This invention relates to furnaces and its general object is to provide an attachment for furnaces of all kinds, steam boilers and the like that will check and prevent the escape of unburnt gases from the fire box of the furnace and cause ignition and practically entire consumption thereof before they reach the atmosphere, therefore all of the products of combustion from the fuel are substantially utilized and turned into heat, with the result maximum heat is obtained from the fuel used and cost of operation of the furnace will be reduced to a minimum.

A further object of the invention is to provide an attachment for furnaces and the like, that produces a constant flow and circulation of draft air to promote combustion, and said flow and circulation can be controlled in accordance with the operator's desires.

Another object of the invention is to provide an attachment for furnaces and the like, that collects and consumes foul air and the like from the premises where installed and enables proper ventilation of said premises by leaving the same in a pure and clean condition.

A still further object of the invention is to provide an attachment for furnaces of the character above set forth that will prevent excess and dangerous accumulation of gases, with the result damage to the furnace by such accumulation will be impossible.

Another object of the invention is to provide an attachment to perform the functions above referred to, that is extremely simple in construction, inexpensive to manufacture and is efficient in operation and service.

A still further object of the invention is to provide an attachment that causes the furnace to consume smoke before it reaches the atmosphere.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing our invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a vertical sectional view taken through a steam boiler and showing the application of our attachment thereto.

Figure 2 is a top plan view thereof with parts in section.

Figure 3 is a sectional view taken approximately on line 2-3 of Figure 2 and looking in the direction of the arrows.

Referring to the drawings in detail it will be noted that we have shown our attachment applied to a tube steam boiler of the usual construction but it is to be understood that the attachment can be applied to any furnace of any kind, type and size without departing from the spirit of the invention.

The steam boiler as shown includes the usual fire box A, bridging B, boiler C with drafting tubes arranged longitudinally therein, and the letter D indicates the front wall which is in communication with the flue E, while the flue E is disposed in communication in the usual manner with the smoke stack F.

The attachment which forms the subject matter of the present invention is shown disposed in communication with the flue E and is formed by a vertically disposed pipe 1 having its lower end spaced from the floor as best shown in Figure 1 of the drawings, and said pipe 1 is supported in such spaced relation by depending legs 2. Secured to the lower edge of the pipe 1 and extending therefrom to the floor is a screen 3 which prevents the passage of dirt and other foreign matter from being drawn into the pipe as will be readily apparent.

Secured to the upper end of the pipe 1 is an elbow 4, and arranged at the point of juncture of the pipe 1 with the elbow 4 and at the front thereof is a substantially V-shaped depression 5 formed in the pipe to provide an air passage. The elbow is otherwise secured to the pipe in a manner to form an air tight connection.

Secured to the flue E in an air tight manner and extending laterally therefrom is a pipe 6 having fixed to its outer end an elbow 7.
which is provided with an opening 8 in its
top and adjacent its connection with a rela-
tively short pipe 9. The short pipe 9 is dis-
posed between the respective elbows and pro-
vides communication therebetween as will be
apparent upon inspection of Figure 3 of the
drawings.

Arranged in the pipe 1 is a damper 10 of
the usual construction and said damper is
disposed slightly below the center of the
pipe 1 as shown in Figure 1.

From the above description and disclo-
sure of the drawings, it will be obvious that
the pipe 1 is in reality a cold air shaft which is
spaced the proper distance from the floor to
allow the free passage of air from the
premises as indicated by the arrows in Fig-
ure 1, and by this construction, it will be ap-
parent that all of the foul air and the like will
be drawn from the premises and be consumed
with the result the premises will be retained
in a pure and clean condition as far as the
atmosphere thereof is concerned. The air
from the pipe 1 is conveyed to the elbow 4
and due to the air passage 5, further air is
added, which causes further impetus to the
air currents. This additional air helps to
convey the air currents through the pipe
9 and elbow 7, and forces the smoke and un-
burnt gases which meet the incoming air cur-
rents substantially in the space of the attach-
ment between the opening 8 and air passage 5
and in the flue E. back to the fire box of the
furnace so that they will be ignited and con-
sumed before being passed to the atmosphere
as will be apparent. The arrows in the fur-
nace indicate the passage of the smoke and
unburnt gases in their outward direction be-
fore they are met by the incoming air from
the attachment. The space in the attach-
ment between the opening 8 and air passage 5 acts
in the nature of an equalizer, as in the event
excessive accumulation of gas should occur
in the flue or parts of the attachment, some
of the gas will escape through the opening 8,
with the result the incoming air currents from
the pipe 1 and passage 5 will always be suf-
cient to balance with the natural draft below
the fire box and retain substantially all of the
unburnt gases in the fire box to be consumed.
In view of the commingling of the unburnt
gases, smoke and the like with the incoming
air, the smoke will be entirely consumed and
residue and the like that accumulates in the
flue and parts of the attachment will be re-
duced to a minimum. The action of the nat-
ural draft from below the grate and incoming
air currents from the chimney, and the incom-
ing air currents from the attachment which
have a tendency to control the movement of
the natural air drafts, will commingle and co-
operate in such a way to promote practic-
ally complete consumption of the products of
fuel in the furnace, and the action of these
respective drafts and air currents will be in
the nature of natural respiration.

It is thought from the foregoing descrip-
tion that the advantages and novel features
of our invention will be readily apparent.

We desire it to be understood that we may
make changes in the construction and in the
combination and arrangement of the several
parts, provided that such changes fall within
the scope of the appended claims.

What we claim is:

1. An attachment for a furnace, a flue for
said furnace, said attachment comprising a
vertically disposed pipe, legs supporting said
pipe above a floor surface to allow the pas-
sage of air thereto, a screen secured to said
pipe to prevent the passage of foreign mat-
ter therein, a damper in said pipe and mak-
ing the same air tight when closed, an elbow
secured to the upper end of said pipe, said
pipe being provided with a depression
formed at the juncture of the pipe with the
elbow to provide an air passage, a second
elbow in communication with the flue, and
being provided with an opening in its top
disposed in a line above the air passage, and
a pipe connecting the respective elbows.

2. An attachment for a furnace, a flue for
said furnace, said attachment comprising a
vertically disposed cold air shaft, legs secur-
ed to and depending from the lower end
of the shaft to space the same from a floor
and allow free passage of air to the shaft, a
damper in said shaft, an elbow secured to the
upper end of said shaft, an elbow adapted to
be in communication with the flue and being
formed with an opening in its top, a pipe
connecting the elbows for communication
with each other, a substantially V-shaped de-
pression formed in the front of said pipe and
at the juncture thereof with its elbow to pro-
vide an air passage as and for the purpose
specified.

3. An attachment for a furnace, a flue for
said furnace, said attachment comprising a
cold air draft pipe adapted to be vertically
disposed and have its lower end arranged in
spaced relation with a floor to allow air to
pass therein, a damper in said pipe, an elbow
secured to the upper end of said pipe, a pipe
extending laterally from the flue and being
in communication therewith, an elbow secur-
ed to the last mentioned pipe and being
provided with an opening adjacent one end
and in its top, a pipe connecting the elbow,
a substantially V-shaped depression formed
in the front of said pipe and at the juncture
thereof with its elbow to provide an air
passage.

4. An attachment for a furnace, a flue be-
tween the furnace smoke box and smoke
stack, said attachment comprising an elon-
gated vertically disposed pipe, a damper in
said pipe, an elbow secured to said pipe, said
pipe being provided with a depression at its
juncture with the elbow to provide an air passage, and means in communication with the flue of the furnace and the elbow and being provided with an air passage cooperating with the air passage first mentioned to allow the air currents to balance one another.

In testimony whereof we affix our signatures.

FRANK BUSHMAN.
ROBERT McFARLANE.