

Words on the Wing

When you take your first air trip you have a feeling of doing something you ought not to, even though records have convinced you of the skill of our pilots, the soundness of ships and motors, and the safety of licensed flying. That's because you're naturally a land-tied creature. Now the aviation industry believes it has found a final fillip to win your patronage—in radio. When you can talk to your home or office from the clouds that "funny feeling" will seem old-fashioned

By
W.B. Courtney

JACK WEBSTER, veteran air-mail flyer, took off from the Cleveland airport on the morning of December 17th last, and headed east toward the New York terminal at Hadley Field, New Jersey, 394 miles away—the last leg of the great transcontinental run. It was 10:35 by the clock in Jack's ship. He was hours behind schedule. The weather had been atrocious lately all along the line—blizzards, bitter cold, fog. Now the first sign of a break had come, and Jack was bargaining through.

Up to Bellefonte, his halfway mark, it wasn't bad. There were many clouds; thick, dripping blobs of gray mist swirled across his course by a whistling gale from the south. But there were many holes, too. With a little dodging he could check his progress by landmarks and compensate for the terrific side drift. Just routine flying. Jack's thoughts began to dwell on prospects of a hot supper and a quiet evening at home in Plainfield.

Then, at the Nittany Mountains, 200 miles west of New York, he suddenly got into fog—"went blind," as pilots say.

He climbed until he was sure of escaping the rocky molar of the Alleghenies, then waited for another break. None came. Presently he figured it was time to feel for the ground. Four times in a row he sloped down to 300 feet on his altimeter, and four times scuttled back to 1,000—for each time he had no visibility except down, and each time he saw treetops not fifty feet from his wheels.

He flew another half hour, then felt for the ground again and saw—water. Fifteen minutes more, another try, and—water again. Evidently his ground speed had been more than he estimated, and he had overshot the Atlantic coast. He made a sharp turn to due north by the compass, hoping to cut back to the mainland; simultaneously, he held the ship in a gentle climb.

At 5,000 feet he had the cloud layer under his wheels, and began to explore it, north and west, for a hole. He could not find one. By now he had not the faintest idea where he was. So he just cruised along—waiting.

At 4:25 in the afternoon his main tanks went dry. He dared a descent to 1,000 feet, but his eyes failed to pierce the murk. The reserve gas tank offered a respite, so up he went once

more. He methodically gathered up his gloves, goggles and helmet, and fastened his parachute straps, pulling them tight. The motor stopped at a mile above sea level.

Jack held the nose down gently—to keep the ship from losing flying speed, thence stalling and falling into a tail-spin—and waited until the propeller stopped. Then he shut off the ignition switches and lights. He opened his safety belt, climbed out of the cockpit and stood on the fuselage steps a minute until he had got a good grip on his flashlight.

Another for the Caterpillar Club

He pushed himself clear, and when he had fallen far enough to cancel danger of fouling his ship, he gave the ring a strong pull and the parachute opened immediately. Jack did not know whether he was dropping toward land or water, and he dropped a mile before his suspense was lifted. His flashlight picked up a clump of trees under his heels a second before he settled into them. He slid to the ground and walked to a gas filling station, where he learned that he was in Suffield, Connecticut. Look at your map to see how he had overshot and wandered. That was a working day on the air mail in the pre-radio age.

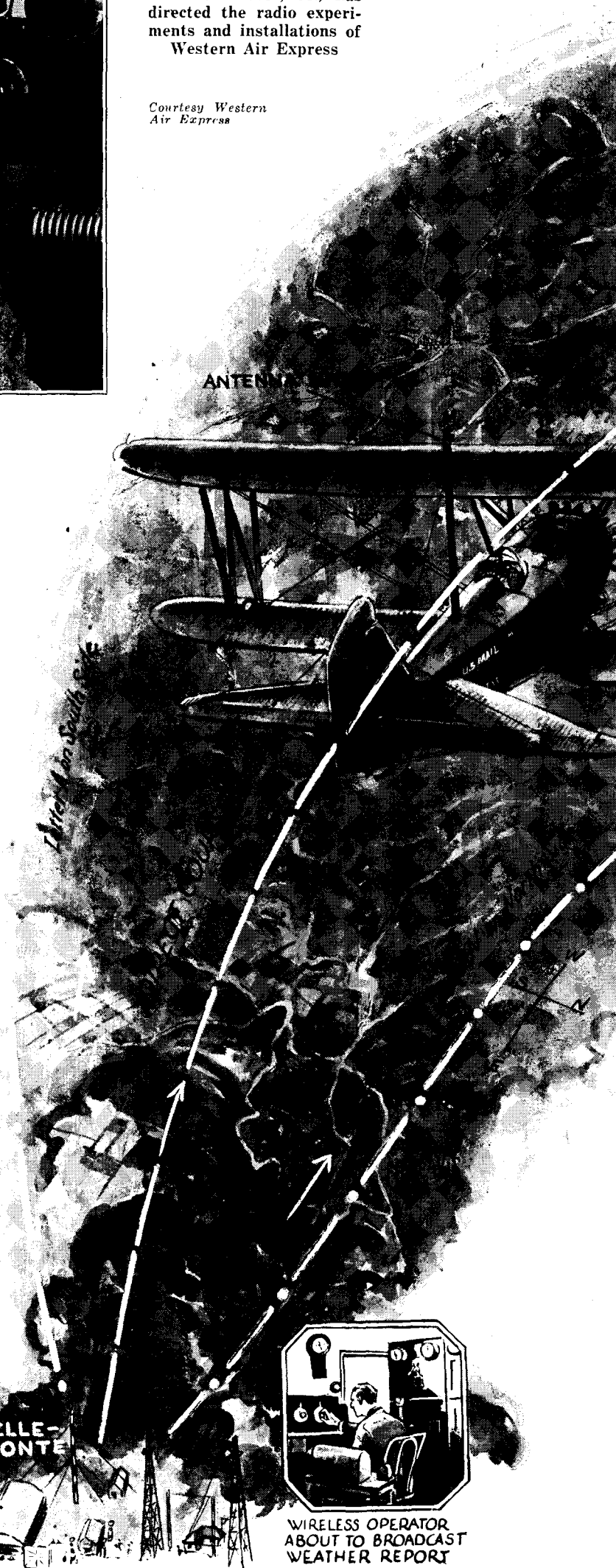
Now let's spend another working day with the same pilot. At 3:15 on the morning of May 30th he again took off from Cleveland. His ship was equipped for radio reception.

While he was still an hour away from Hadley Field the ceiling there had closed down to 350 feet. Worse, the weather reports which were

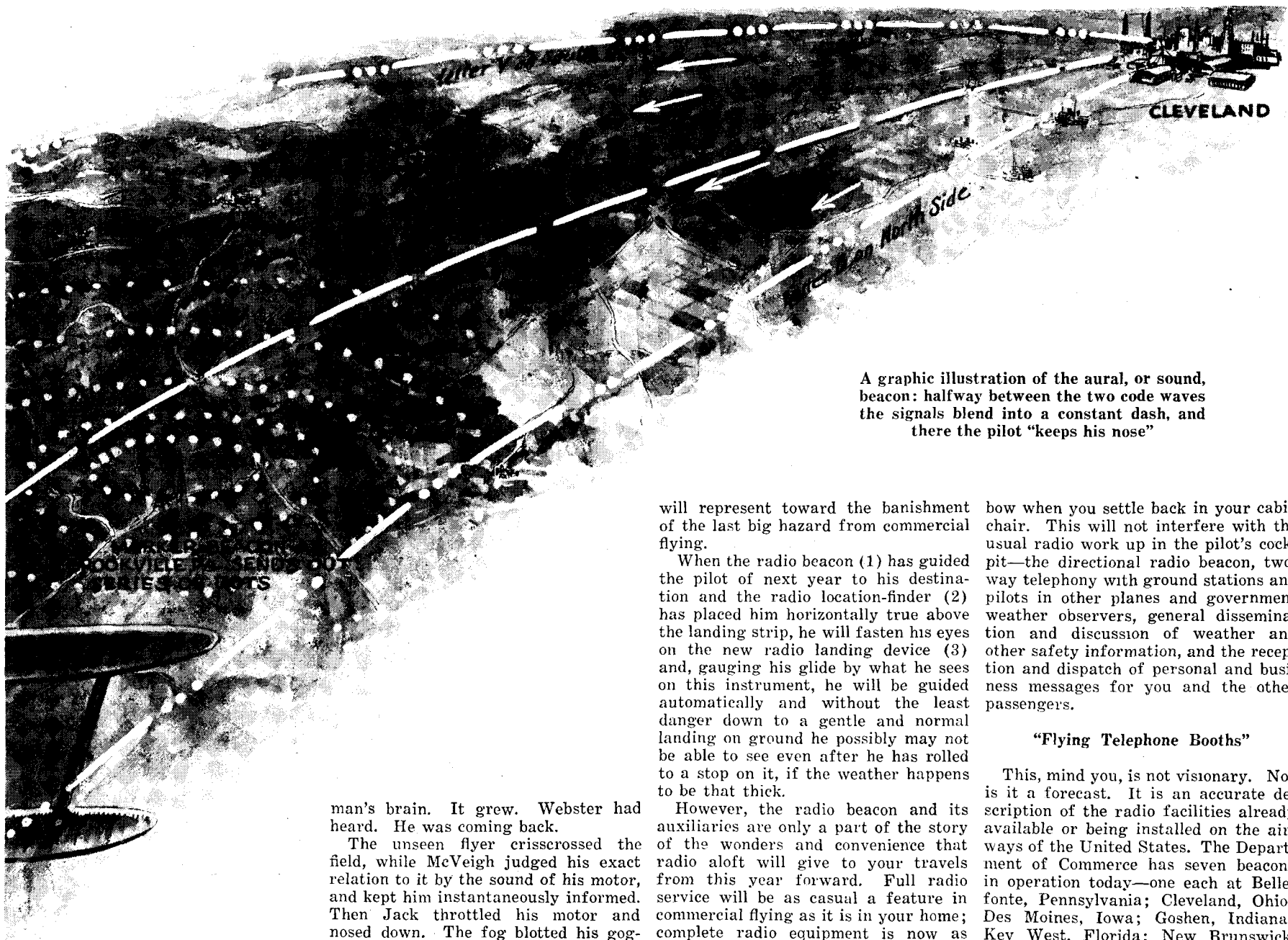


Herbert Hoover, Jr., has directed the radio experiments and installations of Western Air Express

Courtesy Western Air Express



Illustrated by Logan U. Reavis



A graphic illustration of the aural, or sound, beacon: halfway between the two code waves the signals blend into a constant dash, and there the pilot "keeps his nose"

man's brain. It grew. Webster had heard. He was coming back.

The unseen flyer crisscrossed the field, while McVeigh judged his exact relation to it by the sound of his motor, and kept him instantaneously informed. Then Jack throttled his motor and nosed down. The fog blotted his goggles, but he was seeing through the eyes of McVeigh. Smack over the eastern boundary of the field, and 300 feet above the grass tops, the big ship suddenly slanted out of the clouds, and Jack waved a grateful arm.

Eyes for the "Blind"

Between the winter night when Jack Webster had joined the Caterpillar Club, and this spring morning when he landed through similar weather conditions with his hand on the stick, something had happened in the world of aeronautical science. Something had come into his cockpit to bolster the vagaries and limitations of the magnetic compass, and the frailties of human eyesight. A long-hoped-for scientific social event had taken place. The two swiftest mediums of modern social and business intercourse—the radio, fastest message exchange, and the airplane, fleetest physical transportation—had joined hands in commercial wedlock.

Of course some of the value of a radio beacon is lost if a flyer can't see his goal after the beacon has led him to it. So government scientists have devised two supplementary aids. The first, a radio gadget for fetching a blind pilot horizontally true over an unseen runway, has been developed through the co-operation of the Guggenheim Fund for the Promotion of Aeronautics and its famous pilot, borrowed from the army, Lieutenant James Doolittle. The details of the second aid are still secret at this writing. They will be announced in a scientific paper to be released by the Bureau of Standards in December. I am free to indicate only in a general way here the enormous step this aid

will represent toward the banishment of the last big hazard from commercial flying.

When the radio beacon (1) has guided the pilot of next year to his destination and the radio location-finder (2) has placed him horizontally true above the landing strip, he will fasten his eyes on the new radio landing device (3) and, gauging his glide by what he sees on this instrument, he will be guided automatically and without the least danger down to a gentle and normal landing on ground he possibly may not be able to see even after he has rolled to a stop on it, if the weather happens to be that thick.

However, the radio beacon and its auxiliaries are only a part of the story of the wonders and convenience that radio aloft will give to your travels from this year forward. Full radio service will be as casual a feature in commercial flying as it is in your home; complete radio equipment is now as regularly included in the equipment of military and commercial airplanes as

how when you settle back in your cabin chair. This will not interfere with the usual radio work up in the pilot's cockpit—the directional radio beacon, two-way telephony with ground stations and pilots in other planes and government weather observers, general dissemination and discussion of weather and other safety information, and the reception and dispatch of personal and business messages for you and the other passengers.

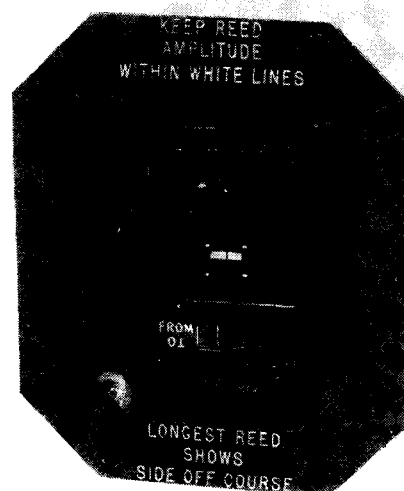
"Flying Telephone Booths"

This, mind you, is not visionary. Nor is it a forecast. It is an accurate description of the radio facilities already available or being installed on the airways of the United States. The Department of Commerce has seven beacons in operation today—one each at Bellefonte, Pennsylvania; Cleveland, Ohio; Des Moines, Iowa; Goshen, Indiana; Key West, Florida; New Brunswick, New Jersey, and Sterling, Illinois. Nine additional beacons will be available before July 1st of next year. Thirty-four ground stations are equipped for point-to-point communication, with fourteen indicated for early inauguration. From twenty-three points scattered across the continent, safety and weather information is broadcast to ships aloft; and nearly as many additional stations will be doing this important work before the middle of next year.

No carrier will dare embark on scheduled service without radio. The matter will not be left to his conscience, indeed. A law, originating in the Department of Commerce, is on its way. It will require every passenger-carrying ship to have radio receiving equipment. And every ship with a capacity of five and more passengers must carry both receiving and transmitting sets.

Yet there has been so much publicity given to radio in flying of late that the foregoing figures may not impress you. You expected more. You have read or heard of the demonstrations conducted in the so-called "flying telephone booths," wherein newspaper men and public officials have talked from aloft to their offices by means of radio telephony hooked up through land exchanges. However, there are only two or three of these flying telephone booths in existence. They have served as laboratories. Again, you have the impression that many of the planes in the post-Lindbergh school of stunt flying were equipped with radio. You read it. Specifically, you recall reading the last words flashed by Captain Erwin one night from far out over the Pacific—"We are in a tailspin."

But what you (Continued on page 50)



Courtesy U. S. Bureau of Standards

The visual beacon indicator: the two small white rectangles in the center vibrate, forming vertical lines which are even when the pilot is on his course

oil gauges and engine-speed indicators. Radio outlets on the instrument panel of the sport plane in which you commute to your country home, or make week-end and vacation trips with your family, will be as standard as electric light outlets in your living-room's baseboard.

Pay loads are still so thin that we have coöperation rather than throat-cutting on the airways. But just as soon as the carriers begin vying for patronage you'll find headphones at your el-

broadcast every fifteen minutes over the airways that clammy morning told him that Philadelphia and Hartford had closed down absolutely tight, as had every field behind him. He could not turn back, nor north, nor south. Hadley was his only chance.

But a ceiling of 350 feet at Hadley presents difficulties. Four miles to the northwest the Watchung Mountains present a 600-foot wall. Four miles to the west are the giant radio towers of station WJZ. Five miles southwest are the thirteen 400-foot masts of the Radio Corporation's transatlantic station. To glide through this interference in fog, by dead reckoning, might well be called risky. So Jack maintained plenty of altitude and waited for the exaggerated banging of the radio beacon in his ears that would tell him when he was directly above the field. And the drama underwent a lightning change of scene.

The drumming of a Liberty motor in the fog overhead had brought the ground crew of the National Air Transport hangar at Hadley Field tumbling out: "It's Webster!" John McVeigh, the crew chief, thought fast. Then he sprinted for the government radio shed, near by. The operators readily gave way to him.

"Jack—Jack—" he shouted into the mike. "Listen, Jack—you've just passed dead over the field, headin' east. Turn back."

All around the field men dropped their tasks and strained eyes and ears toward the down-pressing murk, wherein a muffled beat hung, like the distant pounding of his own pulse in a fevered



Some of Uncle Sam's experts said the note was genuine and others declared it to be a counterfeit

Making Money

By William G. Shepherd

The old-time counterfeiters were artists with hands AND brains. The newcomers need only brains. Cameras and other modern devices have taken the place of skilled fingers. Mr. Shepherd here tells the absorbing story of how the Secret Service has kept pace with the art of counterfeiting

THE "little museum" wherein the Secret Service Division of the Treasury Department has for many years been in the habit of keeping its captured scalps—in the shape of framed specimens of the clever handiwork of eminent counterfeiters, together with excellent portraits of the astute gentlemen themselves—has gone out of business.

It went out quietly. As the result of an order issued by the Chief of the Service, the doors of the little museum were forever closed to the public. And strangely enough, as they now tell the story in Washington, its passing is linked up directly with the greatest counterfeiting conspiracy in the history of the department. Here's the tale:

Quite a few years ago a small group of capable, intelligent, high-class artists—whose names will not be given here for the very same reason that their pictures are no longer on exhibition in the museum—came to the conclusion that they could turn out just as good-looking and, to all practical intents and purposes, just as serviceable a \$100 silver certificate as was then being manufactured by the United States Bureau of Engraving and Printing.

They got busy; chartered a house boat on the Ohio River. There, in that narrow, migratory dwelling, equipped with but a meager amount of necessary paraphernalia, they immediately went into direct competition with the greatest money-making monopoly in the world—the United States Treasury!

From the very beginning, almost, the business which this small group of artistic souls had conceived and launched, turned out to be a financial success. By

a combination of photographic and engraving methods, and with a hand press, these men made such an amazingly good counterfeit that they were soon on the high road to fortune.

They got rid of their product without difficulty; it passed as real money everywhere that it was presented, but just when abundant prosperity bulked large in the foreground—something happened.

An exceptionally astute individual got hold of one of the notes. It didn't look right or feel right; or at any rate, something was the matter with it, and he sent it to the Treasury.

At once an argument arose. Right there among Uncle Sam's experts there was a difference of opinion. Some said the note was genuine and others declared it a counterfeit.

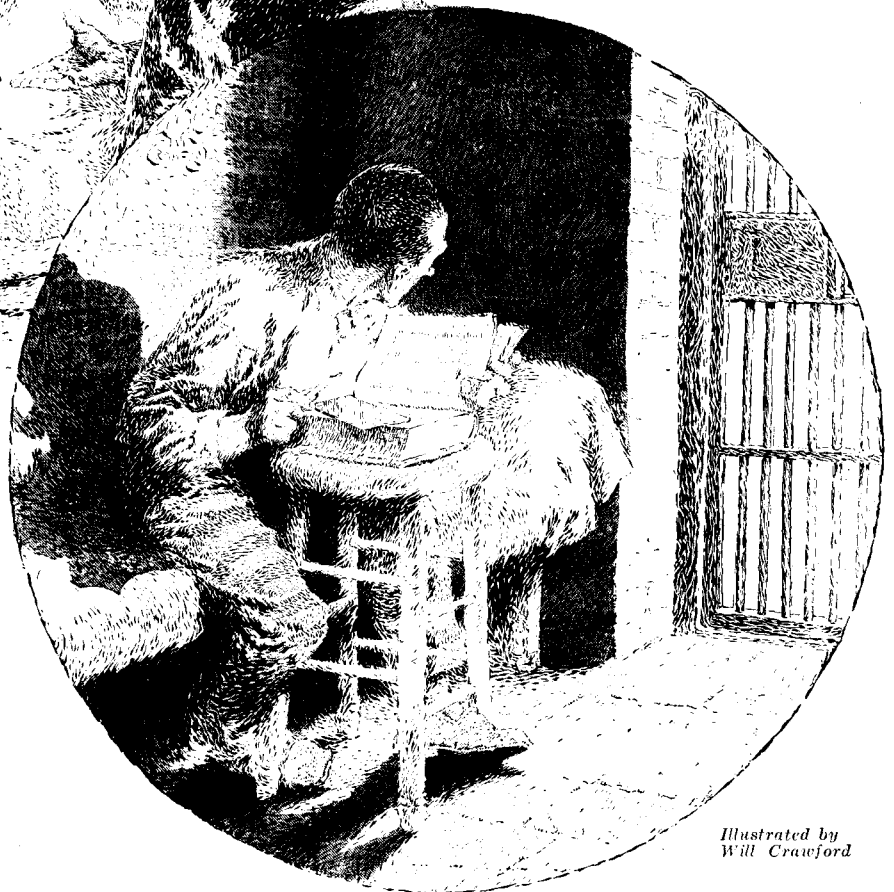
In the end, however, the nays had it; they proved that the bill was bogus and the chase for the makers of this new issue of Ohio River currency began.

It was a long, still hunt; it dragged out into months and in the meantime an alarming situation developed.

Drastic Measures Effective

The makers of this fraudulent \$100 silver certificate were very busy men. They worked their press overtime; because of the excellence of their notes they put them out into circulation with apparent ease, and therefore it was only a question of time, if they were not caught, or something else wasn't done about it, until they would have the country flooded with spurious money.

But something else *was* done about it. It was drastic, but it saved Uncle Sam's credit. The Secretary of the



Illustrated by
Will Crawford

He engraved the plates with tools smuggled into the prison

Treasury, in recognition of the excellent work of the counterfeiters, simply issued an order withdrawing the genuine \$100 silver certificate from circulation, and notifying all banks that thereafter they were to accept notes of that character only for collection, and were to send them all into the Treasury for verification.

Although this order was undoubtedly a compliment to their ability, it was certainly a deathblow to the industry which had been built up by the artists, and shortly thereafter they suffered another, and even worse, disaster. They got caught.

Now the manner in which these men were captured forms no part of this narrative. Sufficient unto the necessities hereof is the fact that thirteen months after the search for them began, the four men had been transferred from the narrow confines of their house boat to the still narrower confines of prison cells.

That was fine. The government rejoiced, and then, with no previous warning, a new counterfeit appeared.

It was a nice twenty-dollar note. It had all of the protective earmarks that the Bureau of Engraving and Printing could have put upon it and in the marts of trade it passed current.

In other words Uncle Sam now had a new competitor; at least he thought he had, but when his experts with their magnifying glasses hung by head-stalls before their languid eyes examined the new issue, they recoiled in startled amazement.

These new twenties, the experts could tell, were made by the same hand that had made the \$100 silver certificates.

But how could that be? How could a man locked up in the penitentiary be engaged in the manufacture of counterfeit money? And yet that was exactly

what one of the Ohio River gang was engaged in.

The Secret Service men traced the bills, located the "passer," found that he was a brother of one of the counterfeiters, gave him the third degree and the story, a perfectly simple one showing how simple is the art of money making, came out in full.

You Can't Keep a Good Man Down

The man in the cell, through an outside agent, had been supplied with a new twenty-dollar note and a couple of sensitized plates. With the point of a needle he had split the bill—which in itself is a rather delicate process—and thereafter, by laying the two faces of the note on his sensitized plates and exposing them to the shaft of sunlight which filtered into his cell, he had obtained a pair of perfect negatives.

To an expert engraver and printer the rest wasn't particularly difficult. When no one was watching, he engraved the plates with a tool that had been smuggled in to him. When that was finished he did his printing on paper brought to him by his own underground railroad.

Altogether it constituted the most audacious attempt at falsifying the currency that the government had ever had to deal with, but, as Uncle Sam found when he rushed the man to trial, the end was not yet!

The counterfeit twenties turned out from the prison cell had been manufactured by the counterfeiter at the suggestion of his lawyer, who wanted to show the government how easy it was for a skilled engraver to "make money"! Along with this demonstration came the demand that the prisoner be given his liberty in (Continued on page 48)