INSTRUCTION CARD FOR METHOD OF OPERATION
Corona Typewriter Company, Inc.

Date Issued 8 - 15 - 1920. 2 Dep't age Part No. 2X1
Operation No. 5 Name MILL CORNER GROOVES.
Time allowed at 100% efficiency for 100 pieces .37 minutes Rate paid for 100 pieces $.20
Output required at 100% efficiency 270 pieces per hour. Earnings at 100% efficiency $.54 per hour
Time allowed on route board for 1000 pieces at 80% efficiency 4.63 Hours

DETAIL OF METHOD OF OPERATION	100% TIME ALLOWED
OPERATOR WORKS STANDING UP.	
1. PICK UP SIX PIECES WITH BOTH HANDS. LOCATE PIECES ON FIXTURE, SIMILAR ENDS SAME WAY. BE SURE PIECES LOCATE ON PINS AND ARE DOWN TO BOTTOM.	.22
2. LOWER FIXTURE CLAMP WITH LEFT HAND, TIGHTEN LOCK NUT WITH SOCKET WRENCH IN RIGHT HAND.	.14
3. RUN TABLE FORWARD WITH LEFT HAND AND THROW IN FEED WITH RIGHT HAND.	.05
4. CUT. WHILE CUT IS BEING MADE, REMOVE PIECES FINISHED IN PREVIOUS LOAD FROM PAN OF KEROSENE AND PLACE IN RACK ON TABLE.	.40
5. RUN TABLE BACK WITH LEFT HAND.	.11
6. LOOSEN LOCK NUT WITH SOCKET WRENCH IN RIGHT HAND.	.07
7. REMOVE PIECES WITH BOTH HANDS AND PLACE IN PAN OF KEROSENE ON TABLE.	.09
8. CLEAN FIXTURE THOROUGHLY WITH AIR.	.165
REST ALLOWANCE @ 5%	.0622
MACHINE AND TOOL DELAY ALLOWANCE @ 2%	.0249
(NOTE--PAN CONTAINING KEROSENE LOCATED ON TABLE PLACED PARALLEL WITH MACHINE TABLE.)	
TOTAL TIME ALLOWED FOR SIX PIECES	1.3321 MIN

Inspection Instructions: WALKING INSPECTOR--(INSPECT SAMPLES FREQUENTLY) MEASURE WIDTH OF SLOTS-SCALE: GAUGE DEPTH OF SLOTS AT EACH END-G.#1509 OR #2271: GAUGE DISTANCE BETWEEN SLOTS-G. #347: GAUGE DISTANCE OF SLOTS FROM CORNER POST HOLES-G. #342: SEE THAT CUTTERS DO NOT LEAVE LARGE BURRS.

NOTE—OPERATORS WILL NOT BE PAID FOR WORK REJECTED BY INSPECTORS ON ACCOUNT OF DEFECTIVE WORKMANSHIP.

If operation or instructions can not be performed as outlined or changes are required, notify the methods Division of the Planning Department immediately.

Method Approved C. T. HIGGINS Date 8-14-20.
Rate and instructions approved J. P. SPEARS Date 8-14-20.
Instruction Div.

Fig. 6. Instruction Card for Operations, Front.

MACHINE AND SET UP INSTRUCTIONS

Machines (on which job can run piece work) 030401 - 030404

Emergency machines (on which job can be run, but not on piece work) NONE

Location of finished work IN RACK ON TABLE, PARALLEL WITH MACHINE TABLE.
Location of unfinished work " " " " " " " "
Condition in which work will come to job CLEAN AND FREE FROM CHIPS, AS LEFT BY PREVIOUS OPERATION.
Material Kind ROLLED STRIP ALUMINUM. Thickness .162" Width 2.730" Grade 2S
Number of machines run by operator ONE Lubricant used COMPOUND How used PUMP
Spindle Speed 860 R. P. M. Feed 44" P. M. Frequency of sharpening Tools
Tools located in tool Crib No. #10

All Tools, Equipment and gauges required (Give all Tool numbers)

1 FIXTURE #207
1 CUTTER ST275
1 " ST276
1 SOCKET WRENCH ST--
AIR CONNECTIONS
2 STEEL TABLES
1 DRIP PAN (FOR MACHINE TABLE)
1 RUBBER HOSE (TO DRAIN DRIP PAN)
1 " " (" " MACHINE TABLE)
PAN OF KEROSENE
1 GAUGE #1509-2271
1 " 347
1 " 342

INSTRUCTIONS FOR SET UP OF JOB

TOTAL TIME ALLOWED AT 100% EFFICIENCY HOURS RATE PAID PER HOUR AT 100% EFFICIENCY — 100% TIME ALLOWED

METHOD OF SET UP NOT STANDARDIZED.
SUPERVISOR OR SET UP MAN WILL SEE THAT ALL TOOLS, GAUGES ETC., ARE AT THE MACHINE: THAT SPEED AND FEED IS CORRECT: THAT WORK IS AT THE MACHINE: THAT QUALITY TURNED OUT IS CORRECT, BEFORE AN OPERATOR IS ASSIGNED TO THIS JOB.

TOTAL TIME ALLOWED

Fig. 7. Instruction Card for Operations, Back.

Materials. Under this classification we have two important records—part list and material specifications. The part list, as its name implies, gives the part number and name of all parts and sub-assemblies. The material specifications are cards made out in the record section of the methods division from information received from the experimental and designing department and from the production equipment engineering department, the former furnishing data as to size, kind and grade of material, and the latter, the number of pounds required to make one thousand parts, the nature of the material—whether strip, coil, rod, etc. and the lengths that shall be bought for strip, rod or bar stock. These specifications are used by the methods division and stores division of the planning department and by the purchasing department.

Machine Burden Record. In this record we list all production machinery by department and by machine number, grouping machines in classes according to the work which they perform. Each group of machines is given a code number by the production equipment engineering department and this code number readily identifies each machine by department and classification. Inasmuch as we use Hollerith tabulating machines for compiling factory information, we cannot use the combination of alphabet and numeral, but must use numerals only. Suppose we have a punch press numbered 140101. The first two digits show that the machine is in department No. 14, the next two digits indicate the classification (in this instance a No. 10 Bliss punch press) and the last two digits show that it is machine No. 1 in the classification. If a machine were numbered 140102 it would show that it is machine No. 2 in the same department and classification as the one above, while a machine marked No. 160103 would be the same kind of a press located in department No. 16 and being No. 3 of the series. The record also gives the average time required for performing each manufacturing operation on one hundred parts and this figure is corrected quarterly, using the efficiency record for the last quarter. When methods are changed the record is immediately changed without waiting for the quarterly period.

The record is kept up-to-date by the record section

RECORD OF EMPLOYEE'S EFFICIENCY ON WORK COMPLETED
CORONA TYPEWRITER COMPANY, INC.
An efficiency of at least 80 per cent is expected from experienced operators, and operators failing to reach this standard will not be considered satisfactory.

Date 8-29-1920 Dept. No. 2

Clock No.	Operator's Name	Part No.	Oper. No.	Operation Name	Order No.	Method of Wage Payment P / D	Reason for Day Work or Extreme Efficiency	Quan. Comp.	100% Time Allowed per 100 Pieces	Total Hours Taken for Lot	Rejections: Paid for Q'ty	Reason	Not Paid for Q'ty	Reason	Scrap Produced	Total Quan. Pd. For	% Labor Eff.	Time Taken per 100 Pieces	100% Time Allowed for Lot
57	Baird	2X1	4	Profile Top	6844	✓		979	1.32	12.61						979	102.		12.92

Fig. 8. Record of Employee's Efficiency on Work Completed.

of the methods division, although used primarily by the control board section in planning their work on the control board. The information is essential to the control board section, both because it gives operation time and because it enables it to allocate work to machine groups and thus equalize the production demand on all machines in the group.

(c) Research to Secure Standards

Time Study, Instruction Cards and Performance Records. Before any work can be done by the instruction card section of the methods division a routine instruction card must be made out for the part that is to be studied and standardized. This is done from information received from the experimental and designing department and the production equipment engineering department. The card has been described elsewhere. The methods section then furnishes the instruction card section with all of the necessary data as to the proper methods of manufacture to be followed, and with this information available they proceed to make the time study observation. For this purpose a time study observation sheet is used (Fig. 5). After the time study man has determined the rate which he feels is satisfactory and up to standard, he presents his conclusion and supporting data on the proposal sheet. This sheet gives all of the information necessary to enable the head of the planning department and the works manager to pass on the proposed rate, and upon their approval the instruction card, showing the method of operation, is issued (Figs. 6 and 7). The standard having been set and the operator having been instructed to perform the work according to the instruction card, and the piece rate being established by the issuing of the card with the work, the operator is rung in on an operation cost ticket and completes the lot assigned to him. Upon completion of the work the operation cost ticket accompanies the work to the planning center, the time is recorded, inspection made and rejections recorded and the planning center clerk posts the accomplishment on the record of the employee's efficiency on work completed (Fig. 8). This record is made out in duplicate, one copy being sent to the department supervisor to be posted in the department if desired, and the other is sent to the record section of the methods division. From the record of employee's efficiency, the record section posts operation efficiency, and operators efficiency records (Figs. 9 and 10), which are always available for the purpose of comparing earnings of individuals, relative efficiency of operators on the same operation, and other information of similar nature. Probably the greatest value of the two records is in furnishing information to the methods division as to the relation of accomplishment to theoretical standards.

It sometimes happens that piece work operations have to be run day work because, although the operation ticket is stamped "Piece Work," the supervisor finds that he cannot, in fairness to the operator, run on piece work. This may be occasioned by the fact that an operator is a learner; that the wrong class of labor is employed, as for example, a man on a woman's job; that piece work has been temporarily suspended because of changes in previous operations or part design; or some other cause of a like nature. In such cases, change to day work is made on approval of the works manager. Occasionally in order to secure balance of production, we are obliged to transfer a man from one operation or job to another. In such cases, where there is sufficient work ahead of the man on his regular job and he is transferred because of his special knowledge of another job, but may not be a high efficiency man on that job because of lack of recent practice, we provide a special method of compensation so that he will not be penalized for his greater value to the company. It may also happen that changes in design cause the temporary suspension of piece rates through no fault of the operator and we feel that he or she should be compensated fairly during the time that the job is under time study observation for change. In all of these cases the supervisor requests a special hourly rate for the operator and, if granted by the works manager, a special hourly rate card is made out on which a rate is given based on the last four weeks average piece work earnings of the operator. This card is in two parts, is sent to the works manager for approval, then the upper part is sent to the cost department and the lower part to the depart-