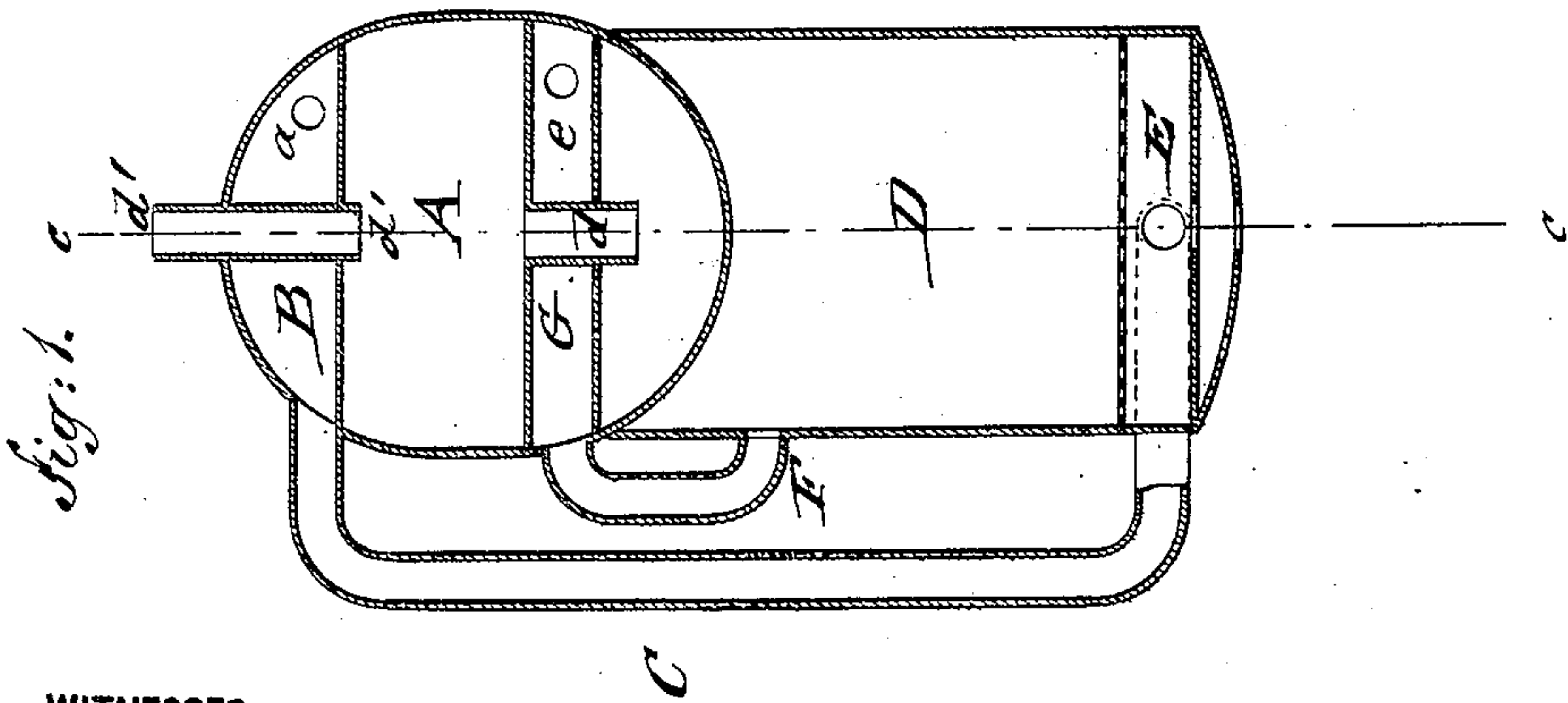
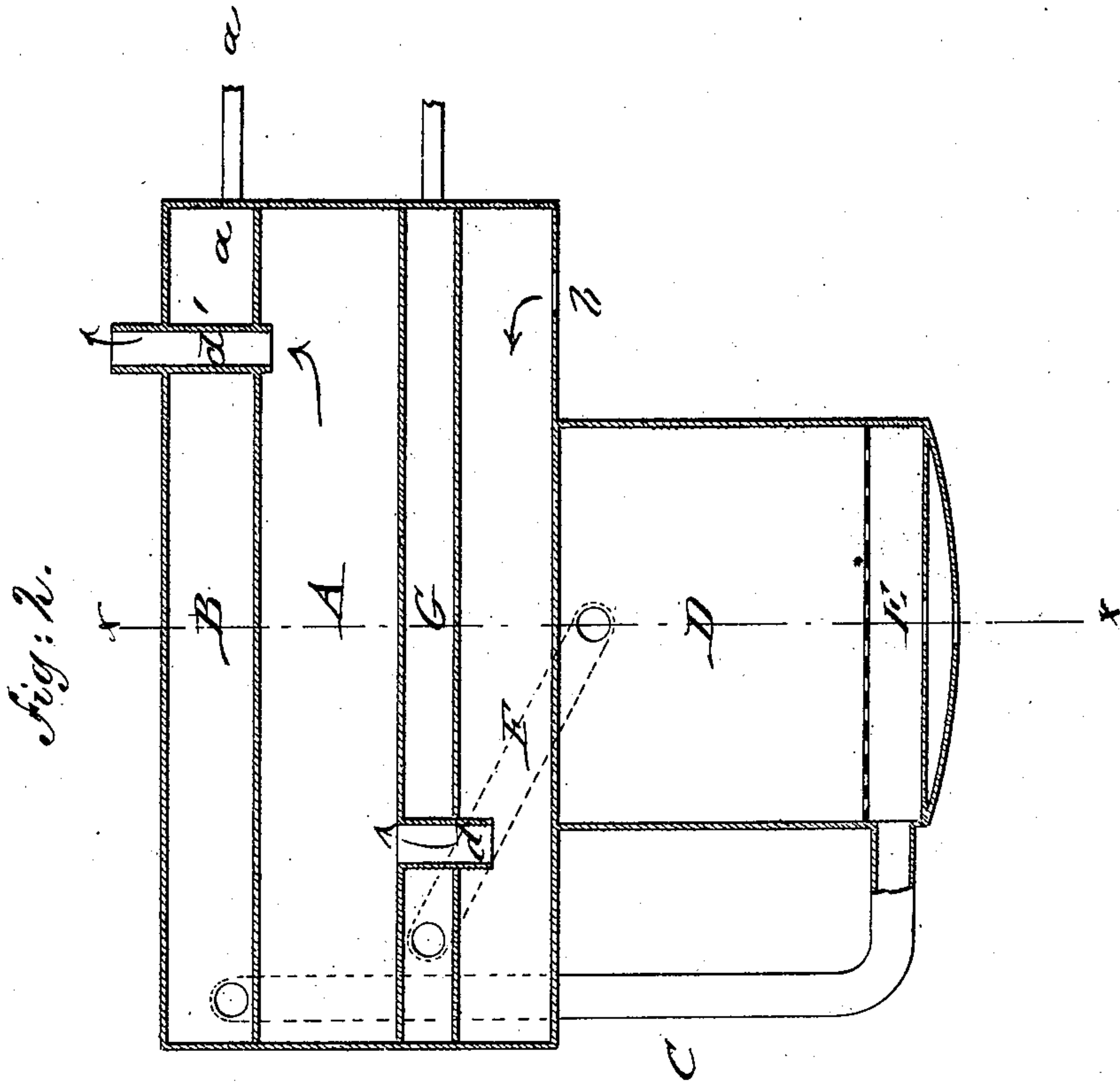


**G. F. JASPER.**

### FEED-WATER HEATER AND FILTER.

No. 178,932.

Patented June 20, 1876.



**WITNESSES:**

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John Goethals

**INVENTOR:**

BY

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# UNITED STATES PATENT OFFICE.

GEORG F. JASPER, OF FREEBURG, ILLINOIS.

## IMPROVEMENT IN FEED-WATER HEATERS AND FILTERS.

Specification forming part of Letters Patent No. 178,932, dated June 20, 1876; application filed January 22, 1876.

*To all whom it may concern:*

Be it known that I, GEORG F. JASPER, of Freeburg, in the county of St. Clair and State of Illinois, have invented a new and Improved Feed-Water Heater and Filter, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a vertical transverse section of my improved feed-water heater and filter, taken on the line *x x*, Fig. 2; and Fig. 2 is a vertical longitudinal section of the same on the line *c c*, Fig. 1.

Similar letters of reference indicate corresponding parts.

The purpose of this invention is to still further improve and simplify the feed-water heater and filter for which Letters Patent were granted to me heretofore under date of December 1, 1874, and June 8, 1875, being, respectively, numbered 157,334, and 164,176; and the invention consists in the arrangement of a double water-box in the heating-tank, in connection with the filtering-receptacle below.

In the drawing, A represents the heating-tank, which is provided at its uppermost section with a water box or chamber, B, with one or more partitions, to which the water is first conveyed from the tank or reservoir by a pipe, *a*. The water receives its first heating to a suitable degree of temperature in the upper water-box B, and then passes downward through a pipe, C, into a mud-chamber, E, at the bottom of the filter-receptacle D. The mud-bottom is provided with a second convex bottom, that forms a space below the mud-chamber for preventing the cooling off of the heated water in the same. The sediments are drawn off, from time to time, through holes of the double bottom of the mud-chamber.

The water passes from the mud-chamber, through a perforated bottom or strainer, into the filter-receptacle D, which is filled with any suitable filtering material. The water is then conveyed, through a second communicating-pipe, F, to a second water-box, G, that is arranged in the heating-tank below the upper water-box in such a manner that a heating chamber or section is formed above and below box G.

The lower water-box has the purpose of

imparting to the water a higher degree of heat than that given in the upper water-box, the exhaust steam entering for this purpose through a pipe or opening, *b*, at the bottom of the heating-tank into the lower section of the same; then through a pipe, *d*, through the lower water-box, to the upper section of the heating-tank, passing thus along both sides of the lower water-box.

The exhaust air is conducted, through a pipe, *d'*, at the other end of the heating-tank, through the upper tank to the outside, heating the same only from below, while acting on the lower box at both the bottom and top sides. The water-boxes may also be filled with filtering material, if necessary. The water passes finally from the lower water-box, through an exit-pipe, *e*, at the proper degree of heat, to the pump and engine.

An escape-valve may be placed on the top or other suitable place of the heater to allow any surplus of water to escape before it attains a too great degree of heat when a pump is used to force the water through the water-boxes.

The water is freed from all impurities and extraneous matter when passed through the heater and filter, the filter being provided with the usual man-holes for replacing the filtering material from time to time.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the upper water-box B, connecting-pipe C, mud chamber and receptacle D, return-pipe F, and lower water-box of heating-tank, substantially as and for the purpose set forth.

2. In a feed-water heater and filter, a heating-tank provided with a water-box at the uppermost part thereof, and with a second water-box below the same, on which the exhaust steam is allowed to act at bottom and top sides, while acting only on the bottom of the upper box, so as to impart a higher temperature to the water in the lower box than in the upper, substantially as and for the purpose described.

GEORG FRANZ JASPER.

Witnesses:

ADAM WOLF,  
GEORGE SINTZEL.