TECHNOLOGY

Flying Flame Thrower

A new era of transportation and sports is being opened by "Buck Rogers" flying belts that may help men outrun horses, jump high walls and wide ravines.

By DAVID PURSGLOVE

➤ ON A FOOTBALL Saturday morning in the fall of 1940 a portable flame thrower was demonstrated to cadets of the U. S. Military Academy, West Point, N. Y. The excitement of the big game only a few hours away obscured a small incident and a brief exchange of remarks that may be recorded in history as a major turning point in modern warfare.

Within a few years, or perhaps even only a few months from now, top officers who witnessed that demonstration as cadets will be directing the use of almost unrecognizable modifications of World War II flame throwers in a new and fantastic kind of "ground" warfare.

Many of those cadets soon will be retiring after 20 years' service and they, at middle age, will be able to join even much older civilian friends in hiking, skiing, mountain climbing and even foot-racing, all without tiring, thanks to "flame throwers" strapped to their bodies.

Some of those officers will join private business and they may even commute from home to work through the air and without airplanes, but with the aid of flame throwers that have become flying belts.

The device, which Army and civilian engineers believe "will give the foot soldier the greatest element of surprise and maybe the greatest tactical advantage ever introduced into warfare," is the "Buck Rogers" personal rocket belt recently disclosed to the public. (See SNL, June 7, p. 358.)

Flying Belt

When it reaches its perfected state, which will require about two years' work, the Buck Rogers will be a true flying belt similar to that worn since 1933 by the comic strip character. It will allow soldiers to travel several miles at a choice of altitudes, change direction at will, and land safely.

Already test models are starting to live up to their name, and have surpassed the implications of the project name, "Grasshopper."

Early units have allowed men to run at a rate of 35 miles per hour for several seconds without tiring; jump trenches 20 feet wide from a running start; broad jump 11 feet from a standing-in-place position; rise eight feet into the air from what had been a standing position.

In only a few months of actual working time, preceded by a series of conferences, this age-old dream of science fiction writers was forced into reality by a group of imaginative young engineers at Reaction Motors Division, Thiokol Chemical Corporation, Denville, N. J.

Their only starting material was what some persons have called a "pipe dream" of the very green Corps of Engineers second lieutenant who tried to stir up interest in the workings of a flame thrower while his audience was more concerned with the possible outcome of the impending football game.

Charles M. Parkin Jr., now a lieutenant colonel at Fort Belvoir, Va., was the officer whose imagination was excited by a near accident and chance remark. The enlisted man who caused the incident remains only a face, but not a name.

In those days, flame throwers consisted of two large tanks, one of fuel oil and one of compressed nitrogen to provide pressure on the oil, a spark mechanism to create a tiny flame from hydrogen contained in a small tank, hoses, a pipe and a nozzle.

At the end of the first demonstration several enlisted men helped the lieutenant strip down the equipment, clean it and then reload the tanks in preparation for the next class.

One of the men—Col. Parkin recalls that he probably was a sergeant—inadvertenly turned the valve on a tank that already had been filled with nitrogen. As he hastily closed the knob on the hissing gas, he turned to the then Lt. Parkin and asked, "What do you suppose would happen, Lieutenant, if I opened this thing all the way?"

Project From a Pipe Dream

The lieutenant thought about it for a moment, then answered, "Well, I guess it could go skittering across the field, but it would be too risky to try it here."

"Then you mean," the soldier said, "that if I put a lot more gas in here—really build the pressure way up—I could hang onto the tank and maybe go flying?"

The soldier's idea was, of course, somewhat over-ambitious, but the thought plagued Lt. Parkin for many weeks. Finally, he had an opportunity to test the possibility of individual rocket propulsion at Fort Belvoir.

REAL-LIFE BUCK ROGERS—A gully 20 feet wide and five feet deep is jumped without strain by Reaction Motors' test stand assistant Ed Kurczewski wearing an early model of a Buck Rogers belt. Present models, still under wraps, are smaller, lighter and more efficient.

He first strapped one of the heavy tanks of highly compressed nitrogen on his shoulders. Then, just before he was ready to turn the slow-acting hand valve, it occurred to him that with the tank strapped so high on his body he might simply be thrown on his face.

He lowered the tank closer to the body's center of gravity near the hips. Then, after slowly turning the hand valve until it was fully open, he made a standing broad jump.

The jump measured 11 feet.

Then he jumped several times without the tank on his back. The best he could do was slightly over eight feet.

Then there was only one logical train of thought: "If I can considerably increase my jumping distance with this heavy tank and slow valve, how much greater would be the effect with a much lighter tank, an immediate action release valve and greater thrust —perhaps from a small chemical rocket?"

During the years that followed, Col. Parkin found himself stationed in all parts of the world. He never forgot about the Buck Rogers rocket. On subsequent tours of duty at Fort Belvoir he was able to make further tests, mostly on his own time and at no expense to the Army.

Interest Aroused

Finally, in 1955 and with the help of civilian scientists at Fort Belvoir, Col. Parkin was able to interest the commanding officer of the Engineer Research and Development Laboratories.

Col. H. F. Sykes Jr., recently retired and now with the Chrysler Corporation's missile division, granted permission for Col. Parkin to investigate the idea on a limited scale. However, the Laboratories never officially picked up "Buck Rogers" as a formal project.

On trips to the Infantry Board at Fort Benning, Ga., and to the Armored Board at Fort Knox, Ky., Col. Parkin was able to discuss the project's feasibility.

He also visited four private companies to feel out their interest. Two of the companies submitted proposals only on paper. One company, Bell Aircraft Corp., Niagara Falls, N. Y., is believed to be working on a Buck Rogers to be revealed shortly.

The fourth company, Reaction Motors, Inc., which recently merged with and became a division of Thiokol Chemical Corporation, examined the problems in conferences, liked what they saw, and, without waiting for Army funds, assigned engineers Harry W. Burdett Jr., Alexander H. Bohr and Raymond Wiech the task of making practical hardware from the basic idea.

Their work was successful and they now believe that, given two years from such time as the Army may accept their work as a formal project, the Buck Rogers will be in every sense a "true flying belt."

Buck Rogers Commuters

The biggest job now is to make the belt, with its rocket fuel tanks and jet nozzles, small, light, cheap and simple enough for general issue to all troops as they enter the Army.

If that can be done, and the Thiokol engineers are sure it can, it means the device will meet the major marketing requirements for civilian use.

They readily agree to all the most obvious civilian uses for the Buck Rogers: short-range transportation, police work, fire fighting, skyscraper or bridge construction and emergency messenger or delivery service.

However, the biggest civilian potential the engineers see for their rocket belt lies in sports.

"Just think," Mr. Burdett suggested, "about all those good hills for skiing where there are no ski tows, but where a fellow can still enjoy himself because he carries his own rocket-propelled tow strapped to his waist."

The Buck Rogers probably will be able to aid most existing sports, but the engineers believe its greater influence may be in creating entirely new sports still unheard of.

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● RADIO

Saturday, August 9, 1958, 1:30-1:45 p.m. EDT.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Frank J. Rogers, general manager and chief engineer, Commercial Electronics Division, The Admiral Corporation, Newark, N. J., will discuss "Closed Circuit Television."

ANTHROPOLOGY

Porcupines Gnawed on Stone Age Man's Tools

➤ RAZOR SHARP edges on some of the bone chisels of Middle Stone Age man in Africa were found to have been put there by the needle-sharp front teeth of porcupines, Dr. Raymond A. Dart of the University of the Witwatersrand, Johannesburg, South Africa, reports.

But the fact that a magnifying glass showed up the telltale marks of rodent teeth on the Stone Age tools does not mean that ancient man himself did not do the original work in splitting and shaping the animal bones.

At the Kalkbank Stone Age campsite in the Central Transvaal, 3,619 bone fragments were collected. Of these, 903 had been gnawed by porcupines.

"The first fact that emerges from the Kalkbank deposit," Dr. Dart stresses, "is that porcupine gnawing, even when it affects 24.95% of the bones in a deposit, does not prove that porcupines collected or split the bones that they gnawed."

Three of the bone pieces found at Kalkbank were big leg or foot bones of a giraffe. The bones were so huge that the Stone Age Man who split them had to use a stone axe or some other sharp, handled stone.

These giraffe bones show no sign of having been gnawed by an animal, but they do show clearly the marks of the stone axe. One of the bones had also been hacked at one end to form a chisel or gouge-like edge.

The evidence of both human and animal working on ancient bone tools is reported by Dr. Dart in the *American Anthropologist* (Aug.).

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