

## New Oxygen Mask Designed for Rescue at Sea

**F**URTHER development of the gas mask has resulted in a new breathing apparatus for rescue work, recently perfected for the navy by the United States Bureau of Mines.

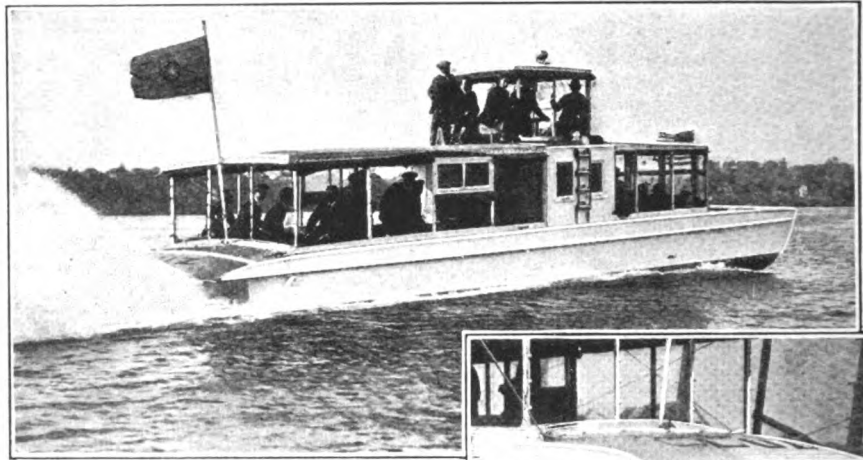
The mask enables the wearer to remain under water for 15 minutes. It consists of a rubber breathing bag in which oxygen, escaping from a tank, is mixed with air from the outside. This air enters the bag through a canister or absorption cartridge which purifies it. Air discharged from the lungs escapes without entering the breathing bag.

The apparatus will find ready use in mines and at fires.



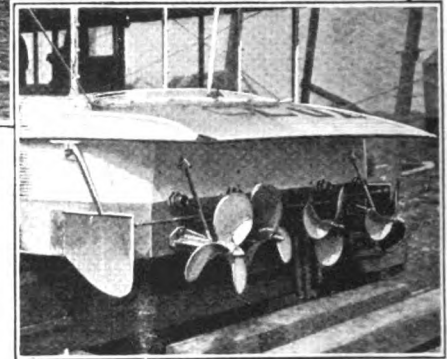
In the breathing bag oxygen and outside air are mixed

## Sea Sled Driven by Surface Propellers



Carrying a load of 51 passengers, this novel sea sled designed for shallow water transportation, recently skimmed over the Connecticut River at a speed of 30 miles an hour

At right: Drydock view of the stern showing four surface propellers and side plate rudders designed to eliminate water resistance



**D**RIVEN by four surface propellers, and designed to skim over the top of the water, a sea sled, built for use as a passenger boat on the Magdalena River, Colombia, S. A., recently developed a speed of 30 miles an hour carrying a load of 51 passengers up the Connecticut River.

The unusual craft is especially designed to operate in shallow waters. Its hull is shaped like an inverted V so that it glides over the surface of the water instead of plowing through it, this feature resulting in comparatively small loss of power from water resistance.

Since the propellers are at the surface, dragging of shafts and struts through the water, with consequent loss of power, is eliminated. In addition, there is little danger that the propellers will encounter the weeds of shallow waters.

### Rudder at Each Side

Side plate rudders also offer little resistance to the speed of the boat, since they form a prolongation of the sides. They are so designed as not to be jammed or damaged by weeds or submerged obstructions.

## Skew Arch Tested to Destruction

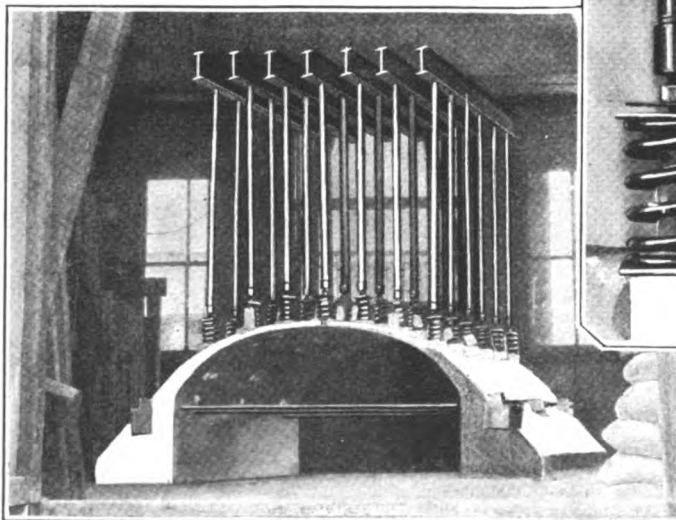
**W**HILE it has been comparatively simple for engineers to design economically an arched bridge to cross a stream at right angles, there has been considerable difference of opinion regarding the correct design of a skew-arch bridge (one that crosses a stream or road diagonally).

To obtain figures for such a design, engineers of the United States Bureau of Agriculture have constructed a skew arch one fourth the size of an actual bridge. This they are testing to destruction by increasing the load upon the top of the arch until it collapses.

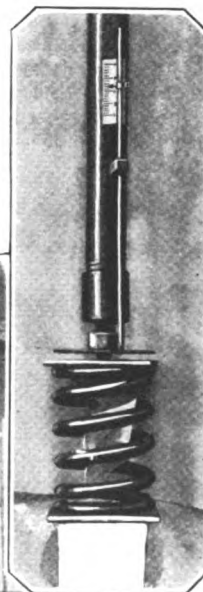
The load is applied by downward pressure on spiral springs distributed over the top of the arch capable of carrying a load of 1500 pounds. Pressure is obtained by tightening screws located between the springs and vertical pipes braced against

crossbeams above. The pressure on each spring is determined by measuring the distance it has been compressed.

Readings are taken with a strain gage to determine the distortion.



Distortion of parts of the arch under increasing pressure, exerted on springs above the arch, is measured by strain gages. Inset shows one of the springs with indicator to measure pressure



## British Experimenters Defend Fireplaces

**H**AVE we been right in discarding the picturesque open fireplace as wasteful, inadequate and dirty?

British scientists, contending that the fireplace is not so wasteful as it may seem, have recently completed experiments showing that the best coal-fired grates give out 25 per cent of the heat of the fuel consumed, while gas fireplaces are nearly 50 per cent efficient and electrical heaters about 75 per cent. Radiant heat, moreover, is said to have certain physiological advantages over warm air from a heating apparatus.

Radiated heat travels directly through space without appreciably warming the air it traverses, although it heats any solid body it strikes. The British heating

idea was explained by Prof. W. A. Bone, of the British Fuel Economy Committee:

"The more nearly conditions under which our living rooms are warmed and ventilated approach those of a warm summer's day—a cooling breeze blowing around our heads, the varying sunshine warming one side of the body, and the heated ground warming our feet—the more healthful our rooms will be; radiated heat creates these conditions."