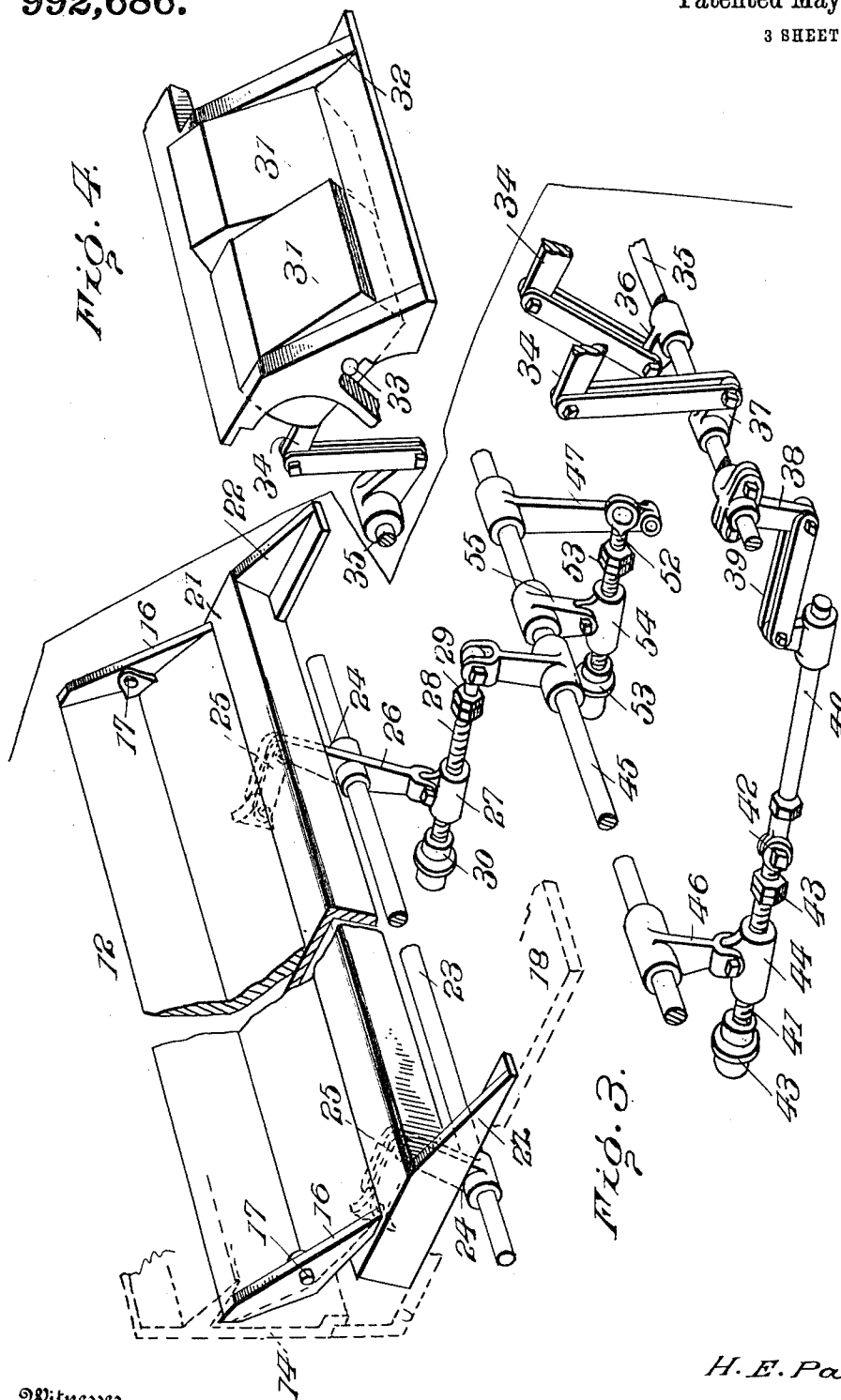
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3 SHEETS—SHEET 3.



Witnesses

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UNITED STATES PATENT OFFICE.

HENRY EDWIN PARSON, OF NEW YORK, N. Y.

COAL-FEEDER FOR MECHANICAL STOKERS.

992,686.

Specification of Letters Patent.

Patented May 16, 1911.

Original application filed February 24, 1905, Serial No. 247,083. Divided and this application filed October 18, 1905. Serial No. 283,286.

To all whom it may concern:

Be it known that I, HENRY E. PARSON, a citizen of the United States of America, and resident of the city of New York, county and State of New York, have invented certain new and useful Improvements in Coal-Feeders for Mechanical Stokers, of which the following is a specification.

My invention relates to a mechanical stoker and has for its object to provide a stoker in which any kind of coal may be burned with equally good effect.

The special elements of novelty in this invention consists of a coal feeding device actuated by power and reciprocating in the bottom of a coal hopper with a coal deflector located over it so as to maintain a pressure of coal on the forward end of the coal feeder while leaving the rear end free of pressure. Also, a long throat through which coal is fed to the fire chamber and at the end of which soft coal will be coked as it is presented to the action of the fire; a platform beyond the end of the throat on which the coal lies while coking. A series of knuckles or breakers are located at the edge of the platform to break and disintegrate the coke as fast as it is formed. An auxiliary blast, entering the furnace above the throat, delivers hot air to the fire chamber.

This application is a division of my application Serial No. 247,083, filed February 24, 1905 and covers a construction shown and described therein, but not claimed.

Referring to the drawings wherein the same part is designated by the same reference numeral wherever it occurs, Figure 1 is a vertical longitudinal section of a boiler setting and furnace embodying my invention. Fig. 2 is a vertical transverse section of the boiler and fire box on line 2—2 of Fig. 1, except that in the right hand side of the figure the breakers are shown in front elevation instead of in section. Fig. 3 is a perspective view of detached parts of the coal feeding device and of the lever and rod connections by which it and the coke breakers and grates are operated. Fig. 4 is a perspective detail of the pair of the coke breakers.

Referring to Fig. 1, 1 designates the front wall of a furnace, 2 the bridge wall, 3 a boiler, 4 a brick arch supporting the front of the boiler, 5 the ash pit, 6 a blast chamber,

7 a blower pipe delivering air under pressure into the chamber 6 through which it passes up through the grates. 8 are the grates which are shown as of the fuel advancing type. These grates are specifically described and claimed in my application Serial No. 283,285 filed October 18, 1905, to which I make reference for a full description thereof.

9 is a closed chamber between the exterior wall 1 of the furnace and the blast chamber 6, 10 is a door in the wall 1 for entrance into the chamber 9 and 11 is a door in the rear wall of the chamber 9 for admission into the blast chamber 6.

12 is a coal hopper located in front of the front wall of the furnace and mounted on supports 13 having an upper portion 14 which is hinged to the lower portion at 15.

16 is a coal deflector pivoted within the upper portion of the hopper below its center at 17 for the purpose of relieving to some extent the lower part of the deflector from the pressure due to the weight of the coal above the coal feeder. The lower portion of the hopper is stationary and, for the purpose of clearness is numbered 18. The portion of the hopper 18 has an inclined bottom inclined downward toward the furnace and an elongated throat 19 which projects through the front wall of the furnace and into the fire chamber.

20 is a coking platform projecting beyond the end of the throat on the lower side thereof.

21 is a coal feeder shown in detail in Fig. 3; it consists of a box shaped casting inverted and resting upon the inclined bottom of the hopper.

22—22 are two fingers projecting from the operative face of the pusher on the level of the bottom of the hopper for the purpose of preventing the pusher from tilting forward when power is applied to it at the opposite side.

23 is a rock shaft journaled in the frames 13. 24—24 are cranks fast upon the rock shaft 23 and connected at their ends to the interior of the coal feeder 21 by links 25 connected to the side of the feeder opposite its operative face. 26 is a second rock arm fast upon the rock shaft 23 and has pivoted to its lower end a sleeve 27.

28 is a power driven rod which passes through the sleeve 27. The rod 28 is screw

threaded and on it are nuts 29—30. The stroke of the rod 28 is constant, but by changing the position of the nuts 29—30 in relation to the sleeve 27, any desired stroke 5 may be given to the feeder 21 within the limit of the stroke of the rod.

31—31 are a series of coke breakers located between the upper end of the grate and the extremity of the coking platform. The coke 10 breakers are shown in detail perspective in Fig. 4 and they consist of hollow castings having a curved surface on both ends struck from their pivotal center and also a flat surface or preferably two plane surfaces on top 15 at an angle to each other.

32 is a frame in which the breakers are mounted in pairs side by side. The frame 32 is supported at its upper end upon the end of the coking platform 20 and below 20 upon the partition between the blast chamber 6 and the chamber 9. This frame is divided into sections by partitions and in each section a pair of coke breakers are mounted.

33 is a shaft mounted in the frame 32 and 25 on which all the coke breakers are loosely journaled.

Projecting from the lower side of each breaker is an arm 34, the arms of all the coke breakers being similarly located in relation 30 to the breakers.

35 is a rock shaft journaled in bearings mounted upon the frame 13. It is shown in perspective in Fig. 3.

36 and 37 are two series of cranks secured 35 to the shaft 35 and projecting horizontally, one series projecting in one direction and the other in the opposite direction, one series being connected by means of links with one set of coke breakers and the other series to 40 the other set of coke breakers, adjacent cranks which project in opposite directions from each other being connected to adjacent breakers so as to give to the adjacent breakers a motion with the result that as the shaft 45 is rocked one-half of the breakers will be up and one-half down, the motion of alternate breakers being in opposite directions.

38 is a crank secured to the shaft 35 and projecting downward and is connected by 50 means of a link 39 with the power driven rod, 40, which at one end is provided with a threaded portion 41. As shown, the threaded portion 41 is not integral with the rod 40, but is connected thereto by means of 55 a pivoted connection 42. The threaded portion 41 is provided with suitable nuts 43—43.

44 is a sleeve through which the threaded portion of the rod 40 extends and through 60 which the portion may slide, the movement between the sleeve 44 and the rod being adjusted by the lock nuts 43—43 in the same manner as described in connection with the locks nuts 29—30.

45 is a rock shaft journaled in the frame 65 13 below the coal hopper.

46 is a crank secured to the shaft 45 and extending downwardly and pivotally connected at its lower end to the sleeve 44.

47 is a crank arm secured to the shaft 45 and depending therefrom and connected at 70 its lower end to any suitable motor or engine by means of which the entire stoker mechanism may be driven. In Fig. 1, I have shown a rod 48 by means of which the crank 47 may be connected to the motor. 75

In the form of my invention herein shown, the grates are given a reciprocating movement in order to cause them to feed the fuel down the grates. In order to cause the feeding movement of the grates, the frames 49 80 which support and actuate the movable section are supported on rollers 50—50 which run upon suitable flanges. To the frame 49 at one end is connected a rod 51 which is provided at its forward end with a section 85 52 pivoted thereto, (see Fig. 3) the section 52 being threaded and fitted with nuts 53—53. 54 is a sleeve pivoted to a crank 55, the sleeve surrounding the threaded rod 52. The crank 55 is fast on the rock shaft 45 90 which is operated by the crank 47. By this means a reciprocating motion is given to the grate frame, the extent of which is regulated by the setting of the nuts 53—53.

56 is an auxiliary air supply which sup- 95 plies air to the chamber 57 through which the air passes by the passage 58 and is delivered to the furnace just over the coking platform 20.

The operation of the device is as follows: 100 Coal is fed into the hopper 12 and rests upon the deflector 16 which being pivoted below its center will be raised at the lower end by the weight of coal upon it, thus relieving the pressure of coal in a great measure from the 105 top of the coal feeder 21. The hopper being pivoted at 15 may be turned backward so as to enable the fireman to gain access to the throat 19 and break up any coke which may form there and which is not broken up by 110 the coke breakers. This tilting back of the hopper in the manner just referred to, also gives access to the fire tubes of the boiler. The coal feeder 21 is connected to a power mechanism by means of the rod 48, as before 115 described, and when forced forward under the operation of the power mechanism, might have a tendency to ride up on the coal in front of the pusher and allow coal to get under the same. To prevent this action, the 120 coal feeder is provided on its operative face with the projecting fingers 22 which rest on the bottom of the coal chute on which the coal lies and by which the operative face of the coal feeder is kept down to the surface 125 of the coal chute. The throat 19 is made comparatively long and narrow and is filled with coal so as to prevent, as far as possible, the admission of air therein. The coking platform projects into the fire chamber be- 130

yond the throat and the coal which is exposed as soon as it leaves the throat is coked and the coked mass is forced before the coal which follows it off the coking platform and
 5 over the breakers where it is broken up. As the coke when it reaches this point is in a friable and brittle condition, it will be broken in small pieces by the breakers and dropped down on the grate where it will
 10 immediately receive the blast passing through the grates and burn. The reciprocation of the movable grate sections will feed the fire and ash down the grate toward the ash pit.

15 While I have described what I believe to be the preferred form of my invention, I desire to have it understood that many changes may be made in the form, construction and arrangement of parts without departing
 20 from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent is:—

1. In a mechanical stoker, the combination of a coal hopper, a coal feeder resting upon
 25 and moving on the bottom of the hopper, and a coal deflector acting automatically under the pressure of the superincumbent coal to relieve the feeder of such pressure.

2. In a mechanical stoker, the combination
 30 of a coal hopper, a coal feeder resting upon and reciprocating on the bottom of the hop-

per, and a coal deflector pivoted in the hopper above the feeder acting automatically under the pressure of the superincumbent coal to relieve the feeder of such pressure. 35

3. In a mechanical stoker, the combination with a coal hopper having a discharge throat to the furnace, breakers in line with said discharge throat in the furnace, said breakers pivotally mounted to oscillate alternately in
 40 opposite directions and having end faces curved substantially on arcs struck from the pivot points, and flat top faces.

4. In a mechanical stoker, the combination with a coal hopper having a discharge throat
 45 to the furnace, breakers in line with said discharge throat in the furnace, said breakers pivotally mounted to oscillate alternately in opposite directions.

5. In a mechanical stoker, in combination
 50 with a hopper, a feeder reciprocating at the bottom of said hopper, said feeder having projections on its lower forward edge parallel to its path of movement to prevent its riding the fuel. 55

Signed by me at Birmingham, Alabama, this 12th day of October, 1905.

HENRY EDWIN PARSON.

Witnesses:

RUTH S. PATRICK,
 ARCHIE WRIGHT.