The autoplate machine turning out stereotype plates in a daily newspaper printing plant

How an Inventor Straightened Out a Labor Tangle

One Case Where a Labor-Saving Machine Went Into Use Without a Conflict With the Men

By James H. Collins

THE technical problems solved after five years' work, and the machine running. A great market waiting, and the first customer ready with his money. The invention finished and successful—but a labor difficulty standing in the way of its introduction.

Many inventions must bring a shifting and displacement of workers. This was that kind of invention—the autoplate, an automatic device for making stereotype plates used in printing newspapers. And this was the situation facing its inventor, Henry A. Wise Wood, some twenty years ago, when his first machine was ready for delivery on contract.

The labor problem is human, and so are inventors, usually. This inventor had the characteristic, and the problem was solved by straightforward human dealing, man to man.

If there was ever a period during his boyhood when he was not familiar with the mechanism of printing, Mr. Wood doesn't remember it. As a youngster he had his printing press, and later published the school paper. In studying engineering after that he had a definite purpose—to improve the printing art.

"At its opening, the nineteenth century boasted hand-made type, set by hand, and a wooden-screw hand press capable of printing two hundred 'sides' an hour," he says. "At its close, it had huge establishments turning out daily issues of many-paged newspapers well up in the hundreds of thousands of copies, printed by machines of incredible swiftness and accuracy. The twentieth century opened with a still greater demand for printing speed."

His first investigations were made in the field of book printing, but he quickly saw that the newspaper was the greatest vehicle for conveying information to the masses, and centered his attention upon newspaper manufacturing. A son of Fernando Wood, mayor of New York City in the fifties, he knew James Gordon Bennett, publisher of the *New York Herald*, and got permission to study the technical side of newspaper making in that journal's plant. The manufacture of newspapers, he found, involved three mechanical departments—the composing room where the type was set, the stereotype room where the printing capacity of the type was multiplied by casting from it curved semi-cylindrical printing plates, and finally the press room. In the composing room such in-

ventions as the linotype and monotype had substituted machine for hand labor, and in the press room there were giant perfecting machines that automatically turned out newspapers at the rate of 15,000 to 24,000 an hour. But stereotyping was still entirely a hand process. The papier-maché matrices were made, the hot type-metal poured, the castings cooled and trimmed by skilled mechanics, aided by practically no labor-saving devices. A newspaper like the *Herald* at that time required 400 stereotype plates for its daily edition, and 1700 for the Sunday issue. To make them, a great many stereotypers were employed. Between the final locking up of the type pages and the starting of the presses an hour and a half was required to make the plates and begin printing, where today, by means of this stereotyping machine, the whole battery of a great newspaper's presses is working in ten to fifteen minutes after the type forms are closed.

"The stereotyping department was like a single-track bridge connecting two sections of a four-track railroad," is the way the inventor expresses it, "and everything involved in the making of a newspaper had to be crowded over that bridge."

After some weeks' study of the different operations necessary in making stereotype plates by hand, he was confident that a machine could be built to do the work—so confident that he went to Mr. Gardner I. Howland, business manager of the *Herald*, with estimates of the

time that could be saved by such a machine. The newspaper man was interested at once. For already publishers vaguely sensed the remarkable expansion of both circulation and size that would be brought by the world war, and the need for machinery to meet it.

"What do you want me to do?" Mr. Howland asked.

"Give me an order for a machine," was the reply.

A contract was made, the *Herald* agreeing to accept and pay \$25,000 for a stereotyping machine, provided it made satisfactory plates, while the inventor was to bear all the cost of building such a device, and get nothing if it proved inadequate. Wood fitted up an experimental laboratory, hired machinists, and went to work in secret on the problem. It took five years to build the first autoplate, bringing it to a capacity of four stereotype plates a minute—later increased to eight. Two different sorts of mechanism were needed, one for the automatic casting of the plates and the other for trimming them to fit the cylinders of the presses.

When the device was ready for demonstration Mr. Howland was fascinated by its working—and also a little scared. There had lately been a strike over the installation of the monotype machine in the office of the *New York Sun*. This had been harmful to that paper. Mr. Howland was afraid that labor trouble would follow the installation of the stereotyping machine in the *Herald* plant. This contingency had been

foreseen by Mr. Wood and provided for in the contract, with the agreement that the *Herald* was to deal with any labor difficulty that might arise. When James Gordon Bennett was told that the new device was ready and that the labor difficulties were now up to him, he was even more apprehensive.

"I have done my work and carried out my part of the contract," said the inventor when Mr. Howland demurred at putting the machine into use. "Here is the machine. Most of my money is tied up in it. It is built to the *Herald's* page size, and can not be used by another newspaper. What are you going to do?"

Face to face, the difficulty looked formidable. Howland could only suggest that the matter be settled by Mr. Bennett, who was in Paris. The prospect of negotiating such a situation by cable was not very promising. After some discouragement and delay, Wood volunteered to shoulder the difficulty

First autoplate machine, installed in the *New York Herald* plant in 1901

himself, to the relief of both Howland and Bennett, who then agreed to accept and pay for the machine if it could be installed without labor trouble.

The inventor's first step was to let the New York stereotypers' union know, indirectly, that a machine to make newspaper stereotype plates had been perfected. This report made a stir among the stereotypers, who held a meeting and appointed a committee to get such information about the device as was obtainable. The only person who had seen the machine at that time, apart from the inventor and his workmen, was Mr. Howland. The committee of stereotypers believed that any information they secured would have to be got in roundabout ways. As soon as he heard of this action Wood wrote to the stereotypers' organization, saying in substance:

"You have heard that a machine has been invented to make stereotype plates automatically, replacing hand labor. The rumor is true. I am the inventor of the machine, and should like to meet your investigating committee."

The committee came to see him, and they had a very frank talk.

"Gentlemen, this is an age of machinery," said the inventor. "Work like yours, done by hand, is bound to be brought into the machine field sooner or later. I have invented the machine to do your work. If I hadn't done so, somebody else would have invented it. It is a machine that may displace large numbers of workmen at first, but like all other devices of the kind, it will eventually make a greater demand for labor. There is no case on record of workmen opposing machines by strikes, or otherwise, and winning against them. The machine always wins in the end. When there is a strike, there must eventually be a compromise. So I thought we might get together at the beginning and see if we couldn't have the compromise without the strike. The success of my machine depends partly upon yourselves. Take plenty of time, discuss matters, and let me know what suggestions you have for installing my machine on a basis that will be fair to yourselves as well as the *Herald* and me."

The stereotypers went away impressed by the inventor's frankness, as well as the force of his argument. After another meeting of the union the committeemen asked if they might see the machine. The request was granted. When they saw delicate stereotype printing plates turned out five times as fast as they could be made by hand they were apprehensive, naturally. But fear of losing their jobs was mingled with admiration for mechanism that did their work—there could be no better audience for such a machine.

Suddenly one of the committeemen propounded a question: "What are the men operating this machine—stereotypers?"

"No, they are machinists; not one of them has ever been in a stereotype room."

"Could machinists operate this machine, then?"

"Certainly—it has never been operated by anyone else."

"What do you pay your machinists?" asked the committeeman, and when told that they got \$2.75 for an eight-hour day, it was obvious to the visitors that possible rivalry with another trade was a factor in the situation to be dealt with. For stereotypers were then getting \$4.50 for six hours' work. The new machine could be both installed and operated by machinists, without stereotyping experience, at a little more than half the wages.

These meetings continued over several months, and finally out of the discussions grew an arrangement with the stereotypers' organization whereby the autoplate was to be installed in the *Herald* office, and operated by *Herald* stereotypers. Three men were enough to run the machine, but it was agreed that five should form the first crew. As money savings were effected for the *Herald*, it was agreed that the stereotypers should share in this economy. Moreover, the union made changes in its constitution that amounted to adopting the machine—the inventor believes this to be the first case in history of a union taking under its protection a new labor-saving invention. Should other newspapers want to install it, the union delegated two of its members to go into an office where the autoplate was working, and there learn its operation, being paid by the union. Members also agreed that they would operate the machine in ways to make it efficient, keeping it in good repair and condition.

Against the inventor's judgment, a steel fence had been built by the *Herald* around the machine when installed in the *Herald* office, and a sign forbade entrance except to the men actually working with it. Under Wood's supervision, work was taken gradually from the hand stereotypers, the autoplate making only a half dozen plates the first few nights, then a dozen, and so on, until at the end of several weeks it was

turning out more than half of the work. During that time the inventor was in the stereotype department every night, and became acquainted with every man personally. There was good feeling and confidence on both sides.

One evening, coming in about 10 o'clock, with his mechanical assistant, Wood walked into the cage and turned up the lights—only to turn them out again almost instantly. For one glance showed that his machine had been damaged. With a single lamp, guardedly they went over broken gears and working parts showing too plainly where they had been pounded with a heavy sledge. When a list of the broken parts had been made, the light was turned off.

"We must replace those parts and have everything running again tomorrow night," said the inventor to his assistant. "Phone the shop and start work at once."

Presently, stereotypers were coming in to work. The dark, locked cage attracted immediate attention. The machine had been jokingly dubbed the "iron horse."

"Why, what's the matter with the iron horse?" was asked.

"It isn't working tonight," Wood replied. "We had an accident on that last run this morning, and broke some of the gears. But we'll be all right again to-

Henry A. Wise Wood, inventor of the autoplate, demonstrating the working of the machine

morrow. Machinery will break down once in a while—I think we've been pretty lucky so far."

Fortunately, the *Herald's* stereotype force was still large enough to make all the plates required. One of the *Herald's* men was president of the union. After the paper had gone to press, Wood took him aside for a talk. He had already sensed something more serious than a breakdown. Who did the damage never transpired, but it was undoubtedly the work of outside hot-heads. Wood was confident that none of the *Herald* men had done the job, but pointed out to the union official that the machine must be protected. Should the *Herald* hire guards, or would the stereotypers themselves undertake this responsibility? The union official pledged the protection of his men.

The next morning Howland sent for Wood and showed him copy for an advertisement to be printed in the *Herald*, offering \$10,000 for information leading to the conviction of the stereotypers who, Mr. Howland said, had damaged the machine. This offer had been cabled from Paris when James Gordon Bennett learned of the trouble. The inventor insisted that the advertisement be suppressed, and as he was in charge of the labor situation, his wishes were respected. At first Mr. Howland refused to do it, saying that he must find the members of the *Herald* crew who had done the damage. To this Mr. Wood replied that he himself would vouch for the fact that the *Herald* men were

straight, loyal fellows who would not commit such an act.

"Leave the matter to me and forget it," finally said Wood to Howland.

"All right," assented Howland.

"Now, will you do me a favor?"

"What is it?"

"Take down that cage today, and the sign—I don't like them."

"What? I was going to put a police guard in it tonight! However, if you will take the responsibility, I'll pull down the cage."

"All right," said the inventor.

News of this advertisement and its suppression were not long in reaching the *Herald* stereotypers, who that night came to the inventor to thank him for intervening to save them from the suspicion such an advertisement would have cast upon them. The steel cage was taken down, and all were invited into the enclosure.

These steps improved good feeling to such a degree that there was never any more damage or trouble. Stereotypers saw that the autoplate was not a make-shift but a practical device. It had been pointed out to them that it would lighten their hot, heavy work, enabling them to use their mechanical skill and their heads to better advantage, becoming supervisors of machinery instead of working as machines themselves, and increasing their output and earning capacity. These promises were now realized. This union had always had excellent relations with employers, and was proud of its foresight in helping make the transition from hand to machine work instead of opposing it. In a few weeks all the *Herald's* stereotype plates were being cast by machinery, and delegates of stereotypers from other newspapers were working to acquire the experience needed to make the same transformation elsewhere.

There was practically no loss of employment. The growth of the *Herald's* work was so great, because of this machine, which made rapid publication so easy, that in a short time more stereotypers were employed in the *Herald* office than ever before. Once when a visitor asked the foreman how many men would be required to produce by hand the 2300 plates being made that night by 18 men, he calculated that it would require 75 at least.

From that day to this there has been only one strike against the autoplate, which occurred when the machine was first introduced in Europe. On that occasion the inventor went abroad and settled the difficulty in a few hours. He was invited to do this by union officials on the other side, and carried a letter from the stereotypers in this country.

When the first autoplate was installed in New York the stereotypers' union had about 200 members. Today it has 650 stereotypers and finishers at work, in addition to 350 electrotypers, a striking illustration of the fact that labor-saving machinery ultimately does increase employment by increasing output. Any prospect of going back to hand drudgery would be vigorously opposed by stereotypers themselves. In the old days a newspaper stereotyping room on hot summer nights came as near being an inferno as the stokehold of a steamer going through the Red Sea. It was nothing unusual for three or four men to be overcome by heat every night. Burns and strained muscles were common, and so was poisoning by lead and antimony fumes from the type metal. Today the "iron horse" does all this hot, heavy work automatically, casting stereotype plates from metal heated to 600 degrees, against the 750 degrees necessary in hand casting. Instead of lifting hot metal and plates, machine operators simply pull levers, and a newspaper stereotype room in summer is now as cool and pleasant as any other department of the plant. So this invention besides being useful was merciful as well.

Alfalfa

AS a result of investigations, an account of which is contained in the *Journal of Agricultural Research* for July 15, 1921, Messrs. R. A. Oakley and H. L. Westover, of the Bureau of Plant Industry, Washington, D. C., conclude that it is the day-night relation of alfalfa and not their reaction to temperature that causes the development of marked differences between the seedlings of the various varieties when seed is sown at certain times of the year. By the proper control of the length of day, which can be accomplished in the greenhouse at any time of the year with little trouble or expense, and by the method used in the authors' experiments, it is easily possible to distinguish between seedlings of the commercial groups of alfalfa. The tests can be so quickly and easily made that the method is offered especially to Experiment Station workers and those engaged in alfalfa-seed certification work as a means of assisting in the identification of the various lots of seed.